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A Study to Assess Depression, Anxiety, Loneliness and Internet Addiction among College Students Using Internet in Selected College, Chennai

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Abstract

A study to assess depression, anxiety, loneliness and internet addiction among college students using internet in selected colleges, Chennai. Majority of the participants were males, were 20 years old, residing in urban community, used their mobile for internet services, used internet first time in the school, spent more than 4 hrs/day on internet, spend Rs. 300/- per month and use the internet for study, online purchase,whats app & face book, you tube. Majority of the participants had mild level of internet addiction. Equal number of participants had mild, borderline and moderate level of depression (16.3% each). Minority of them reported extreme depression. Majority of the participants had mild anxiety and minority had severe anxiety. Majority of the participants had mild level of loneliness and minority had moderate level of loneliness. Source of internet, browsing duration/day and amount spent for the internet are significantly associated with internet addiction. Browsing duration/day is significantly associated with depression.

Keywords: Depression, anxiety, loneliness, internet addiction.

Introduction

Internet is an exciting new medium that is evolved as an essential part of everyday humans life all over the developing state, country and world. It has opened a domain to social interactivity with the promise increasing efficiency and worldwide understanding. Though device primarily facilitates research, information seeking interpersonal communication and business interaction, for some internet users its has become the central focus for their lives and a temptation that is hard to resist.

There has been an uncontrolled growth in the use of internet not only in India but also worldwide. Internet has become the most essential part of our daily life. ⁽¹⁾ It is being used extensively throughout the world, especially among adolescents and youth. It has become a problematic use and also associated with various psychological and physical symptoms. Internet is used for education, entertainment, social networking and information sharing.⁽²⁾

Statement of the Problem: Assessment of depression, anxiety, loneliness and internet addiction among college students using internet in selected colleges, Chennai

Objectives:

- To assess depression, anxiety, loneliness and internet addiction among college students using internet in selected colleges in Chennai.

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- To associate depression, anxiety, loneliness and internet addiction among college students using internet with their demographic variables.

Materials and Method

Research Approach: A descriptive approach was considered appropriate for the study.

Research Design: The research design chosen for the study was non experimental descriptive research design.

Research Setting: The study was conducted in a private university, Chennai.

Population: The population of the present study includes adolescents age about 18 to 22 years were studying in vels university.

Sample: Third year students of Electrical and Computer Engineering (ECE) and Electrical and Electronics Engineering (EEE).

Sample Size: Sample size was calculated using the formula $n = 4pq/d^2$ ($p = 82.47\%$). The sample size was 98.

Sampling Technique: Convenient sampling technique will be used.

Sampling Criteria:

Inclusion Criteria:

- Samples between the age group of 18 to 22 years.
- Willing to participate in the study.
- Able to understand and speak Tamil or English.
- Available at the time of data collection.

Study Instruments: Demographic data, Beck's Depression Inventory, Generalized Anxiety Disorder Assessment, Original Internet Addiction Test(IAT) and Revised UCLA Loneliness Scale.

Data Collection Procedure: The investigators questionnaires to the sample. The sample were instructed to fill the data. Each sample will take 30 minutes for completion of their data.

Findings: Majority of the participants were males (66.3%), age 20 years old (51.0%), residing in urban community (87.8%), used their mobile for internet services (71.4%), used internet first time in the school (39.8%), spent more than 4 hrs/day on internet (59.2%),

spend Rs. 300/- per month (40.8%) and use the internet for study, online purchase, whats app & face book, you tube (42.9%).

Majority of the participants had mild level of internet addiction (43.9%) and 36.7% had moderate level of internet addiction. Majority of the participants did not have depression (33.7%). Equal number of participants had mild, borderline and moderate level of depression (16.3% each). 13.3% reported severe depression and 4.2% extreme depression. Majority of the participants had mild anxiety (37.8%). 31.6% had no anxiety. 28.6% had moderate anxiety and 2% had severe anxiety. Majority of the participants had mild level of loneliness (75.5%) and minority had moderate level of loneliness (4.1%). Source of internet, browsing duration/day and amount spent for the internet are significantly associated with internet addiction ($p=.031, .005, .017$ respectively). Browsing duration/day is significantly associated with depression ($p=.023$).

Discussion

Majority of the participants had internet addiction, had depression, anxiety and loneliness. Similar findings were reported in the earlier studies.^{3,4,5,6}

Conclusion

Internet is a useful media which has to be used with caution as it can lead to be an addiction.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 04-02-2019.

Reference

1. Sachin R Gedam, santanu ghosh, lipsy modi. study of internet addiction prevalence, pattern and psychopathology among health professional undergraduates, 4th ed. Maharashtra, India: Sachin R gedam; 2017.
2. Arvind goyal, Sachin R gedam, Himanshu Mansharamani. study of internet addiction pattern and psychopathology among health professional undergraduates, 4th ed. Maharashtra, India: Sachin R gedam; 2017.

3. Ganesh A. Self-Reported Behaviour about Internet Addiction among Medical and Paramedical Students. *Journal Of Clinical And Diagnostic Research*. 2017; 11(10).
4. Bahrainian S, Alizadeh K, Raeisoon M, Gorji O, Khazae A. Relationship of Internet addiction with self-esteem and depression in university students. *Journal of Preventive Medicine and Hygiene*. 2014;55(3):86–89.
5. Musarrat A. The Relationship between Internet Addiction and Anxiety among students of University of Sargodha. *International Journal of Humanities and Social Science*. 2014;4(1):288-292.
6. Sharifpoor E, Khademi M, Mohammadzadeh A. Relationship of Internet Addiction with Loneliness and Depression among High School Students [Internet]. 2017 [cited 3 July 2019]. Available from: <http://article.sapub.org/10.5923.j.ijpbs.20170704.01.html>

Early Identification of Proteinuria by Using Urine Dipstick among Patients with Type II Diabetes in Selected Community Area, Kanchipuram Dist., Tamil Nadu, India

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Abstract

Early identification of Proteinuria by using urine dipstick among patients with Type II Diabetes in Selected Community Area, Kanchipuram Dist, Tamil Nadu, India. The objectives of the study to assess the Proteinuria by using urine dipstick among Patients with Type II Diabetes. To find out the association between level of Proteinuria with selected demographic variables among Patients with Type II Diabetes.. The sampling technique was non probability- purposive sample technique and the sample size was 200. The demographic variable proforma and the random urine dipstick analysis were done to identify the prevalence of proteinuria. The interpretations were nil, trace, 1+, 2+ and 3+.. Hypothesis were formulated. The level of significance selected was $p < 0.05$. The data was collected and it was analyzed by descriptive and inferential statistics. It presented through tables and figures. The study finding revealed that (47%) of patients were not having proteinuria. Then (38.5%) were having trace, (12%) of patients having 1+, (1.5%) having 2+ and (1%) patients were having 3+ of proteinuria. The study finds also revealed that there was a significant association between the demographic variables such as age $X^2=8.4120$, educational status $X^2=6.8901$, monthly income $X^2=10.9762$, occupational status $X^2=4.9031$, history of diabetes $X^2=12.14$, previous blood glucose level $X^2=0.9876$, family history $X^2=5.1056$, unhealthy habits $X^2=10.74$ were non significant to $p < 0.05$ were as, marital status $X^2=16.428$, dietary pattern $X^2=17.594$ were significant to $p > 0.05$ with the level of prevalence of proteinuria among type II diabetes patients.

Keywords: Early identification, proteinuria among type II diabetes patients, dipstick test.

Introduction

Background of the Study: Diabetes Mellitus is a metabolic syndrome that manifests with elevated blood glucose levels. The onset of diabetes heralds a drastic and permanent change in the lifestyle of the affected

child, as well as the entire family unit. Type 1 diabetes is a complex disease requiring insulin administration in conjunction with a structured meal plan that should take into consideration social, economic, cultural and logistical factors, so as to achieve optimal disease control. Microalbuminuria (defined as urinary albumin excretion of 30-300 mg/day, or 20-200 $\mu\text{g}/\text{min}$) is an earlier sign of vascular damage⁽¹⁾. It is a marker of general vascular dysfunction and nowadays is considered a predictor of worse outcomes for both kidney and heart patients.

There is a significant correlation between Diabetes and proteinuria. Even high blood glucose is associated with significant higher frequency of microalbuminuria and this way may be a biomarker of increased cardiovascular risk. Microalbuminuria could be taken

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also, as an indicator of insulin resistance and of the increased renal and cardiovascular risk associated with metabolic syndrome. Renal involvement is a pivotal development in diabetes and microalbuminuria is generally the first clinical sign of renal dysfunction in diabetics. It is demonstrated that cardiovascular and renal risk is elevated even in the high normal range of microalbuminuria (below 30 mg/day). There is no doubt that therapies that prevent or delay the development of microalbuminuria and all measures that reduce it, may help to prevent or delay end organ damage⁽⁵⁾.

In developing countries like India, the cost of doing an albumin-to-creatinine ratio in a random sample is \$5.60 U.S. (INR 250), while 100 patients can be screened for albuminuria by a dipstick at the cost of \$9.80 U.S. (INR 439). A repeat test is, however, essential in positive cases to ascertain the presence of microalbuminuria or proteinuria. The cost efficiency and the high sensitivity and specificity of the urine dipstick test will encourage its use among primary care physicians and private practitioners as a diagnostic tool for microalbuminuria and proteinuria. This would initiate the first step toward detection of incipient diabetic nephropathy in developing countries.⁽⁶⁾

Vilas U. Chavan et al (2010) were conducted A Comparative Study Of Clinical Utility of Spot Urine Samples with 24-h urine albumin excretion for screening of microalbuminuria in type 2 diabetic patients. He suggested that a higher proportion of individuals with type 2 diabetes are found to have microalbuminuria and overt nephropathy shortly after the diagnosis of their diabetes⁽³⁾.

Need for the Study: Diabetes is widely recognized as an emerging epidemic that has a cumulative impact on almost every country, age group and economy across the world. According to the International Diabetes Federation, in 2015, approximately 415 million people were suffering from diabetes worldwide and this number is expected to exceed 640 million by the year 2040. It is estimated that half of patients with diabetes are unaware of their disease and are thus more prone to developing diabetic complications. However, the cost of dealing with diabetes can be unaffordable in terms of money spent and lives lost. In 2015, approximately 5.0 million deaths were attributed to diabetes, albeit in the same year, more than 12% of the global health expenditure was dedicated to coping with the disease and its complications. Diabetes complications are common among patients with type 1

or type 2 diabetes but, at the same time, are responsible for significant morbidity and mortality⁽²⁾.

The chronic complications of diabetes are broadly divided into microvascular and macrovascular, with the former having much higher prevalence than the latter. Microvascular complications include neuropathy, nephropathy and retinopathy, while macrovascular complications consist of cardiovascular disease, stroke and peripheral artery disease (PAD)⁽⁴⁾. Diabetic foot syndrome has been defined as the presence of foot ulcer associated with neuropathy, PAD and infection and it is a major cause of lower limb amputation. Finally, there are other complications of diabetes that cannot be included in the two aforementioned categories such as dental disease, reduced resistance to infections and birth complications among women with gestational diabetes.

Statement of the Problem: Early identification of Proteinuria by using urine dipstick among patients with Type II Diabetes in Selected Community Area, Kanchipuram Dist, Tamil Nadu, India.

Objectives:

- To assess the Proteinuria by using urine dipstick among Patients with Type II Diabetes.
- To find out the association between level of Proteinuria with selected demographic variables among Patients with Type II Diabetes.

Operational Definition:

Urine Dipstick Test: A urine test strip or dipstick test is a basic diagnostic tool used to determine pathological changes in a patient's. These strips are a fast and easy means to testing one's urine sample. In this study, Micral dipstick test is used to identify the proteinuria.

Proteinuria: The presence of abnormal quantities of protein in the urine, which may indicate damage to the kidneys.

Type II Diabetic Mellitus: Diabetes mellitus type 2 (also known as type 2 diabetes) is a long-term metabolic disorder that is characterized by high blood sugar, insulin resistance and relative lack of insulin. Type 2 diabetes primarily occurs as a result of obesity and lack of exercise.

Early Identification: To recognize a problem, need, fact, etc. and to show that it exists.

Research Methodology

A quantitative approach with descriptive design was used in study. The study was conducted among type II diabetes patients in Poonjeri. A Convenient sampling technique was used to select 200 samples with the following inclusion criteria. Patient who all are having diabetes more than three years, who are all present during data collection, who are able to read and understand English and Tamil. The data was analyzed by using descriptive and inferential statistics.

Data Collection Procedure: The study was conducted in Poonjeri after the written permission from the authorities, 200 Samples were selected, using convenient sampling technique who are willing to participate to study. The objective of the study was explained and informed consent was obtained from the samples. Demographic data were obtained from each sample and random urine sample was collected to identify proteinuria by using urine dipstick test. The investigator thanked the participants for their cooperation throughout the data collection period.

Plan for Data Analysis: The data of the present study was planned to be analyzed based on specific objectives. The data obtained from 200 samples were analyzed by using descriptive and inferential statistics as follows.

Descriptive statistical method such as frequency and percentage was used for describing demographic variables.

The association between the level of prevalence of proteinuria among type II diabetes patients with the selected demographic variables was analyzed by inferential statistical method (i.e.) Chi square test.

Results and Discussion

The discussion is presented as follows:

1. Frequency and percentage distribution of demographic variables among type II diabetes patients.
2. Frequency and percentage distribution of level of proteinuria among type II diabetes patients.

3. Association between demographic variables with level of prevalence of proteinuria among type II diabetes patients

1. Frequency and percentage distribution of demographic variables among type II diabetes patients:

The study showed that most of the patients were in the age group of 51-60 years. Majority of them (93%) were belongs to married. Majority (27%) of the patients were having diabetes for about 10 years. (43%) of the patients were earning monthly income as 5,000-10,000. Majority (55.5%) of the patients are having family history of diabetic mellitus. And the table shows that most of the patients were in the group of no unhealthy habits about 47.5%. Most of the patients (37%) were non literature. Majority (39%) of the patients were sedentary workers. Majority of the patients were belongs to (44%) 250-300 mg/dl of previous blood sugar test level. (93.5%) were taking to mixed diet.

2. Frequency and percentage distribution of level of proteinuria among type II diabetes patients

S.No.	Level of Proteinuria	Frequency	Percentage
1	Nil	94	47%
2	Trace	77	38.5%
3	1+	24	12%
4	2++	3	1.5%
5	3+++	2	1%

Table 1: Shows that the majority of patients (47%) were not having proteinuria. Then (38.5%) were having trace, (12%) of patients having 1+, (1.5%) having 2+ and (1%) patients were having 3+ of proteinuria.

3. Association between demographic variables with level of prevalence of proteinuria among type II diabetes patients:

Demographic variables like age $X^2=8.4120$, educational status $X^2=6.8901$, monthly income $X^2=10.9762$, occupational status $X^2=4.9031$, history of diabetes $X^2=12.14$, previous blood glucose level $X^2=0.9876$, family history $X^2=5.1056$, unhealthy habits $X^2=10.74$ were non significant to $p<0.05$ were as, marital status $X^2=16.428$, dietary pattern $X^2=17.594$ were significant to $p>0.05$ with the level of prevalence of proteinuria among type II diabetes patients.

Conclusion

A study to assess the knowledge on maternal and child Health services among women in reproductive age group in mahabalipuram, Kanchipuram District,

Tamil Nadu, India. A total of 200 samples were selected by using convenient sampling technique. The level of proteinuria was assessed from random urine sample by using urine dipstick. The collected data were analyzed by using the descriptive statistic and inferential method. The study showed that majority of patients (47%) were not having proteinuria. Then (38.5%) were having trace, (12%) of patients having 1+, (1.5%) having 2+ and (1%) patients were having 3+ of proteinuria.

Ethical Clearance: In this study researchers have got prior permission to conduct the study and got informed consent from each participant. We ensured that no physical harm to the samples. Confidentiality maintained.

Source of Funding: Self funding.

Conflict of Interest: Nil

References

1. Adler AI, Stevens RJ, Manley SE, Bilous RW, Cull CA, Holman RR, et al. Development and progression of nephropathy in type 2 diabetes: The United Kingdom Prospective Diabetes Study (UKPDS 64) *Kidney Int.* 2003;63:225–32. [PubMed]
2. Mogensen CE. Microalbuminuria predicts clinical proteinuria and early mortality in maturity-onset diabetes. *N Engl J Med.* 1984;310:356–60. [PubMed]
3. Reutens AT, Prentice L, Atkins R. The epidemiology of diabetic kidney disease. In: Ekoe J, editor. *The Epidemiology of Diabetes Mellitus.* 2nd ed. Chichester: John Wiley & Sons Ltd; 2008. pp. 499–518.
4. Sarika A. Renal function in diabetic nephropathy. *World J Diabetes.* 2010; 1:48–56. [PMC free article] [PubMed]
5. Viberti GC, Hill RD, Jarrett RJ, Argyropoulos A, Mahmud U, Keen H. Microalbuminuria as a predictor of clinical nephropathy in insulin-dependent diabetes mellitus. *Lancet.* 1982; 1:1430–2. [PubMed]
6. Vrhovac B, Jakšić B, Reiner Ž, Vucelić B. *Interna Medicina.* Zagreb: Republic of Croatia; 2008. pp. 1258–9.

Assess the Prevalence and Identify the Risk Factors of Hypertension among Adults Residency in a Selected Rural Community, Kanchipuram District, Tamil Nadu, India

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Abstract

A study to assess the prevalence and the risk factors of hypertension among adults residing in a selected rural community, Kanchipuram District, Tamil Nadu. The objectives were to assess the prevalence of hypertension among adults and to find out the association between the selected demographic variables and the risk factors for hypertension. A Sample of 30 adults who fulfilled the inclusion criteria were selected for the study. An extensive review of literature and guidance by experts formed the foundation to the development of the study. The data collection tool was validated & reliability was established. The data collection for the study was done. The collect data was tabulated and analyzed. The prevalence of rate of hypertension was 30. In that, 20% were males and 10% were Females. The association between the demographic variables like Obesity, Excessive salt intake, Alcoholism, Smoking, Physical Inactivity was related with the risk factors for hypertension among adults. It showed that there was a significant difference between the risk factor with a Age-28.2, Education-22.14, Family status-14.44 and there was no significant difference the risk factors with Sex-8.59, Dietary Pattern-9.89 at the P value <0.05 level of significant.

Keywords: Assess, Hypertension, Adult, Prevalence, Risk Factor.

Introduction

“One way to get hypertension is to go mountain climbing over Mole hills”
—Earl Wilson

According to WHO (2013) Hypertension is an important public health problem in both economically developed and developing nations. Hypertension was defined as a systolic BP equal to or above 140 mmHg and/or diastolic BP equal to or above 90 mmHg¹. JNC

VII has proposed another definition of hypertension. According to JNC VII, hypertension was defined as systolic BP level of ≥ 140 mmHg and diastolic BP of ≥ 90 mmHg. The JNC VII defined normal BP as a systolic BP < 120 mmHg and diastolic BP < 80mmHg. The area between systolic BP of 120-139 mmHg and diastolic BP of 80-89 mmHg is defined as “prehypertension”².

They suggested prevalence rate for hypertension in Indian to be 29-45% in men and women 25-38%. previously identified risk factors for hypertension in Indians include higher body mass index, abdominal obesity, greater age, greater alcohol consumption sedentary lifestyle and stress³. Hypertension is one of the leading risk factor for cardiovascular disease and the prevalence of hypertension has been increasing all over the world⁴. We also report the prevalence of other cardiovascular disease risk factors, such as Obesity, Cholesterol, Triglycerides and HbA1c and their association of blood pressure⁵.

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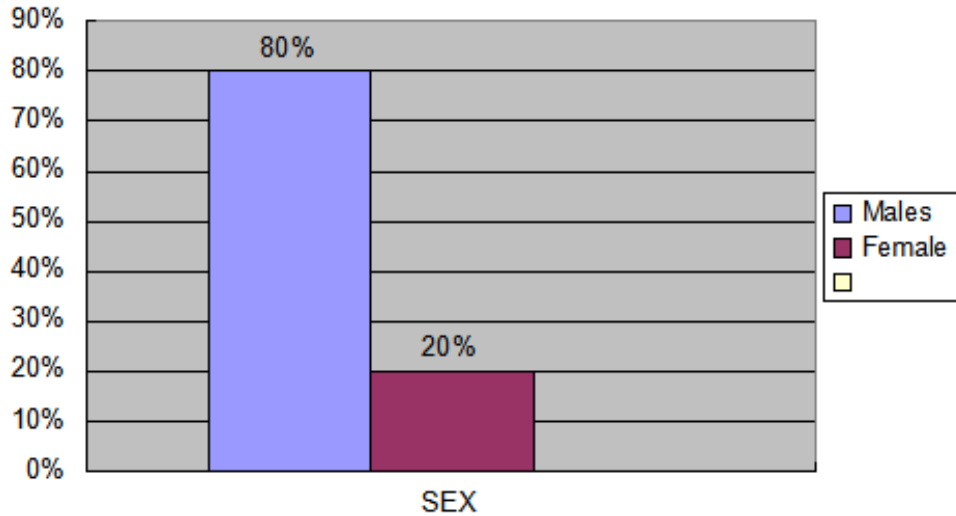
Methodology

A Descriptive research approach with Non experimental descriptive design. The Study conducted in Community area in Kanchipuram District, Tamil Nadu. The target population is adult's age of 25-65 years. The accessible population in the present study will be adults

who are suffering from Hypertension in a selected area in Kanchipuram District Tamil Nadu. Non Probability-purposive sampling technique will be adopted for this study. Adults who have age above 25-65 years who full fill the inclusion criteria.

Results

Section-A: To assess the prevalence of hypertension among adults.



Section-B: To find out association between the selected demographic variables such as Age, Sex, Education, Dietary Pattern, Family Status and the risk factors for hypertension.

The study revealed that to assess the prevalence of hypertension among adults. 30% was the prevalence of hypertension 20% was Males. 10% was Females. The study findings revealed that the study was to find out the association of demographic variables such as Age, Sex, Education, Dietary pattern, Family Status & Risk factors among adults, The finding shows that the χ^2 value of Age is 28.2 The finding shows that the χ^2 value of Sex is 8.59. The finding shows that the χ^2 value of Educational Status is 22.14 The finding shows that the χ^2 value of Family Status is 14.44. The finding shows that the χ^2 value of Dietary Pattern is 9.89. The study revealed that there was significant association of demographic variables such as Age, Sex, Education, Dietary pattern, Family Status of Risk factors among adults. The p value is less than χ^2 value 0.05 which makes the significant. The p value is More than χ^2 value 0.05 which makes the Non significant.

Discussion

We have conducted a research topic on A study to assess the prevalence and the risk factors of hypertension among adults residing in a selected rural community, Kanchipuram District, Tamil Nadu. The total population in the rural community is 50. The prevalence of rate of hypertension is 30. In that 80% male and 20% Female. The association between the demographic variables such as Age, Sex, Education, Dietary pattern, Family Status was related with the risk factors for hypertension among adults. It is showed there is significant difference between the risk factor with Age-28.2, Education 22.14, Family status-14.44 and there is No significant difference between the risk factor with Sex 8.59, Dietary pattern 9.89 at the P value <0.05 level of significant.

Summary: This chapter has dealt with the analysis and interpretation of the collected data from the the prevalence and the risk factors of hypertension among adults . The collected data was tabulated and analyzed using descriptive and inferential statistics. Statistics diagrams like, conical graph, pie chart were used to represent the important data of the study.

Source of Funding: Nil

Ethical Consideration: Chettinad Academy of Research and Education, Institution Human Ethics Committee

Conflict of Interest: Nil

Reference

1. Donna D. Ignatavicius, Kathy A. Hausman., Medical Surgical Nursing across the Health Continuum, 3rd edition., Philadelphia, WBSaunders's Company, 1999, P.No 110-115.
2. Joyce M. Black, Jane HokansonHowks., Medical Surgical Nursing 7th edition., St. Louis, Saunders's Publications, 2005, P.No: 1000-1003.
3. Shyamala D. Manivannan, Text book of Community Health Nursing-I, 1st edition, CBS Publisher, 2017, P.No 220.
4. Prem Sharma, Introduction to Sociology, 2nd edition, Lotus Publisher, 2012, P.No 123
5. K. Park, Park's Textbook of Preventive and social medicine, 23rd Edition, Banarsidas Bhanot Publishers, 2015, P.No 52.

A Cross Sectional Study of Deaths Due to Poisoning: Autopsied at a Tertiary Care Centre: Davangere

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Abstract

Poisoning is an important health problem in every country of the world. Occupational exposure to industrial chemicals and pesticides, accidental or intentional exposure to household and pharmaceutical products and poisoning due to venomous animals, Toxic plants and food contamination, all contribute to morbidity and mortality. Poison is a substance that being soluble in the blood either destroys life or impairs seriously the functions of one or more organs of the body. Poison can be defined as, a substance (solid, liquid or gas) which if introduced in a living body or brought in contact with any part thereof will produced ill health or death by its constitutional or local effects or both.¹ Due to rapid development in the field of science and technology and vast growth in the industrial and agricultural sector, the poisoning is spreading like a wild fire. Poisoning is a medical emergency and the patients are invariably admitted to the hospital through emergency services. The poisoning may be suicidal, accidental or homicidal. With this background, the present study has been carried out to determine the profile of poisoning cases, autopsied at SSIMS & RC, Davangere, Karnataka. The study revealed that victims of rural population (68.9%) are highest among the habitation, followed by urban population. Most of the victims are married people (63.9%). Most of the victims were educated with matriculation (62.3%). Most of the poisoning cases are seen in Hindu religion (91.8%). Most of the cases were seen in winter season (42.6%) and in most of the cases the victims has consumed the poison at home (83.9%).

Keywords: Autopsy, FSL Report and Poisoning.

Introduction

Annually it has been estimated that the health hazards are directly or in directly due to poisons is for more than 1 million illnesses worldwide and this could be just the tip of the iceberg as most of the cases of poisoning actually go unreported and untreated, especially in developing and underdeveloped countries.²

The incidence of poisonings is increasing day by day because of its low cost, easily availability without any check on their sales and irregularity in distribution. However, the magnitude of the problem, the circumstances of exposure and the types of poisoning vary from country to country and it also varies from region to region. The variables include the degree of industrialization and urbanization, the type of agricultural activities and the available medical facilities and expertise to prevent and manage toxic exposures.

With this background present study has been conducted to assess the most prevalent habitation involved. And also to find out the marital status, educational status, religion, seasonal variation, place of consumption and to know the consumed poison was known or unknown in deaths due to poisoning cases, autopsied at SSIMS & RC, Davangere, Karnataka.

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Materials and Method

All the cases brought to the department of Forensic Medicine and Toxicology, SSIMS and RC, Davangere, for medico legal autopsy with history of poisoning and cases that were diagnosed as poisoning after post mortem examination during the period of one and half year, from November 2013 to March 2015. Total 61 cases were selected for this prospective study.

The present study has been carried out after obtaining the ethical clearance and consent from the relatives to take the relevant information.

In all cases of poisoning the detailed history and information were collected from the police and the relatives of the deceased questionnaire and post mortem findings were analyzed with the chemical analysis reports. In case of hospital admitted and treated cases the information's were collected by the perusal of hospital records. The cases of food poisoning, snake bite and any other insect bite envenomation and deaths due to idiosyncratic reaction to the drugs were excluded from the study group. Meticulous autopsy was done in all cases and the routine viscera and body fluids were collected and sent to Forensic Science Laboratory for Chemical analysis and report.

Results

Total 61 cases were selected for the present study and the following observations were made. It is observed that more number of poisoning in this study population is seen with the residence of rural (69%) as compare to the residence of urban (31%).

Table 1: Distribution of study population according to habitation.

Rural/Urban	Frequency	Percent (%)
Rural	42	68.9
Urban	19	31.1
Total	61	100.0

From the above graph it is observed that more number of poisoning cases were seen in the married group (64%), followed by unmarried group (34%) and the least percentage seen in the divorced group (2%).

From the above study it is observed that more number of poisoning cases in the present study population were seen among matriculates (62%) as compare to others and least numbers of cases were seen in the postgraduates

group (1.6%) and the least being the illiterates (1.6%).

Table 2: Distribution of the study population according to Marital Status.

Marital Status	Frequency	Percent (%)
Divorced	1	1.6
Married	39	63.9
Unmarried	21	34.4
Total	61	100.0

Table 3: Distribution of the study population according to Educational status.

Educational Status	Frequency	Percent (%)
Illiterate	1	1.6
Under-Matriculate	17	27.9
Matriculate	38	62.3
Graduate	4	6.6
Post-graduate	1	1.6
Total	61	100.0

From the above study among the religion, it is observed that more number of cases in the present study population were seen among Hindu (92%) population as compare to Muslim (8%) population.

Table 4: Distribution of the study population according to religion.

Religion	Frequency	Percent (%)
Hindu	56	91.8
Muslim	5	8.2
Total	61	100.0

It is observed that more number of cases in the present study population among the seasonal variations were seen in winter season (43%), followed by rainy season (33%) and summer season (24%).

Table 5: Distribution of the study population according to Seasonal Variation

Seasonal Variation	Frequency	Percent (%)
Summer	15	24.6
Rainy	20	32.8
Winter	26	42.6
Total	61	100

From the above study it is obtained that in more number of cases among present study population people have consume poison at home (84%), followed by other places (6%), work place (5%) and remote area (5%).

Table 6: Distribution of the study population according to place of consumption.

Place of Consumption	Frequency	Percent (%)
Home	51	83.6
Workplace	3	4.9
Remote areas	3	4.9
Other places	4	6.6
Total	61	100

Discussion

In a study done by Gupta B D and Vaghela PC on 132 autopsied poisoning cases in the Dept. of Forensic Medicine and Toxicology, MP Shah Medical College, Jamnagar during the span of one year have shown that majority of victims were married, Hindu and rural population.¹¹ Our study correlates with the above mentioned findings.³

Vishwajeet Pawar and others did a study at Mahatma Gandhi Institute of Medical Sciences, Sewagram during the period May 2007 to April 2009. During this study maximum poisoning cases belong to rural area and married people.⁴ These findings were agreement with the present study.

A study done by Sanjeev K and others in the department of Forensic Medicine at Rajkot (Gujarat) to know the pattern of fatal poisoning. Total 208 cases of death due to fatal poisoning were selected for this prospective study, which were brought for postmortem examination during the span of one year (From January 2007 to December 2007). Study revealed that most of the victims of fatal poisoning were Hindus and married population.⁵ Our study correlates with the above mentioned findings.

Vikram Palimar, & Prateek Rastogi has conducted a study on profile of insecticide mortality by retrospective review of poisoning cases autopsied at Kasturba Medical College, Manipal, Of the total 1917 autopsies conducted, 372 cases were due to poisoning, of which 287 cases were due to insecticides with a predominance of organophosphates. Majority of the victims were belonged to rural areas. These cases were more during the winter season and indoor consumption of the poison was observed in more than three-fourth of the cases.⁶ these findings were in agreement with the present study.

One more study on the poisoning trends undertaken for 2 years at Malwa region, Punjab showed that

incidence of poisoning was more amongst married (68%) as compared to unmarried (32%), residing in rural (64%) as compared to urban area (36%). Incidence of poisoning was more among under-matriculates (43%) followed by illiterates (37%) and literates (14%).⁷our study correlates with the above mentioned findings.

A 6 years study conducted at Government Medical College, Chandigarh from 1994-1999 revealed that rural preponderance (66.9%) was more compared to urban (33.1%) areas.⁸These findings were in agreement with the present study.

A study Of the 285 cases of poisoning studied at SRN Hospital, Allahabad it was seen that majority of death being more among the Hindus (84.91%) followed by Muslim (12.63%) having rural background.⁹ These findings are in agreement with the above study.

It was observed that of the 117 cases of organophosphorus poisoning brought to the mortuary of Gandhi Medical College, Bhopal from the year 1999-2001 revealed that married people were affected more than the unmarried. Incidence of poisoning was more in people with rural background and maximum number of deaths were seen in illiterates.¹⁰ So these findings are in agreement with the above study.

Conclusion

From the above study conducted on 61 cases of poisoning, autopsied at SSIMS & RC, Davangere, following conclusions were drawn, most of the victims were of rural population (68.9%) among the habitation, followed by urban population. Most of the victims are married people (63.9%). Most of the victims were educated with matriculation (62.3%). Most of the poisoning cases are seen in Hindu religion (91.8%). Most of the cases were seen in winter season (42.6%) and in most of the cases the victims has consumed the poison at home (83.9%).

Conflict of Interest: Nil

Source of Funding: Self

References

1. Reddy KSN: The essentials of forensic medicine and Toxicology. 32nd ed, Hyderabad: sugunadevi; 2013: 498.
2. Pillay VV, Modern Medical Toxicology. 4th ED, Jaypeebrothersmedicalpublishers(P)Ltd,2013:3-4.

3. Gupta BD, Vagehla PC, Profile of fatal poisoning in and around Jamnagar. *JIAFM* 2005;27(3):145-8.
4. Pawar V, Pankaj M, Bipinchandra T. Trends of poisoning cases at a Medical college and hospital in central Indian during the period of may 2007-April 2009; *Journal of Forensic Medicine, Science and Law*. Official Publication of Medicolegal Association of Maharashtra. 20(1);2-23.
5. Kumar S, Pathak A and Mangal HM. Trends of Fatal Poisoning In Saurashtra Region of Gujarat. *JIAFM* 2011; 33(3):197-9.
6. Palimar V, Rastogi P. Mortality due to insecticide poisoning: A retrospective postmortem study. *Journal of South India Medicolegal Association*. 2011;3(2): 50-2.
7. Singh K, Oberoi. S.S, Bhullar. D.S. "Poisoning Trends In The Malwa Region Of Punjab". *Journal of Punjab Forensic Medicine and Toxicology*, 2003; 3:26-29.
8. Adarsh Kumar, Krishan Vij. "Trends of Poisoning in Chandigarh-A Six Year Autopsy Study". *Journal of Forensic Medicine and Toxicology*, 2001; 18(1): 8-11.
9. Sinha US, Kapoor AK, Agnihotri, Srivastava PC. "A Profile of Poisoning cases Admitted In SRN Hospital,Allahabad With Special Reference To Aluminium Phosphide Poisoning", *Journal of Forensic Medicine and Toxicology*, 1999; 16 (1):- 40-42.
10. Nigam M, Jain A K, Dubey. B.P,Sharma. V.K. "Trends Of Organophosphorus Poisoning In Bhopal Region An Autopsy Based Study". *Journal of Indian Forensic Medicine*, 2004; 26 (2):62-65.

Pattern of Medico-Legal Cases in a Tertiary Care Centre at Sangli, Maharashtra: A Retrospective Study

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Abstract

A medico-legal case is the one where besides the medical treatment; investigations by law enforcing agencies are essential to fix the responsibility regarding the present state/condition of the patient. Medico-legal cases therefore have both medical and legal implications. Medico-legal cases are an integral part of medical practice that is frequently encountered by medical officers working in casualty. The casualty department is a backbone of every hospital because apart from medical emergencies, it also deals with the medico-legal cases. The study was conducted in a retrospective manner and all the medico-legal cases which came to the emergency department of the BVDU & MC hospital during January 2018 to December 2018 were studied. The study revealed that majority of the victims in this study population was males (70.99%) as compare to females (29.01%). Most of the victims were belonging to younger age group (21-30 years). Highest numbers of victims in the study population were Hindu (86.82%) and belonged to rural area (72.75%). Road traffic accident cases (40.22%) were highest in number among all registered medico-legal cases.

Keywords: *Casualty, Tertiary care centre, Medico-legal cases, Road traffic accidents and Poisoning.*

Introduction

Generally doctor has two duties, medical and medico-legal. It is true in Indian context also. Cases coming to hospital are made "medico-legal" on various grounds. These ground, though follow same general principles in most parts of the world, may differ country to country as per the laws of the land.¹ It is the responsibility of a registered medical practitioner to judge each and every case properly and in doubtful cases, it is mandatory to inform the police as required by law. This saves the doctor from unnecessary and needless allegations later.² A medico legal case (MLC) is a case of injury or illness where attending doctor after eliciting, listing and

examining patient; is of opinion that some investigation by law enforce agencies is essential to establish and fix responsibility for the case in accordance with the law of the land.³

MLC constitutes road traffic accidents (RTA), sexual offences, assault, poisoning, suicidal attempt, burns, drug overdose etc. Majority of the medico-legal cases are due to road traffic accidents.⁴ All the medico-legal cases are registered in casualty. Casualty department is very crucial for any hospital as all the medical and surgical emergencies first report there. Further, it serves as an outpatient department after the routine outpatient department hours.⁵ With this background present study has been conducted to find out the pattern of medico-legal cases at a tertiary care centre, BVDUMC & H, Sangli, Maharashtra.

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Materials and Method

This is a retrospective study, conducted in medico legal section and casualty of BVDUMC & H, Sangli, Maharashtra, for a period of 1 year (i.e. from January

2018 to December 2018). Total 455 medico legal cases recorded in medico legal register of the hospital were included in the study. Information regarding various parameters of the study were obtained from medico legal register and hospital record of individual patient. The data thus obtained was analyzed; observations were presented in tables & graphs, discussed and compared with other studies.

Results

A total of 455 cases were selected for the present study and the following observations were made. It is observed that more number of medico-legal cases in this study population is seen with the male (70.99%) as compare to the females (29.01%).

Table 1: Distribution of study population according to sex.

Sex	No of Cases	Percentage%
Male	323	70.99
Female	132	29.01
Total	455	100

From the present study it is observed that more number of victims in this study population are of 21-30 years age group (31.2%), followed by 31-40 years age group (16.93%).

Table 2: Distribution of study population according to age group.

Age Group	No of Cases	Percentage%
0-10 years	37	8.14
11-20 Years	50	10.99
21-30 Years	142	31.2
31-40 Years	77	16.93
41-50 Years	70	15.38
51-60 Years	43	9.45
>60 Years	36	7.91
Total	455	100

From the present study it is also observed that more number of victims in this study population belongs to rural habitat (72.75%) as compare to urban habitat (27.25%).

From the present study it is observed that more number of victims in this study population belongs to Hindu religion (86.82%) as compare to Muslim religion (11.87%).

Table 3: Distribution of study population according to habituation.

Habituation	No of Cases	Percentage%
Rural	331	72.75
Urban	124	27.25
Total	455	100

Table 4: Distribution of study population according to religion.

Religion	No of Cases	Percentage%
Hindu	395	86.82
Muslim	54	11.87
Christian	6	1.31
Total	455	100

The present study reveals that RTA cases (40.22%) were more in number than any other medico-legal cases in our study population. Next to RTA cases, poisoning cases (17.81%) were more in number.

Table 5: Distribution of study population according to type of Medico-legal case

Type of MLC	No of Cases	Percentage%
Assault	30	6.6
RTA	183	40.22
Brought Unconscious	17	3.74
Poisoning	81	17.81
Animal Bite	14	3.08
Electrocution	7	1.54
Accidental Injuries	50	10.99
Brought Dead	9	1.97
Violent Asphyxia	11	2.41
Criminal Abortion	3	0.66
Burns	4	0.88
Others	46	10.1
Total	455	100

Discussion

Atul S and others have conducted a retrospective study on 264 medico-legal cases registered in medico-legal register in casualty of SRMS IMS Medical College, Bareilly from January to December 2014. Study revealed that majority of the victims was males as compared females. Most of the victims were of younger age group (21-30 years) and road traffic accidents comprised of the maximum number of medico-legal cases.⁶ These findings were in agreement with the present study.

Manoj KK and others conducted a study from August 2014 to July 2015 of all medico legal cases coming to Department of Forensic Medicine and Toxicology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. Study shows that majority of the victims were males. Rural population was more affected as compared to urban population. Majority of the victims represented from younger age group (21-30 years). Road traffic accidents comprised of the maximum number of medico-legal cases.⁷ Our study correlates with the above mentioned findings.

A retrospective study of medico-legal cases done by Jitendra T and others at casualty of Sri Aurobindo Medical College and PGI, Indore for a period of 1 year, from 1st June 2016 to 31st May 2017 revealed that maximum number of medico-legal cases were of road traffic accident, seen among young individuals. Majority of the victims were males.⁸ These findings are in agreement with the present study.

The study conducted prospectively by Mohammed SM and others over a period of one year from 1st October 2014 to 31st September 2015 on all medico legal cases registered in the Accident and Emergency Medicine department at Sher-I-Kashmir Institute of Medical Sciences, SKIMS, Srinagar. Study revealed that majority of the victims were males, younger age group (21-30 years) and most of the victims were of rural population. RTA cases were highest in number among all registered medico-legal cases.⁹ Our study correlates with the above mentioned findings.

Santhosh CS and others have conducted a prospective study for a period of one year from 1st October 2014 to 30th September 2015 on a 4066 medico-legal cases attending Casualty department of J.J.M. Medical College and Bapuji Hospital, Davangere, Karnataka. This study shows that maximum number of medico-legal cases are accidental (RTA) in nature, seen among young individuals. Majority of the victims were males.¹⁰ These findings are in agreement with the present study.

Visnuraj Kumar J and others conducted a retrospective study at the casualty at the Manakula Vinayagar Medical College, Pondicherry from 1st January 2014 to 31st December 2014 on a 2391 medico-legal cases, study revealed that maximum number of medico-legal cases were due to RTA, followed by poisoning. Majority of the victims were males and of younger age group (21-30 years).¹¹ Our study correlates with the above mentioned findings.

Conclusion

The casualty department of any hospital not only treats the patients who reports in emergencies but also carry out legal responsibilities to examine, document and certify medico legal cases. This puts a lot of burden on casualty department. The present study shows that majority of the victims are males as compare to females. Younger age group (21-30 years) is more commonly affected. Most of the victims in this study population are Hindus. Rural habitant population is more commonly affected. RTA cases were highest in number among all registered medico-legal cases. This can be reduced by implementing strict road traffic rules as well as by improving the road condition by concerned authorities, at the same time users of the road and vehicles also realize their responsibility in following traffic rules. Awareness regarding proper protective measures and effect of intoxicating substances on once driving ability will also help to reduce the incidences of Road traffic accidents.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: taken from IEC, BVDUMC & H, SANGLI.

References

1. Trangadia MM, Mehta RA, Rada NH, Gupta BD. Profile of medico-legal cases in tertiary care hospital in Jamnagar, Gujarat: Retrospective study of one year. *J Res Med Den Sci* 2014;2(4):57-62.
2. Mina SS, Basu S, Kumar V, Mina D. Profile of medico-legal cases registered at a tertiary care children's hospital. *Int J Contemp Pediatr* 2017;4(4):1345-8.
3. Raju K, Hemanth Raj MN. Profile of medico-legal cases at tertiary care centre. *International Journal of Recent Trends in Science and Technology* May 2015; 15(1): 68-70.
4. Manju. L, Beevi PN. A study on medico legal cases attended in a tertiary care hospital in south Kerala. *Int J Health Sci Res.* 2018;8(11):257-260.
5. Brahmkar TR, Sharma SK. A record based study of frequency and pattern of medico-legal cases reported at a tertiary care hospital in Miraj. *Int J Community Med Public Health* 2017;4:1348-52.
6. Atul S, Vinod K. Chaudhary SR. Pattern of

- Medico-legal Cases in the Casualty Department of A Teaching Hospital, Bareilly, Uttar-Pradesh. *J Indian Acad Forensic Med.* Oct-Dec 2015;37(4): 338-40.
7. Manoj KK, Jyotish G, Tulsi M. Profile of Medicolegal Cases at Rajendra Institute of Medical Sciences, Ranchi, Jharkhand from 2014-2015. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS).* Nov 2016; 15(11):12-14.
 8. Jitendra T, Abhishek V, Manish N. Profile of medico-legal cases in the Casualty of SAMC and PGI, Indore. *Indian Journal of Forensic and Community Medicine,* July-Sept 2017;4(3):171-5.
 9. Mohammed SM, Farooq AJ, GH Yattoo. Profile and Pattern of Medico-Legal Cases in a Tertiary Care Hospital of North India. *JMSCR.* Sep 2016;4(9): 12628-34.
 10. Santhosh CS, Anupam D.-A Study Pattern of Medico-legal Cases Treated at a Tertiary Care Hospital in Central Karnataka. *Indian Journal of Forensic and Community Medicine,* 2015; 2(4):193-7.
 11. Visnurajkumar J, Kumaran M, Arun Prakash K S, Arun M Sri Manakula Vinayagar Medical College, Puducherry. *MedPulse – International Medical Journal.* February 2016;3(2): 171-3.

Practices and Problems Related to Breastfeeding among Mothers of Under-Five Children

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Abstract

Objective: The purpose of present study is to identify the practice and problems related to breastfeeding among the mothers of under five children .

Design: A quantitative, descriptive survey design

Setting: Paediatric In Patient and Out Patient Department at AIMS, Kochi, Kerala, India.

Subjects: Convenience sampling was used to select 60 mothers of under-five children .

Method: Semi structured interview schedule was used to assess the breast feeding practices among mothers of under-five children and Checklists to assess breast feeding problems and factors influencing breast feeding practices among mothers of under-five children.

Result: Majority of mothers (90%) given colostrum. 53.3% had given exclusive breast feed while thirty seven mothers 46% opted formula feed and 26.7% had given expressed breast milk during the first six months of life. 48.3% mothers feed their baby completely from one breast before offering the other. 70% offered alternate breast during next feed, 43.3% taken dietary modifications and supplements to increase breast milk. Most of the mothers 58.35% initiated breast feeding after two hours. Majority of mothers 46.7% had complaints of problems related to biting during breast feeding. Out of sixty mothers twenty one (35%) reported inadequate breast milk production as a problem during feeding, 30% faces problems related to breast engorgement.

Conclusion: WHO recommended the exclusive breast feeding up to 6 months. But the present study shows that 46.7% of the mothers initiated formula fed before six months and of 90% of mothers fed colostrum. Hence there is a need to educate mothers about exclusive breast feeding up to 6 months.

Keywords: Breast feeding, Mothers of under five children.

Introduction

WHO (1999) defines breast feeding as “the child

has received breast milk directly from the breast or expressed” and it satisfies all the three needs of new born such as warmth, food and protection¹. The 54th world health assembly which met in Geneva in May 2001 affirmed the importance of exclusive breast feeding for six months. The WHO recommends exclusive breast feeding for the first six months of life, the introduction of local, nutrient rich complementary foods thereafter with continued breast feeding to two years of age or beyond.²

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Current statistics of infant mortality rate is 47 per

1000 live birth. Exclusive breast feeding can reduce infant mortality rate. According to National Family Health Survey India 2005-2006, only 23.5% of mothers initiated breast feeding within first hour after birth, 99.2% had ever breast fed their infant, 89.8% were currently breast feeding.³

A survey-based study was conducted by Ashmika Motee, Deerajen Ramasawmy, Prity and Rajesh Jeewon on a group of 500 mothers (2011) to elicit information about infant feeding practices by the use of a properly designed questionnaire given to mothers in Area Health Centres (AHCs) and Community Health Centres (CHCs) both in rural and urban areas of the island, Mauritius. This study shows that the prevalence of breastfeeding has increased over the past 20 years in Mauritius. Despite a high breastfeeding initiation rate of 61%, only 18% succeed to give exclusive breastfeeding until 5-6 months. The mean duration of exclusive breastfeeding is 2 months, with adding water as the main reason for not continuing exclusiveness. Awareness of the health benefits of breastfeeding was noted in 65%, a percentage that may be increased by further breastfeeding education and support. The major barriers to breastfeeding practices in this study were type of delivery, parity, alcohol consumption, occupation and education, breast problems and mainly milk insufficiency.^{4,5}

Statement of the problem

A descriptive study on practices and problems related to breastfeeding among mothers of under-five children attending paediatric wards and OPDs of AIMS, Kochi

Primary Objective: Assess breast feeding practices among mothers of under five children.

Secondary Objectives:

1. Identify factors influencing breast feeding practices among mothers of under five children.
2. Identify the problems related to breast feeding practices among mothers of under five children.

Operational definitions:

Breast Feeding Practices: It refers to the practice followed by the mother during the lactation period which includes initiation, techniques and duration of breast feeding.

Under Five Children: Children in the age group between 2-5 years of age in selected wards and OPDs of AIMS Kochi.

Factors influencing Breast Feeding: It refers to the reasons for inadequate breastfeeding which affects both mother and baby such as family support, attending prenatal classes, formula feed, illness of mother and baby, severe stress, interest of mother, inadequate breast milk production, intake of special diet or supplements

Breast Feeding Problems: It refers to the act or difficulty that affects the mother and baby resulting in inadequate breastfeeding such a nipple problems, breast engorgement, unable to suck, GI problems, breast infections, maternal and mental problems, abnormal breast discharge, inadequate breast milk production, consumption of medicine, etc.

Method

The quantitative research approach with descriptive survey design is used to assess breast feeding practices and problems among mothers of under five children. . Using convenience sampling method, sixty mothers of under-five children were selected and the study is conducted on march 2014 in paediatric wards and Paediatric Out Patient Department of AIMS, Kochi.

The mothers of under-five children who are willing to participate in the study and mothers who can understand English or Malayalam were included. Mothers who are mentally challenged, impairment in hearing and speech, who had not at all fed the baby were excluded from the study.

The research proposal was presented before the Research Committee of Amrita College of Nursing. It was then submitted before Thesis review committee of AIMS and ethical clearance was obtained. After getting prior permission from HOD's and supervisors of Paediatric department, data was collected from mothers of under five children (2-5years) who attended the Paediatric in Patient (T4F4 Ward and annex paediatric ward) and Out Patient Department in AIMS. After the selection of mothers based on inclusion criteria, rapport was established and purpose of the study was explained, informed consent was obtained and a structured interview was conducted to assess the breast feeding practices. Then instructions were provided for filling up the check list. It took 25 minutes for each mother to complete the tool.

Result

Socio Demographic characteristics: Out of sixty mothers, 29 (48.3%) were belongs to the age group of 24-29. Twenty one mothers (35%) are graduates, majority of them (86.3%) are non-working, 32 (53.3%) are having only one child .Regarding the type of delivery, most of the mothers (55%) underwent LSCS, majority of the children (51.7%) suffered from recurrent disease, 47 (78.3%) children undergone hospitalization, majority of the mothers (78.3%) gave birth to their child

in government sector, most of the mothers 19 (31.7%) received information on breast feeding from parents and relatives .

Breast Feeding practices among mothers of under-five children: Among the mothers, 11 (18.3%) initiated breast feeding within 30 minutes [Fig. No. 1]. While feeding about half of the mothers (50%) practiced sitting position, (21.7%) of mothers practiced lying position and (28.3%) practiced both sitting and lying position . [Fig. No. 1].

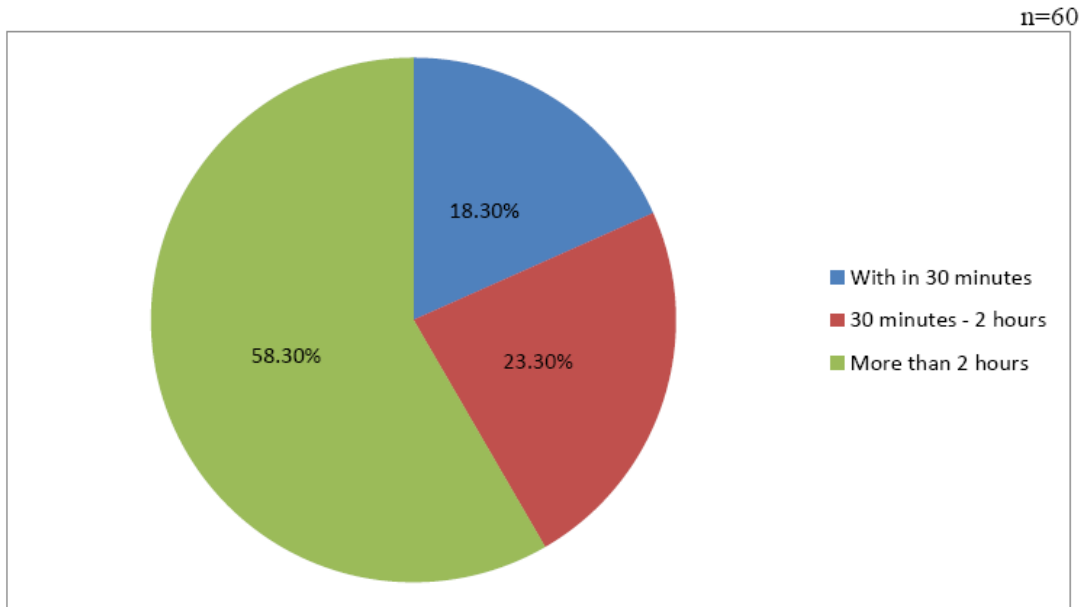


Figure 1: Pie Diagram showing time of initiation of breast feeding

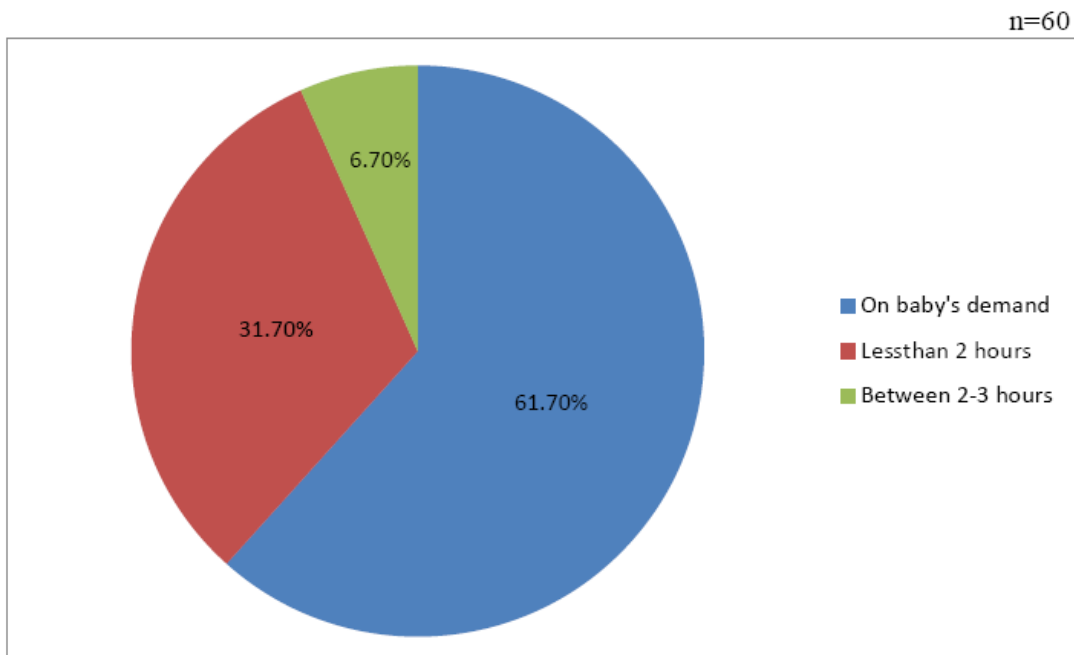


Figure 2: Pie diagram showing time interval between feeds

Out of sixty mothers, thirty seven (61.7%) fed baby on demand whereas nineteen (31.7%) fed within 2 hours [Fig. No. 2].

Forty eight (79.7%) has started weaning from or after 6th month and rest (20.3%) started weaning before six months. Majority of the mothers (72%) initiated

weaning with raggi, nine mothers (15%) initiated with sooji gothambu, the rest of them (6.7%) used either juices or smashed foods. Among the mothers, twenty eight (46.7%) practices breast feeding up to 2 years and twenty six (43.3%) practiced breast feeding more than 2 years where as only 10% fed the baby for less than 6 months.

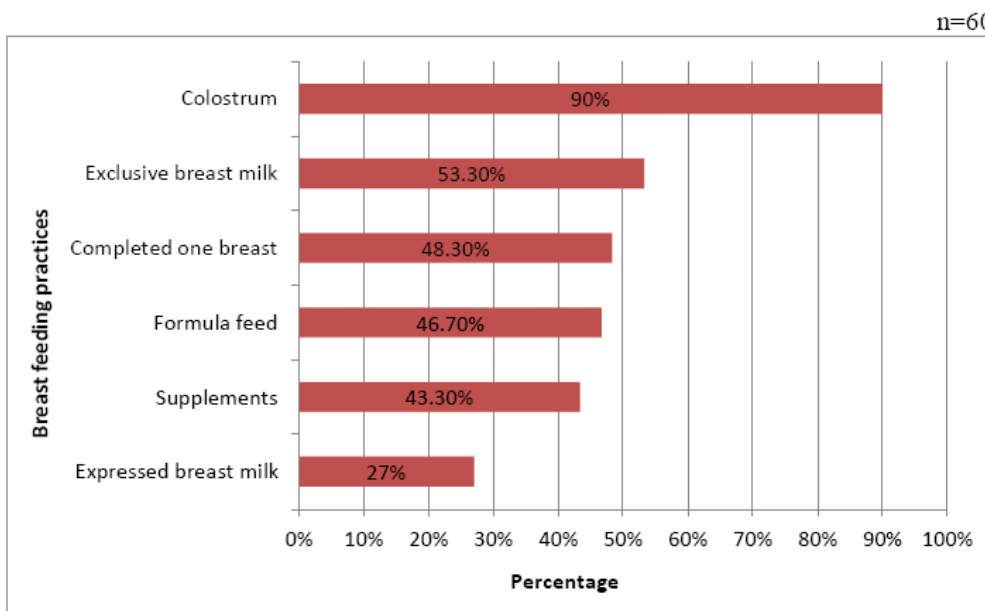


Figure 3: Bar diagram showing Breast feeding practices among mothers

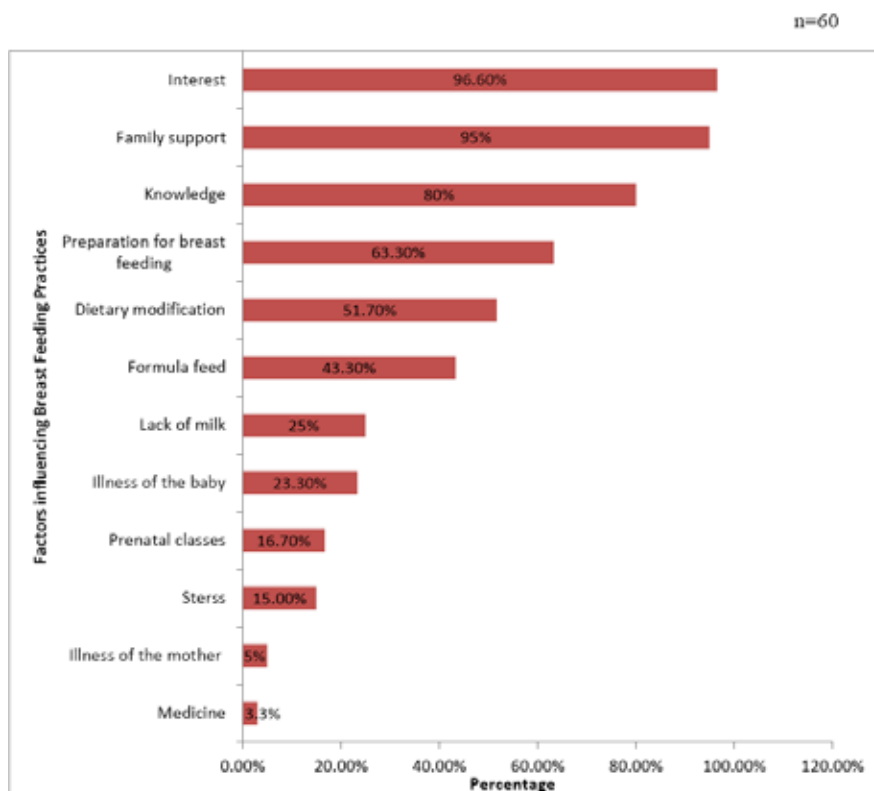


Figure 4: Multiple bar diagram showing factors influencing breast feeding practice

Factors influencing breast feeding practices.

Problems related to breast feeding practices: Out of sixty, 28 mothers (46.7%) complaints of problems related to biting during breast feeding and twenty one mothers (35%) reported inadequate breast milk

production as a problem during feeding. Among them 18 (30%) faces problems related to breast engorgement, Sore nipple and cracked nipple ranked same 18 (28.3%). Least number of mothers (11.7%) complained of inverted nipple, lack of confidence and leaking from breast .

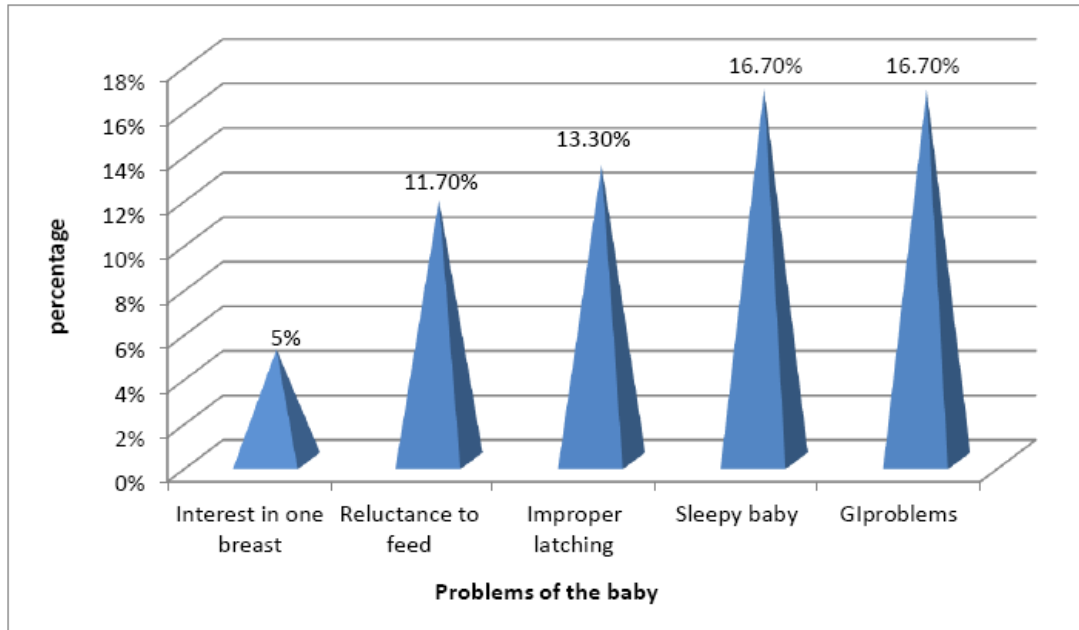


Figure 5: Clustered pyramid showing the percentage of problems of baby

Discussions

The present study shows only 11 (18.3%) initiated breast feeding within 30 minutes and 14 (23.3%) within 30 minutes to 2 hours and rest of 35 (58.3%) initiated after 2 hours, 32 (53.3%) practiced exclusive breast feeding, 54 (90%) fed colostrum, received information's from parents and relatives 19 (31.7%), from health professionals 16 (26.7%) and 28 (46.7%) initiated formula feeding before 6 month. Another study conducted by Abdulbasit Musa Seid, Mekie Edris Yesuf, Digso Negese Koye⁶ - community based cross sectional study in Gujarat in 2007 suggest that almost 99% of children had ever breast fed at some point in the past 709 (87%) of the mother initiated breast feeding within one hour of birth, 679 (83.3%) had fed colostrum and 220 (27%) of mother gave one or more protected feeding 97 (11.9) of the participants having breast related problems that created difficulty in feeding their infant. The results are almost same.

The present study shows that 63.3%had antenatal preparation for breast feeding, 80% of mothers had

knowledge regarding breast feeding, 95% of mothers had adequate family support and 96.6% mothers had interest in breast feeding. The results are more or less consistent with the study conducted by Chudasama and P.Patel⁷ breast feeding initiation practises and factors affecting breast feeding in India (2008). The study was conducted in 480 mothers and suggested the following factors influencing breast feeding that is socio economic status, type of family, maternal age and education, number of antenatal visit taken (43.3%), knowledge (70%), breast feeding advice (25%), postnatal visit, inter delivery interval more than 24 h5ours, family support (85%). The findings are 55% of infants were males & 45% were females 85% have received exclusive breast feeding, 50% of the babies not received colostrum.

Present study shows that 46.7% of mothers complaints of problems related to biting during breast feeding and 35% mothers reported inadequate breast milk production as a problem during feeding .30% of mothers faces problems related to breast engorgement .sore nipple and cracked nipple ranks same (28.3%).

11.7% of subjects complaints of inverted nipple, lack of confidence and leaking from breast. The results are more or less consistent with the study on maternal knowledge and perception about breast feeding and factors influencing it, conducted by Ashwin Borade⁸ in 2009 March among 150 mothers, Pune. This study shows that 10% of mothers had problems such as retracted nipple, sore nipple, 35% of mothers had breast engorgement

Conclusion

Breast milk is the most effective and natural method of feeding the baby. In the present study only half of mothers practiced exclusive breast feeding so it is important to include educational activities related to breast feeding and it should be promoted to mothers.

Conflicts of Interest: Nil

Source of Funding: Self

References

1. Fraser MD, Cooper MA. Myles text book for midwives. Midwifery. 2003;33(3). p.752
2. World Health Organization. World Health Assembly Resolution 54 May 2001. Geneva Wilson D, Rodgers CC. Wong's essentials of pediatric nursing. Elsevier Health Sciences; 2005-06
3. Patel A, Pusdekar Y, Badhoniya N, Borkar J, Agho KE, Dibley MJ. Determinants of inappropriate complementary feeding practices in young children in India: secondary analysis of National Family Health Survey 2005–2006. *Maternal & child nutrition*. 2012 Jan;8:28-44.
4. Motee A, Ramasawmy D, Pugo-Gunsam P, Jeewon R. An assessment of the breastfeeding practices and infant feeding pattern among mothers in Mauritius. *Journal of nutrition and metabolism*. 2013 Jun 24;2013.
5. Divya A, Viswanath L, Philip A. Effectiveness of breast massage on expression of breast milk among mothers of neonates admitted in neonatal intensive care unit. *J SAFOG* 2016;8(1):21-24.
6. Seid AM, Yesuf ME, Koye DN. Prevalence of Exclusive Breastfeeding Practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia: a community based cross-sectional study. *Int Breastfeed J*. 2013 Oct 23;8(1):14. doi: 10.1186/1746-4358-8-14. PubMed PMID: 24152996
6. Chudasama RK, Patel PC, Kavishwar AB. Determinants of exclusive breastfeeding in South gujarat region of India. *J Clin Med Res*. 2009 Jun; 1(2):102-8. doi: 10.4021/jocmr2009.06.1242. Epub 2009 Jun 21. Pub Med PMID: 22505975; Pub Med Central PMCID: PMC3318851.
7. Kumari P, Vansa N, Lata S. A comparative study to assess the knowledge and attitude of mothers regarding exclusive breast feeding in selected rural and urban areas of district Jalandhar, Punjab. *IOSR J Nurs Heal Sci*. 2015;4(3):61-p.

A Study to Assess the Knowledge on Protein Energy Malnutrition among Mothers of Under Five Children in Selected Areas at Kanchipuram District, Tamil Nadu

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Abstract

A descriptive study was conducted to assess the level of knowledge on protein energy malnutrition among mothers of under five children in selected areas at Kanchipuram District, Tamil Nadu. The objectives of the study was to assess the level of knowledge on protein energy malnutrition among mothers of under five children and to associate the knowledge on protein energy malnutrition with demographic variables.

Research approach for the present study was a quantitative descriptive approach. Quasi Experimental design seems to be the most appropriate design for this study. The study was conducted at Paiyanoor village, Kanchipuram District, Tamil Nadu. Mother of under-five children in the age group of five years residing in Paiyanoor Village, Kanchipuram and The participants of the study were selected by purposive sampling technique. The data analysis was done using descriptive and inferential statistics. Descriptive statistics like frequency, percentage and mean.

Chi-square test was used to find out the association between the risk factors and selected personal information sheet of the mothers of under-five. The findings shows that the majority (20%) of the mothers of under-five children having adequate knowledge. The majority (63%) of mothers of under-five having moderate knowledge. The majority (17%) of mothers of under-five having inadequate knowledge.

Keywords: Assess, Knowledge, protein energy malnutrition, mothers of under five children.

Introduction

The prevalence of protein Energy Malnutrition among children in south Asia is the highest in the world. It is the almost double the prevalence in sub Saharan Africa. This high prevalence together with the large population of the region explain why more than half of all malnourished children live in south Asia, 101 million

out of 184 million. On average there has been a small decrease in the prevalence of underweight children in south Asia⁽³⁾

Using the WHO Global Database on Child Growth and Malnutrition, which covers 87% of the total population of under 5 year old in developing countries, we describe the worldwide distribution of Protein energy malnutrition based on nationally representative cross sectional data gathered between 1980 and 1992 in 79 developing countries in Africa, Asia were underweight, 269(44.3%) were stunting and 72(11.9%) were wasting. Protein energy malnutrition is an important problem in this contemporary epoch and more under- Five children's are affected with Protein energy malnutrition. This is mainly due to unhealthy Environment and poor knowledge among the parents regarding the disease condition.⁽⁵⁾

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Consequently, a number of health-related non-governmental organizations, including Catholic Relief Services (CRS), Adventist Development and Relief Agency (ADRA), World Vision International (WVI) and the Ghana Health Service (GHS) have been promoting proper childcare practices, including appropriate infant-feeding practices and management of childhood illnesses, such as diarrhea⁽²⁾. Health and nutrition messages are usually targeted to mothers, most of whom have not received formal educate these women usually patronize health services at antenatal clinics and child welfare center's (CWC). Additionally, patronage of preventive health services provides an opportunity to improve care practices through both preventive healthcares.⁽⁶⁾

Materials and Method

The methodology of research indicates the general patterns of organizing the procedure for getting valid and reliable data for investigation. Research approach for the present study was a quantitative descriptive approach. Quasi Experimental design seems to be the most appropriate design for this study. The study was conducted at Paiyanoor village, Kanchipuram District, Tamil Nadu. A purposive sampling technique was used to select 30 samples that full fill the inclusion criteria viz. The tool was organized in two sections.

Section A: Demographic variable

It consist of the demographic data age, occupation, income, types of family and source of information

Section B: Knowledge questionnaire's

A structured questionnaire consists of 14 items. The total attainable score was 14 the cut off score was 8. The knowledge scoring is given below:

1. 0-5(<50%) Inadequate knowledge
2. 6-10(51-73%) Moderately adequate knowledge
3. 10-14(>74%) -Adequate knowledge

Results and Discussion

The collected data was tabulated and analyzed. Descriptive research study was used. The Mean value is 51.5% and standard deviation is 2.093, Table shows that Mean, Mean% and SD of knowledge of under-five mothers on protein energy malnutrition the study shows that (20%) of them having adequate knowledge. (63%) of them having moderate knowledge and (17%) of them

having inadequate knowledge. The findings shows that the majority (74%) of the mothers belongs to the age of 21-30 years.

Regarding the demographic variables, The majority (74%) mothers are Hindu. The majority (74%) mothers are occupation. The majority (75%) mothers having per income is a 6000-8000. The majority (78%) mother having nuclear family. The study showed that there is no significant association between protein energy malnutrition with the selected demographic variables

Conclusion

Health and nutrition messages are usually targeted to mothers, most of whom have not received formal educate these women usually patronize health services at antenatal clinics and child welfare center's (CWC). Additionally, patronage of preventive health services provides an opportunity to improve care practices through both preventive healthcares and services.

Conflict of Interest: Nil

Sources of Funding: Self-funding

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee.

Reference

1. K Park. Textbook of preventive and social medicine, 20th ed. Jabalpur: Banarasidas Bhanot Publishers; 2005. p 255
2. Sudheer K. A textbook of nutrition, 11th ed. India: Florence Publishers; 2010. p 32
3. Sreevani R. Malnutrition and mental development. *Nightingale Nursing Times*. 2000;4(12):21
4. BT Basavanthappa. Community health nursing, 2nd ed. New Delhi: Jaypee Brothers Medical Publishers; 2011. p 135.
5. Hurlock E. Developmental psychology. 3rd ed. London: McGraw hills publishing company; 1994. p.211-243.
6. Aparna B, Marrie. Health research: A community based approach. World Health Organisation. New Delhi 1981: 123.
7. Tiwari Mk, Sharma KK et al. Growth and nutritional status of the Bharia- A primitive tribe of Madhya Pradesh. *Coll Antropol*. 2007 Mar: 31(1):95-101.

8. Vichai Tanphai Chitri Winai Dahlam, Aree Vallyasevi Human Nutrition Better Nutrition, better life, Aksornsmi press publication. Bangkok: Thailand.
9. Khokar A. A study to assess the knowledge of mothers with regard to nutritional status of under-five children in selected rural community area. *India J Paediatr.* 1998; 63:122-23.

The Prevalence of Anemia among the Adolescent Girls in a Selected College in Kanchipuram

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Abstract

In developing nations, the adolescent group is progressively exposed to health issues and young girls are increasingly weak due to anemia. An observational study was conducted to assess the prevalence of anemia among the adolescent girls in a selected college in Kanchipuram. The objectives were to assess the socio-demographic variables of the adolescent girls, to assess the prevalence of anemia among the adolescent girls and to associate the prevalence of anemia and the socio-demographic variables of the adolescent girls. The cross sectional design was used to conduct the study. The setting of the study was a selected Allied Health Science college in Chennai. Adolescents in the age group of 17 to 19 years were selected as samples for the study. The convenience sample technique was used to select the samples. The sample size was 32. The results showed that 16 (50.0%) of the participants belong to the age 17 years and 18 years equally and the majority of the study participants 27 (84.0%) belong to nuclear family and 05 (16.0%) of the population belong to joint family and the 08 (25.0%) of the study participants were vegetarian and 24 (75.0%) of them were non vegetarian. The level of hemoglobin showed that majority of the study participants 22 (56.0%) suffer low hemoglobin level.

Keywords: Adolescent girls, Adolescence, Anemia, Prevalence, level of hemoglobin, pallor.

Introduction

Anemia is defined as a clinical condition characterized by low Hemoglobin level for the age, sex, physiological condition and related disease condition of that human being¹. It is a worldwide problem, mainly affecting poor people from countries with low income. Women are the main victims of the anemia because of blood loss during menstruation and childbirths when compared to other groups of the population. It is seen that no one is immune

to anemia. This can be caused by innumerable factors, the most common one is the deficiency of essential elements of Hemoglobin synthesis, blood loss, inadequate intake of iron-rich foods and worm infestation. Iron deficiency anemia is the most common anemia found among the human population and it is reported that anemia affects 01.62 billion people and 30.0% of the adolescent girls globally².

As indicated by an examination by WHO on iron deficiency during 1993-2005, the overall prevalence of anemia was 25.0%³. As indicated by WHO guidelines for control of anemia, nutritional anemia is the most common issue in India and is essential because of iron insufficiency. The National Family Health Survey-3 (NFHS-3) information recommends that the predominance of anemia in adolescent girls (15-19 years) is 56.0%. As per the National Nutrition Monitoring Bureau Survey (NNMBS) 2006, the severity of weakness in pre-adult young ladies (12-14 years) is 68.60% while in (15-17 years) it is 69.70%⁴. Iron insufficiency is a

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preventable disease. The high predominance of pallor (Hemoglobin <12.0 gm%) among immature young ladies in India, causes 01.80% loss of GDP. Every day prerequisite of iron for an adolescent girl is 0.80 mg/1000 K cal of dietary energy⁵. In the twelfth five year plan, the Indian government has defined an objective to lessen the burden of iron deficiency in adolescent girls by half.

In developing nations, the adolescent group is progressively exposed to health issues and young girls are increasingly weak due to anemia. Studies demonstrated that anemia was the most common issue experienced in low-income nations. India had revealed a high incidence of anemia among adolescent girls, which is evidently higher when contrasted and the other nations. There were numerous investigations centered around anemia among pregnant ladies and youngsters, however, just a couple of studies were accessible on anemia among young ladies. This examination was meant to discover the commonness of anemia among pre-adult young ladies and to correspond with socio-demographic status in a college zone of south India¹⁸.

Adolescent girls are selected for the examination as by improving anemia and knowledge among adolescent girls, maternal morbidity and mortality particularly, during pregnancy, can be improved. In perspective on the above mentioned, this investigation was done to discover the predominance and components related to pallor among young girls.

Statement of the Problem: An observational study to assess the prevalence of anemia among the adolescent girls in a selected college in Kanchipuram.

Objectives:

To assess the socio-demographic variables of the adolescent girls

To assess the prevalence of anemia among the adolescent girls

To associate the prevalence of anemia and the socio-demographic variables of the adolescent girls

Hypothesis: There was a significant association between the prevalence of anemia and the socio-demographic variables of the adolescent girls.

Operational Definition:

Prevalence – In this study prevalence referred to the

widespread of anaemia among the adolescent girls of Kanchipuram District.

Anaemia – Anaemia is a condition in which there is low level of haemoglobin in the blood (<12.0gm/dl)

Adolescent girls – In this study adolescent girls refers to the age group of 17 to 19 years old.

Methodology

The cross sectional design was used to conduct the study. The setting of the study was a selected Allied Health Science college in Chennai. The target population was the adolescent girls in Tamil Nadu. The accessible population in the present study was the adolescent girls (17-19years) in Allied Health Science, Chettinad Academy of Research and Education, Kelambakkam. Adolescents in the age group of 17 to 19 years were selected as samples for the study. The convenience sample technique was used to select the samples. The sample size was 32.

Inclusion Criteria:

1. Adolescents who were having age of 17-19 years.
2. Adolescents who were willing to participate in the study.
3. Adolescents who were present during the data collection.

Exclusion Criteria:

1. Adolescents who had history of any significant illness.
2. Adolescents who were sick during data collection.

Data Collection: The data collected for a week. The investigator introduced her/him to the participants and the purpose of the study was explained to ensure better co-operation during the data collection period. The study participants were asked to fill the socio-demographic questionnaire and the blood sample was collected from the participants and send to the pathology lab for the results. Procedure of Haemoglobin testing was done by Cyanmethemoglobin method (Drabkin's method). Data was analyzed by using descriptive and inferential statistics with PSPP software package.

Results and Discussion

It is showed that 16 (50.0%) of the participants belong to the age 17 years and 18 years equally. A study

conducted to assess the prevalence of anemia among adolescent girls in Ethiopia showed that the mean age of the study participants was 14.5 (± 2.28) years⁶. Similarly, an Indian study results on the same topic and population showed that that majority (53%) of girls were in the age group of 15-16 years⁷. In the present study, 24 (75.0%) of them were from Hindu, 01 (03.0%) were Muslim, 07 (22.0%) of them were Christians. A study conducted to assess the prevalence of anemia and its risk factors showed that the majority 172 (66.90%) of the study participants belonged to Hindu, Christian 74 (28.80%) and Muslim 11 (04.30%)⁸. In contrary, another study conducted in Ethiopia showed that around 99.0% of them are christian followers⁶.

In the current study, 01 (03.0%) of participants' family earned below Rs.5,000 per month, 07 (22.0%) of them earn Rs.5,001-10,000 per month, 07 (22.0%) of them earn Rs.10,001-15,000 per month, 07 (22.0%) of them earn Rs.15,000-20,000 per month, 10 (31.0%) of them earn Rs.15,001 and above per month. A study conducted in South India showed that majority of the study subjects belonged to middle class 137 (53.40%) followed by upper lower 117 (45.50%)⁸. An Ethiopian study showed that 30.30% of study participants had an estimated average monthly household income of less than 1000 Ethiopian birr⁶.

In the present study, the majority of the study participants 27 (84.0%) belong to nuclear family and 05 (16.0%) of the population belong to joint family. A study on prevalence of anemia in Bihar showed that the 68 (33.0%) in adolescent girls who belong to joint family and 138 (66.90) belong to nuclear families⁹. Another study of anaemia and its correlates among adolescent girls in schools of Haldwani, India showed that the majority of the study participants 487 (63.25%) belong to nuclear and joint families 283 (36.25%)¹⁰.

The current study showed that the 08 (25.0%) of the study participants were vegetarian and 24 (75.0%) of them were non vegetarian. A Study of correlation between dietary habits and anemia among adolescent girls in Ranchi and its surrounding area showed that 117 were vegetarians and remaining 183 were non-vegetarians¹¹. Similarly, anemia and Iron deficiency in adolescent school girls in Kavar Urban Area, Southern Iran showed that the majority of them are non vegetarian¹².

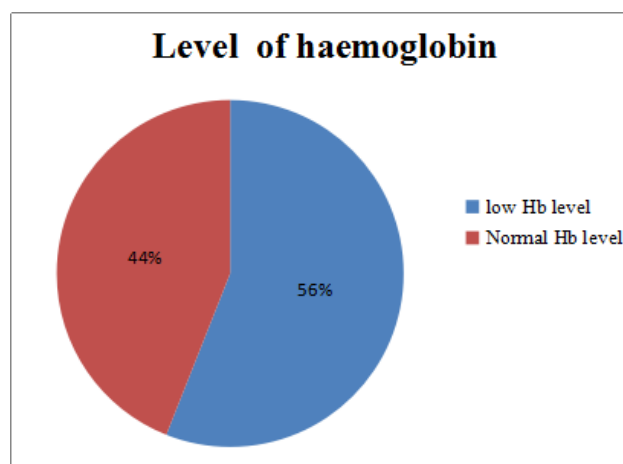


Fig 1: Distribution of adolescent girls based on the level of haemoglobin

The current study on the previous knowledge on anaemia depicted that 12 (38.0%) of the population gained knowledge from mass media, 20 (62.0%) from friends and relatives. A similar study conducted in Karnataka showed that the study participants learned about anemia from school teachers, followed by doctors and health care workers¹³. Similarly another study conducted in Indonesia showed that the majority of the study participants heard about anemia through parents and family members and from doctors also¹⁴.

Figure 1 illustrates the distribution of haemoglobin based on the level of hemoglobin and it is showed that majority of the study participants 22 (56.0%) suffer low hemoglobin level. The study on the prevalence of anaemia and its associated risk factors among adolescent girls of central Kerala showed that the the prevalence of anemia was 21% and risk factors associated with anemia in the uni variate analysis were presence of ova or cyst in stool ($p = 0.003$, $OR = 2.94$) and number of pads per day during menstruation⁸. Another similar study conducted in Uttar Pradesh showed that the prevalence of anemia among the adolescent girls was found to be 78.50%, of which 40.0% had mild, 33.0% had moderate and 05.50% had severe anemia¹³.

The current study results showed that there was no significant association between the age and level of hemoglobin of the study participants. Similarly a study conducted in Southwest Ethiopia showed that there was no significant association between the age and level of hemoglobin of the study participants ($P < 0.63$)¹⁵. However, another study conducted to assess anemia and associated factors among adolescent girls living in Aw-Barre refugee camp, Somali regional state, Southeast

Ethiopia showed that late young girls were all the more fundamentally influenced by anemia and the chances of developing anemia were 2 times more among late young people as compared with early aged girls (10 – 14yrs) (AOR: 1.95, 95% CI (1.09, 3.47)¹⁶. It is showed that there was no significant association between the religion and level of hemoglobin of the study participants. Likewise, another study conducted in North Kerala showed that there was no significant association between the religion and level of hemoglobin of the study participants ($P<0.8$)⁸. In contrary, another similar study results showed that there was a significant association between the religion and level of hemoglobin of the study participants and the adolescent girls who belonged to Hindu religion are mostly affected ($P<0.03$)¹⁷.

The present study showed that there was no significant association between the family monthly income and level of hemoglobin of the study participants. Likewise, another study conducted in North Kerala showed that there was no significant association between the income and level of hemoglobin of the study participants ($P<0.95$)⁸. The current study showed that there was no significant association between the type of family and level of hemoglobin of the study participants. Likewise, another study conducted in North Kerala showed that there was no significant association between the type of family and level of hemoglobin of the study participants ($P<0.25$)⁸. However, another study conducted in Southwest Ethiopia showed that there was a significant association between the type of family and level of hemoglobin of the study participants ($P<0.001$)¹⁵.

The present study showed that there was no significant association between the type of diet and level of hemoglobin of the study participants. Likewise, another study conducted in North Kerala showed that there was no significant association between the dietary habit and level of hemoglobin of the study participants ($P<0.35$)⁸. In contrary, a study of correlation between dietary habits and anemia among adolescent girls in Ranchi and its surrounding area showed that on comparing type of diet, anemia was more common in vegetarians¹¹.

The present study showed that there was no significant association between the previous knowledge on anemia and level of hemoglobin of the study participants. However, a study conducted on Ethiopia showed that more than three-fourths, 332 (78.5%), of the study subjects had not heard about anemia. The majority

of them, 240 (56.7%) of members had poor information on anemia. Around 43.3% adolescent girls had great learning about iron deficiency. Of all investigation members, just 162 (38.3%) knew on the reasons for iron deficiency, 178 (42%) on signs and manifestations, 196 (46.3%) on side effects and 183 (38.5%) on prevention and management of anemia⁶.

These are findings derived in the present study.

Conclusion

Anemia was observed to be a general medical issue in the study setting. Family month salary, family size, intestinal parasite infections, span of menstrual stream per each cycle and BMI for age were the fundamental indicators of anemia. Hence, college-based Iron folic acid supplementation and regular screening and deworming projects ought to be executed to help juvenile young ladies who are in danger of pallor.

Conflict of Interest: Nil

Source of Funding: Nil

References

1. Patel S. Iron Deficiency Anemia in anemic patients. Gujarat Medical Journal. 2009; 64(2): 15-18.
2. de Benoist B et al., eds. Worldwide prevalence of anaemia 1993-2005. WHO Global Database on Anaemia Geneva, World Health Organization, 2008.
3. Worldwide prevalence of anaemia. WHO global database on anaemia; 1993-2005. Available from https://apps.who.int/iris/bitstream/handle/10665/43894/9789241596657_eng.pdf;sequence=1
4. National Nutrition Monitoring Bureau. Diet and Nutritional Status of Rural Population and Prevalence of Hypertension among adults in Rural areas, NNMB Technical Report No. 24. Hyderabad: NNMB, NIN; 2006.
5. WHO guidelines for control of anemia, Adolescent division, Ministry of Health And Family Welfare, Government of India. 2013
6. Getachew Mengistu, Muluken Azage and Hordofa Gutema. Iron Deficiency Anemia among In-School Adolescent Girls in Rural Area of Bahir Dar City Administration, North West Ethiopia. Anemia. 2019: 08.

7. Niba Johnson. A study on knowledge regarding prevention of iron deficiency anemia among adolescent girls in selected pre-university colleges of Mangaluru. *Int J Cur Res Rev.* 2016; 8(18): 05-07.
8. Siva PM, Sobha A, Manjula VD. Prevalence of Anaemia and Its Associated Risk Factors Among Adolescent Girls of Central Kerala. *J Clin Diagn Res.* 2016; 10(11):LC19–LC23. doi:10.7860/JCDR/2016/20939.8938
9. Chand MIA, Nandan M, Mukherjee B. A study of prevalence of anaemia and sociodemographic factors associated with anaemia among adolescent girls in rural area of Katihar, Bihar. *J. Evolution Med. Dent. Sci.* 2016;5(74):5470-5473, DOI: 10.14260/jemds/2016/1238
10. Goyal, Neha; Rawat, C. M. S.. A study of anaemia and its correlates among adolescent girls in schools of Haldwani, India. *International Journal of Research in Medical Sciences.* 2018; 6(10): 3320-3326.
11. Chaturvedi D, Chaudhuri PK, Priyanka, Chaudhary AK. Study of correlation between dietary habits and anemia among adolescent girls in Ranchi and its surrounding area. *Int J Contemp Pediatr* 2017;4:1165-8.
12. Ramzi M, Haghpanah S, Malekmakan L, et al. Anemia and iron deficiency in adolescent school girls in kavar urban area, southern iran. *Iran Red Crescent Med J.* 2011; 13(2):128–133.
13. Navinkumar A. Knowledge, attitude and practice about anemia among adolescent girls in urban slums of Davangere City, Karnataka. *International Journal of Medical Science and Public Health.* 2016; 5 (03): 416-419.
14. Sitti P. Knowledge, attitude and practice of balanced diet and correlation with hypochromic microcytic anemia among adolescent school girls in maros district, South Sulawesi, Indonesia. *An International Journal of Medical Sciences.* 2016; 27(1): 24-28
15. Tesfaye M, Yemane T, Adisu W, Asres Y, Gedefaw L. Anemia and iron deficiency among school adolescents: burden, severity and determinant factors in southwest Ethiopia. *Adolesc Health Med Ther.* 2015;6:189–196. Published 2015 Dec 15. doi:10.2147/AHMT.S94865.
16. Engidaw MT, Wassie MM, Teferra AS. Anemia and associated factors among adolescent girls living in Aw-Barre refugee camp, Somali regional state, Southeast Ethiopia. *PLoS One.* 2018; 13(10):e0205381. Published 2018 Oct 11. doi:10.1371/journal.pone.0205381.
17. Rakesh PS. Prevalence of Anaemia in Kerala State, Southern India - A Systematic Review. *J Clin Diagn Res.* 2017; 11(5):LE01–LE04. doi:10.7860/JCDR/2017/24681.9951.
18. Abhilash S. Prevalence of anemia among adolescent girls in a rural area of Tamil Nadu, India. *Journal of family medicine and primary care.* 2019; 8(4): 1414-1417.

A Descriptive Study to Assess Knowledge, Attitude and Practices of Mothers Regarding Prevention of Juvenile Sexual Abuse

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Abstract

Sexual assault involves a perpetrator coercing or physically forcing a sexual act or non-consensual touching. A descriptive study was conducted to assess knowledge, attitude and practices of mothers regarding prevention of juvenile sexual abuse in selected community area in Kanchipuram (DT), Tamil Nadu. Objectives were to assess the knowledge, attitude and practices of mothers regarding the prevention of juvenile sexual abuse and to find out association between the knowledge, attitude and practices of mothers regarding juvenile sexual abuse and selected demographic variables. Mothers occupation had significant association with knowledge regarding prevention of juvenile sexual abuse ($p=.030$). Majority of the samples had adequate knowledge (80.0%), adequate attitude (62.2%) and adequate practice (75.6%) regarding prevention of juvenile sexual abuse.

Keywords: Knowledge, attitude, practices, prevention, juvenile sexual abuse.

Introduction

“Child sexual abuse is the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violates the laws or social taboos of society. Child sexual abuse is evidenced by this activity between a child and an adult or another child who by age or development is in a relationship of responsibility, trust

or power, the activity being intended to gratify or satisfy the needs of the other person. This may include but is not limited to: the inducement or coercion of a child to engage in any unlawful sexual activity; the exploitative use of a child in prostitution or other unlawful sexual practices; the exploitative use of children in pornographic performance and materials” (WHO, 2003) ⁽⁸⁾. Sexual assault involves a perpetrator coercing or physically forcing a sexual act or non-consensual touching. Rape falls under sexual assault and includes acts like the penetration of a penis, any object or any part of the body to any extent, into the vagina, mouth, urethra or anus of another person; or making another person do so. Any sexual activity, irrespective of consent with a girl or a boy below the age of 18, constitutes statutory rape (SNEHA) ⁽⁵⁾.

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Table 1: Types of juvenile sexual abuse (Tulir & SNEHA)^(5,7)

Touching Behaviors	Non-touching Behaviors
<ul style="list-style-type: none"> • Fondling a juvenile’s body for sexual pleasure • Kissing a juvenile with sexual undertones/inclinations • Rubbing genitals against a juvenile’s body • Sexually touching a juvenile’s body and specifically private parts (breasts and genitals). Includes encouraging or forcing a juvenile to do likewise • Making a juvenile touch someone else’s genitals, or playing sexual (“pants-down”) games • Encouraging or forcing a juvenile to masturbate, with the juvenile as either a participant or observer • Encouraging or forcing a juvenile to perform oral sex (mouth-to-genital contact on or by the juvenile) • Inserting objects or body parts (like fingers, tongue or penis) inside the vagina, mouth, or anus of a juvenile; includes attempts of these acts 	<ul style="list-style-type: none"> • Encouraging a juvenile to watch or hear sexual acts either in person or lowering the bars of privacy • Looking at a juvenile sexually • Exposing one’s private body parts to a juvenile (exhibitionism) • Watching a juvenile in a state of nudity, such as while undressing, using the bathroom, with or without the juvenile’s knowledge (voyeurism) • Making suggestive comments to the juvenile that are sexual in nature • Commenting on the sexual development of a juvenile • Encouraging or forcing a juvenile to read/watch pornography, giving pornographic material or using the juvenile in pornography • Making, viewing or downloading sexual images of juvenile on the Internet

Warning signs of juvenile sexual abuse (RAINN; 2018)

Physical Signs:

- Bleeding, bruises, or swelling in genital area
- Bloody, torn, or stained underclothes
- Difficulty walking or sitting
- Frequent urinary or yeast infections
- Pain, itching, or burning in genital area

Behavioral Signs:

- Changes in hygiene, such as refusing to bathe or bathing excessively
- Develops phobias
- Exhibits signs of depression or post-traumatic stress disorder
- Expresses suicidal thoughts, especially in adolescents
- Has trouble in school, such as absences or drops in grades
- Inappropriate sexual knowledge or behaviors
- Nightmares or bed-wetting
- Overly protective and concerned for siblings, or assumes a caretaker role
- Returns to regressive behaviors, such as thumb sucking

- Runs away from home or school
- Self-harms
- Shrinks away or seems threatened by physical contact

Juvenile vulnerable to sexual abuse: Juveniles frequently abused are of female gender, unaccompanied, in foster care, adopted, stepchildren, physically or mentally handicapped, history of past abuse, poverty, war/armed conflict, psychological or cognitive vulnerability, single parent homes/broken homes, social isolation (e.g. lacking an emotional support network), parent(s) with mental illness, or alcohol or drug dependency ⁽⁴⁾.

Simi, Kochuthresiamma & Suba (2017), reported that majority of the samples belonged to the age group of 31-40 years (62.3%), children were school agers (69.8%), had moderately adequate knowledge (73%) and attitude (68.4%). Minority (27.4%) had moderately adequate practice regarding prevention of juvenile sexual abuse. There was a significant association between maternal age (p=0.002), marital status (p=0.006), place of residence (p=0.070), mother’s occupation (p=0.006) with the knowledge, attitude and practice of mothers regarding prevention of juvenile sexual abuse ⁽⁶⁾.

Binsha, Jipsa, Jenita, Nikeetta & Victoria (2017), reported that majority of the mothers were in the age group of 26-30 years (35%), were with 2 children (44%), had 1 male child (52%), had one female child (55%). Most of the mothers (60%) had excellent knowledge regarding prevention of juvenile abuse, about (34%)

of them had good knowledge, about (6%) had average knowledge and none of the mothers had poor knowledge (2).

Fredrick, Tumaini, Phillippo & David (2016), reported that majority of the samples had high knowledge regarding prevention of juvenile sexual abuse (95.6%) and positive attitudes on preventing juvenile sexual abuse (98.7%). Minority (27.3%) had good practices on protection and prevention of juvenile sexual abuse. Anjali & Shenoy (2017), reported that 90% of subjects had inadequate knowledge regarding juvenile sexual abuse and 90% subjects had positive attitude regarding prevention of juvenile sexual abuse (3).

Method

Research Approach: Non-experimental research approach was used.

Research Design: A Descriptive research design was used.

Research Setting: The study was conducted at Pooncheri, Kanchipuram (DT), Tamil Nadu.

Population: Mothers of children with the age group of 0-14 years.

Sample Technique: Random sample technique was used.

Sample Size: Sample size was calculated using the formula $N = 4pq/d^2$. The estimated range was 81 to 101. The final sample size was 90.

Instrument/Material: Demographic variables proforma and self-administered tool were used. Self-administered tool was used to assess the knowledge, attitude and practice of mothers regarding a prevention of juvenile sexual abuse. The self-administered tool is a structured questionnaire assessing parent’s concepts on juvenile sexual abuse, attitudes regarding juvenile sexual abuse and practices in prevention of juvenile sexual abuse. Few of the items were ‘children are most likely to be abused by familiar people’, ‘child sexual abuse occurs only in the adolescent age’, ‘the perpetrators usually buy children expensive gifts or give them money for no apparent reason’, ‘men sexually abuse children in majority of cases’, ‘do you feel child sexual abuse prevention education in school is necessary’, ‘do you feel that body safety rules should be taught to the child at the primary level’, ‘told my child about good touch

and bad touch’ and ‘told them that if someone wants to see or touch there private parts they should definitely say ‘NO’ and leave at once’.

Scoring and Interpretation: It consists of 30 items. Responses to the items based on a two point scale. For negative statement reverse scoring was done. Tool validation was done by subject experts. The first 10 items loaded on knowledge, next 10 on attitude and last 10 on practices regarding prevention of juvenile sexual abuse. Total score can range between 0 and 30.

Table 2: Scoring and interpretation

Level of Knowledge	Score
Adequate	21-30
Moderately adequate	11-20
Inadequate	0-10

Procedure: Data was collected over one week. The written informed consent was obtained from the parent and guardian as well as from the study participants. Permission letter was obtained from the HOD of Mental Health Nursing department, HOD of Community Health Nursing department, Community area, UG Committee and Human Ethical Committee.

Statistical Analysis: Descriptive statistics like frequency distribution, percentage, mean, standard deviation and inferential statistics like chi square was used to analyze the data.

Result

The study finding revealed that: Maximum samples were between 31-40 years of age (38.9%), had primary level of education (43.3%), followed Hindu religion (76.7), were homemakers (61.1%) and had two children (64.4%).

Mothers occupation had significant association with knowledge regarding prevention of juvenile sexual abuse (p=.030).

Majority of the samples had adequate knowledge (80.0%) and lest had moderate knowledge (20.0%) regarding prevention of juvenile sexual abuse. Majority of the samples had adequate attitude (62.2%) and lest had inadequate attitude (1.1%) regarding prevention of juvenile sexual abuse. Majority of the samples had adequate practice (75.6%) and lest had moderate practice (24.4%) regarding prevention of juvenile sexual abuse

(Table 3).

Table 3: Knowledge, attitude and practice of mothers regarding prevention of juvenile sexual abuse N=90

S.No.	Variable	Inadequate		Moderate		Adequate	
		No.	%	No.	%	No.	%
1	Knowledge of mothers regarding prevention of juvenile sexual abuse	0	0%	18	20.0	72	80.0
2	Attitude of mothers regarding prevention of juvenile sexual abuse	1	1.1%	33	36.7	56	62.2
3	Practice of mothers regarding prevention of juvenile sexual abuse	0	0%	22	24.4	68	75.6

Source of Funding: Self
 Conflict of Interest: Nil

Discussion

Maximum samples were between 31-40 years of age. Similar finding is reported by Simi, Kochuthresiamma & Suba (2017)⁽⁶⁾. Maximum samples had two children as reported by earlier findings by Binsha, Jipsa, Jenita, Nikeetta & Victoria (2017)⁽²⁾, unlike the findings by Anjali & Shenry (2017)⁽¹⁾. Mothers occupation had significant association with knowledge regarding prevention of juvenile sexual abuse (p=.030). Similar finding is reported by Simi, Kochuthresiamma & Suba (2017)⁽⁶⁾. Majority of the samples had adequate knowledge, which is supported by study findings by Binsha, Jipsa, Jenita, Nikeetta & Victoria (2017)⁽²⁾ and Fredrick, Tumaini, Phillippo & David (2016)⁽³⁾. Majority of the samples had adequate positive attitude as reported by Fredrick, Tumaini, Phillippo & David (2016)⁽³⁾ and Anjali & Shenry (2017)⁽¹⁾. Majority of the samples had adequate practice (75.6%) regarding prevention of juvenile sexual abuse unlike the report by Fredrick, Tumaini, Phillippo & David (2016)⁽³⁾ unlike the findings of Simi, Kochuthresiamma & Suba (2017)⁽⁶⁾. Mothers occupation had significant association with knowledge regarding prevention of juvenile sexual abuse. Similar finding was reported by Simi, Kochuthresiamma & Suba (2017)⁽⁶⁾.

Ethical Clearance: Chettinad Academy of Research & Education - Institution Human Ethics Committee.

Reference

1. Anjali Kaushik and Shenry Danie. Knowledge and Attitude of Mothers regarding Prevention of Child Sexual Abuse. International Journal of Nursing & Midwifery Research 2017; 4(4): 42-48
2. Binsha Pappachan C, Jipsa Philip, Jenita Pinto, Nikeetta Aleyamma Kurian, Victoria Rufina Rodrigues. Knowledge of mothers regarding prevention of child abuse. Innovational Journal of Nursing and Healthcare 2017; 3(1): 7-10.
3. Fredrick M. Mlekwa, Tumaini Nyamhanga, Phillippo I. Chalya and David Urassa. Knowledge, attitudes and practices of parents on child sexual abuse and its prevention in Shinyanga district, Tanzania. Tanzania Journal of Health Research 2016; 18(4): 1-9.
4. RAINN. Rape, Abuse & Incest National Network. <https://www.rainn.org/articles/child-sexual-abuse> (accessed).
5. SNEHA.(ND)What are Rape and Sexual Assault? <http://snehamumbai.org/rape-and-sexual-assault/> (accessed).
6. Simi Mohan, Kochuthresiamma T, Suba Joice. Knowledge, Attitude and Practices on Prevention of Child Sexual Abuse among Mothers in a Tertiary Setting. International Journal of Science and Research 2017; 6(11): 382 - 385.
7. Tulir. Centre for the Prevention and Healing of Child Sexual Abuse (CPHCSA). <http://www.tulir.org/childsexualabuse.htm> (accessed).
8. WHO. Guidelines for medico-legal care for victims of sexual violence. <http://apps.who.int/iris/bitstream/handle/10665/42788/924154628X.pdf?sequence=1> (accessed).

Correlation of Injury Severity Score with Survival time in Fatal Road Traffic Accidents in Central Indian Population

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Abstract

The study was carried out in the department of forensic medicine at Government College and hospital, Nagpur over a period of one and half year on 200 dead bodies of victims of road traffic fatalities brought to mortuary for medico-legal post mortem examination. The aim of study was correlation between injury severity score (ISS) and survival time of victim of road traffic accidental deaths. The ISS was calculated from abbreviated injury scale (AIS). The cases were divided into four groups based on their ISS, where the group with less serious injuries (ISS<25) was considered survivable. The second group (ISS 25-49) was considered as severe, third group (ISS 49-74) was critical and fourth group (ISS 75) was fatal. Survival time was more in victims of road traffic accidents who had injury severity score (ISS) less than 25. On the contrary to this, victims who had ISS more than 25 (25-74), survival time was low. Victims who had ISS 75 died on spot or within 1 hours of fatal road traffic accidents. The ISS score is negatively correlated with the survival time with Pearson's correlation coefficient $r = -0.419$ which is highly significant ($p < 0.0001$).

Keywords: Injury Severity Score (ISS), Abbreviated Injury Scale (AIS), Road Traffic Accidents (RTAs), survival time.

Introduction

Road traffic accidents (RTAs) have emerged as an important public health issue. This needs to be tackled by multi-disciplinary approach. The trend in RTA injuries and death is becoming alarming in India. Injuries and death due to road traffic accidents are the major health problem in developing countries where more than 85% of all deaths and 90% of disability-adjusted life years were lost due to road traffic injuries.¹

Trauma has only recently been recognized as a discrete entity by the medical community. The ideal

method used for scoring trauma rely on anatomical or physiological measurements or a combination of the two. The abbreviated Injury Scale (AIS) and its derivative Injury Severity Score (ISS) both are anatomical scales. The Abbreviated Injury Scale, publication of the 1980 revision of the AIS was enthusiastically embraced by the trauma research community as a useful and reliable injury assessment tool. The AIS has been continuously improved since its inception. The current edition, AIS 2005 Update 2008, represents a five-year revision process involving hundreds of contributors in the USA, Canada, Australia, New Zealand and numerous European countries. Today, the AIS is the global system of choice for injury data collection and has become the basis for a number of derivative scales in use (e.g., Injury Severity Score, TRISS, ASCOT).^{2, 3}

The Injury severity score is calculated from AIS virtually the only standard anatomical scoring system in use that correlates linearly with the mortality, morbidity, hospital stay and other measures of severity. So, the purpose of the present study is to establish the correlation

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between injury severity score (ISS) and survival time of victims of road traffic accidental deaths. Introduction of these anatomical scoring method in forensic medicine may provide a standardized database of autopsy findings, clinical value for evaluation of trauma patients which would be a tremendous contribution to the quality of trauma treatment and the assessment of preventable deaths.

Material and Method

The cross sectional prospective study was conducted on total 200 dead bodies of victims of road traffic fatalities brought to mortuary for medico-legal post mortem examination in the department of forensic medicine at Government College and hospital, Nagpur, Maharashtra which serves mostly central Indian population. Duration of study was two years. The study was approved by institutional ethics committee. Decomposed bodies, cases with doubtful history were excluded from the study. The cases were divided into four groups based on their ISS, where the group with less serious injuries (ISS<25) was considered survivable, second group (ISS 25-49) was considered severe, the third group (ISS 49-74) was considered as critical and fourth group (ISS 75) was considered as fatal, thus not survivable.

Injury severity score (ISS) scoring method: Each injury is assigned an abbreviated injury scale (AIS) score and the nine body regions of AIS are grouped into six body regions mentioned below. Only the highest AIS score in each body region is used. The three most severely injured body regions have their score squared and added together to produce the ISS score.^{4,5,6}

$ISS = A^2 + B^2 + C^2$ where A, B, C are the AIS scores of the three most injured ISS body regions. The six body regions of injuries used in the ISS are: 1-Head or neck Face 2-Chest 3-Abdominal or pelvic contents 4-Extremities or pelvic or shoulder girdle 5- Extremities or pelvic or shoulder girdle 6-external. Association for advancement of automotive medicine, 2005 protocols updated in 2008 used for calculation of injury severity score (ISS).

Results

Table 1: Distribution of Cases according to Survival Period

Survival Time	Cases	Percentage
Spot death/< 1 hrs	37	18.50
1 to 6 hrs	44	22.00
6 to 12 hrs	9	4.50
12 to 24 hrs	23	11.50
24 to 48 hrs	22	11.00
48 to 96 hrs	29	14.50
4 to 7 days	11	5.50
>7 days	25	12.50
Total	200	100.00

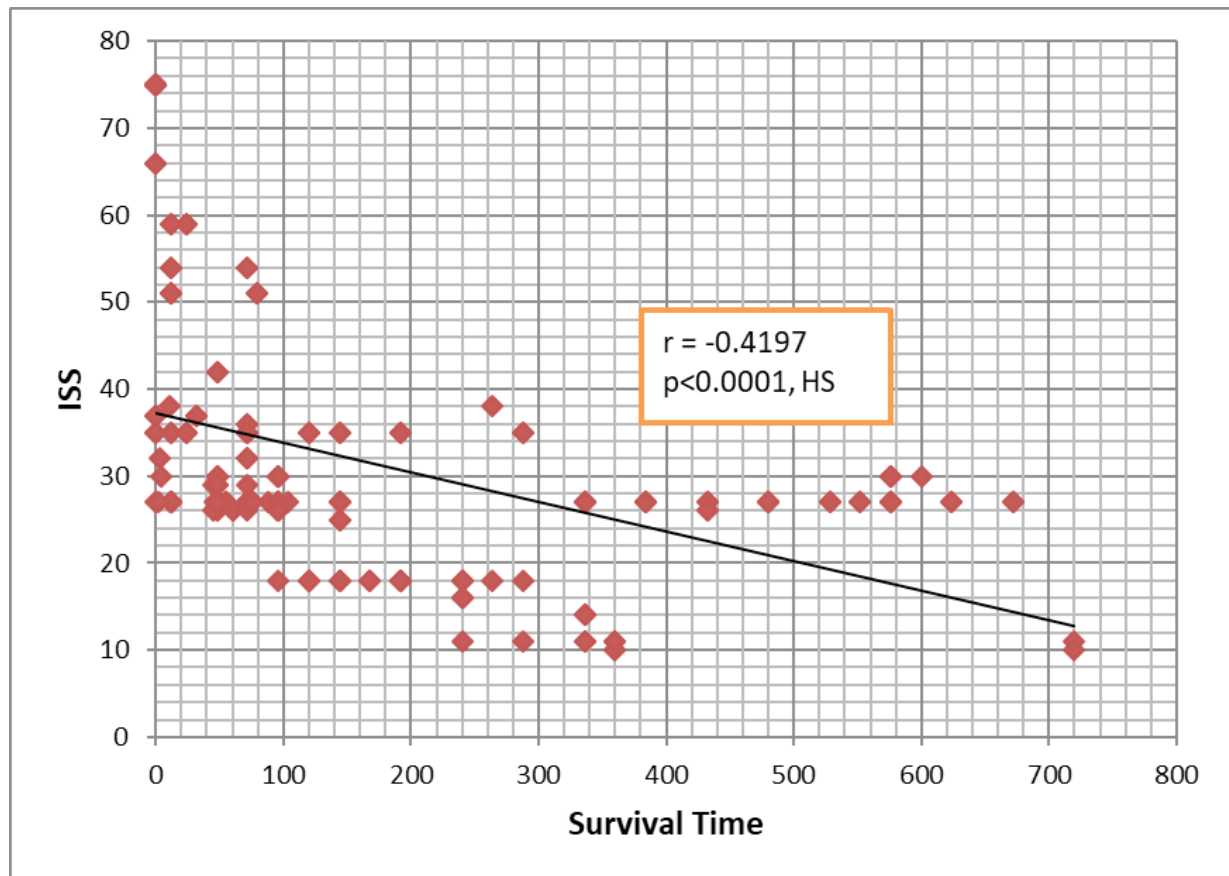
Table 2: Distribution of Cases according to Injury severity score (ISS)

Injury Severity Score	Cases	Percentage
< 25	34	17.00
25 to 49	139	69.50
50 to 74	15	7.50
75	12	6.00
Total	200	100.00

Table 3: Correlation between ISS and Survival time

Survival Time	ISS < 25	ISS 25 to 49	ISS 50 to 74	ISS 75
Spot death/< 1 hrs	0	14	11	12
1 to 6 hrs	0	40	4	0
6 to 12 hrs	0	9	0	0
12 to 24 hrs	0	23	0	0
24 to 48 hrs	0	16	0	0
48 to 96 hrs	1	25	0	0
4 to 7 days	8	12	0	0
>7 days	25	0	0	0
Total	34	139	15	12
Percentage	17.00	69.50	7.50	6.00

The ISS score is negatively correlated with the survival time with pearson's correlation coefficient $r = -0.419$ which is highly significant ($p < 0.0001$) as shown in graph 1.



Graph 1: Scatter plot showing correlation of ISS and Survival time

Discussion

Survival Time: 22% (44 cases) of victims of road traffic accidents died in between 1 to 6 hours of interval while 18% (36 cases) of victims died on spot or within one hour of road traffic accident i.e. 40% of victims died within 6 hours after the road traffic accidents. Only 12.50% (25 cases) of victims survived for more than 7 days (table 1). Mean survival time \pm SD = 145.73 ± 293.31 Median survival time = 20 hours and Range is 0-1800 hours.

Present study findings are partly comparable with Sharma B.R et al⁷, Rautji R et al⁸, Kamdar BA et al⁹ and Kumar A et al¹⁰.

The reason for major mortality within the 6 hours of road traffic accidents were most of the injuries were too severe in nature to seek treatment, most of them died on spot or during transportation of victims to the hospitals.

Injury severity score grouping: 17% (34 cases) had an ISS less than 25, while 69.50% (139 cases) of road traffic accidents victims had an ISS in between 25-49. 7.5% (15 cases) had an ISS in between 50-74 and 16% (12 cases) of road traffic accident victims had ISS 75 (as shown in table 2)

Our study is partly in accordance with the studies conducted by Rautji R et al⁸, Friedman Z et al¹¹ and Henrikson EM et al¹². The reason for maximum number of cases had ISS value in between 25-49 is because of the more serious nature of accidents resulting into more severe injuries. The percentage of cases falling between ISS 25-49 is consequently much more as compared to the developed countries, where the higher percentage of cases are seen with ISS 75 (non-survivable). The reason behind it may be due to urgent, prompt treatment and facility of trauma centre in developed countries, majority of death having ISS in between 25-49 could have been prevented.

Correlation between injury severity score and survival time: Victims who had ISS less 25, among them, 1 case survived for 48 to 96 hours, 8 cases survived for 4 to 7 days and 25 cases survived for more than 7 days.

On the other hand victims who had an ISS in between 24-49, 14 cases died on spot or within one hour of accidents, 40 cases survived for 1 to 6 hours, 9 cases survived for 6 to 12hours, 23 cases survived for 12 to 24 hours, 16 cases survived for 24 to 48 hours, 25 cases 48 to 96 hours and 12 cases 4 to 7 days. None of them survived for more than 7days. ISS in between 50-74 which was considered as critical had total 15 cases (7.50%) of victims of road traffic accidents, out of which 11 died on spot or within one hour of road traffic accidents while 4 cases survived for 1 to 6 hours. None of them survived for more than 6 hours in this group. ISS 75 which was considered as fatal had total 12 victims, all of them died on spot or within one hour of road traffic accidents (as shown in table 3). The ISS score is negatively correlated with the survival time with Pearson's correlation coefficient $r=-.0.419$ which is highly significant ($p<0.0001$) as shown in graph 1.

Our study partly correlates with the study conducted by Baker SP et al⁶, Rautji R et al⁸ and Nikolic' et al¹³, Vivek S et al¹⁴.

From our observation and above studied it is clear that survival time was more in cases having ISS less 25 (serious group) and cases having ISS in between 25 to 49 (severe group). Death may be prevented in these groups if effective emergency medical system, urgent and prompt surgical intervention, medical care and treatment were done in time. The higher figure of mortality in both these ISS group in our country is due to virtual absence of basic resuscitative measures being given to the casualties at the accident sites, as most of the casualties in the present study were brought to the emergency department by the general public and police personal, who unfortunately have no practical knowledge of basic first aid.

On the contrary, third group ISS 50-74 which was considered as critical and fourth group ISS 75 considered as fatal and thus un-survivable had very low survival time. Death cannot be prevented in this group regardless of adequate medical care and emergency measure. The injuries were fatal in nature.

Conclusion

Survival time was comparatively more in serious and severe groups as compared to critical and fatal groups in our study. The Injury Severity score is negatively correlated with the survival time with Pearson's correlation coefficient $r=-.0.419$ which is highly significant ($p<0.0001$). The patients in these groups require immediate care and prompt treatment by specialists. With the quality of care and treatment, prognosis of these patients could be better. The use of survival scoring systems permits rapid identification of unexpected outcomes, allowing investigators to perform detailed reviews of particular cases and to determine the reasons for particular outcomes. Very few studies have been done in central Indian scenario on this topic. Further studies and researches with more sample sizes are needed to enhance its role in post mortem cases.

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References

1. Gopalkrishnan S. A. Public health perspective of road traffic accidents. [Online]. 2013[cited 2013 Sep 17]; Available from: URL: <http://www.jfmc.com>
2. Association for the Advancement of Automobile Medicine. Barrington, Illinois, USA. [Online]. 2011[cited 2012 Aug 11]; Available from: URL: <http://www.aaam.org/about-ais.html>
3. Thomas A, Gennarelli MD. The Abbreviated Injury Scale 2005. update 2008, association for the Advancement of Automobile Medicine. Barrington, IL 60011-4176 USA.
4. Injury severity score .[Online].2012[cited 2012 Dec 1]; Available from: URL: <http://www.trauma.org/archive/scores/iss.html>
5. Shyan R,Wane J M.Management of acute trauma. Sabiston's text book of surgery. Elsevier publisher 2012; 19th ed. Vol.1: ch.18,p-432.
6. Baker SP, O'Neill B, Haddon W, Long WB. The injury severity score: a method for describing patients with multiple injuries and evaluating

- emergency care. *J Trauma*. 1974; 14(3): p.187-96.
7. Sharma BR, Gupta M, Bangar S. NISS a valuable tool for trauma scoring on autopsy Pakistan journal of biological sciences. 2005; 8 (7):p.995-1000.
 8. Rautji R, Bhardwaj DN, Dogra TD. The Abbreviated Injury Scale and its Correlation with Preventable Traumatic Accidental Deaths: A study from South Delhi. *Med. Sci. Law* .2006; 46(2).
 9. Kamdar BA, Arden GP. Road traffic fatalities (review of 142 post mortem reports) *Postgraduate Medical Journal*. 1974 Mar; 50:p.131-34.
 10. Kumar A, Lalwani S, Agarwal D, Rautji R, Dogra T. Fatal road traffic accidents and their relationship with head injuries: An epidemiological survey of five years. *Indian Journal of Neurotrauma (IJNT)* 2008; 5(2):63-67.
 11. Friedman Z, Kungel C, Hiss J, Margovit K, Stein M, Shapira S . The Abbreviated injury scale – a valuable tool for forensic documentation of trauma. *Am J Forensic Med Pathol* .1996; 17(3):p. 233-38.
 12. Henriksson EM, Ostrom M, Eriksson A. Preventability of vehicle-related fatalities. *Accid. Anal. and Prev*. 2001; 33:p.467-75.
 13. Nikolic' S, Micic' J, Mihailovic' Z. Correlation between survival time and severity of injuries in fatal injuries in traffic accidents. *Srp Arh Celok lek*. 2001;139:291-5.
 14. Vivek S, Anil K, Banerjee KK. New Injury Severity Score in Fatal Blunt Thoracoabdominal Trauma in North East Delhi. *J Indian Acad Forensic Med*. 2015;37(1):65-67.

Prevalance and Risk Factors of Gestational Diabetes Mellitus: A Retrospective Study

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Abstract

A retrospective study to assess the prevalence and risk factors of gestational diabetes mellitus among antenatal mothers in a selected Tertiary Care Hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India. The objectives were to assess the prevalence of Gestational Diabetes Mellitus within last two years (2016 to 2018) in a selected Tertiary Care Hospital at Kelambakkam, at Kanchipuram District, Tamil Nadu and to associate the risk factors of GDM with the selected demographic variables. The convenient sampling was used to select 35 medical records of antenatal mothers with gestational diabetes mellitus. The data regarding risk factors like History of GDM in previous pregnancy, Fasting blood glucose, Random blood glucose, Diagnosed at which trimester, Previous history of LSCS, previous history of abortion, duration in hospital, complications other than gestational diabetes mellitus were collected from the medical records. The result showed that 120 antenatal mothers were diagnosed with gestational diabetes mellitus within last 2 years. There is a significant association of demographic variables like parity with the risk factors of history of gestational diabetes mellitus in previous pregnancy ($\chi^2 = 7.882$, $P \leq 0.05$)

Keywords: Prevalance, Risk factors, Gestational Diabetes Mellitus (GDM).

Introduction

Gestational diabetes mellitus (GDM) is referred to "Carbohydrate intolerance leading to hyperglycaemia of variable severity with onset or 1st recognition throughout maternity". Maternal hyperglycemia may cause fetal hyperinsulinemia. Many maternal and fetal side effects are associated with this carbohydrate disorder, such as fetal macrosomia, perinatal mortality, cesarean delivery and preeclampsia. Later in life, this affected community tends to suffer from more complications, such as type 2

diabetes mellitus and obesity, however. To avoid such health problems early diagnosis of GDM is important. (Crowther CA, Hiller JE 2005)^[1]

Women were considered to belong in the high risk group if they have any one of the following risk factors: any previous history of GDM, macrosomia, congenital malformation, recurrent abortions and/or unexplained intrauterine death, any first degree relatives with diabetes, maternal obesity, intake of drugs that can affect carbohydrate metabolism such as steroids, maternal age >30 years and obstetric risk factors such as polyhydramnios, macrosomic fetus, fetal abnormality or recurrent genital tract infections. Those without the above risk factors were considered to be low risk. Based on this local data, the ASGODIP (AFES study group on diabetes in pregnancy) concur with international recommendations that all pregnant women should be assessed for any risk factors during the first prenatal visit and should screen patients using a 50g oral challenge test (OGCT) for low risk patients and an OGTT for high risk patients. (Clapperton M, Jarvis J 2009)^[2]

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Need for the Study:

- International Diabetes Federation (IDF), Diabetes Atlas (2017) has shown that there were an estimated **204 million woman** (20-79 years) living with diabetes. This number is projected to increase to **308 million** by 2045.
- **1 in 3 woman with diabetes** were of reproductive age.
- **21.3 million or 16.2% of live births** had some form of hyperglycaemia in pregnancy. An estimated 85.1% were due to gestational diabetes.
- **1 in 7 births** was affected by gestational diabetes.
- the vast majority of cases of hyperglycaemia in pregnancy were in **low-and middle income countries**, where access to maternal care is often limited.
- It is important for woman with diabetes in pregnancy or GDM to **carefully control and monitor their blood glucose levels** to reduce the risk of adverse pregnancy outcomes with the support of their healthcare provider (**International Diabetes Federation**)^[3]

Recently, prevalence of GDM was found to be 18% in HAPO (hyperglycaemia and adverse pregnancy outcome) study. WHO estimated that prevalence of GDM in India was about 40.9 million in 2009 & is expected to rise to 69.9 million by 2025. Thus making it an important public health problem in India (**D. Lakshmi, 2018**)^[4]

Statement of the Problem: Prevalence and Risk factor of Gestational Diabetes Mellitus in a selected

Tertiary Care Hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India.

Objectives of the Study:

- Assess the prevalence of Gestational Diabetes Mellitus with in last two years (2016 to 2018) in a selected hospital
- Associate the risk factors of GDM with the selected demographic variables

Operational Definitions:

Prevalence: Prevalence is the number of records of mothers diagnosed with Gestational Diabetes Mellitus with in last two year (2016-18) in a selected hospital

Risk Factors: Risk factors is one of the conditions that increase your risk of developing a disease. Risk factors are either modifiable, meaning you can take measures to change them, or non-modifiable, which means they cannot be changed

Risk factors as taken from the records of mothers diagnosed with Gestational Diabetes Mellitus from 2016-2018 like History of GDM in previous pregnancy, Fasting blood glucose, Random blood glucose, Diagnosed at which trimester, Previous history of LSCS, previous history of abortion, duration in hospital, complications were collected from the medical records

Gestational Diabetes Mellitus: Gestational diabetes mellitus is defined as Impaired Glucose Tolerance (IGT) with onset or first recognition during pregnancy, diagnosed by following criteria

Screening steps and cutoff values of the two-step test for GDM:

Testing	Dose	Timing of test	Cutoff value		Consequence
			mmol/L	mg/dl	
Pre-test(GCT)					
	50g	After 1 hour	≥7.5 and ≤11.1	≥135 and ≤200	Prompt application of the diagnostic test
Diagnostic test (OGTT)					
		Directly fasting	≥5.1	≥92	Upon reaching or exceeding one of the 3 cutoff values: GDM diagnosis
	75g	After 1 hour	≥10.0	≥180	
		After 2 hour	≥8.5	≥153	

Material and Method

Research Approach: Quantitative descriptive research approach was used this study

Research Design: The retrospective design used for this study.

Research Setting: The study was conducted in Medical Record Department, Chettinad Hospital and Research Institute, Kanchipuram District, Tamil Nadu, India

Population: Records of all antenatal mothers

Sample: The sample in the present study was records of antenatal mothers with Gestational Diabetes mellitus who have admitted in antenatal ward, CHRI.

Sample Size: The medical records of mothers with Gestational Diabetes Mellitus within last two year (2016-2018).

Sampling Criteria:

Inclusion Criteria: The medical records of mothers with Gestational Diabetes Mellitus with in last two year (2016-2018).

Selection and Development of Study Instrument: In the present study the study instrument was medical records.

Data Collection Procedure:

- After obtaining ethical committee clearance and written permission from the Dean and Medical Superintendent, the main study was conducted in Medical record department, Chettinad Hospital and Research Institute.
- The case sheet was be selected through convenient sampling technique, the necessary data regarding Risk factors like History of GDM in previous pregnancy, Fasting blood glucose, Random blood glucose, Diagnosed at which trimester, Previous history of LSCS, previous history of abortion, duration in hospital, complications were collected from the medical records belonging to a particular race and short stature of mother was collected.
- The duration of data collection was one week

Data Analysis: The data was analyzed by using descriptive and inferential statistics as follows

- Mean
- Mean difference
- Chi-square

Ethical Considerations:

- UG committee permission was obtained
- IHEC clearance was obtained
- Permission obtained from Dean, Medical Superintendent, HOD, Medical Records Department was obtained

Findings: The findings are presented based.

Finding 1: Association of Previous History of GDM in previous pregnancy with demographic variables of antenatal mothers with gestational diabetes mellitus

Demographic variable parity has significant association with the history of GDM in previous pregnancy ($\chi^2 = 7.882$ ($p \leq 0.05$))

Finding 2: Association of Fasting blood glucose with Demographic variable of antenatal mothers with gestational diabetes mellitus.

There was no demographic variables had significant association with fasting blood glucose ($p \leq 0.05$).

Finding 3: Association of Random blood glucose with Demographic variable of gestational diabetes mellitus.

There was no demographic variables had significant association with Random blood glucose ($p \leq 0.05$).

Finding 4: Association of diagnosis of gestational diabetes mellitus at which trimester with Demographic variable of antenatal mothers with gestational diabetes mellitus.

There was no demographic variables had significant association with diagnosis of gestational diabetes mellitus at which trimester ($p \leq 0.05$).

Finding 5: Association of Previous history of LSCS with Demographic variable of antenatal mothers with gestational diabetes mellitus.

There was no demographic variables had significant association with Previous history of LSCS ($p \leq 0.05$).

Conclusion

The study result showed that there was no significant association between all risk factors except parity $\chi^2 = 7.882$ ($p \leq 0.05$) with the selected demographic variables.

Conflict and Interest: Nil

Source of Funding: Self funding .

Ethical Clearance: Obtained clearance from Institutional Human Ethical Committee on 04.02.2019.

References

1. Crowther CA, Hiller JE, Moss JR, et al. For ACHOIS Trial Group Effect of treatment of Gestational Diabetes Mellitus on pregnancy Outcomes. 2005; 352(24)
2. Clapperton M, Jarvis J, Mungrue K.: Gestational Diabetes Mellitus an Important Contribute to Metabolic Disorder in Trinidad and Tobago?. *Obstetrics and Gynecology* 2009; 28
3. International Diabetes Federation, International Diabetes Federation (IDF), Diabetes Atlas
4. Lakshmi D, John William Felix, Devi R. *Obstetrics and Gynecology International* 2018.

A Descriptive Study to Assess the Risk Factors of Obesity among Housewives Residing at Selected Community, Setting in Kanchipuram District, Tamil Nadu

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Abstract

A descriptive study to assess the risk factors of obesity among housewives residing at selected community, setting in Kanchipuram District, Tamil Nadu. The objectives were to assess the risk factors of obesity among the housewives to find out the association between assess the risk factors of obesity and selected demographic data of obesity among the house wives. A non – experimental, descriptive study was conducted.

The sampling technique was non-probability, purposive sampling technique with the sample of 30 housewives among obesity and Structured questionnaires (SQ) in the form was used to the assess the risk factors obesity among housewives. The variables were assessed the assess the risk factors of obesity among housewives. Hypotheses were formulated. The level of significance selected was $p < 0.05$. The investigator used demographic data and Structured questionnaires (SQ) was used to collect data. The data collection for the main study was done .

The collected data was tabulated and analysed. Descriptive and inferential statistical were used. The mean value was 207 and the standard deviation was 2.8133. The study shows that the risk factors of obesity inadequate 7 (23%) were moderate 21(70%) and adequate was 2 (7%). The study concludes that there is moderate 70% to assess the risk factors of obesity among housewives.

Keywords: *Assess risk factors, housewives living with obesity.*

Introduction

Obesity is a complex condition, one with serious social and psychological dimensions, that affects virtually all age and socio-economic groups and threatens to overwhelm both developed and developing countries. As in developed societies, the risk for obesity in developing countries is also strongly influenced by diet and lifestyle, which are changing dramatically as a result

of the economic and nutrition transition. Obesity is a key risk factor in the natural history of non-communicable diseases like hypertension²

According to WHO global estimates, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2014. Prevalence of obesity varies according to age, sex and region. In India the percentage of ever married women aged 15-49 years who are overweight or obese increased from 11% in National Family Health Survey (NFHS)-2 to 15% in NFHS-3. The percentage of women who are overweight or obese is highest in Punjab (29.9%), followed by Kerala (28.1%) and Delhi (26.4%). Therefore in the present study, an attempt has been made to find the prevalence and risk factors for overweight and obesity in women aged 20-60 years in Ludhiana city.⁴

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Obesity is a major health problem and becomes an important epidemic in both developed and developing countries since an increase in the risky lifestyles. Obesity is a global problem, affecting and estimated 300 million people worldwide and its prevalence in the recent decade had a rapid increase (17%). Obesity substantially in the increase the risk of several major cancers especially postmenopausal breast cancer and endometrial cancer. Moreover, study indicated that overweight and obesity are associated with an increase in mortality and a considerable reduction in life expectancy¹.

Obesity is a complex condition, one with serious social and psychological dimensions, that affects virtually all age and socio-economic groups and threatens to overwhelm both developed and developing countries. As in developed societies, the risk for obesity in developing countries is also strongly influenced by diet and lifestyle, which are changing dramatically as a result of the economic and nutrition transition. Obesity is a key risk factor in the natural history of non-communicable diseases like hypertension⁵. According to WHO global estimates, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2014. The foods we eat every day contribute to our well-being. Foods provide us with the nutrients we need for healthy bodies and the calories we need for energy. If we take in more calories than we burn, the extra food turns to fat and is stored in our bodies. If we overeat regularly, we gain weight and if we continue to gain weight, we may become obese⁴.

Objectives:

- To assess the risk factors of obesity among the housewives.
- To find out the association between the risk factors of obesity and selected demographic data of obesity among the housewives.

Hypothesis:

H 1: There will be a significant association between the risk factors of obesity and demographic data of the obesity among the housewives.

Research Methodology: Research approach for the present study was a quantitative descriptive approach.

The research design is non experimental descriptive design was used for the study. The study was conducted at Paiyanoor village, Kanchipuram District, Tamil

Nadu with the population of housewives, available in the age group of 20-60 years. The sample size was 30 housewives in the age of 20-60 years who were residing in Paiyanoor village, Kanchipuram District. The participants of the study were selected by purposive sampling technique.

Selection and Development of Study Instruments:

It consisted of two sections.

1. Demographic data of the subjects
2. Structured questionnaires.

Section A: The consent form to be obtained from each study sample was given in section A.

Section B: It consisted of demographic data of obesity among the housewives which includes age in years, educational qualification, religion, occupation, socio economic status, how many times do your meals in a day, are you vegetarian or non-vegetarian and BMI.

Section C: Structured questionnaire (SQ) in the form was used to assess knowledge level of risk factors obesity among housewives.

Scoring and Interpretation of the Tool: Structured questionnaires consist of 12 items. The total attainable score was 12. The cut off score was 8. Higher the cut off score indicates greater the knowledge level of risk factors of obesity and also correlated to BMI.

Table: 3.1. To assess the knowledge level of risk factors obesity among housewives was interpreted which was presented in the table:

Data Collection Procedure: The data collection was done for one week at Paiyanoor village, Kanchipuram District, Tamil Nadu. Structured questionnaire was used to assess the knowledge level of risk factors of obesity among housewives. The researchers collected the demographic data and structured questionnaire (SQ) by conducting confidential data of the participants.

Data Analysis: The data analysis was done using descriptive and inferential statistics. Descriptive statistics like frequency, percentage and mean. Chi-square test was used to find out the association between the risk factors and selected personal information sheet of the obesity among housewives. Collected information on demographic data of housewives and assess risk factors on obesity among housewives and Structured

questionnaires (SQ) in the form of demographic data of housewives which includes age, educational qualification, occupation, family monthly income, BMI.

Descriptive and inferential statistical were used. The mean value is 207 and the standard deviation is 2.8133.

Results

Table 1: Mean, Mean% and assess the knowledge level of risk factors for obesity among housewives. [N= 30]

S.No.	Level of knowledge	Number of House Wives	Total of Number Question	Score Range	Total Sore	Mean	Mean %	Knowledge %	
								Individual	Total
1	Inadequate knowledge	30	12	0-5	7	207	88%	23%	100%
2	Moderate knowledge	30	12	6-7	21			70%	
3	Adequate knowledge	30	12	10-12	2			7%	

The study shows that the risk factors of obesity inadequate 7(23%) were moderate 21(70%) and adequate was 2(7%). The study concludes that there is moderate 70% to assess the risk factors of obesity among housewives.

Conclusion

The finding of the present study reveals that significant association between assess the risk factors of obesity among housewives with selected demographic data housewives [Educational Qualification And Occupation] and there is no significant association between like age in years, family monthly income, BMI.

Conflict of Interest: Nil

Sources of Funding: Self-funding

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee.

Reference

1. Nutrition in India. National Family Health Survey (NFHS-3) India 2005-06. International Institute for Population Sciences Deonar, Mumbai. http://www.rchiips.org/nfhs/nutrition_report_for_website_18sep09.Pdf. [Last accessed on 2014 Apr 28].

2. National Family Health Survey-3, India, 2005-2006 Adult Nutrition. Available <http://www.nfhsindia.org/NFHS.../NFHS3%20Nutritional%20Status%20of%20Adultspt>. [Last accessed on 2014 May 01].; 2015. Broussard BA, Johnson A, Himes JH, etl.. prevalence of obesity in American Indians and Alaska natives. *AMJCLIN nutri*-2013;53, (suppl): 1535S-42S.
3. Sugamran JR, white LL, Gilbert TJ. evidence for a secular change in obesity, height, weight, among Navjio Indian *AM J.clin nutr*.2014;52-960-6.
4. Rita singh RS, Raghavanshai and priyangasinghal. *International Journal of Food and Nutritional Science* VOLUME-2, ISSUE-4;oct-dec-2013. ISSN:2220-7876.
5. Sangeethagirbhar, sarit Sharma, etl.. and epidemiological study of over weight and obesity among women in an urban area of north india, 2016, 41(2), page no:(154-7).
6. Controlling the global obesity epidemic. World Health Organization. Available from: www.who.int/nutrition/topics/obesity/en/. [Last accessed on 2015 Apr 25].
7. Obesity and Overweight. World Health Organization. Available from <http://www.who.int/mediacentre/factsheets/fs311/en/>. [Last accessed on 2015 Apr 25].

Assessment of Presence of the Phenotypic Characteristics of Polycystic Ovarian Syndrome among Young Adult Girls in a Selected College, Kanchipuram District, Tamil Nadu, India

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Abstract

Assessment of presence of the phenotypic characteristic of Polycystic Ovarian Syndrome among young adult girls in a selected college in Kanchipuram District, Tamil Nadu. The Objectives are to assess the phenotypic characteristics of polycystic ovarian syndrome among young adult girls. To determine the association between phenotypic characteristics with selected demographic variables. The convenience sampling technique was used to select 295 sampling. Validity and Reliability data collection tools were established. The data were collected by self-structured questionnaires. The collected data were tabulated and analyzed. The findings of the present study Shows that the presence of phenotypic characteristics of PCOS based on score of hirsutism was estimated to be (39.7%) and based on grading of acne was estimated to be (66.8%) of young adult girls have mild acne characteristics of PCOS, (13.5%) of young adult girls have moderate acne characteristics of PCOS.(11.9%) have severe acne characteristics of PCOS and (7.8%) have very severe acne characteristics of PCOS.

There is significant association between the demographic variables and the scoring of hirsutism of young adult girls in their age, residence, age of menarche, regulation of menstrual cycle, length of menstrual cycle, BMI at p value= <0.05 level of significant. And there is significant association between demographic variables and the grading of acne among young adult girls in their residence, menstrual cycle, length of menstrual cycle, family history of PCOS, co-morbidities, BMI at p value= <0.05% level of significant.

Keywords: Phenotypic characteristics of polycystic ovarian syndrome, Young adult girls.

Introduction

Polycystic ovarian syndrome (PCOS) is the common endocrine disorder of women in reproductive age . PCOS was described by Ashtyn and Leventhal.

PCOS is a major public health concern in terms of a frustrating experience for women and a challenging complex syndrome for clinicians.⁽¹⁻²⁾

Prevalence estimates highly variables on age group depending on difficulties in hormonal evaluation.⁽³⁾ and ranging from 2.2% to 26%. The prevalence has been increasing in the adolescent population ⁽⁴⁾, In more than 40% of cases, PCOS is associated with obesity, as well as impaired glucose tolerance, type 2 diabetes and the metabolic syndrome. ⁽⁵⁾ During this pubertal transition, several features may be in evolution and thus many findings may be transitory which stabilize later during diagnosis in order. PCOS is the important to make an early diagnosis in order to prevent early and late sequel of the syndrome.

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The characteristics of PCOS include increased secretion of androgen level (hyperandrogenesis) and gonadotropin releasing hormone (GnRH) that leads to menstrual irregularity, hirsutism and infertility⁽⁶⁾. It can be diagnosed at all the phases of life that girls having 8-9 year of age through post- menopausal females. Amenorrhea is the most common problem of PCOS in young girls.⁽⁷⁾ obesity is also common features in women with PCOS and Family history of obesity, diabetes mellitus, thyroid disease, PCOS is strongly supports a genetic susceptibility to this disorder at present lifestyle, food habits, environmental exposures to toxins and stress have also contributed to the development of PCOS.

Insulin resistance is central to the pathogenesis of PCOS ⁽⁸⁾ Indians are known to have high prevalence of insulin resistance, so the prevalence of PCOS is expected to be high in the Indian population ⁽⁹⁾. The short complications of polycystic ovarian disease include menstrual irregularities, hyperandrogenism, insulin resistance and hyperinsulinemia, obstructive sleep apnea, dyslipidemia, oligoovulation anovulation and the long-term complications includes endometrial hyperplasia, metabolic syndrome, cardiovascular disease and psychological disorders.

Materials and Method

A Quantitative descriptive approach with a cross sectional design was used in the study . The study was carried out in a selected college, Kanchipuram District, Tamil Nadu, India. The study population included all young adults girls in the selected colleges. The young adult girls who fulfilled the sampling criteria were the samples for this study. The sample was selected by using a convenient sampling technique.

Inclusion Criteria:

The Young Adults Who

- Are in the age group from 18-21years
- Young adult girls who are willing to participate in the study

Exclusion Criteria:

The Young Adult Girls Who:

- are not available during the study period
- are all having congenital abnormalities

- Transgender are excluded from the study

Sample size Estimation: All young adult girls in selected colleges, Kanchipuram District, Tamil Nadu were the population.

Samples of 295 adult girls in selected college in Kanchipuram District

Young adult in age group between of 18-21 year.

Sample Size:

$$\text{Sample calculation formula} = Z^2p(1-p)/d^2$$

$$= 1.96^2(0.26)(1-0.26)/0.05^2$$

Sample Size = 295

Z-Level of confidence standard 95% value is 1.96

p-expected prevalence

d-precision value is 0.05

Data Collection: The data collection procedure will be carried out for period of 6 days. The study will be initiated after obtaining prior permission from to concerned authorities. The data will be collected from the adolescent girls in selected college.

The research tool consisted of two sections.

The structured interview format contains question of the following section.

Section 1:Standardized Questions related to demographic variables

Section 2:

- A. Selected standardized variables
- B. Standardized scales for Hirsutism.
- C. Global Acne scale.

In this study standardized questionnaire was used to elicit demographic variables and standardized scales for hirsutism and global acne scale was used to assess the presence of phenotypic characteristics of PCOS among young adult girls and the score for hirsutism was interpreted as follows below 6 is absent, above 6 is present hirsutism.

Categorization of global acne score:

The Global Acne Grading System ⁽¹²⁾	
Location	Factor
Forehead	2
Right cheek	2
Left cheek	2
Nose	1
Chin	1
Chest and upper back	3

Note: Each type of lesion is given a value depending on severity: no lesions = 0, comedones = 1, papules = 2, pustules = 3 and nodules = 4. The score for each area (Local score) is calculated using the formula: Local score = Factor x Grade (0-4). The global score is the sum of local scores and acne severity was graded using the global score. A score of 1-8 is considered mild; 19-30, moderate; 31-38, severe; and >39, very severe.

Analysis: Descriptive and Inferential statistics was used to analyze and interpret the data. Descriptive analysis was used to analyze the demographic data. Chi square test was used to determine the association between phenotypic characteristics of PCOS with selected demographic variables.

Study Findings: Distribution of demographic variables among young adult girls.

The demographic characteristics were included in this study was age, residence, age of menarche, menstrual cycle, regulation of menstrual cycle, length of menstrual cycle, family history of PCOS, co-morbidities, BMI.

This study found that the age (60.3%) belongs to the age group of 18-19 years and (39.7%) belongs to the age group of 20-21 years. This study also found the age (73.2%) were adolescents (15-19 years) which is similar to the findings of **Beena Joshi, Srabani Mukherjee**, "et al" showed that.

In regard (65.8%) of young adult girls have menarche between age group of 12-14 years, (8.1%) have menarche between 19-11 years, (26.1%) have menarche at age >14 years. In regard (73.5%) have 3-5 days menstrual cycle, (24.1%) have 5-7 days menstrual cycle, (2.4%) have above 7 days menstrual cycle. (72.5%) have regular menstrual cycle and (27.5%) have irregular menstrual cycle. (67.8%) have 28 days length of menstrual cycle, (23.7%) have 1-2 days length of menstrual cycle, (7.5%) have 3-4 days length of menstrual cycle, (1%) of young adult girls have more than 4 months length of menstrual cycle. (3.4%) of young adult girls have history of PCOS in their family while (96.6%) young adult girls show no

history of PCOS. (1%) of young adult girls have diabetes mellitus, (3.4%) have hypertension, (1.4%) have thyroid problem, (94.2%) of young adult girls shows no problem in their medical condition. (61%) of the young adult girls were having normal BMI, (25.1%) of young adult girls were of underweight, (13.9%) of young adult girls comes under obese.

- **The first objective of the study was** To Assess presence of phenotypic characteristics of Poly Cystic Ovarian Syndrome Among young adult girls. In this study was observed the presence of phenotypic characteristics of Poly cystic ovarian syndrome based on the score of hirsutism it was estimated to be (39.7%) and based on grading of acne it was estimated to be (66.8%) of young adult girls have mild acne characteristics of PCOS, (13.5%) of young adult girls have moderate acne characteristics of PCOS. (11.9%) have severe acne characteristics of PCOS and (7.8%) have very severe acne characteristics of PCOS.
- **The second objective of the study was** Determine the association between phenotypic characteristics with selected demographic variables. There was statistically significant association between the demographic variables and the scoring of hirsutism of young adult girls in their age, residence, age of menarche, regulation of menstrual cycle, length of menstrual cycle, BMI at p value= <0.05 level of significant. There is no significant association between the other demographic and the scoring of hirsutism of young adult girls in their menstrual cycle, family history of PCOS, co-morbidities.

Conclusion

The findings of the present study Shows that the presence of phenotypic characteristics of PCOS based on score of hirsutism was estimated to be (39.7%) and based on grading of acne was estimated to be (66.8%) of young adult girls have mild acne characteristics of PCOS, (13.5%) of young adult girls have moderate acne characteristics of PCOS. (11.9%) have severe acne characteristics of PCOS and (7.8%) have very severe acne characteristics of PCOS. There is significant association between the demographic variables and the scoring of hirsutism of young adult girls in their age, residence, age of menarche, regulation of menstrual cycle, length of menstrual cycle, BMI at p value= <0.05 level of significant. And there is significant association between demographic variables and the grading of acne

among young adult girls in their residence, menstrual cycle, length of menstrual cycle, family history of PCOS, co-morbidities, BMI at p value= <0.05% level of significant.

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Conflicts of Interest: The Authors declared that there is no conflict of Interest.

Source of Funding: Self

Ethical Clearance: The Study was done with the approval of the institutional Ethics Committee Chettinad Academy of Research and Education.

References

1. Mahesh Gupta, "et al". A Cross Sectional Study of Polycystic Ovarian Syndrome among young women in Bhopal, Central India. *International Journal of Community Medicine and Public Health* 2017;5(1): 95-100.
2. Jayshree J Upadhye, . A Wareness of PCOS (Polycystic Ovarian Syndrome) in adolescent and young girls. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 2017; 6(6): 2297-2301.
3. Beena Joshi, "et al". A Cross-Sectional Study of Polycystic Ovarian Syndrome Among Adolescent and Young girls Mumbai, India. *Indian Journal of Endocrinology and Metabolism* 2016; 18(13): 317-324.
4. N. A Desai,Prevalence of Polycystic Ovarian Syndrome and its Associated Risk Factor among Adolescent and Young Girls in Ahmedabad Region. *Indian Journal of Pharmacy Practice* 2018; 11(3): 119-128.
5. Suneet Kumar Upadhyaya, "et al". Prevalence of anxiety and depression in polycystic ovarian syndrome. *International Journal of Medical science and Public Health* 2015; 5(4): 681-683
6. Ranjini Nanjaiah, Prevalence of Polycystic Ovarian Syndrome among Female Student: Across-section Study. *National Journal of Community Medicine* 2018; 9(3): 187-191.
7. Tabassum K. Ultrasonographic prevalence of polycystic ovarian syndrome in different age group. *Indian Journal of Clinical practice* 2014; 25(6): 561-564.
8. Sonia Rawat, "et al" Structured Teaching programme on knowledge about polycystic ovarian syndrome among adolescent girls. *International Journal of Research in Medical science* 2017; 5(11):5004-5008.
9. R.S SushmitaUpadhya, "et al". Prevalence of Poly Cystic Ovarian Syndrome Among Student of a Tertiary Care Teaching Hospital. *Indian Journal of Obstetrics and Gynaecology Research* 2018; 5(4): 481-481.

Effect of Video Assisted Teaching on Prevention and Management of Dengue among Mothers in a Selected Rural Community, Kancheepuram District, Tamil Nadu, India

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Abstract

Dengue is one of the most common mosquito borne diseases in India and it is most prevalent condition in the community. The number of cases of dengue goes up high during monsoon season as the mosquito breed in stagnant water and in warm and humid weather. The study topic was “Effects of video assisted teaching on prevention and management of dengue among mothers in selected rural community, Kanchipuram District, Tamil Nadu, India”. The objectives of the study were to assess the pre and post-test knowledge of mothers regarding prevention and management of dengue, to assess the effectiveness on video assisted teaching among the mothers in the rural community and to find out the association between pre-test knowledge scores regarding prevention and management of dengue with selected demographic variable. Quantitative research approach was used for this study. Quasi-experimental, one group pre-test post-test design was used for this study. The sample consists of 194 mothers. Self structure questionnaire was used to assess the effect on video assisted teaching on prevention and management of dengue. The data collection period was one week. The data was collected in 194 mothers in the age group between 20 to 60 years in pooncheri rural community. The samples are selected by using simple random sampling technique. The data was analyzed and tabulated. The results shows pre-test knowledge scores on prevention and management on dengue was 51% (98) had moderate knowledge, 43% (84) had inadequate, 6%(12) had adequate knowledge. Post-test knowledge scores after video assisted teaching on prevention and management on dengue was 9%(18) had moderate knowledge and 91% (176) had adequate knowledge. Study shows that there was significant association between pre-test and post-test knowledge of mothers with T Value of 25.76 which was statistically significant at $p < 0.05$ level. The post-test knowledge score was greater than the pre-test knowledge score (pre-test-13.70 < post-test-21.57).

Keywords: Knowledge, video assisted teaching, prevention, management, dengue fever.

Introduction

Dengue is one of the most common mosquito borne disease in India. It causes a high fever and a rash. Unlike most mosquitoes, dengue causing mosquitoes bite during the day. These mosquitoes breed in stagnant water and in warm and humid weather. This is why the number of cases of dengue go up high during monsoon season¹ (Nivedita Gupta et al 2012).

Dengue viruses are arboviruses capable of infecting human and causing diseases. A Prevalence of *Aedes aegypti* and *Aedes albopictus* together with the

circulation of dengue virus of more than one type in a particular area tend to be associated with outbreak of dengue hemorrhagic fever and dengue shock syndrome² (Chaturvedi U S 2014).

The earliest known documentation of dengue fever like illness was in the Chinese Encyclopedia of symptoms in Chin Dynasty (CE 265-420). The illness was called ‘Water poison’ and was associated with flying insects near water. Outbreak of febrile illnesses compatible with dengue fever have been recorded throughout history, with first epidemic described in 1635 in West Indies.

In 1779-1780 the first confirmed, outbreak reported, almost simultaneously in Asia, North America and Africa. Benjamin Rush coined the term break bone fever to describe the intense symptoms reported by one of his patients. A dengue like epidemic in East Africa in the early 1820's was called, in Swahili, Ki denga pepo (it is a sudden taking over by the spirit). The English version of this term 'Dandy Fever' was applied to an 1827-28 Caribbean outbreak and in the Spanish Caribbean colonies, the term was altered to 'dengue'³(**Guzmaan MG 2010**)

Need for Study: The incidence of dengue has increased by 30 folds from 1960-2010. This increase is believed to be due to urbanization, population growth, increased international travelers and global warming⁴ (Itrat A 2008).

With regard to Dengue fever epidemic in Chennai, a study on clinical profile and outcome was done in the month of October to December 2001. It showed 59 sero positive cases were reported in the hospital during the study, of which 5 were DSS, 11 were DHF and 20 were DF. The age groups affected are between 7 months to 12 years⁵(**Doke 2001**)

In the year 2012, 14,203 cases were suspected in Kanchipuram District. 13308 cases were tested, 18% of the tested samples - positive for DF and 9 deaths. Due to dengue, increase of death rates in rural community compared to urban – mainly due to lack of awareness on prevention⁶(**Devaleenal B 2015**)

So the major responsibilities lay with health care providers to impart knowledge. So the researchers proposed to conduct the study on prevention and management of dengue among rural community.

Objectives of the Study:

1. To assess the pre and post- test knowledge of mothers regarding prevention and management of dengue.
2. To assess the effectiveness of video assisted teaching among the mothers in the rural community.
3. To find the association between pre-test knowledge scores regarding prevention and management of dengue with selected demographical variables such as age, educational status, occupation, previous history of illness.

Operational Definitions:

Assess: Refers to the process to identify the level of knowledge of adults towards prevention of dengue fever.

Effectiveness: It refers to the difference in pre test scores and post test scores on prevention of dengue fever.

Video assisted teaching program :It is series of visual information given through slide shows regarding prevention of dengue fever.

Prevention: It refers to the measures to be taken at primary, secondary, tertiary levels of care

Dengue fever: It is an acutely infectious mosquito borne viral disease.

Mothers: It refers to mothers in the rural areas in the age group of 20 to 49.

Methodology

Research Approach: Quantitative research approach was used.

Research Design: The quasi-experimental design.

Research Setting: The study will be conducted in Poonchery Village, Kanchipuram District, Tamil Nadu.

Population: It includes the mothers in the age group of 20 years and below 60 years.

Sample Criteria:

Inclusion Criteria:

- Mothers with age group the between 20 years and below 60 years.
- Mothers who are residing at selected village.
- Mothers who understand and can able to speak Tamil language.
- Mothers who are present during the data collected.

Exclusion Criteria:

- The study excluded for Mothers who are not willing to participate in the study.
- Physical disabilities like Deaf and dumb.
- Mental disability.

Sampling Size: The sample size - 194 mothers

Sampling Technique: Simple random technique

Data Collection Procedure:

- Data collection period-10 days.
- Selected samples by using simple random sampling technique.
- Consent obtained from each participant of the study.
- Pre-test knowledge was assessed by structured questionnaire before the video assisted teaching programme – 10-30 minutes in each house during home visit.

- The video was played in each house lasting for 20 minutes.
- Post-test knowledge was assessed using the same tool 15 minutes later.

Data analysis and interpretation: descriptive statistics for frequency, percentage distribution of demographic variables such as age, religion, marital status, educational status, occupation, previous history of illness and for previous family history of illness and Chi-square was used for association of knowledge scores on prevention and management of dengue.

Knowledge Score:

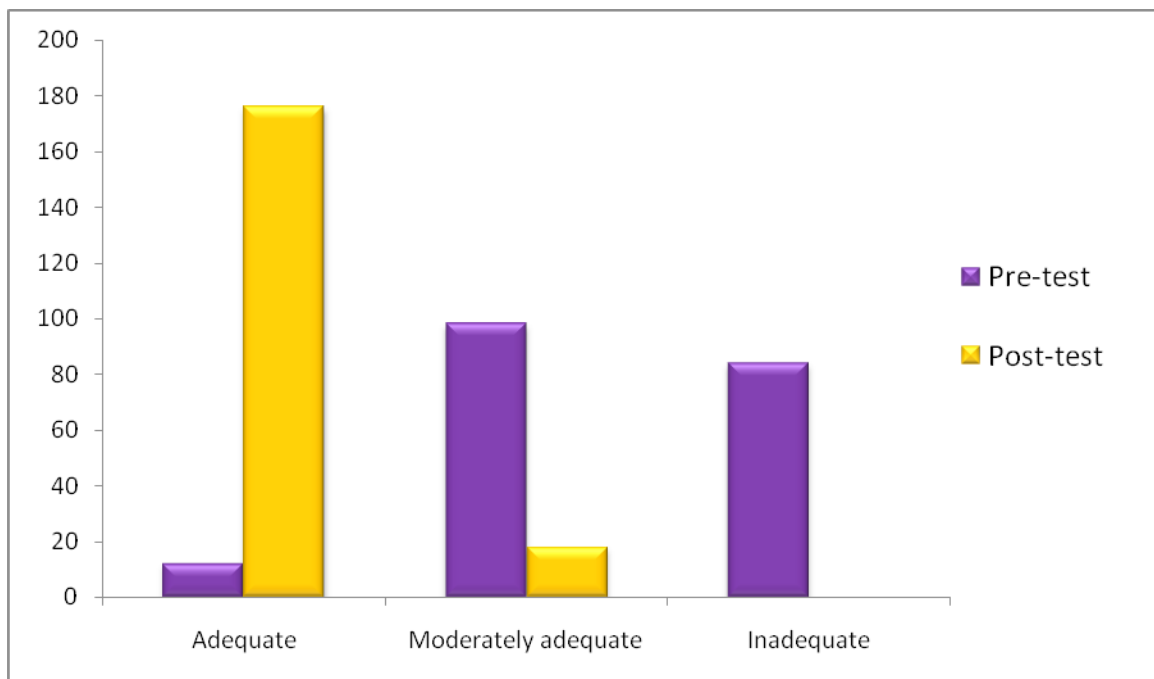


Fig. 1: Percentage distribution pre-test and post-test level of knowledge on prevention and management of dengue fever

Results and Discussion

The collected study was tabulated and analyzed. In the population majority 51% (98) of mothers having moderate knowledge, 43% (84) having inadequate knowledge, only 6% (12) of them having adequate knowledge regarding prevention and treatment of dengue. After the video assisted teaching on prevention and management of dengue the result is 91% (176)

having adequate knowledge, 9% (18) having moderately adequate knowledge and none them were having inadequate knowledge regarding prevention and treatment of dengue.

Conclusion

This study shows mothers have less knowledge in pre-test and the Video assisted teaching is effective in

increasing the knowledge level among mothers in post-test on prevention and management of dengue.

Source of Funding: No other source

Ethical Clearance: Obtained

Conflict of Interest: Nil

References

1. Gupta N, Srivastava S, Jain A, Chaturvedi U. Dengue in India. *Indian Journal of Medical Research*. 2012 Sep 1; 136(3):373
2. Kurane I, Takasaki T. Dengue fever and dengue haemorrhagic fever: challenges of controlling an enemy still at large. *Reviews in medical virology*. 2001 Sep; 11(5):301-11.
3. Guzman MG, Halstead SB, Artsob H, Buchy P, Farrar J, Gubler DJ, Hunsperger E, Kroeger A, Margolis HS, Martínez E, Nathan MB. Dengue: a continuing global threat. *Nature reviews microbiology*. 2010 Dec 1;8(12supp):S7.
4. Itrat A, Khan A, Javaid S, Kamal M, Khan H, Javed S, Kalia S, Khan AH, Sethi MI, Jehan I. Knowledge, awareness and practices regarding dengue fever among the adult population of dengue hit cosmopolitan. *PloS one*. 2008 Jul 9;3(7):e2620.
5. Doke P, Pawar S. Profile of dengue fever outbreaks in Maharashtra. *Indian Journal of Community Medicine*. 2000;25(4):177-80.
6. Devaleenal B, Shanthi S, Rajasekaran S, Mehendale S. Dengue fever in Saidapet health unit district in Tamil Nadu: trends from 2004 to 2011. *Clinical Epidemiology and Global Health*. 2015 Aug 1; 3(2):94-8.

Assessment of Level of General Anxiety among the Higher Secondary School Students

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Abstract

This research has been undertaken to determine the level of general anxiety among the higher secondary school students at Kanchipuram District, Tamil Nadu. The objectives of the study were to determine the level of general anxiety and to find out the association between the level of general anxiety and selected demographic variables of higher secondary school students. The sampling technique was convenience sampling technique with samples of 100 higher secondary school students. Demographic variable proforma and Self - structured rating Scale were used to collect data on anxiety among higher secondary school students. The mean value is 52.97 and 61% of students had mild anxiety, 20% of students had moderate anxiety, 8% of them severe anxiety and 11% of students had very severe anxiety. There was significant association between the levels of general anxiety and medium of instruction, High school mark percentage and availing Tuition facilities. Adolescents need to be assessed periodically to identify the symptoms of general anxiety, for earlier management and also to provide health education related to coping strategies which will be beneficial to adolescent students to manage general anxiety.

Keywords: Level of general anxiety, higher secondary school students.

Introduction

¹General anxiety disorders are the most common group of psychiatric illnesses in children. General anxiety is a blanket term covering several different forms of abnormal and pathological fear. Anxiety disorders are often debilitating chronic conditions, which can be present from an early age or begin suddenly after a triggering event.

²Anxiety is a normal human emotion and involves

behavioural, affective and cognitive responses to the perception of danger. It is considered to be excessive or pathological when it is out of proportion to the challenge or stress or when it results in significant distress and impairment.

It is viewed as a normal part of school student. Students experience fear, nervousness, shyness and avoidance of places and activities that persist at times despite the helpful efforts of parents, caretakers and teachers. General anxiety disorders are one of the most common disorders seen among children and adolescents. The prevalence of general anxiety disorders ranges from 4% to 20%.

Common anxiety disorders among children are specific phobia, social phobia, generalized anxiety disorder and separation anxiety disorder having mean prevalence rates between 2.2% and 3.6%. Agoraphobia (1.5%) and post-traumatic stress disorder (1.5%) are less prevalent, whereas panic and obsessive-compulsive disorders are relatively rare (i.e., below 1%).

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⁴The disorder is frequently accompanied by physiological symptoms such as headache, excessive sweating, muscle spasms, palpitations and hypertension, which in some cases lead to fatigue and exhaustion. Those affected can also flare up at times of high stress.

⁵Although in casual discourse the words anxiety and fear are often used interchangeably, in clinical practice, they have distinct meanings. General anxiety is defined as an unpleasant emotional state for which the cause is either not readily identified or perceived to be uncontrollable and unavoidable; whereas, fear is an emotional and physiological response to a recognized external threat. The term anxiety disorder, however, includes fears (phobias) as well as anxieties.

⁶Anxiety disorders are often co morbid with other mental illnesses, particularly clinical depression, which may occur in as many as 60% of people with anxiety disorder. There is considerable overlap between symptoms of anxiety and depression and the same environmental triggers can provoke symptoms in either condition, this may help to explain this high rate of co morbidity.

It is also known that anxiety disorder is more likely to occur among those with a positive family history of the disorder. Children and adolescents with anxiety disorder typically experience intense fear, worry, or uneasiness that can last for a long period of time and significantly affect their everyday activity.

If not treated early, anxiety disorder can lead to repeated school absenteeism and inability to complete ones education, this is usually due to poor concentration and maladjustment. Some affected children have impaired relationship with their peers, others have low self-esteem. Failure to identify and manage the disorder could also result in alcoholism and use of other hard drugs by affected persons. In some individuals the disorder continues into adult life.

⁷General anxiety is a large heading where disorders such as general anxiety; social anxiety are part of it. It is manifested as nervousness, apprehension and fear and worrying. Besides, it may cause physical symptoms and disturbance. A mild form of anxiety is hazy and disturbed, while severe anxiety can impair the normal function of life.

⁸**G. Natrajan (2015)** conducted a study regarding test an anxiety level assess school student undergoing

higher secondary examination. The sample size is 150 (75 males and 75 females). The study used anxiety rating scale. Academic level of anxiety data revealed that majority 53% (79) were having moderate level of anxiety and 34% (51) were having several level of anxiety where as 13% (20) were having mild level of anxiety.

³Although anxiety is among the most common psychiatric problem faced by children and adolescent, anxiety disorders have been a relatively neglected research topic in comparison to childhood disruptive behaviour and depressive disorder.

Methodology

Research Approach: Quantitative descriptive approach was used for the study. The present study was conducted to assess the level of general anxiety among the higher secondary school students in selected school, Kanchipuram District, Tamil Nadu, India.

Research Design: Non-experimental descriptive research design was used.

Research Setting: The study was conducted at St. Joseph Higher Secondary School, Vettuvankeni, Kanchipuram District, Tamil Nadu.

Population: Higher secondary school students who were studying in 11th Standard in the selected school, Kanchipuram District, Tamil Nadu.

Sample Size: The sample size used was 100 based on population proportion and the open-epi sample size determination.

Sampling Technique: Convenience sampling technique was used for the study.

Sampling Criteria:

Inclusion Criteria:

The study includes higher secondary school students who were

- available at the time of data collection
- able to read and write both English and Tamil.

Exclusion Criteria:

- The study excludes the elderly people who were
- absent on the day of data collection.
 - not willing to participate in the study.

Description of the Tool:

Section-A: It consist of demographic variables of the Higher Secondary School Students which include Age, Religion, Medium of Instruction, High school mark percentage, Area of Residence and availing private tuition facility.

Section-B: Self – structured rating scale was used to assess the level of general anxiety among the Higher Secondary School Students. It was in the form of rating scale and consists of 68 items. The items were rated as 0,1,2,3 and 4 regard to the aspects as none, mild, moderate, severe and very severe respectively. The total attainable score is 272 which were interpreted as follows:

Score	Percentage	Level of Anxiety
0	0	Normal
1-82	1-30%	Mild Anxiety
83-117	31-43%	Moderate Anxiety
118-144	44-53%	Severe Anxiety
145-272	54-100%	Very Severe Anxiety

Method of Data Collection: The data was collected after providing proper information and getting informed

consent from the parents of the higher secondary school students. The data was collected by using self- structured questionnaire.

Statistical Analysis: The data was analysed using descriptive statistics like frequency distribution, percentage, mean and inferential statistics was used to find out the association between the level of general anxiety and demographic variables of the Higher Secondary School Students.

Results and Discussion

The study result shows that majority (52%) of higher secondary school students were in age of 15 years. More than half of them (59%) were Hindus. Most of higher secondary school students (56%) studying in Tamil medium. Majority of higher secondary school students (33%) high school marks was below 60%. More than half of them (62%) were residing in urban area. Majority of higher secondary school students (66%) were not availing private tuition facilities. The study are revealed that 61% of higher secondary school students had mild anxiety, 20% of students had moderate anxiety, 8% of them had severe anxiety and 11% of students had very severe anxiety.

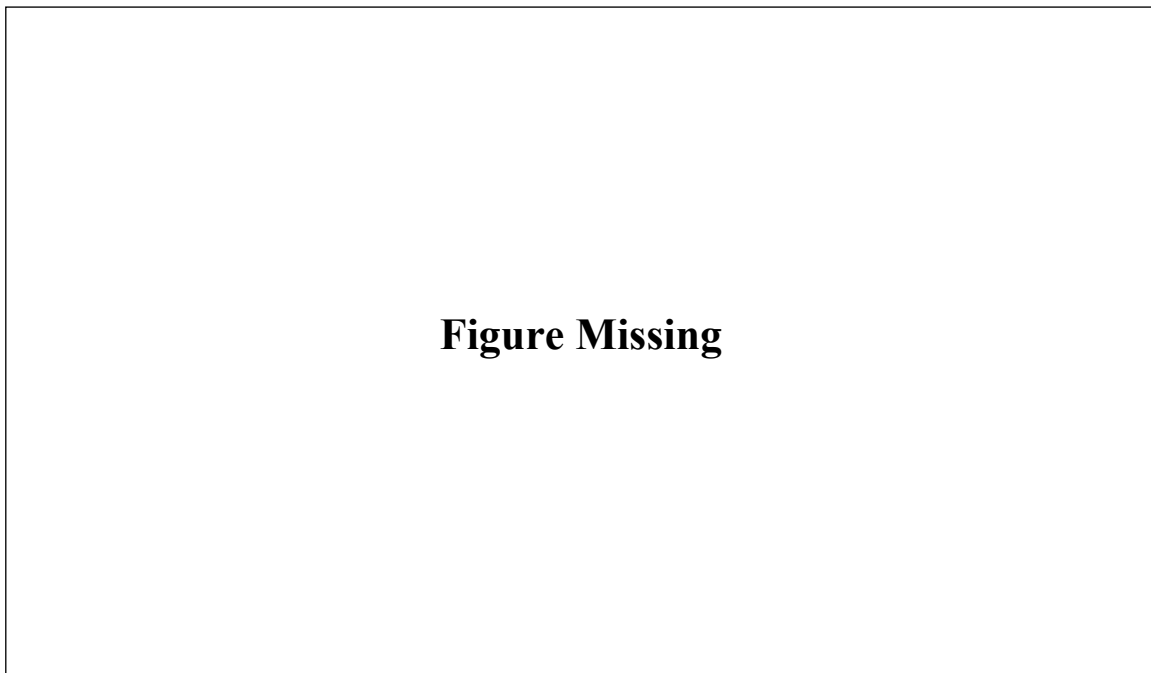


Figure 1: Percentage distribution of higher secondary school students based on availing private tuition facilities. N= 100

Table 1: Association of level of general anxiety with the selected demographic variables of higher secondary school students.

S.No.	Characteristics	Category	No of Samples	Level of Anxiety				Chi Square	P Value
				Mild	Moderate	Severe	Very Severe		
1	Age in years	15	52	34	7	6	5	9.594	12.59
		16	46	27	12	2	5		
		17	2	0	1	0	1		
2	Religion	Hindu	59	38	11	2	8	7.346	12.59
		Christian	28	17	6	4	1		
		Muslim	13	8	1	1	3		
3	Medium of instruction	Tamil	56	40	11	0	5	12.30	7.82*
		English	44	23	7	8	6		
4	High school percentage	<60%	33	22	7	2	2	41.48	16.92*
		61-70	30	21	5	1	3		
		71-80	28	13	5	4	6		
		>80%	9	5	4	0	0		
5	Area of residence	Urban	62	39	12	5	6	2.089	7.82
		Rural	38	25	6	1	6		
6	Private tuition facilities	Availing	34	21	7	3	3	13.01	7.82*
		Not availing	66	42	12	4	8		

There was significant association between the levels of general anxiety and medium of instruction, High school mark percentage and availing private tuition facilities at $p < 0.05$ level of significance but all other demographic variables such as age, religion and area of residence had no significant association with the level of anxiety.

Conclusion

It was concluded that (61%) of the students had mild anxiety, (20%) had moderate anxiety, (8%) had severe anxiety and (11%) had very severe anxiety. Health teaching was given about the symptoms of general anxiety and cognitive appraisal of anxiety to higher secondary students to overcome the anxious situation. Nurses who are working in hospitals play a vital role in giving health education to adolescents on coping strategies to manage general anxiety.

Conflict of Interest: Nil

Source of Funding: Self funding and no external funding.

Ethical Clearance: Obtained clearance from Institutional Human Ethical Committee on 11.04.2018.

Reference

1. Kashani JH, Orvaschel H, Rosenberg JK. A community study of anxiety in children and adolescents. *American journal of psychiatry*. 1990; 147:313–318.
2. Krain AL, Ghaffari M, Freeman J, Garcia A, Leonard H, Pine DS. Anxiety disorders. In: Martin A, Volkmar FR, editors. *Lewis's child and adolescent Psychiatry*. 4th ed. Philadelphia: Lippincott Williams and Wilkins; 2007. p. 538-48.
3. Pine DS. Childhood anxiety disorders. *Curr. Opinion Pediatrics*. 1997;9:329–338
4. Trivedi JK, Gupta PK. An overview of Indian research in anxiety disorders. *Indian J Psychiatry* 2010;52 (Suppl 1):S210-8
5. Costello EJ, Egger HL, Angold A. Developmental epidemiology of anxiety disorders. In Ollendick TH, March JS, editors. *Phobic and anxiety disorders in children and adolescents. A clinician's guide to effective psychosocial and pharmacological interventions*. New York: Oxford University Press; 2004. pp 61-91.
6. Benjamin RS, Costello AJ, Warren M. Anxiety disorders in pediatric sample. *Journal of Anxiety Disorders*. 1990:293–316

7. Bernstein GA, Borchardt CM. Anxiety disorders of childhood and adolescence: A critical review. *Journal of American Academy of Child and Adolescent Psychiatry.* 1991; 30:519–532
8. G.Natrajan a study on anxiety level among school students undergoing higher secondary examination. *International journal of student research in technology and management* vol 3 (03), March 2015. ISSN 2321-2543 pg no. 302-304.

Assessment of Knowledge of Mothers Regarding Diaper Rashes in Infants in a Selected Rural Community, Kanchipuram District, Tamil Nadu, India

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Abstract

The study aimed at assessing the knowledge of mothers on diaper using a descriptive research design. The sample size consisted of 144 mothers. A Convenient Sampling was used for selecting the mothers. The Sampling criteria included the mothers of infants in the age group of 0 to 1 years of age. The demographic profile of the mother was assessed using a structured interview. A self-administered Questionnaire was used to assess Mothers Knowledge regarding diaper rashes. Data were analyzed using Descriptive analysis and Pearson Chi-Square analysis.

The Study findings revealed that nearly 70% mothers had inadequate knowledge, 28% mothers had moderate knowledge, 2% mothers had adequate knowledge regarding diaper rashes in infants in rural community. A statistically significant association was found between mother's knowledge and number of children, educational status, occupational status, usage of diapers, source of information at $p > 0.005$.

The study helped to conclude that mothers have inadequate knowledge on diaper rashes.

Keywords: Diaper rashes, Mothers Knowledge, Infants.

Introduction

Diaper use for babies has been in practice since decades to prevent soiling and for social convenience. Diaper dermatitis is an irritating condition that develops on the skin that is covered by a diaper which causes discomfort to infants and anxiety to parents and caregiver **Kimberly A Horii, MD 2017**¹.

It is a very common coetaneous condition in neonates and infants, peaks between 9 and 12 months of age. It may be due to introduction of new foods which leads to skin irritation, peeling or scaling of the skin, red or pink patches and the rashes may become severe causing bleeding A. Antonie Kazzie M.D 2006².

One study reported that the eruption of the skin in the diaper area is created by the presence of moisture, warmth, urine, feces and friction and is seen in 25% of children wearing diapers Ward DB, Fleischas AB, Felman SR, Krowchuk Dp 2000³.

Disposable diapers are associated with fewer cases of yeast diaper rash than cloth diapers. Absorbent gelling materials present in the disposable diapers draws away the moisture from delicate skin surfaces. Infants who wear breathable disposable diapers developed significantly fewer diaper rashes of any type than infants who wore standard, non-breathable disposable diapers

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in a series of clinical trials Fernandis JD, Mchado Mc, Oliveria ZN 2009⁴.

Although many people debate, that children who wear cloth diapers have fewer cases of diaper rashes due to the natural fibers and better circulation of air, proponents of disposable diapers disagree. Modern science has developed materials used in disposables that draw moisture into the diaper and away from the child’s skin Mahadevi M, S. Rajeshwari 2016⁵..

Materials And Method

A Quantitative research approach with a descriptive research design was used in the study . The study was carried out in a selected rural community, Kanchipuram District, Tamil Nadu, India. The study population included all the mothers of infants in the selected rural community. The mothers of the infants who fulfilled the sampling criteria were the samples for this study. The sample was selected by using a convenient sampling technique.

Inclusion Criteria:

- Mothers of infants 0 to 1 year
- Mothers who use diapers for their child

Exclusion Criteria:

- Mothers who can’t read and understand English and Tamil.
- Mothers who are not willing to participate in the study.

Sample Size Estimation: According to open source epidemiologic statistics for public health Schaefer.RL¹⁸.

$$n = \frac{DEFF * ND(1-P)}{(Cd^2/2^2) 1-a/2*(n-1)+p*(1-p)}$$

Population size (N) = 228

Confidence level: 95%

Confidence interval: 5%

At 95% confidence level the sample size (n) is 144

Data Collection: The research tool consisted of two sections.

Section-I: A Structured interview to assess the demographic profile of the mothers.

Section-II: A self-administered structured questionnaire to assess the mother’s knowledge on

diaper rashes in infants.

Scoring: Structured questionnaire on knowledge consisted of 17 questions. Each correct answer was awarded “one” mark and for wrong answer “zero” mark. Maximum score was 17 and Minimum score zero.

Categorization of level of knowledge on diaper rashes:

Level of knowledge on diaper rashes	Score %
Inadequate Knowledge	< 50%
Moderate Knowledge	50 -70%
Adequate Knowledge	> 70%

Analysis: Descriptive and Inferential statistics was used to analyze and interpret the data. Descriptive analysis was used to analyze the socio demographic data. Pearson chi square test was used to associate the knowledge of mothers with other variables.

Study Findings:

Distribution of Demographic Profiles of mother:

144 samples were recruited in the study in the age group of 21- 40 years. Majority of the samples nearly 54.16%were in the age group of 26-30 years, while 36.11% were in the age group of 21- 25 years, only 0-10%were in the age group of 31-40 years respectively.

The educational level of majority of samples nearly 25.69% were graduates, while 20.13% were higher secondary level, around 17.36% were high school, nearly 11.11% were post graduates and diploma and only 7.66% were illiterates.

With regard to occupational status nearly 82.63% were house wife and only 17.34% were working women. Nearly 60% of the samples belonged to Nuclear family while 40% were from Joint families. Majority of samples had 53.47% of one child and the remaining 46.53% had two children.

Nearly 53.48% of the samples were using diapers for their children and 46.52% were not using diapers. Nearly 46.52% of the samples received information on diaper rashes from family members, the other source of information were from 31.25% health professionals and 22.23% were from mass media.

- **The first objective of the study was to assess the level of knowledge regarding diaper rashes in infants among the mothers**

In this study, it was observed that 70% of the mothers had inadequate knowledge, while 28% of the mothers had moderate knowledge and 2% of the mothers had adequate knowledge on diaper rashes. This is in contrast to the study by **Vinitha D Souza et al., 2018⁶**, in which only 20% of mothers had inadequate knowledge, 54% mothers had moderate knowledge and 25% mothers had adequate knowledge.

- **The second objective of the study was to** associate the level of knowledge on diaper rashes with selected demographic variables of mothers.

There was statistically no significant association between the demographic variables (number of children, educational status, occupational status, usage of diapers, source of information) with the knowledge diaper rashes. The findings also shows that the demographic characteristics (age of mother and family type) had statistically significant association with the knowledge on diaper rashes at $p < 0.05$.

Similarly **Madhurishambhakar 2018⁷**, in their study found no significant association between the educational status, number of children, occupational status and source of information with the knowledge level. However **Jemy Elizabeth Joseph 2013⁸**, in their study projected that there was statistically no significant association between age of mother and family type with the level of knowledge.

Conclusion

This study was carried out to assess the level of mother's knowledge regarding diaper rashes in infants. As the Study findings revealed that 70% of mothers have inadequate knowledge while 28% of mothers had moderate knowledge and only 2% of the mother's had adequate knowledge regarding diaper rashes hence it is necessary to create awareness among the mothers on diaper rashes.

Acknowledgement: The Authors are grateful to all the mothers who participated in the study.

Conflicts of Interest: The Authors declared that there is no conflict of Interest.

Source of Funding: Self

Ethical Clearance: The Study was done with the approval of the institutional Ethics Committee Chettinad Academy of Research and Education. Informed consent was obtained from the mother's who were assured of strict anonymity and confidentiality during this survey.

References

1. Kimberly A Horii MD, Patient education: Diaper dermatitis in infants and children.; 2017. Available from <http://www.uptodate.com>.
2. A Antoniekazzi MD, Pediatrics, diaper rash.; Available from eMedicine.medscape.com/article/801222 updated on October 2006.
3. Ward DB, Fleischer AB, Feldman SR, Krowchuk DP, Characterization of diaper dermatitis in the United States. *Archieve Pediatric Adolescent Medicine* 2000, 154 (9): 943–946.
4. Fernandis JD, Mchado MC, Oliveria ZN. 2009 Jan-Feb; 84 (1) : 47-54.
5. M. Mahadevi, S. Rajeshwari. Effectiveness of diaper rash preventive strategies on knowledge, practice of primi mothers and occurrence of diaper rash among their newborn. *Journal of science* 2016; 6(8):391-399.
6. Vinitha D. Souza et al. Knowledge of mothers on diaper dermatitis. *European journal of biomedical and pharmaceutical sciences. Department of obstetrics and gynecology* 2018; 5(9):.
7. Madhuri Shambharkar. Effectiveness of planned teaching regarding prevention of diaper dermatitis among the mothers of infants. *Paripex-Indian Journal Of Research* 2018; 7(2):.
8. Jemy Elizabeth Joseph, Shiju Mathew. The effectiveness of teaching programme regarding prevention and management napkin dermatitis in Allahabad. *International journal of public health science (LJPHS)* 2013; 2(1):.(accessed).

Estimation of Stature from Percutaneous Length of Tibia in Natives of Gujarat

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Abstract

The Indian Constitution guarantees equal right of justice, life and liberty to all Indian citizens. Every person has freedom of expression (unlawful act committed upon him/her) and it remains when the person died by any mean. Identification of an individual is primary element to investigate both civil and criminal cases. With the time, complexity of crime advance and forensic experts' role become very crucial in investigation of crime. Crime investigation become very difficult and crucial when investigation agency find unknown mutilated body, bundle of bones or parts of bone. Without identification of dead person, investigation of crime become directionless. Key factor for identification are age, sex and stature. Many factors should be taken in to consideration to fix stature with help of bone. Many researchers had been clearly proved that long bone can be uses to estimate stature and it depend on race, ethnic and region. Very less work had been done to formulate regression formula from tibia in state of Gujarat. This study aims at formulate a regression formula to estimate stature from percutaneous length of tibia (PCTL) for native of Gujarat. This study was carried out in Department of Forensic Medicine, C.U. Shah Medical College, Surendranagar, Gujarat. Total 800 (400 male & 400 Female) undergraduate MBBS student between 18 to 25 years of age were participated in study. Their stature and percutaneous length of tibia were estimated with standard method and manner. Results are analysed and studied. Results show that there is highly significant in mean length of tibia and stature in both male and female participants ($P < 0.05$). Stature and percutaneous length of tibia has positive correlation and regression formula is obtained to estimate stature from tibial length for natives of Gujarat.

Keywords: Tibia Length; Stature; Identification; Gujarat.

Introduction

Natural and man-made disasters like earthquakes, floods, cyclones, stampede, fires, transport accidents, industrial accidents, explosions etc cause significant loss of life and mutilation of body. A murderer always tries to mutilate dead body to hinder the identification of the person.¹ Key factors for identification are Age, Sex and

Stature. Many factors should be taken in to consideration while fixing stature with help of bone. Use of anatomical measurement of body is very ancient. The word 'Anthropometry' was first used by a German physician J. Sigismund Elshwltz (1623-88).² Anthropometric characteristics have direct relationship with sex, shape and form of an individual and these factors are closely linked with each other and manifestation of internal structure and tissue components which in turn are influenced by environmental and genetic factors.³ Hand length, foot length, Ulna length and Tibia length can be used to determine the stature of the person whenever mutilates, bones or part of bone comes for post-mortem examination.

Percutaneous length of long bone is more convenient method for estimation of stature than dry bone as it is

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a tedious and time consuming process which involves cleaning and preparation of bones.⁴ Lower limb length plays important role in estimation of standing height of an individual hence most predictive formulas are based on length of tibia, femur and fibula.⁵ Tibia being located subcutaneously easily approachable to measure in living population.⁶ Since the relationship between long bones and stature is influenced by ethnicity and gender of an individual, there are no universally applicable formulae for stature estimation from the length of long bones.⁷ Therefore, population-specific formulae are more reliable for estimation of stature in medicolegal cases.⁸⁻¹³ This research was done in department of Forensic Medicine, C.U. Shah Medical College, Surendranagar to derive the region specific regression formula to estimate the stature from percutaneous ulnar length in natives of Gujarat.

Material and Method

This study was carried out in Forensic Medicine Department of C.U. Shah Medical College, Surendranagar, Gujarat after taking ethical approval from the Institutional Ethics Committee-CUSMC. Total 800 (400 male & 400 Female) healthy undergraduate MBBS students, age between 18- 25 years, without any physical deformity, chronic illness or any other

condition/s affecting the stature or tibia length or bone growth were included in study. Informed written consent obtained from each participant. All the measurements were taken at a fixed time between 09:00 - 11:00 hours in the morning to eliminate diurnal variation. All the measurements were recorded by the same person to minimize the bias.

Stature of the participants measured in standing posture with standing barefoot, heels touching together and back of head, head in Frankfort-Horizontal plane; shoulder blades, buttocks and feet touching the backboard using standard equipment for measuring height. Stature was taken from Vertex to floor.

Percutaneous tibia length (PCTL) was taken from the highest point on medial border of the head of the tibia to the most distal point on the medial malleolus in seating position with ankle resting on another knee. The measurement was taken for both tibia with spreading calliper.

Results

All variables were collected and analysed in IBM SPSS Statistics 23 software.

Table 1: Gender wise descriptive analysis of variables. (N=800)

		Male			Female		
		Right PCTL	Left PCTL	Stature	Right PCTL	Left PCTL	Stature
N	Valid	400	400	400	400	400	400
	Missing	0	0	0	0	0	0
Mean		39.072	38.863	169.943	37.741	35.537	159.641
Std. Error of Mean		0.2240	0.2244	0.3580	0.1563	0.1569	0.3792
Median		39.00	38.80	170.00	35.20	35.00	159.720
Mode		38.0	37.0	168.0	35.00	35.00	159.00
Std. Deviation		4.4797	4.4879	7.1598	3.1258	3.1375	7.5846

*PCTL- Percutaneous Tibia Length

Table 1 shows, for Mean Stature for Male is 169.943 cm and for Female is 159.641 cm.

Mean PCTL in male is 39.072 cm and 38.863 cm

for right and left lower limbs respectively. In Female participants mean PCTL is 37.741 cm and 35.537 cm for right and left lower limbs respectively.

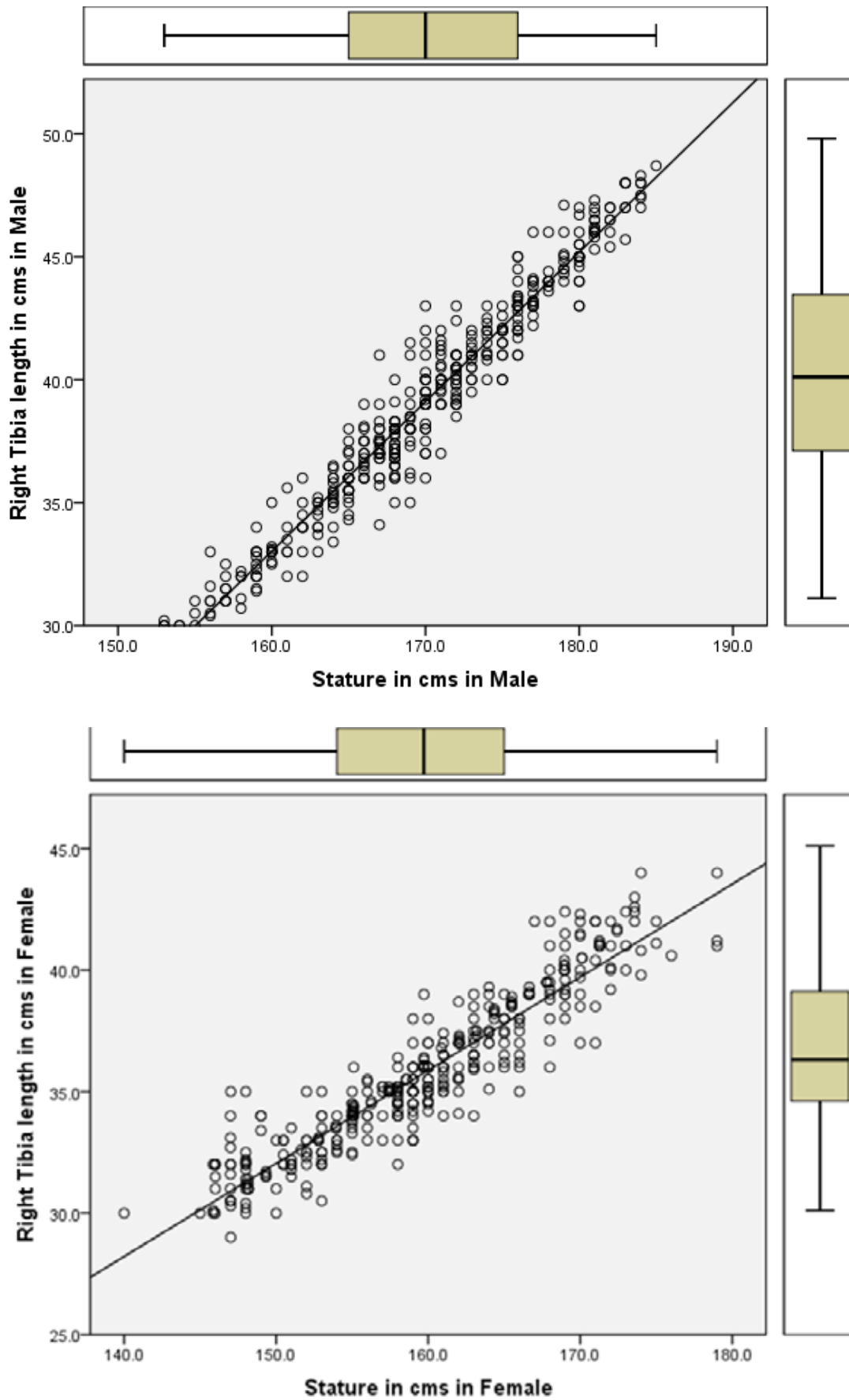


Figure 1: Shows Right PCTL in cm on X-axis and Stature in cm on Y-axis.

Z test is applied to compare Standard Error of difference between means of PCTL and Stature, found to be highly significant at $P < 0.0001$ level for each right

& left lower limb in male participants. Same correlation also established for female participants.

Table 2. Regression formula derivatives for calculating stature from PCTL.

	Constant (a)		Regression Coefficient (b)		Correlation Coefficient (r)		Correlation Determination (r^2)		Std. Error of the Estimate	
	Right	Left	Right	left	Right	Left	Right	Left	Right	Left
Male	108.98	109.49	1.562	1.557	0.972	0.971	0.945	0.943	1.6779	1.7094
Female	79.00	79.79	2.256	1.594	0.930	0.930	0.865	0.864	2.7946	2.8002

Table 2 shows constant (a), regression coefficient (b), Correlation coefficient (r) and correlation determination (r^2) for right & left Tibia for both gender.

Regression formula to estimate Stature from Tibia length are as follow:

For Male:

(a) Stature in cm = $108.99 + 1.562 \times (\text{Right PCTL}) \pm 1.68$

(b) Stature in cm = $109.49 + 1.557 \times (\text{Left PCTL}) \pm 1.71$

For Female:

(a) Stature in cm = $79.00 + 2.256 \times (\text{Right PCTL}) \pm 2.79$

(b) Stature in cm = $79.79 + 1.594 \times (\text{Left PCTL}) \pm 2.80$

Discussion

In the first study of this kind, Rollet assessed the correlation between stature and long bone length in adult French cadavers and published a report with the method of measurement, the individual measurements and tables of stature estimations.¹⁴ This study shows that the stature is significantly correlated to percutaneous tibial length in both gender in natives of Gujarat.

Pearson (1899) used Rollet's data to create regression formulae for estimating stature. He used only long bone lengths of the right side. Pearson contributed greatly to the advancement of stature estimation.

Table 3: Mean stature, Tibia length and Regression formula derived for different regions of India

Region	Study	Male/Female/Combine	Stature cm	Tibia Length cm	Regression Formula $S = \text{Stature in cm}$ $T = \text{Tibial Length in cm}$
Delhi (Shia Muslims)	Bhavna et al. ²¹	Male	167.66	36.48	$S = 84.74 + 2.27 (T) \pm 3.67$
		Female	154.40	33.66	$S = 75.66 + 2.34 (T) \pm 3.42$
Gwalior	Trivedi A. et al. ²²	Male	164.50	38.24	$S = 105.971 + 1.53 (T) \pm 7.452$
		Female	155.30	36.06	$S = 103.76 + 1.43 (T) \pm 4.69$
Haryana	Gaur R. et al. ²³	Male	167.21	38.26	~~
		Female	154.72	35.26	~~
Kori Population, North India	Renu Kamal, Praveen Kumar Yadav ²⁴	Male	164.63	42.42	$S = 139.80 + 0.58 (T)$
		Female	151.00	40.00	$S = 108.1 + 1.07 (T)$
Maharashtra	Chavan S. K. et al. ²⁵	Male	167.89	37.32	$S = 81.30 + 2.32 (T) \pm 3.56$
		Female	151.41	34.44	$S = 95.28 + 1.63 (T) \pm 3.69$
Tamil Nadu	Anitha MR et al. ²⁶	Combine-Right	161.93	37.43	$S = 94.5 + 1.8 (T)$
		Combine-Left	161.93	37.50	$S = 88.55 + 1.95 (T)$
West Bengal	Anirban D. et al. ²⁷	Male	164.06	35.99	$S = 71.2333 + 2.5792 (T)$
		Female	156.38	33.83	$S = 65.345 + 2.6914 (T)$
West Bengal (South)	Mantotosh Banerjee et al. ²⁸	Male	164.3	35.99	$S = 71.361 + 2.575 (T) \pm 2.943$
		Female	156.38	33.83	$S = 65.344 + 2.691 (T) \pm 1.974$
Gujarat	Present study	Male (Right)	169.94	39.07	$S = 108.99 + 1.562 (T) \pm 1.68$
		Female (Right)	159.64	37.74	$S = 79.00 + 2.256 (T) \pm 2.79$

According to Trotter and Gleser world population is getting taller and therefore the relationship between height and length of long bones is changed and fresh formulae are needed for each generation, hence they attempted to find out fresh formula for Indians.¹⁵

The Stature differs in different part of India and world.¹⁶ Indian population is mixture of various religion, castes, tribes, culture and geo-environmental regions. Indian built and stature found different in different parts of the country. The stature not only differs from region to region but also varies based on different castes and tribes. Estimated mean stature of Barelas (tribe) as 161.5 cm and that of the Bhils (tribe) 160 cm, in same state of Madhya Pradesh.¹⁷ Bose reported mean status in west Bangal is 166.6 cm.¹⁸, Mohanty reported the stature for male Oriya population as 162.2 cm. Kolte PM et al. estimated average statures of male in Marathwada region of Maharashtra was 163.7 cm.¹⁹ whereas Patil T.L. et al found average status as 161.9 cm for male in Vidarbha region of Maharashtra.²⁰

Table 3 shows that different regions of same country has different height and length of tibia. Table also shows that regression formula to estimate stature from tibia length is different and specific to each region. Mean stature of male and Female of Gujarat 169.94 cm and 159.64 cm respectively, which is highest of all the studies mentioned in table 3. Which is near to 173.40 cm for male previously calculated by M.P. Patel in Gujarat.²⁹

Mean length of tibia of both male & female is highest for Kori population of North India, i.e. 42.42 cm in male and 40.00 cm in female.

This clearly proves that regression coefficient of one region is not applicable for another region.

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This clearly proves that regression coefficient of one region is not applicable for another region.

Conclusion

Establishment of identity is utmost important in both civil and criminal cases. Stature is one of the key indicator to established identity. Present study proves that stature and PCTL has positive correlation and regression formula is formed to estimate stature from ulna length.

There are different study throughout world to estimate stature from long bones, but there are vast variation in formula derived. With changing world, body parameters are also changing. Hence, it is necessary to research more among population of different regions, ethnic groups to obtain a reliable formula to estimate stature.

Conflict of Interest: The Authors declare that there is no conflict of Interest.

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References

1. Mirzanaik AD, Patil RC, Ranjakash S. Stature estimation from hand length in north Karnataka population, India. *IP International Journal of Forensic Medicine and Toxicological Sciences* 2018;3:41-4. doi:10.18231/2456-9615.2018.0011
2. Indera P Singh, M.K; Bhasin A manual of biological anthropology; 1st Ed; Kamalraj Enterprises; 2004; p9.
3. Krishan K. Anthropometry in Forensic Medicine and forensic Science- 'Forensic Anthropometry'. *The Internet Journal of Forensic Science* 2007. Vol. 2 no 1.
4. Kumar KA, Shrivastava AK, Verma AK. Estimation of Stature by Percutaneous Measurements of Distal Half of Upper Limb (Forearm & Hand). *Journal of Indian Academy of Forensic Medicine* 2010;32:325-8.
5. Mohanty NK; Prediction of height from percutaneous tibial length amongst Oriya population. *Forensic Sci Int.*,1998;98(3):137-141.
6. Miltred T, Gleser GC; Estimation of stature from long bones of American white and negroes. *Amj phy Anthropol.*1952; 10(4):436-514.
7. Ilayperuma I, Nanayakkara G, Palahepitiya N. A Model for the Estimation of Personal Stature from the Length of Forearm. *Int J Morphol.* 2010; 28: 1081-1086.
8. Radoinova D, Tenekedjiev K, Yordanov Y. Stature estimation from long bone lengths in Bulgarians. *Homo.* 2002; 52: 221-232
9. Ilayperuma I, Nanayakkara G, Palahepitiya N. A Model for the Estimation of Personal Stature from the Length of Forearm. *Int J Morphol.* 2010; 28: 1081-1086,

10. Pelin IC, Duyar I. Estimating stature from tibia length: a comparison of method. *J Forensic Sci.* 2003; 48: 708-712.
11. Chibba K, Bidmos MA. Using tibia fragments from South Africans of European descent to estimate maximum tibia length and stature. *Forensic Sci Int.* 2007; 169: 145-151.
12. Bidmos MA. Stature reconstruction using fragmentary femora in South Africans of European descent. *J Forensic Sci.* 2008; 53: 1044- 1048.
13. Marinkovic N, Vilic JB. The correlation between the length of the long bones of the forearm and lower leg with body height in our population. *Vojnosanit Pregl.* 2012; 69: 394-398.].
14. Pillay VV. *Text book of Forensic Medicine and Toxicology* . 4th ed. Hyderabad : Paras Publication; 2007.
15. Trotter M, Gleser GC. Estimation of stature from long bones of American Whites and Negroes. *Am. J. Phys. Anthropology.* 1952; 10:463-514.
16. Anitha MR et al. Estimation of height from percutaneous tibial length among South Indian population, *Indian Journal of Clinical Anatomy and Physiology*, October-December 2016;3(4);405-407
17. Bhargava L, Kher GA; A comparative Anthropometric study of Bhils and Barelals of Central India. *J Anat Soc India*, 1961; 10:31-33.
18. Bose A; Anthropometry of the Kayasthas of Bengal with special reference to Vangaj Kayasthas. *J Anat Soc India*, 1963; 12:20–25.
19. Kolte PM, Bansal PC; Determination of regression formulae for reconstruction of stature from long bones of upper limbs in Maharashtra's of Marathwada region. *J Anat Soc India*, 1974;23:6-11.
20. Patil TL, Gawhale RS, Muzumdar RD; Reconstruction of stature from long bone of both upper and lower limb. *J Anat Soc India*, 1983;32(3):111–118
21. Bhavna, S Nath, Use of Lower Limb Measurements in Reconstructing Stature among Shia Muslims; *The Internet Journal of Biological Anthropology* Volume 2 Number 2, 1-13
22. Dr. Akhilesh Trivedi¹, Dr. Sudhir Saxena², Dr. Rajesh Morya³, Dr. Massarat Jehan⁴, Dr. Vipendra Bhadkaria¹. Stature Estimation Using Per-Cutaneous Tibial Length in People of Gwalior Region *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 13, Issue 5 Ver. I. (May. 2014), PP 65-70
23. Gaur R, Kaur K, Airi R, Jarodia K (2016) Estimation of Stature from Percutaneous Lengths of Tibia and Fibula of Scheduled Castes of Haryana State, India. *Ann Forensic Res Anal* 3(1): 1025.
24. Renu Kamal a, Praveen Kumar Yadav; Estimation of stature from different anthropometric measurements in Kori population of North India; *Egyptian Journal of Forensic Sciences* (2016) 6, 468–477.
25. *Chavan S.K., **Chavan K.D., ***Mumbre S.S, ****Makhani C.S, Stature and Percutaneous Tibial Length: A Correlational Study in Maharashtrian Population, *Indian Journal of Forensic Medicine and Pathology.* July-Sept 2009; Vol. 2 No. 3, 109-112
26. Anitha MR^{1,*}, Bharathi D², Rajitha V³, Chaitra BR. Estimation of height from percutaneous tibial length among South Indian population, *Indian Journal of Clinical Anatomy and Physiology*, October-December 2016;3(4);405-407
27. Anirban D, Arindam B, Prithviraj K (2013) Estimation of Stature of Eastern Indians from Measurements of Tibial Length. *Anatom Physiol* 3: 115. doi:10.4172/2161-0940.1000115
28. Dr. Manotosh Banerjee¹, Dr. Chiranjit Samanta², Dr. Satyajit Sangram³, Dr. Moumita Hota⁴, Dr. Pinki Kundu⁵, Dr. Maitreyi Mondal⁶, Dr. Reshma Ghosh⁷, Prof. (Dr.) Sudeshna Majumda. Estimation of human height from the length of tibia, *Indian Journal of Basic and Applied Medical Research*; December 2015: Vol.-5, Issue- 1, P. 30-47
29. Patel MP, Joshi NB, Dongre AV; Regression equation of height on tibial length. *Indian J Med Res.*, 1964;52:541–534.

Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India

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Abstract

Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India. The objectives were to assess the effect of perceived stress on menstruation among adolescent girls in a selected college, Correlate between perceived stress and blood flow during menstruation among adolescent girls, Associate between perceived stress on menstruation among adolescent girls with their selected demographic variables, Associate between blood flow during menstruation among adolescent girls with their selected demographic variables. The convenient sampling technique was used to select 50 samples. The data were collected by using perceived stress scale and pictorial blood assessment scale. The collected data were tabulated and analyzed. Descriptive and inferential statistics were used. The result showed that 12% of samples having low stress level, 80% of samples having moderate stress level and 8% of samples having severe stress level and 16% of samples had low bleeding, 30% of samples had normal flow and 54% of samples had severe flow. There was moderate positive correlation ($r = 0.84$) between perceived stress and blood flow among adolescent girls. The demographic variables like menstrual cycle periodicity ($X^2=1.78$) stress level, ($X^2=3.87$) blood flow and duration of menstrual flow ($X^2=4.32$) stress level, ($X^2=5.93$) blood flow had significant association with stress and blood flow during menstruation respectively.

Keywords: Perceived stress, Menstruation, Adolescent girls.

Introduction

Back Ground of the Study: Menstruation, also known as a period or monthly, is the regular discharge of blood and mucosal tissue (known as menses) from the inner lining of the uterus through the vagina.^[1]

The first period usually begins between twelve and

fifteen years of age, a point in time known as menarche. However, periods may occasionally start from eight years old children and still it is considered normal.^[1]

The average age of the first period is generally later in the developing world and earlier in the developed world.^[1]

Among women, it's very common to experience stress during the normal monthly cycling of ovulation. It is not uncommon and actually almost predictable to have subtle and not-so-subtle fluctuations in menstruation.^[2]

Many women notice erratic, unpredictable bleeding or a delay of menstruation when they encounter particularly difficult times such as deadlines at work or school, personal illness, or death of a loved one.^[2]

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Need for Study:

Nazish Rafique and Mona H. Al-Sheikh (2018) conducted a cross sectional study on prevalence of menstrual problems and their association with psychological stress in young female student studying health science. Results showed that **Ninety-one percent of the students were suffering from some kind of menstrual problem. High perceived stress (HPS) was identified in 39% of the students.** A significant positive correlation was found between HPS and menstrual problems. Therefore, it was recommended that **health science students should be provided with early psychological and gynecological counselling to prevent future complications.**^[3]

Ziba Raisi Dehkordi (2017) conducted a cross-sectional study to evaluate the effect of perceived stress on dysmenorrhea among female students residing in dormitory in Shahrekord University of Medical Sciences in Shahrekord, Iran. Results showed that **66 students had a PSS score >20 High stress levels (PSS >20) was associated with only menstrual irregularities and not with duration, amount of flow or dysmenorrhea.**^[4]

Statement of the Problem: Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India.

Objectives:

- Assess the effect of perceived stress on menstruation among adolescent girls in a selected college.
- Assess the blood flow during menstruation among adolescent girls in a selected college.
- Correlate between perceived stress and blood flow during menstruation among adolescent girls.
- Associate between perceived stress during menstruation among adolescent girls with their selected demographic variables.
- Associate between blood flow during menstruation among adolescent girls with their selected demographic variables.

Hypothesis:

H₀: There is no correlation between perceived stress and blood flow during menstruation.

H₁: There is no significant association between

perceived stress on menstruation among adolescent girls with the selected demographic variables.

H₀: There is no significant association between blood flow during menstruation among adolescent girls with the selected demographic variables.

Operational Definitions:

Perceived stress: Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point (During menstruation) or over a given time period which will be assessed using **Perceived stress scale.**

Menstruation: Any amount of blood loss during first three days of girl's monthly cycle, which will be assessed using **Pictorial blood assessment scale.**

Adolescent girls: Girls in the age group of 18-20 years.

Research Methodology: A Quantitative approach with descriptive design was used in the study. The study was conducted among Adolescent girls in Allied Health Science, Chettinad Academy of Research and Education. A convenient sampling technique was used to select 50 samples with the following inclusion criteria. Adolescent girls who are: Studying 1st and 2nd year in Allied Health Science, Chettinad Academy of Research and Education, Age group between 18-20 years, Able to read and write in English. The data was analysed by using descriptive and inferential statistics.

Data Collection Procedure:

- The researcher got prior permission and consent from the study participant.
- The questionnaire was given to collect the data on demographic variables.
- PSS scale was given to assess the perceived stress during their menstrual period.
- PBAS scale was given to the sample and asked them to fill during menstruation.
- Duration of data collection was 1 week.

Ethical Consideration:

- UG Committee clearance was obtained.
- Human Ethics committee clearance was obtained.
- Prior permission from the head of the institution was obtained.

- Informed consent was obtained from the samples.
- Confidentiality was maintained.

Findings: Findings of the study were presented under the following headings based on the study objectives.

Objective 1: Assess the effect of perceived stress on menstruation among adolescent girls.

The finding of the present study revealed that

12% of adolescent girls had Low stress level.

80% of adolescent girls had Moderate stress level.

8% of adolescent girls had Severe stress level.

Objective 2: Assess the amount of blood flow during menstruation among adolescent girls.

16% of adolescent girls had low bleeding.

30% of adolescent girls had normal blood flow.

54% of adolescent girls had severe bleeding.

Objective 3: Correlate between perceived stress and blood flow among adolescent girls.

The result showed that moderate positive correlation ($r = 0.84$) between perceived stress and blood flow among adolescent girls.

Objective 4: Associate between perceived stress during menstruation among adolescent girls with their selected demographic variables.

Result showed that the demographic characteristics like menstrual cycle periodicity ($X^2=1.78$) and duration of menstrual flow ($X^2=4.32$) have significant association whereas the demographic characteristics like Age

($X^2=5.01$), Department ($X^2=6.22$), Age at menarche ($X^2=12.89$) and menstrual irregularities ($X^2=6.78$) have no significant association with perceived stress during menstruation.

Objective 5: Associate between blood flow during menstruation among adolescent girls with their selected demographic variables.

Result showed that the demographic characteristics like menstrual cycle periodicity ($X^2=3.87$) and duration of menstrual flow ($X^2=5.93$) have significant association whereas the demographic characteristics like Age ($X^2=2.13$), Department ($X^2=8.20$), Age at menarche ($X^2=15.51$) and menstrual irregularities ($X^2=2.58$) have no significant association with blood flow during menstruation.

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Reference

1. Kerri Durnell. Women's Gynecologic Health, 2ed. Burlington: Jones & Bartlett; 2011.
2. Dr. Christina Matera. Stress & How It Affects Your Menstrual Cycle. <http://Tampax.com> (accessed 19 november2018).
3. Nazish Rafique, Mona H. Al-Sheikh. Prevalence of menstrual problems and their association with psychological stress. Saudi. . Med J 2018; 39(1).
4. Ziba Raisi Dehkordi. Evaluate the effect of perceived stress on dysmenorrhea. BMJ Open 2017; (015415).
5. Cohen .S, Kamark . T Etal. A global measures of perceived stress. Journal of health and social behavior 1983; 24(386-396).

Effect of an Informative Pamphlet in Improving Parental Knowledge about Retinopathy of Prematurity

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Abstract

Introduction: The childhood blindness due to retinopathy of prematurity (ROP) can be prevented if infants at risk are screened before the progression of the condition. The parental awareness on need of follow-ups for screening and identification of ROP will help in reducing the incidence of childhood blindness due to ROP.

Method: In the present study an informative pamphlet was developed and distributed to find its effectiveness in improving the parents' knowledge on retinopathy of prematurity. Quantitative research approach was used with pre-experimental pre-test post-test one group design. Conceptual framework used was General system theory by Ludwig Von Bertalanffy. Using convenience sampling method 30 parents of preterm babies were selected. The baseline proforma and knowledge questionnaire were administered and later an informative pamphlet about ROP were given. Post-test knowledge assessment was done 7 days after the exposure to pamphlet.

Result and Discussion: The study finding showed an increase in the knowledge of parents on ROP after the exposure to pamphlet ($Z=4.628$, $p=.001$). An association was found between pre-test knowledge and previous parental knowledge on eye diseases in newborn babies ($U=59$, $p=.048$). The present study concludes that the pamphlet made by the researcher on ROP was effective in improving the parents' knowledge about ROP.

Keywords: Retinopathy of prematurity (ROP); Parental knowledge; Informative pamphlet.

Introduction

Retinopathy of prematurity (ROP) is a preventable cause of blindness in children. The improvement of neonatal care increased the survival of preterm babies. These babies are at high risk for developing ROP^[1]. The study reports in 2010, out of 15 million survived preterm babies, minimum of 1,84,700 reported some stage of ROP, among them 53,800 progressed to potential vision impairment^[2]. Preterm births are highest in India, China,

Nigeria, Pakistan and Indonesia. East Asia, South East Asia and the Pacific are the regions with the highest number of preterm babies who survive and the highest number who develop visual loss from ROP^[3].

A simple screening test by an ophthalmologist within few weeks of birth will prevent ROP related blindness. Eventhough there is highest rate of preterm births, there is an uncertainty about the practices of screening tests in developing countries like India and china All developed countries follow the screening test and protocols very strictly. The practice of remedial measures will decrease the incidence of ROP related blindness^[4].

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AAP policy on ROP recommends that, "Infants with a birth weight ≤ 1500 gms or gestational age of ≤ 30 weeks and the infants with a birth weight between 1500gms and 2000 gms or gestational age of more than

30 weeks with an unstable clinical course, should be screened for ROP^[5]. In developing countries like India, a birth weight ≤ 1750 gms and/or gestational age of ≤ 34 weeks is used as a cut-off for ROP screening. According to the guidelines by National Neonatology Forum of India "Screening for ROP should be performed in all preterm neonates who are born < 34 weeks gestation and/or < 1750 gms birth weight; as well as in babies 34-36^{6/7} weeks gestation or 1750-2000 grams birth weight, if they have risk factors for ROP"^[6].

ROP is progressive in nature and, the infant has to undergo multiple sequential eye check-ups to identify the likelihood to develop ROP. The goal of an effective ROP screening program is to identify the infants who could benefit from treatment and make appropriate recommendations on the timing of future screening and treatment interventions. If diagnosed to have ROP, the neonate needs to undergo timely treatment by an ophthalmologist who is experienced in the examination of preterm infants for ROP using a binocular indirect ophthalmoscope on a scheduled basis according to their gestational age at birth and their disease severity^[5]. A major problem faced by the ROP screening programmes is the missing of follow-up of infants after their discharge from the NICU^[7].

Unidentified ROP can lead to permanent blindness, hence it is important that all at risk infants to be screened in a timely fashion, recognizing those who require treatment. Parents should be aware of ROP screenings and should be informed by the staff if the child has ROP, with subsequent updates on ROP progression^[5].

As the responsibility of bringing the baby for follow-up ophthalmologic care after discharge is delegated to the parents, they should be made to aware of the importance of timely screening; as there is a critical time period for the successful treatment^[8]. The attendance of the multiple visits can be improved only if the parents are informed about the nature of the disease and its magnitude.

The researcher during her exposure in neonatal ICU observed many infants are missing their ophthalmologic assessments after their discharge from the hospital.

The major reason could be the unawareness of the parents. Hence it was planned to develop a pamphlet on ROP emphasising the importance of followups. The information should be given by the healthcare service providers during the hospital stay, either verbally or in

writing or both, thus the attendance in the scheduled screening can be improved.

Material and Method

A quantitative study using One group pretest post-test pre-experimental design was conducted in two multi-speciality hospitals at Tiruvalla, Kerala. The researcher prepared a knowledge questionnaire and an informative pamphlet for the study and was validated by 5 experts. The experts were selected from the field of neonatology, ophthalmology and pediatric nursing. Reliability of the tool has been established by administering to 7 samples and found feasible ($r = .920$). The final tool consisted of two parts. First part is the baseline variables of parent and the baby. Eight items each on parents and the baby were included in the final tool. Second part is the knowledge questionnaire consisted of 16 items. The informative pamphlet prepared by addressing prematurity, general anatomy of the eye, symptoms, prevention, treatment and complications of ROP. The same aspects were included in the knowledge questionnaire. All questions had one correct answer and carried a score of one. Pilot study was conducted among

5 samples. Thirty parents of preterm babies ≤ 34 weeks of gestation and/or ≤ 1750 gms birth weight admitted in the two hospitals during the month of February – March 2018 were selected using convenience sampling technique.

The tools were distributed to the identified samples and collected back after completion. It took around 20 minutes for the samples to complete the tool. The researcher was present near during data collection to clarify the doubts. After completion of the knowledge questionnaire an informative pamphlet on ROP were given to them. Researcher requested them to read once in front and clarify doubts. Later it was given to them to read as and when time permits. After 7 days a post test was carried out using the same questionnaire. The effectiveness of the pamphlet was analysed by comparing pretest and post-test knowledge scores by using Wilcoxon signed ranks test. The association between pre-test knowledge scores and the baseline variables were analysed using Kruskal Wallis and Mann Whitney U test.

Findings:

Description of the baseline variables of the parents of preterm babies: Out of 30 parents 23

(76.7%) were mothers and 7 (23.3%) were fathers and 13 (43.3%) were in the age group between 29 to 33 yrs. (Table 1).

Half of the samples were residing in rural area and 43.3% had monthly family income between Rs 16020 – 32049. (Table 1)

Most (53.3%) of them are from joint family and 63.3% did not have knowledge about any eye diseases affecting the newborn babies. (Table 1).

Description of the baseline variables of the babies: A total of 26 babies were involved in the study including 3 twins. Fourteen babies were male and twelve babies were female. Twelve babies each were first born and second born and 2 babies were third in birth order (Table 1). The mean age of the babies was 6 days. The mean birth weight and mean gestational age were 1720 gms and 31 +6 weeks respectively (Table 2).

Table 1: Frequency and percentages of baseline variables on parent and baby factors N=30

Selected baseline variables	Category	Frequency	Percentage %
Parent Factors			
Age of the parent in years	18 – 23	2	6.7
	24 – 28	7	23.3
	29 – 33	13	43.3
	34 – 38	8	26.7
Relationship with the baby	Mother	23	76.7
	Father	7	23.3
Place of residence	Urban	5	16.7
	Semi urban	10	33.3
	Rural	15	50
Family income in rupees	>32,050	5	16.7
	16020–32049	13	43.3
	12020 – 16019	3	10
	8010 – 12019	2	6.7
	1601 – 4809	1	3.3
	<1600	6	20
Family type	Nuclear family	14	46.7
	Joint family	16	53.3
Previous knowledge of parents about eye disease in newborn	Yes	11	36.7
	No	19	63.3
Baby Factors			
Gender	Female	12	46.15
	Male	14	53.84
Birth Order	First	12	46.15
	Second	12	46.15
	Third	2	7.69

Table 2: Mean age, Birth weight and Gestational age of the baby N=26

Parameters	Mean
Mean Age	6 days
Mean Birth Weight	1720 gms
Mean Gestational Age	31 +6 weeks

Findings of pre-test and post-test knowledge scores of parents of preterm babies: The knowledge scores were categorized into poor, average and good. In the pretest, 15 (50%) had average knowledge, 14 (46.7%) had poor knowledge and only 1 (3.3%) had good knowledge. Whereas in the post-test 18 (60%) had good knowledge, 12 (40%) had average knowledge and no one was in poor category.

Effect of informative pamphlet in improving parental knowledge about retinopathy of prematurity: Wilcoxon signed ranks test was used to compare the pre-test and posttest scores of the samples. Analysis showed that out of 30 samples, 28 (93.33%) had improved their knowledge and 2 samples (6.66%) had no change in their

knowledge after using the pamphlet. There is significant improvement in the knowledge of parents in the post-test as compared to the pre-test ($Z= 4.628$ $p=.001$). Hence the null hypothesis H_{01} rejected and H_1 accepted. It is proved that the informative pamphlet was effective in improving parental knowledge on ROP.

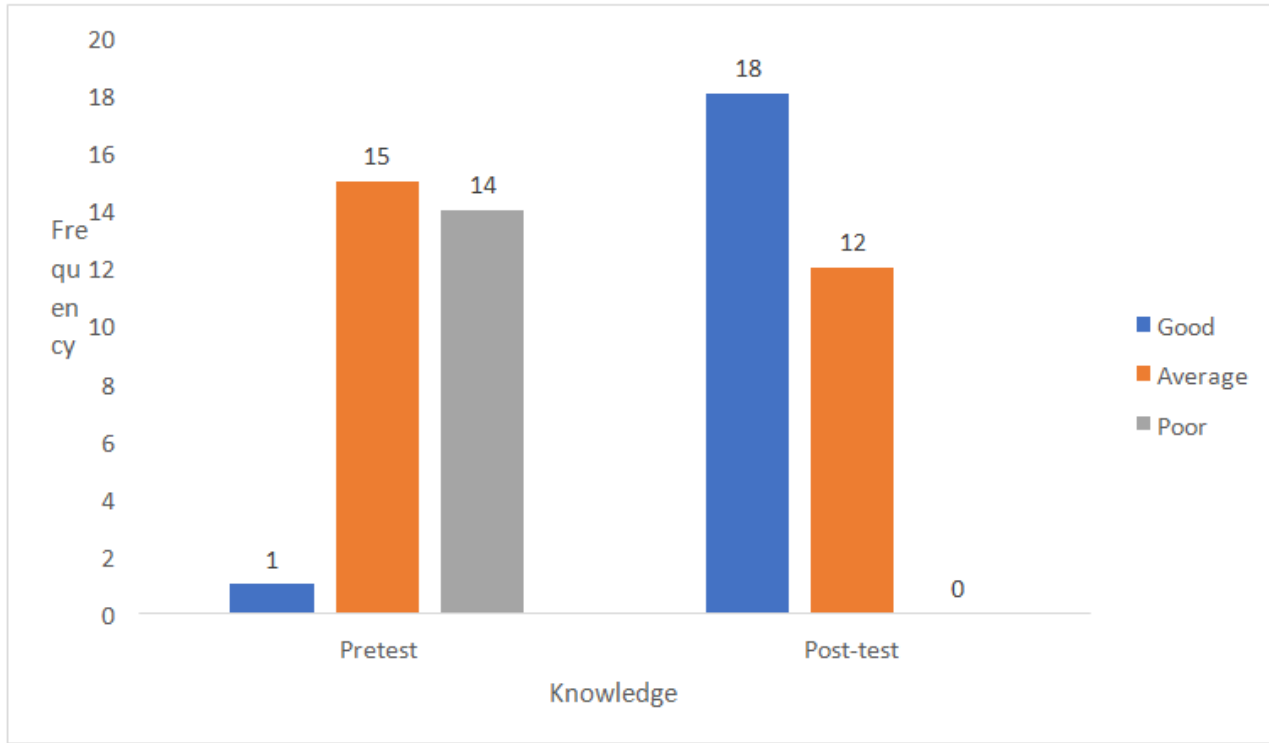


Fig 1: Parental knowledge on pre-test and post test

Table 3: Comparison of pre-test and post-test mean ranks of parents of preterm babies about retinopathy of prematurity. N=30

		f	Mean Rank	Sum of Ranks	Z	p
Pre-test post-test	Negative Ranks	0	.00	.00	-4.628	.001*
	Positive Ranks	28	14.50	406.00		
	Ties	2				
	Total	30				

Wilcoxon Signed Ranks Test (* $p<.001$)

Association between pre-test knowledge scores with selected baseline variables: The selected baseline variables were the age of the parents, relationship with the baby, family type, previous knowledge about eye disease in new born, age of the baby and birth order.

Analysis was done using Mann: Whitney U test and Kruskal Wallis test. Previous knowledge of the

parents about eye diseases in newborn babies had a significant association with pretest knowledge scores ($U=59$, $p=.048$). The null hypothesis H_{02} was rejected in favour of research hypothesis in terms of previous knowledge of parents of preterm babies about eye diseases in newborn. Hence it is proved that the parents who had knowledge on any eye diseases in new born had knowledge on ROP.

Discussion

There were only few published researches on the parental education about ROP. Most of the published researches had mainly focused on the incidence and prevalence.

The study conducted by Mousavi et al. (2010) reports the mean gestational age of preterm babies included in the study are

31.4 weeks^[9]. This finding is very similar to the present study where the mean gestational age of babies were 31.6 weeks.

The mean birth weight of the preterm babies included in the present study were 1720gms. The study conducted by

Mousavi et al. (2010) reports the birth weight of the preterm babies included in the study were 1562 gms^[9]. These findings were showing a difference of .158gm. This may be because of the difference in geographical location.

In the present study 76.9% of babies were born by singleton pregnancy and the study conducted by Mousavi et al. (2010) reports 60.2% of babies born by singleton pregnancy^[9]. When we compare the gender of the babies included in the study both the studies having majority of the babies of male gender.

The study done by Daftarian et al. (2016) reported that parents' knowledge remained the same after and before the pamphlet exposure, however their perception about the importance of timely screening improved which led them to the successful completion of scheduled eye appointment^[10]. On contrary to this, in the present study 28 samples has improved their knowledge in the post test and 2 had the same knowledge before and after pamphlet exposure. All parents acknowledged the importance of timely follow up of ROP examinations, post introducing the pamphlet.

Feng J et al. (2016) reported that 94.1% of parents of ROP infants were informed of ROP and received recommendations for screening, whereas 5.9% of parents were not informed by their attending paediatrician about the need for an eye examination. Among them only 71.1% parents were aware of ROP and 28.1% parents had no idea about the disease^[11]. This shows the advantage of written information like a pamphlet on ROP to make the parents aware about the need for timely screening.

Conclusion

The major conclusion of this study is that most of the parents were unaware about the importance of timely screening and the potential consequences of the missing of followups of ROP screening. A pamphlet with detailed description about the disease could help them to understand their role in preventing childhood blindness.

Conflict of Interest: None declared.

Source of Funding: Self

Ethical Clearance: Institutional ethical committee clearance was obtained. (Ref. No. Pcon/136/596/17)

References

1. Retinopathy of Prematurity | National Eye Institute [Internet]. nei.nih.gov.
2. Blencowe J, Lawn JE, Vazquez T, Fielder A, Gilbert C. Beyond newborn survival: Preterm associated visual impairment and estimates of retinopathy of prematurity at regional and global level for 2010. *Pediatr Res*. 2013; 54:36–49.
3. March of Dimes, PMNCH, Save the Children, WHO. Born too soon: The global action report on preterm Birth. Geneva: World Health Organization; 2012.
4. Shah PK, Prabhu V, Karandikar SS, Ranjan R, Narendran V, Kalpana N. Retinopathy of prematurity: Past present and future. *World J Clin Pediatr*. 2016;5(1):35-46.
5. Section of Ophthalmology American Association of Pediatrics, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. *Pediatrics* 2006; 117:572-576.
6. Pejaver RK, Vinekar A, Bilagi A. National Neonatology Foundation's Evidence Based Clinical Practice Guidelines. Retinopathy of Prematurity (NNF, India, Guidelines) 2010:253–62.
7. Vinekar A, Jayadev C, Dogra M, Shetty B. Improving follow-up of infants during retinopathy of prematurity screening in rural areas. *Indian Pediatrics*. 2016;53(2):S151-4
8. Al Amro S, Al Aql F, Al Hajar S, Al Dhibi H, Al Nemri A, Mousa A et al. Practical guidelines for screening and treatment of retinopathy of

- prematurity in Saudi Arabia. *Saudi Journal of Ophthalmology*. 2018;32(3):222-226.
9. Mousavi SZ, Karkhaneh R, Roohipour R, et al. Screening for retinopathy of prematurity: the role of educating the parents. *Iran J Ophthalmol*. 2010; 22(2):13–18.
 10. Daftarian S, Lin P, Mitchell K. Retinopathy of prematurity: Improving parental awareness and perceived importance of follow-up eye exams using an informative pamphlet. *Journal of Neonatal Nursing*. 2016;22(5)228-230
 11. Feng J, Sun YY, Meng XF, Deng X, Chen Y. Parental awareness of the need for screening of retinopathy of prematurity in Northern China. *Int Eye Sci*. 2017; 17(6)1011-14.

Knowledge, Attitude and Practice among Postnatal Mothers Regarding Postnatal Exercise in Selected Villages at Pooncheri, Kanchipuram District, Tamil Nadu, India

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Abstract

A descriptive study to assess the knowledge, attitude and practice among postnatal mothers regarding postnatal exercise in selected village adopted by rural health centre Pooncheri, Kanchipuram District, Tamil Nadu, India. The objectives are to assess the knowledge, practice and attitude among postnatal mothers regarding postnatal exercise in selected villages adopted by rural health centre Pooncheri, Kanchipuram District, Tamil Nadu, India. To find out the association between level of knowledge, practice and attitude with demographic variables. The purposive sampling technique was used and the samples were 73. The data collection tools were validated and reliability was established. The data were collected by self-administered questionnaire. The collected data tabulated and analyzed. Descriptive and inferential statistics were used. The study shows, In knowledge, 12.3% of the mothers had adequate knowledge, 52% of mothers had moderate knowledge and 35.6% of mothers had inadequate knowledge. In practice, 1.3% of mothers had adequate practice, 38.3% of mothers had moderate practice and 60.2% of mothers had inadequate practice, In attitude, 60.2% of mothers had negative attitude, 39.7% of mothers had undecided attitude and none of mothers had positive attitude among postnatal exercise.

Keywords: Postnatal exercise, postnatal mothers.

Introduction

Child birth is a significant event in women. It is a privilege the mother to deliver a baby woman role is completing after child birth. Childbirth is the culmination of a human pregnancy or gestation period with birth of one or more newborn infants from a women's uterus. The process of normal human childbirth is categorized

in the three stages of labour. The shorting and dilation of the cervix, descent and birth of the infant and birth of the placenta. In some cases, childbirth is achieved through caesarean section, the removal of the neonate through a surgical incision in the abdomen, rather than through vaginal birth.^[1](Rajiya.H, 2011)

WHO 2008 reports, the outcome on the full range of issues relevant to the postpartum period for the mother and newborn which is a comprehensive view of maternal and newborn needs at a time which is decisive for the life and health of both the mother and her newborn. Taking women own perception of their needs during this period, it is major maternal and neonatal health challenges.

A number mothers experience to trouble bringing their abdomen into its original tone and size after childbirth. Some exercise can help our abdomen return to its original size. There has been gradual acceptance that exercise is beneficial during any part of reproductive

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process. Benefits are particularly apparent for those women exercising postpartum, where exercise have been found to improve weight loss and prevent long term weight retention.

Specific postnatal exercise is fairly important and involves re-strengthening and toning weakened abdomen, lower and upper back muscles. A series of physical exercise that are performed by the mother is to bring about optimal functioning of all system and prevent complication.^[2](Shelin Christie, 2014)

Postnatal exercise offers a wide range of benefits for the mother. Postnatal exercise will speed up the recovery process and build valuable strength specific exercise for abdominal wall is transverse abdominal muscle which is used in the treatment of back pain. The specific exercise approach aims to improve the dynamic stability role of the local muscle in providing stiffness to the segments of the spine and pelvic during functional posture and movements.^[3](Asha Sreenivasan, 2017)

The postnatal period is the time during which mothers body adjusts physically and psychologically to the process of childbearing. The period following childbirth during which the body tissues, in particular the genital and the pelvic organs, return to the condition they were pre-pregnancy, which lasts 6 weeks. Physiological changes during this time include: The cardiovascular system reverts, the vaginal wall is initially swollen, bluish and pouting but rapidly regains its tone although remaining fragile for 1-2 weeks, perineal edema may persist for some days. Biologically, Postnatal period is a time during which the mothers body including hormone levels and uterus size returns to pre-pregnancy conditions.^[1](Rajiya.H,2011)

Research Methodology

The chapter deals with a brief description of different steps undertaken by the researchers for the study. It involves research approach, design the setting, the population, sample and criteria, sampling technique, sample size, data collection tool, score and interpretation and ethical consideration.

Research Approach: It involves the description of the plan to investigation the phenomenon under study in a structured, unstructured, or a combination of the two method (quantitative-qualitative integrated approach).

In this study, researchers assessed the knowledge, practice and attitude of postnatal exercise among postnatal mothers by using **Quantitative approach**.

Research Design: Research design can be defined as a blue print to conduct a research study, which involves the description of research approach, study setting, sampling size, sampling technique, tools and method of data collection and analysis to answer specific research questions or for testing research hypothesis.

Descriptive research design was used for the present study.

Research Setting: The physical location and condition in which data collection takes place in a study.

The study was conducted in selected villages adopted by rural health centre Pooncheri, Kanchipuram District, Tamil Nadu, India.

Population: The entire set of individuals or objects having some common characteristic(s) selected for a research study.

The present study comprises of all the postnatal mothers.

Target Population: The entire population in which the researchers are interested and to which they would like to generalize the research findings.

All the postnatal mothers in a selected villages adopted by rural health centre .

Accessible Population: The aggregate of cases that conform to designated are inclusion or exclusion criteria and that are accessible as subjects of the study.

The population of the present study comprises of all postnatal mothers who were all available during the period of the data collection in the selected villages adopted by rural health centre.

Sample: All the postnatal mothers in a selected villages.

Sample Criteria: List of the characteristics essential for inclusion or exclusion in the target population.

Inclusion Criteria: Postnatal mothers available at the time of data collection

Postnatal mothers who can understand Tamil

Exclusion Criteria: Postnatal mothers who are not willing to participate.

Sample Technique: Sampling is the process of selecting a representative part of the population. Thus a carefully carried out sampling process helps to draw a sample that represents the characteristics of the population from which the sample is drawn. There are several method or techniques of sampling; however, basically sampling techniques are classified in two broad categories:

1. Probability sampling technique
2. Non-probability sampling technique

The purposive sampling technique was adopted for this study.

Sample Size: The sample size = 73

Data Collection Tool: Identification of subjects and the precise, systematic gathering of information (data) relevant to the research purpose or the specific objectives, questions, or hypothesis of a study.

A self-structured questionnaire was used as a tool for data collection, it was consisted the following parts.

Part-1: Questions related to demographic profile of postnatal mothers. Age, Educational status, Occupation, family income, type of family, number of pregnancy, type of delivery, number of children, source of information.

Part-2: Self-structured questionnaire to assess the knowledge practice and attitude it consist of 30 questions each sample.

Score and Interpretation: Each correct answer was given 1 mark.

Table 1: Total number of knowledge questions-10, Total number of practice questions-10

Level of Knowledge and Practice	Score
Adequate knowledge and practice	75% and above
Moderate knowledge and practice	51-75%
Inadequate knowledge and practice	Below 50%

Table 2: Total number of attitude questions-10

Level of Attitude	Score
Positive attitude	75% and above
Undecided attitude	51-75%
Negative attitude	Below 50%

Table 3: Five point scale scoring interpretation

Attitude	Score
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

Statistical Analysis: Descriptive and Inferential statistical analysis was used to analyze the data.

Ethical Consideration: UG Committee clearance was obtained.

Human Ethical committee clearance was obtained.

Prior permission was obtained from village panchayat.

Informed consent was obtained from the sample

Findings: Findings of the study were presented under the following headings based on the study objectives

Objective 1 To assess the knowledge, practice and attitude among postnatal mothers in a selected villages adopted by rural health centrepooncheri, Kanchipuram District, Tamil Nadu India.

The finding of the present study reveals that

9(12.3%) of postnatal mothers had adequate knowledge

38(52%) of postnatal mothers had moderate knowledge

26(35.6%) of postnatal mothers had inadequate knowledge

1(1.3%) of postnatal mothers had adequate practice

28(38.3%) of postnatal mothers had moderate practice

44(60.2%) of postnatal mothers had inadequate practice

44(60.2%) of postnatal mothers had negative attitude

29(39.7%) of postnatal mothers had undecided attitude

0(0%) of postnatal mothers had positive attitude

Objective 2 To associate demographic variables with the level of knowledge of postnatal exercise.

Finding-1: Age and level of knowledge of postnatal exercise.

There was no significant association between the age and the level of knowledge of postnatal exercise $\chi^2=12.35$, $p(0.05)=12.59$

Finding-2: Education status and level of knowledge of postnatal exercise.

There was no significant association between the Education status and the level of knowledge of postnatal exercise $\chi^2=8.304$, $p(0.05)=18.31$

Finding-3: Occupation and level of knowledge of postnatal exercise

There was no significant association between the occupation and the level of knowledge of postnatal exercise $\chi^2=12.97$, $p(0.05)=16.81$

Finding-4: Family income and level of knowledge of postnatal exercise

There was no significant association between the family income and the level of knowledge of postnatal exercise $\chi^2=5.878$ $p(0.05)=15.51$

Finding-5: Type of family and level of knowledge of postnatal exercise

There was no significant association between the type of family and the level of knowledge of postnatal exercise $\chi^2=1.520$ $p(0.05)=9.49$

Finding-6: Gravida and level of knowledge of postnatal exercise

There was no significant association between the gravida and the level of knowledge of postnatal exercise $\chi^2=2.734$ $p(0.05)=15.51$

Finding-7: Type of delivery and level of knowledge of postnatal exercise

There was no significant association between the type of delivery and the level of knowledge of postnatal exercise $\chi^2=7.819$ $p(0.05)=9.49$

Finding-8: Live birth and level of knowledge of postnatal exercise

There was no significant association between the live birth and the level of knowledge of postnatal exercise $\chi^2=4.183$ $p(0.05)=15.51$

Finding-9: Source of information and level of knowledge of postnatal exercise

There was no significant association between the source of information and the level of knowledge of postnatal exercise $\chi^2=17.71p(0.05)=20.09$

To associate demographic variables with the level of Practice of postnatal exercise.

Finding-1: Age and level of Practice of postnatal exercise.

There was no significant association between the age and the level of practice of postnatal exercise $\chi^2=4.976$, $p(0.05)=12.59$

Finding-2: Education status and level of practice of postnatal exercise .

There was no significant association between the Education status and the level of practice of postnatal exercise $\chi^2=5.323$, $p(0.05)=18.31$

Finding-3: Occupation and level of practice of postnatal exercise

There was no significant association between the occupation and the level of practice of postnatal exercise $\chi^2=5.370$, $p(0.05)=12.59$

Finding-4: Family income and level of practice of postnatal exercise

There was no significant association between the family income and the level of practice of postnatal exercise $\chi^2=6.852$, $p(0.05)=15.51$

Finding-5: Type of family and level of practice of postnatal exercise

There was no significant association between the type of family and the level of practice of postnatal exercise $\chi^2=1.645$, $p(0.05)=9.49$

Finding-6: Gravida and level of practice of postnatal exercise

There was no significant association between the gravida and the level of practice of postnatal exercise $\chi^2=2.096$, $p(0.05)=15.51$

Finding-7: Type of delivery and level of practice of postnatal exercise

There was no significant association between the type of delivery and the level of practice of postnatal exercise $\chi^2=6.852$ p (0.05) = 9.49

Finding-8: Live birth and level of practice of postnatal exercise

There was no significant association between the live birth and the level of practice of postnatal exercise $\chi^2=2.347$, p (0.05) = 15.51

Finding-9: Source of information and level of practice of postnatal exercise

There was no significant association between the source of information and the level of practice of postnatal exercise $\chi^2=11.96$ p (0.05) = 15.51

To associate demographic variables with the level of Attitude of postnatal exercise.

Finding-1: Age and level of attitude of postnatal exercise.

There was no significant association between the age and the level of attitude of postnatal exercise $\chi^2=6.961$, p (0.05) = 12.59

Finding-2: Education status and level of attitude of postnatal exercise.

There was no significant association between the Education status and the level of attitude of postnatal exercise $\chi^2=4.739$, p (0.05) =18.31

Finding-3: Occupation and level of attitude of postnatal exercise

There was no significant association between the occupation and the level of attitude of postnatal exercise $\chi^2=6.994$, p (0.05) =12.59

Finding-4: Family income and level of attitude of postnatal exercise

There was no significant association between the family income and the level of attitude of postnatal exercise $\chi^2=13.77$ p (0.05) = 15.51

Finding-5: Type of family and level of attitude of postnatal exercise

There was no significant association between the type of family and the level of attitude of postnatal exercise $\chi^2=0.534$ p (0.05) = 9.49

Finding-6: Gravida and level of attitude of postnatal exercise

There was no significant association between the gravida and the level of attitude of postnatal exercise $\chi^2=5.093$, p (0.05)= 15.51

Finding-7: Type of delivery and level of attitude of postnatal exercise

There was no significant association between the type of delivery and the level of attitude of postnatal exercise $\chi^2=4.008$ p (0.05) = 9.49

Finding-8: Live birth and level of attitude of postnatal exercise

There was no significant association between the live birth and the level of attitude of postnatal exercise $\chi^2=4.206$, p (0.05) = 15.51

Finding-9: Source of information and level of attitude of postnatal exercise

There was no significant association between the source of information and the level of attitude of postnatal exercise $\chi^2=3.508$ p (0.05) = 15.51

Conclusion

To conclude the Researcher would like to: Improve the knowledge, practice and attitude on postnatal exercise among postnatal mothers, create awareness on benefits of postnatal exercise and prevention of complication during postnatal period.

Conflict of Interest: Nil

Source of Funding: Self funding and no external funding.

Ethical Clearance: Obtained clearance from institutional human ethical committee on 04.02.2018

Reference

1. Bent V. Ruthilinda. K. Brown; Myles. Text Book for Midwives, 13 edition ed: Churchill Livingstone Publishers; 1999
2. Myles. Textbook for Midwives. Edition fourteenth.

3. Rajiya. A study on effectiveness of video assisted teaching regarding postnatal exercises among postnatal mother. Bangalore; 2011.
4. Shelin Christie. To assess effectiveness of planned teaching programme on knowlegde regarding postnatal exercise among postnatal mothers. Journal of Nursing and Health Sciene Nov-Dec. 2014; 3(6).
5. Swastikmulay. Sinhgad e-journal of nursing dec. 2016; 4(2).
6. Avinash H. Salunkhe. Knowlegde of primigravida mothers regarding postnatal exercise; Indian Journal of Applied Research July 2016; 6(7).

Knowledge on Maternal and Child Health Service among Women in Reproductive Age Group in Mahabalipuram, Kanchipuram District, Tamil Nadu, India

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Abstract

The study to assess Knowledge on maternal and child health services among women in reproductive age group in Mahabalipuram, Kanchipuram District, Tamil Nadu, India” The objectives were to assess the knowledge of women regarding maternal and child health services and associate the level of knowledge with selected demographic variables among women in reproductive age group. 184 samples were selected by convenient sampling technique. Data collected by structured questionnaire. The collected data was tabulated and analysed. Descriptive and inferential statistical were used. The results are majority 60% of women had moderate knowledge where as minority 12% had inadequate knowledge. Demographic variables like Age $\chi^2=12.14$, Educational status $\chi^2=16.572$, Monthly income $\chi^2=16.4828$, Type of family $\chi^2=23.788(p\leq 0.05)$ were significant where as Marital status $\chi^2=1.0432$, Occupational status $\chi^2=0.7601$, Number of pregnancy $\chi^2=0.8079$ ($p\leq 0.05$) not significant with the selected demographic variables among women in reproductive age group.

Keywords: Maternal and child health services, Reproductive age group women.

Introduction

The Maternal and Child Health program standards provide an evidenced-based framework for the consistent, safe and quality delivery of the maternal and child health service. The program standards support the provision of clinical and corporative governance within the service and provide a systematic to improving service delivery and safety. (Nnenaya N. Kalu- Umeh, MBBS, MPH, Mohammed N. Sambo, MBBS, FWACP).¹

In MCH Programme, Village Health Nurses visit villages in their Health sub centre area and register the Antenatal Mothers in early stage and use to conduct free Lab investigation, IFA, Albendazole Tablets and Immunization given to them and Sonography Investigation in the PHCs.²

Immunization: Under National Immunization Schedule, for Children below One Year to be immunized with 1 dose of BCG, 3 doses of OPV and Pentavalent, IPV 2 doses, 3 doses of Rota Vaccine and 1 Dose of MR Vaccine. Out of target 40914, achievement in BCG 38959 (95%), 3rd dose of OPV and Penta achievement 39873 (97%) and 39904 (97%) achieved in MR Vaccine.³

Need for the Study:

National Health Outcome Goals for the 12th Plan:

Reduction of Maternal Mortality Ratio (MMR) to 100: At the recent rate of decline of 5.5% per annum

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India is projected to have an MMR of 143 by 2015 and 127 by 2017. An Accomplishment of the Millennium Development Goal (MDG) of Minimizing MMR to 109 by 2015 would require an advancement of this historical rate of decline. At this accelerated rate of decline, the country targeted to achieve MMR of 100 per 1000 by 2017, but it is not yet achieved. current MMR ratio 137 per 10000 in the year 2017 so they reset the target of achievement by 70 per 10000 in the year 2030.

India MMR Ratio: In Indian maternal mortality rates ratio is 137 per 10000 at 2017

Tamil Nadu MMR: In Tamil Nadu maternal mortality rates ratio is 66 per 10000 at 2015 -2016.

Hemant Mahajan et al(March 2014): A longitudinal epidemiological study conducted on utilization of maternal and child Health services by primigravida female in urban and rural area of India with consecutive 240 primigravida mother . Maternal complications and poor perinatal outcome are highly associated with non utilisation of antenatal and delivery care services and poor socioeconomic conditions of the patient. It is very important that all pregnant women have permission to high quality of obstetric care throughout the pregnancy. The study was carried out to Associate utilization of Maternal and child health services by urban and rural primigravida females and (240) study samples were enrolled in this study . And illiteracy and less mean age at the time of marriage were noted in rural population. Poor knowledge about prelacteal feed, colostrums, tetanus injection and iron-folic acid tablet consumption was noted in both urban and rural areas. Very few study participants from both areas were counselled for HIV testing before pregnancy. Abortion rate was (19.2%) were noted in urban compared to rural area . The Utilization study was poor in both urban and rural areas A Assisted and Focussed IEC Campaign to upgrade the awareness amongst community on maternal and child health services will enhance the community participation. This may improve the quality, accessibility and utilization of maternal health care services provided by the government agencies in both rural and urban areas almost 17% of rural subjects were illiterate compared to urban population (7.5%) Early marriage (below 18 years) was more in urban and rural area. However, more rural subjects than urban subjects (46.70% rural and 34.10% urban primi females) were married before the age of 18 years. In this study, majority of subjects were from age group 18 to 21 years, that is, 79 (65.80%) in

rural and 56 (46.70%) in urban area. The mean age at the time of marriage was years in rural and years in urban group. With mention to socio economic class, major part of rural and urban samples were from socioeconomic class was 62 (52%) and urban 67(56%) . Major part of urban samples 118 (98%) were house wives and 2 (2%) were working as tailor. Comparably, among rural study population only 92 (77%) sample were housewives.

Statement of the Problem: Knowledge on Maternal and Child Health service among women in reproductive age group in Mahabalipuram, Kanchipuram District, Tamil Nadu, India.

Objectives:

- Assess the knowledge of women regarding maternal and child health service.
- Associate the level of knowledge with selected demographic variables among women in reproductive age group.

OPERATIONAL DEFINITION:

Knowledge on Maternal and child health services

The information regarding the knowledge level of

Dr. Muthulakshmi Reddy maternity benefit scheme, Amma Baby Kit, Breast Milk Bank Programme, Janani Suraksha Yojana, Janani Sishu Suraksha Karyakram Scheme.

Reproductive age group women: The female who all are in the reproductive age group of 18-60 years .

Research Methodology: A quantitative approach with descriptive design was used in study. The study was conducted among women who are all in the age group of 18-60 years in Mahabalipuram. A Convenient sampling technique was used to select 184 samples with the following inclusion criteria. Women who are all: In the age group of 18 to 60 years, who are all present during data collection, who are able to read and understand Tamil. The data was analyzed by using descriptive and inferential statistics.

Data Collection Procedure: The study was conducted in Mahabalipuram after the written permission from the authorities, 184 Samples were selected, using convenient sampling technique who are willing to participate to study. The objectives of the study was explained and informed consent was obtained from the

samples. Demographic data were obtained from each sample and answers for self administered questionnaires collected. The investigator thanked the participants for their cooperation throughout the data collection period.

Plan for Data Analysis: The data of the present study was planned to be analyzed based on specific objectives. The data obtained from 184 samples were analyzed by using descriptive and inferential statistics as follows.

Descriptive statistical method such as frequency and percentage was used for describing demographic variables.

The association between the level of knowledge with the selected demographic variables was analyzed by inferential statistical method (i.e.) Chi square test.

Ethical Consideration:

- Obstetrics and Gynecological Nursing department clearance was obtained from Chettinad College of Nursing.
- UG Committee Clearance was obtained.
- Ethical Committee Clearance was obtained.
- Formal Permission was obtained from the Principal, Chettinad College of Nursing.
- Formal Consent was obtained from the study samples before collecting the information.

Results and Discussion

The discussion is presented as follows:

1. Frequency and percentage distribution of demographic variables among women in reproductive age group.
2. Describes about the level of knowledge on about maternal and child health services among women in reproductive age group.
3. Association of level of knowledge on maternal and child health services with the selected demographic variables among women in reproductive age group.

1. Frequency and percentage distribution of demographic variables among women in reproductive age group: The study revealed that majority (39%) of the samples were in the Age group of 38-60 yrs and (91%) of samples were Married. (53%) of the samples were received

Education from secondary & degree. (39%) of the samples Monthly income of 10357-20714. (79%) samples were a House wife. (70%) of samples were Multiple pregnancy. (63%) of samples were belong to Nuclear family.

2. Describes about the level of knowledge on about maternal and child health services among women in reproductive age group.

Table 1: Describes about the level of knowledge on about maternal and child health services among women in reproductive age group.

Level of Knowledge	Total Number of Sample	Percentage
Adequate	52	28%
Moderate	110	60%
Inadequate	22	12%
Total	184	100%

Table 1: Showed that majority 60% of women had moderate knowledge where as minority 12% had inadequate knowledge.

3. Association of level of knowledge on maternal and child health services with the selected demographic variables among women in reproductive age group.

Demographic variable like Age $X^2=12.14$, Educational status $X^2=16.572$, Monthly income $X^2=16.4828$, Type of family $X^2=23.788$ were significant to $p \leq 0.05$ where as Marital status $X^2=1.0432$, Occupational status $X^2=0.7601$, Number of pregnancy $X^2=0.8079$ were not significant to $p \leq 0.05$ with the knowledge on Maternal and Child Health Services among women in reproductive age.

Conclusion

A study to assess the knowledge on maternal and child Health services among women in reproductive age group in mahabalipuram, Kanchipuram District, Tamil Nadu, India. A total of 184 samples were selected by using convenient sampling technique. The knowledge level of samples was assessed by using a self structured questionnaire. The collected data were analyzed by using the descriptive statistic and inferential method. The study showed that majority 60% of women had moderate knowledge where as minority 12% had inadequate knowledge.

Ethical Clearance: In this study researchers have got prior permission to conduct the study and got

informed consent from each participant. We ensured that no physical harm to the samples. Confidentiality maintained.

Source of Funding: Self

Conflict of Interest: Nil

References

1. MCH program resource guide . Maternal and Child Health Service guidelines. february 2013;
2. <https://vellore.nic.in/health/>..(accessed).(https://vellore.nic.in/health/)
3. Vipin M Vashishtha, Convener. Indian Academy of Pediatrics (IAP) recommended immunization schedule for children aged 0 through 18 years, India, 2013 and updates on immunization. pubmed. gov 2013 Dec; (50(12)):
4. Eschen A. Acting to save women lives report of the parter's for safe motherhood World Bank, Washington, DC.. 1992.

Assessment of Knowledge on Disaster Preparedness among Adult in a Selected Rural Community at Kanchipuram District Tamil Nadu, India

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Abstract

“Assessment of knowledge on Disaster preparedness among Adults”. The objectives of this study are to assess the level of knowledge on disaster preparedness among adults and associate the knowledge on disaster preparedness among adults with selected demographic variables. The sampling technique used was simple random sampling technique with the samples of 100 adults. The study assessed the knowledge on disaster preparedness among adults. The data collection tool was validated by nursing experts. The collected data was tabulated and analyzed. That based on the age of adults 69(69%) of adults were in between 20-40 years, 26(26%) were in between 41-59 years, 5(5%) were above 60 years. According to the sex distribution 52(52%) were male and 48(48%) were female. According to the educational status 72(72%) were studied up to primary and middle school, 23(23%) were studied upto secondary and higher secondary education school and 5(5%) were under graduate. Regarding the type of disaster 68 were experienced flood, 72 were experienced cyclone, 20 were experienced earthquake and 1 were experienced draught . Regarding the sources of knowledge subjects gained knowledge from newspaper 16(16.4%), from television 82(84.4%), from phone 3(3.09%), from Panchayat 1(1.03%) and from pamphlet 1(1.03%). Regarding previous disaster status 42(42%) were experienced disaster once, 36(36%) were experienced disaster twice and 22(22%) were experienced disaster more than thrice . To create the awareness among public and to reduce the Impact of disaster.

Keywords: Knowledge, Disaster preparedness, Adult.

Introduction

Preparedness for disasters is critical for households, businesses and communities, but many remain unprepared. As recent disasters serve to highlight the need for individual responsibility, local coordination and continuity plans to ensure the ability to respond to and recover that everyone responds and recover from major events, the federal government has prioritized national preparedness as a goal without developing a system to achieve and maintain it. Further more, the public organization have been charged with assesing their state of readingness and identifying their strengths and weakness as a requirement for receiving federal funding and Homeland security grants¹.

This research will be useful for groups responsible

for public education campaigns, business continuity programs and emergency responders, as well as those who have an interest in developing a standardized index to measure disaster preparedness. This report describes concepts and measures that social scientists and practitioners employ in assessing preparedness activities carried out by households, public agencies, private sector entities and communities. It also review on guidance on how to enhance preparedness efforts¹.

Need for the Study:

Selby D, kagawa F(2011) In 2011 population statistics says, that 3.6 million people living in dwelling are India. They accounted for approximately 2.8% of all home in a risk of facing disaster between 1990 and 2000 there was housing boom characterized by some

authors as “Tsunami” that drastically increased the pool of housing in India. A day after cyclone gaja pummeled several central and coastern districts of Tamil Nadu. They confirmed the death of many people including men, women and children so far in the storm².

Simth k, (2015) In early, the internal displacement monitoring center published a report entitled “risk of disaster induced displacement in south Asia” in which they attempted to assess the risk of displacement due to natural disaster in eight countries of south Asia in the report, India was ranked as the country with the highest quantity of potentially displaced people over the next ten years as consequence of natural hazards. The research indicated that in India disaster induced displacement is a problem relevant for both urban and rural areas and the large numbers of people without access to adequate housing, water, health and sanitation³.

Mahayana. B. (2010), pointed out that in the absence of a suitable infrastructure that might be transformed temporarily as relief to each house holds of Flood Victims, community based approach helps to keep lesson with the local and/or district level administration and thus to enhance local level capacity to facilitate floods management, community people helps to shift marooned people into flood shelter (S) and/or to flood campus in the relocation process no problem government or relief can be effective as the community people themselves⁴.

Three days after cyclone gaja Made is landfall between Tamil Nadu coastal districts of nagapattinam and vadaranyam, the damage to lives and livelihoods and the ruin that left in its wake is vast. The official estimate of 2,49,083 people was evacuated⁵.

A disaster plan this not equal complete preparedness (kaji and Lewis 2006); however, a comprehensive disaster plan is consistent preparedness one important aspects of comprehensive disaster plan all hazards approach, which refers to the consideration of any incident or event that could pose a threat to human life, property or environmental (ASTM 2009). An all hazards approach does not literally mean being prepared for any and all hazards that might manifest in a particular community including a hospital. Instead, it means that there are common needs and responses that are required in disasters, such as need for the treatment and triage of victims that can be addressed in a general plan; this type of plan can provide the basis for responders to prepare for these types of unexpected events⁶.

The plan provides a basic framework for responding to various types of disaster; however, planers typically only address the kinds of disasters that might be expected to occur (Waugh, 2005) Another disaster plan is to consider all phases of the disaster management cycle⁶.

Mulyasari F, atakeuchi Y, Shaw R, (2016) The disaster for Hospital administrator must first have a clear and complete understanding of the types of disaster that can affect their facilities, specially that magnitude and probability of occurrence .give these exposure, they must identify the vulnerable areas of the hospital complex, particularly those parts that provide essential support to the facility: namely, the electrical rooms air, handling equipment, fire protection system, medical gasses and communications, Finally, once exposure and vulnerability are identified, they hospital disaster. on the basis of the findings of the study the following suggestions for giving disaster preparedness⁷.

Objectives of Study: To assess the level of knowledge on disaster preparedness among adults.

To associate the knowledge on disaster preparedness among adults with select demographic variable.

Operational Definition:

- The potential for physical harm and social disruption to societies and their larger subsystems associated with hazards and disasters. Generally there are two types of vulnerability one is physical vulnerability and other social vulnerability.
- Physical vulnerability represents threats to physical structures and infrastructures, the natural environment and related economic losses. The well-being of human populations is under threat due to social vulnerability and related economic losses. The response for disaster is immediate protection of life and property, reestablishing control and minimizing the effects of a disaster.

Methodology

Research Approach: Descriptive research approach was used for this study.

Research Design:: Descriptive research design was used for this study.

Research Setting: The study was conducted at Kokilamedu at Kanchipuram District.

RESEARCH POPULATION:

Adults age between 20-59 years, residing at selected village in the Kanchipuram District, Tamil Nadu.

Sampling Criteria:

Inclusion Criteria:

- People who are available at the time of data collection.
- People who can read or speak Tamil/English

Exclusion Criteria:

- People who are not willing to participate.
- People with deaf and dumb

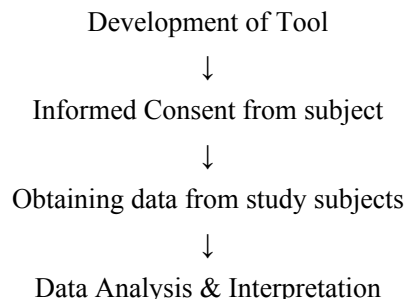
Sample Size:

Sample size $n = \frac{DEF * Np(1-p)}{d^2 / z^2 * (N-1) + p(1-p)}$

Sample size $n = 100$

Sample Technique: The participants of this study was selected by convenient sampling technique.

Data Collection Procedure:



Data Analysis: Descriptive statistics like frequency distribution, percentage was used to assess the knowledge on disaster preparedness, Chi-square test was used to find out the association between knowledge of disaster preparedness with selected demographic variables.

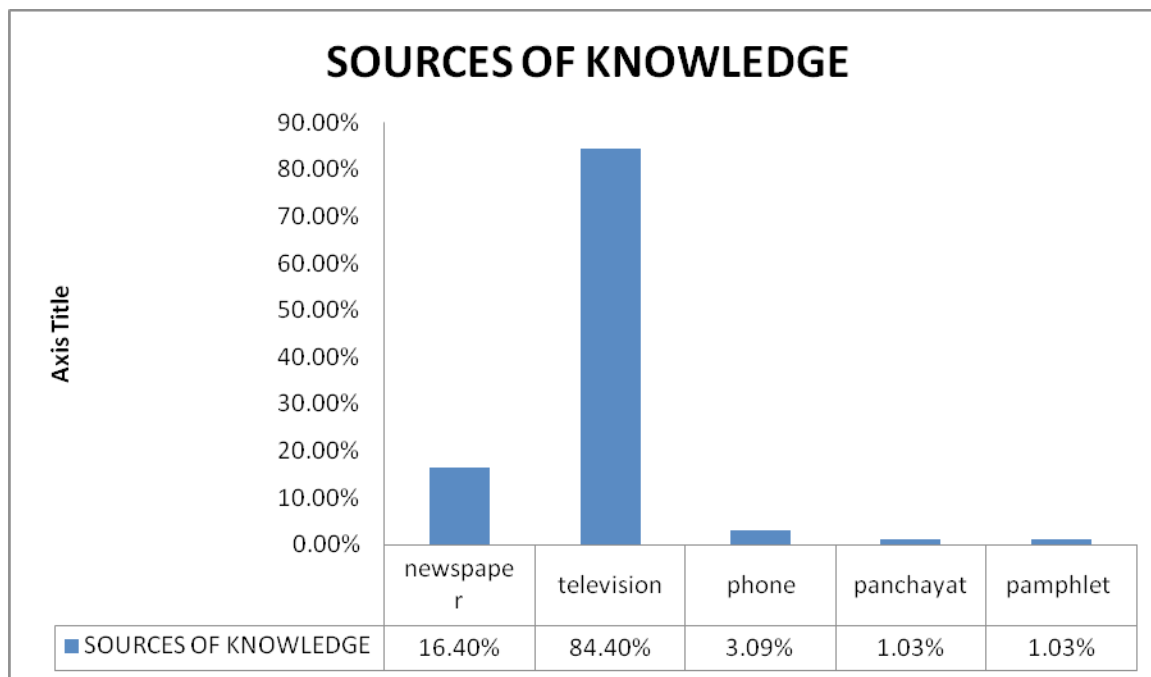


Figure 1: Percentage distribution on sources of knowledge

Result and Discussion

It shows that the age of 69(69%) of adults are in between (20-40) years, 26(26%) are in between the (41-59) years, 5(5%) are above 60 years. According to the sex distribution 52(52%) are and 48(48%) are female. According to the educational status 72(72%) are primary

and middle, 23(23%) are secondary and high school and 5(5%) are under graduate. Regarding the type of disaster it shows 68(109.4%) experienced flood, 72(115.9%) experienced cyclone, 20(32.2%) experienced earthquake and 1(1.6%) experienced drought . Regarding the sources of knowledge it shows 16(16.4%) from newspaper,

82(84.4%) from television, 3(3.09%) from phone, 1(1.03%) from panchayat and 1(1.03%) from pamphlet. Regarding previous disaster status it shows 42(42%) experienced disaster once, 36(36%) experienced disaster twice and 22(22%) experienced disaster more than thrice.

Conclusion

Each year natural disaster kills thousands of people and inflict billions of dollars in economic losses. No community is immune to their damage. In 1989, two disasters, areas earthquake, caused direct losses of billion and indirect losses. As a result of these two events ninety people were killed and more than a year later, thousands remained homeless. This study will help community to reduce the impact of disasters among human being, environment animals, etc. It can be used as basic research to improve community preparedness along with government and non government agencies.

Source of Funding: Self

Conflict Of Interest: Nil

Ethical Clearance: Obtained

Reference

1. Jeannette Sutton and Kathleen Tierney, Disaster preparedness; Concepts, Guidance and Research. Institute of behavioural Science November 3, 2006.
2. Bolin, R.c. Post-earthquake shelter and housing research findings and policy implication.. Earthquake conference monograph Pp107-131 in committee 1993, 5 Socio impact. Memphis, TN; center united (States Earthquake conortium. (5)); 1
3. Pelton k, palosaari E. in Feranado c, Ferrai M, editors spinger. (Evidence-based resilience enhancng interventon metodfor. People affect disaster risk reduction appears as though by armed of disaster preparedness 2013;4(4):
4. Mashing Wang R,s man's. The politics and economic of earthquake Hazard Mitigation: unreinforced Masonry Buildings in state. Boulder, Co: Natural Hazard Research and Application information center, 1998; Institute of Behavioural Science, (University of colorado.):S
5. Newport, Jawahar citizen preparedness Riview. Bringing youth preparedness education to Forefront. 2010;(6)(13):
6. Alesch, D.J. and J.N Holly. Small business failure,survual and recovery: Lesson from the January 1994. NEHRP conference and workshop on Research on the Norhridge, India Earthquake 1998;of January 17, (1997):1
7. Arlikatti, S, M.K Lindell, C.s. Prater and Y. Zhang. In press. area accuracy and .Hurricane evacuation of. Coastal disaster preparedness residents environmental and behaviour 2017;review (112):15.

A Descriptive Study to Assess the Paternal Knowledge and Attitude towards Exclusive Breastfeeding in a Selected Tertiary Care Setting, Kanchipuram District, Tamil Nadu, India

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Abstract

The study aimed at assessing the paternal knowledge and attitude towards exclusive breastfeeding using a descriptive research design. The sample size consisted of 125 fathers of children in the age group of \geq 6 months to 2 years of age. A Convenient Sampling was used for selecting the fathers. The demographic profile of the fathers and infants was assessed through a structured interview. Paternal Knowledge and Attitude towards exclusive breastfeeding was assessed with the help of a self-administered Questionnaire and a self-administered Opinionnaire.

The Study findings revealed that nearly 74% of fathers had good knowledge on exclusive breastfeeding and nearly 69% of fathers had positive attitude towards exclusive breastfeeding. Study also revealed a positive correlation ($r=0.32$) between paternal knowledge and attitude towards exclusive breastfeeding. A statistically significant association was found between paternal knowledge and paternal age, family type and residence at $p<0.05$ and a statistical significant correlation was found between paternal attitude and paternal age, employment status, family type, NICU stay of infant and residence at 5% level of significance ($p<0.05$).

The study helped to conclude that fathers are aware about Exclusive breastfeeding and fathers with good knowledge had a positive attitude towards Exclusive breastfeeding. The fathers are aware about Exclusive breastfeeding. Hencefathers can be a source of great support to their partners and help to promote the culture of Exclusive breastfeeding.

Keywords: *Exclusive breastfeeding, Paternal, Knowledge, Attitude*

Introduction

“Breastfeeding is the cornerstone for an infant’s survival, nutrition and development”. Exclusive breastfeeding is feeding the infants with only breast milk. This includes breastfeeding from a wet nurse and feeding from expressed breast milk **WHO 2016**¹.

WHO 2017² & **UNICEF 2017**³ recommends initiation of breastfeeding within the first hour after birth; exclusive breastfeeding for the first six months; and continued breastfeeding for two years and beyond, together with safe, nutritionally adequate, age appropriate, responsive complementary feeding starting in the sixth month.

Exclusive breast feeding for the first six months of life is now considered a global public health goal that is linked to reduction of infant morbidity and mortality, especially in the developing world **WHO 2011**⁴. Exclusive breastfeeding is well known for the benefit of infant’s health and optimization of development, benefit for Mother’s health and economic benefits especially in poor and developing countries **Stanley L, Chung M 2007**⁵; **Gibney J 2008**⁶.

AAP 2012⁷, UNICEF 2015⁸ in their studies projected that early initiation of breastfeeding and exclusive breastfeeding helps in child survival; it accounts for healthy brain development, promotes cognitive

and sensory performance and is noted for enhancing intelligence and academic performance in children.

Exclusive breast feeding in the first six months of life stimulates babies' immune system and protects them from diarrhea and acute respiratory infections UNICEF 2006⁹. UNICEF 2017³ in a breastfeeding Campaign in 2013, termed the essence of breastfeeding as a "first immunization and an inexpensive life saver".

According to UNICEF 2009¹⁰, exclusive breastfeeding in India is a universal practice. India met the globally recommended target for exclusive breastfeeding in 2006 and the recent national survey estimates exclusive breastfeeding rates in the country to be about 55%. However, in the urban informal settlements (slums) from different parts of India have estimated much lower rates, ranging from 8 to 37%.

However practice of Exclusive breast feeding is still a challenge in both developed and developing countries even in countries with high rates of breast feeding initiation. Exclusive breastfeeding rates in infants less than six months of age varied from as low as 20% in Central and Eastern European countries to 44% in south Asia A. Imdad, M. Y. Yakoob and Z. A. Bhutta, 2011¹¹.

Worldwide, only 35% of infants are exclusively breastfed during the first four months of their life. According to UNICEF, 2003¹². Globally, the exclusive breastfeeding rate is 38%, however the World Health Assembly in 2012¹³ set a target to increase the rate of exclusive breastfeeding by at least 50% by 2025.

A lack of exclusive breastfeeding during the first six months of life contributes to over a million avoidable child deaths each year **Weimer J 2001**¹⁴.

Giugliani 2015¹⁵ reported that father's opinion about breastfeeding was the most important factor related to breastfeeding. In addition, father knowledge regarding breastfeeding found to be associated with higher rates of full breastfeeding at 6 months.

Partners of mothers who had a good level of knowledge and a great attitude towards breast feeding had longer duration of exclusively breastfeeding **Juherman Y., Pengetahuan., Kemal sari, 2008**¹⁶.

There is a paucity of information on whether fathers in India play a significant role in influencing exclusive breastfeeding practice among mothers. Therefore this research was undertaken to assess the paternal

knowledge and attitude towards exclusive breastfeeding.

Materials and Method

Research Approach and Design: A Quantitative research approach with a descriptive research design was used in the study

Research Setting: The study was conducted in the immunization clinic, well baby clinic and pediatric OPD, Chettinad Hospital and Research Institute, Kanchipuram District, Tamil Nadu, India.

Population: Population included all the fathers attending the immunization clinic, well baby clinic and pediatric OPD, Chettinad Hospital and Research Institute, Kanchipuram District, Tamil Nadu, India.

Sample: The fathers of children who fulfilled the sampling criteria were the samples for this study.

Criteria for Sample Selection:

Inclusion Criteria:

- Fathers of a singleton full term child
- Fathers of children in the age group of ≥ 6 months to 2 years of age.

Exclusion Criteria: Fathers not willing to participate in the study.

Sample Size: According to Open Source Epidemiologic Statistics for Public Health Schaefer RL¹⁷.

Population Size (N) = 180

Hypothesis% frequency (P) = 50% +/-5

Confidence limits (d) = 5%

Design effect (DEFF) = 1

Sample Size (n) for 95% confidence level = 123

Sampling Technique: The sample was selected by using a convenient sampling technique.

Research Tool: The research tool consisted of three sections.

Section-1: Consisted of

Part A- A structured interview to assess the demographic profile of the fathers

Part B- A structured interview to assess the demographic profile of infants.

Section-2: A self-administered structured questionnaire to assess the paternal knowledge on exclusive breastfeeding.

Scoring: The structured questionnaire on knowledge consisted of 11 questions. Each right answer will be given one mark and wrong answer was zero

Maximum score was 11

Categorization of level of knowledge on exclusive breastfeeding

Level of knowledge on exclusive breastfeeding	%
Poor knowledge	0-30%
Moderate knowledge	> 30%-70%
Good knowledge	>70%

Section-3: A self-administered structured opinionnaire was used to assess the paternal attitude towards exclusive breastfeeding. It was a five point likert scale (strongly disagree, disagree, not sure, agree, strongly agree)

Scoring: The opinionnaire consisted of 15 statements of which 6 were positive statements and 9 negative statements.

Positive statements was scored in the forward direction as (strongly disagree=1, disagree=2, not sure=3, agree=4, strongly agree=5). The negative statements scored in the reverse direction as (strongly disagree=5, disagree=4, not sure=3, agree=2, strongly agree=1)

Maximum score was 75.

Categorization of level of attitude towards exclusive breastfeeding

Level of attitude towards exclusive breastfeeding	%
Negative attitude	0-30%
Neutral attitude	>30%-70%
Positive attitude	>70%

Reliability of the questionnaire and opinionnaire was 0.897 and 0.982 respectively as determined by cronbach’s alpha reliability coefficient test. The research tool was pretested among ten fathers attending the immunization

clinic, well baby clinic and pediatric OPD, Chettinad Hospital and Research Institute, Kanchipuram District, Tamil Nadu, India and necessary modifications were made before starting the main study. Data collection was carried out for a week (1.4.2019 to 6.4.2019).

Data Analysis: Descriptive and Inferential statistics was used to analyse and interpret the data. Descriptive analysis was done to analysis the socio demographic data. Karl Pearson correlation co-efficient analysis was used to correlate the paternal knowledge score with paternal attitude score. Pearson chi square test was used to compare the knowledge and attitude scores with other variables.

Findings

The study findings are organized under the following sections.

Section A – Assessment of demographic variables

Part A: Demographic variables of fathers

Part B: Demographic variables of infants

Section B – Assessment of paternal knowledge on Exclusive breastfeeding

Section C – Assessment of paternal attitude towards Exclusive breastfeeding

Section D – Correlation between paternal knowledge and attitude towards exclusive breastfeeding

Section E – Association between paternal knowledge on exclusive breastfeeding with selected demographic variables

Section F – Association between paternal Attitude towards exclusive breastfeeding with selected demographic variables

Section A – Assessment of demographic variables

Part A- Demographic variables of fathers: Majority of the fathers nearly 49% were in the age group of 31- 35 years. The educational levels of fathers nearly 28% were higher secondary level. With regard to employment status nearly 90% were employed, Nearly 74% of fathers were Hindus, around 64% of the fathers belonged to Nuclear family and majority of fathers nearly 63% were from an urban setting. Nearly 52% of the fathers belonged to lower income group as their monthly family income was in the range of Rs 10830-

21659. 42% of respondents received information on exclusive breastfeeding from health professionals.

Part B- Demographic variables of infants: The sex of the Infants was found to be equally distributed as 50% female and 50% male. Majority of infant’s birth weight, nearly 58% was ≤ 2.5 kg. Nearly 87% of the infants had NICU Stay of ≤ 24 hours. Nearly 68% of the infants were breastfed ≤ 1 hour of birth, although, majority of the respondents infants nearly 75% were not exposed to prelacteal feeds, 100% of the respondents breastfeed their babies, of which nearly 59% of the respondents children were exclusively breastfed for ≤ 4 months.

Section B – Assessment of paternal knowledge on Exclusive breastfeeding

Table 1: Distribution of fathers by their level of knowledge on exclusive breastfeeding

Level of knowledge	Range (%)	Frequency	Percentage
Poor knowledge	0-30%	0	0
Moderate knowledge	>30- 70%	33	26%
Good knowledge	>70%	92	74%

Majority of fathers nearly 74% had good knowledge on exclusive breastfeeding while the remaining 26% had moderate knowledge on exclusive breastfeeding.

Section C – Assessment of Paternal Attitude towards Exclusive Breastfeeding

Table 2: Distribution of fathers by their Level of Attitude towards Exclusive Breastfeeding

Level of attitude	Ranges in %	Frequency	Percentage
Negative attitude	0-30%	0	0
Neutral attitude	>30-70%	39	31%
Positive attitude	>70%	86	69%

Majority of the fathers nearly 69% have a positive attitude towards exclusive breastfeeding while 31% had a neutral attitude towards exclusive breastfeeding.

Section D – Correlation between paternal knowledge and attitude towards exclusive breastfeeding

A positive correlation between paternal knowledge and attitude towards exclusive breastfeeding was found (Pearson’s correlation, $r= 0.32$). The finding indicates that the father with good knowledge on exclusive breast feeding is more likely to have a positive attitude towards exclusive breastfeeding.

Section E – Association between paternal knowledge on exclusive breastfeeding with selected demographic variables

A statistically significant association was found between paternal knowledge with paternal age, family type and residence at 5% level of significance ($p<0.05$).

Section F – Association between paternal Attitude towards exclusive breastfeeding with selected demographic variables

A statistically significant association was found between paternal attitude with paternal age, employment status, family type, NICU stay of infant and residence at 5% level of significance ($p<0.05$).

Conclusion

This study was carried out to assess the level of paternal knowledge and attitude towards exclusive breastfeeding as they are responsible to provide support and encouragement to their partner to promote the culture of exclusive breastfeeding. The Study findings revealed that nearly 74% of the fathers had a good knowledge on exclusive breastfeeding. Nearly 69% of fathers had a positive attitude towards exclusive breastfeeding. There was a positive correlation ($r=0.32$) between paternal knowledge and attitude towards exclusive breastfeeding. The Study concluded that fathers with good knowledge had a positive attitude towards exclusive breastfeeding.

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Conflicts of Interest: No conflict of Interest.

Source of Funding: No funding sources

Ethical Clearance: The Study was done with the approval of the institutional Ethics Committee. Informed consent was obtained from the fathers, who were assured of strict anonymity and confidentiality during this survey.

References

1. World Health Organization. Infant and Young Child Feeding. 2016. (Accessed 22.02.2017). <http://www.who.int/mediacentre/facesheets/fs342/en/>
2. World Health Organization. Exclusive breastfeeding for six months best for babies everywhere. 2017. Retrieved August 11, 2014. Available from: <http://>

- www.who.int/mediacentre/news/statements/2011/breastfeeding_20110115/en/
3. UNICEF. Breastfeeding: The global breastfeeding collectives. 2017. Retrieved August 11, 2014. Available from: http://www.unicef.org/nutrition/index_24824.html
 4. World Health Organization. Department of Nutrition for Health and Development of Child and Adolescent Health. 2011.
 5. Stanley L, Chung M, Raman G, Chew P. Breastfeeding with their maternal and infant health outcomes in developed countries: Evidence report/technology assessment. 2007; Vol-7: 153-159.
 6. Gibney J. Gizi kesehatan masyarakat, Jakarta: EGC. 2008.
 7. American Academy of Pediatrics (AAP). Breastfeeding and the use of human milk. *Pediatrics*. 2012; Vol-129: 827-841.
 8. United Nations Children's Fund. Breastfeeding. 2015. (Accessed 22.02.2017). http://www.unicef.org/nutrition/index_24824.html
 9. UNICEF. Progress of Children Exclusive Breastfeeding. Report on Nutrition. May 2006; 3(11).
 10. UNICEF/WHO. Baby-friendly Hospital initiative revised, updated and expanded for integrated care. 2009. Available from: www.unicef.org/nutrition/files/BFHI_2009_s3.1_2.pdf
 11. Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding. *BMC public health*. 2011; Vol-11, no-3: 24-29.
 12. UNICEF. Global strategy for infant and young child feeding. 2003. Available from: www.unicef.org/nutrition/files/finalreportondistribution.pdf
 13. World Health Assembly. Indicators for assessing infant and young child feeding practice. USAID part 3 Geneva. 2012.
 14. Weimer J. The economic benefits of breastfeeding: A Review and analysis. ERS food assistance and nutrition. Report no 13. 2001.
 15. Giugliani E, Bronner Y, Caiaffa W, Vogelhut J. Are fathers prepared to encourage their partners to breastfeed: A Study about father's Knowledge of breastfeeding. *Acta Paediatrica*. 2015; 83(11): 1127-1131.
 16. Juherman Y, Pengetahuan, Kemal sari, Sikap. Dan Peranan Ayah Terhadap Pemberian ASI. Institute Pertanian Bogor. 2008.
 17. Schaefer RL, Mendaenhal W. Elementary survey sampling. 4th Edition. Duxbury press: California; 1990.

Assessment the Risk Factors and Incidence of Low Back Pain among Higher Secondary Students in Selected School at Kanchipuram Dist Tamil Nadu India

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Abstract

Cross sectional research design study was conducted to “Assessment of the risk factor and incidence of low back pain among higher secondary students selected school at Kanchipuram District, Tamil Nadu, India”. The objectives of the study were to assess the demographic variables with the risk factors of low back pain. To assess the incidence of low back pain among higher secondary school students. To associate the risk factors and incidence of low back pain among higher secondary school students with elected demographic variables. Convenient sampling technique was followed and 102 higher secondary students selected school who met inclusion criteria were in the higher secondary school students participate from the class 11th to 12th. Students who are available in data collection student who can read and understand Tamil/English.

The collected data were formulated and analysed by using cross sectional research design and inferential statistics. Result shows, that Maximum no of low back pain in secondary school students were in the age group of 59(84%), among sex of male participated were 53(52%) are low back pain secondary school student majority of playing participation in the games was “Yes” 96(94%),majority of low back pain for secondary school students hobbies like sports 62(61%), among the this students maximum height are 55(54%) and maximum weight of the students 58(57%), the majority of students BMI 58(57%), are low back pain in secondary school students bag weight of 79(77%).

There is significant association of assessment of the risk factor and incidence of low back pain among higher secondary school students with demographic variables like participation in the games, bag weight. But there is no significant of assessment of the risk factor and incidence of low back pain among higher secondary school students.

Keywords: Risk factor, Incidence, bags, low back pain, Higher secondary students.

Introduction

The prevalence of low back pain (LBP) among

secondary school students is increasing. The magnitude of the problem is not well quantified. Evidence shows LBP in adolescents can be a significant risk factor for back pain in adulthood¹. The present study aimed to determine the lifetime prevalence of LBP among secondary school students from schools of an urban metropolitan city and the prevalence of LBP in the presence of associated factors².

It has been estimated that over 80% of the population will report low back pain (LBP) at some point in life and each year 7% of the adult population consult their

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GP with symptoms¹¹. Prevalence increases with age, reaching a peak during the sixth decade of life. Until recently little was known about LBP at young ages. Clinically it was perceived to be uncommon with few children consulting because of LBP in primary care³. Large prospective epidemiological studies have shown that, in those free of LBP at baseline, the best predictor of future onset is a previous history of LBP. Therefore, to understand the epidemiology of LBP and what predisposes someone to a trajectory of LBP in adult life, it is important to examine the condition at young ages, to determine factors responsible for onset of initial episodes and to examine whether LBP in childhood is related to symptoms in adulthood⁴.

Estimates of LBP prevalence in children and adolescents vary widely between studies depending on the age of study participants and on methodological differences. Particularly in terms of LBP definition⁶, prevalence of 24% in schoolchildren aged 11–14 years in the one year prevalence to be 26% in schoolchildren aged 12–17 years in Switzerland. The one year prevalence of LBP “with limitation to activity” to be 17.6% in 14 year old Finnish children¹⁰. Also in report a prevalence of 18%, using the same definition. Even studies that record pain over a very short time interval (for example, point prevalence) reveal that as many as 1 child in 20 may be suffering from LBP at any one time. As in adults, prevalence of LBP in childhood increases with age and has been shown repeatedly to be higher in girls than in boy¹².

Materials and Method

The methodology of research indicates the general patterns of organizing the procedure for getting valid and reliable data for investigation. Research approach for the present study was a Quantitative research approach. The Cross sectional research design seems to be the most appropriate design for this study. The study was conducted in the selected area in pooncheri villages, Kanchipuram District, Tamil Nadu. The selected school of higher secondary students residing who fulfilled the sampling criteria was included in the study.

Sampling Criteria:

Inclusion Criteria:

- Student participate from the class 11th to 12th
- Students who are available in data collection student who can read and understand Tamil/English.

Exclusion Criteria:

- Higher secondary school students who are not willing to participate in the study
- Have the history of back injury
- By using Convenient sampling technique 102 samples were selected.
- The tool used for the study consists of the demographic variables like age, sex, educational status, Hobbies, Height, Weight, BMI, Bag weight, Family history of low back pain.

Findings of the Study:

- Maximum no of low back pain students were in the age group of 15-16 years 59(58).
- Maximum male 53(52%) are low back pain for secondary school students.
- Majority of participation in the games 96(94%).
- Majority of secondary school students hobbies 62(61).
- Majority of secondary school students height 151-170cm 55(54%).
- Majority of weight 58(57%).
- Majority of secondary school students BMI 10-20 kg 46(45%)
- Majority of secondary school students bag weight 1-6 kg 23(23)
- Demographic variables shows that there is significant association between in the participation in the games and bag weight
- A demographic variable shows that there is no significant association between in the age, sex, hobbies, BMI.
- A Demographic variable shows that there is significant association between in the participation in the games and bag weight.
- A Demographic variable shows that there is no significant association between in the age, sex, hobbies, BMI.
- Regarding to the risk factors secondary school students for low back pain in the how many time is spent carriage from to school 48(47%), the type of bag 50(49%), how many books in the school bag 49(48%), method of carriage 86(84%).

- Regarding to the incidence of low back pain among higher secondary school students in the you have to back pain 65(64%), if you have to any problem related to back pain 54(53%), frequency of back pain 57 (56%), whether you were prone to get back pain 43(42%).

Discussion

Back pain among high school students all over the world is on the rise. It is one of the most underestimated public health problems in today's generation. Musculoskeletal pain in school children is becoming new topic of health concern. Government recommendation of safe load limit of schoolbag is 10% of body weight. The study aimed to determine the prevalence of musculoskeletal health problems in higher secondary school students.

There has been rising incidence of LBP among many young adults and children, which is of concern. There have been a few studies regarding LBP but very few in this part of the world. This study was hence conducted to assess the prevalence of lower back pain among the young adults in our area.

Conclusion

Back pain is common, with about nine out of ten school students experienced in their school life. Some estimate up to 95% of people will experienced back pain at some point in the life. .

Conflict of Interest: Nil

Sources of Funding: Self-funding

Ethical Clearence: Chettinad Academy of Research and Education, Institutional Human Ethics Committee

Reference

1. M. A. Alshagga, A.R. Nimer, L.P. Yan et al. Prevalence and factors associated with neck, shoulder and low back pain among medical students in a Malaysian medical college. 2013;6(1)
2. Cimbiz A et al. Determination of back pain intensity risk factors, among school children with nonspecific low back pain . 2011; 6(17): 12-5
3. Derek Richard smith. Musculoskeletal disorders self-reported by female nursing students in central japan. International journal of nursing studies 2003; 40(7): 9.
4. Bauer DH, e.g. al. Backpack load limit recommendation for middle school students based on physiological and psychophysical measurement; 2009- 0832.
5. Burton AK, e.g. al. European guidelines for prevention in low back pain .; 2006.
6. Kristjansdottir G. prevalence of self reported back pain in school children.; 1996.
7. Power c, frank, hertzman.c et al. predictors of low back pain onset in a prospective british study.; 2001.
8. Hakala PT et al,. frequent computer related to activities increase the risk of neck shoulder and low back pain in adolescents. public health; 2006.
9. N. Wedderkopp, C. back pain reporting pattern in a danish population based sample of chidren and adolescents.; 2001.
10. Linton sj, et al . the secondary prevention of low back pain.; 1989.
11. Macedo R, et. quality of life, school back pack weight and low back pain in children and adolescents.; 2014.
12. i.calvo - munoz et al. prevalence of low back pain in children and adolescents.; 2013
13. Dickinson et al. an examination of the Nordic musculoskeletal.; 1992.
14. Shipp et al. severe back pain among farm worker high students from star country.; 2007.
15. Thomas et al . Predicting who develops chronic low back pain in primary care.; 1999.
16. Sjolie et al. Predicting who develops chronic low back pain in primary care.; 1999.

A Community Based Cross Sectional Study on Knowledge, Attitude and Hand Hygiene Practices among Mothers of Under Fives

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Abstract

The study aimed at assessing the Knowledge, Attitude and hand hygiene Practices among mothers of under fives. The study was conducted in a selected community area, Kancheepuram District, Tamil Nadu, India.

A Convenient sampling technique was used to select 109 mothers of under fives. The research tool consisted of a structured interview schedule to assess the demographic profile of the sample, a structured questionnaires to assess the knowledge and practice and a structured opinionnaire to assess the attitude of the hand hygiene.

The study findings revealed that nearly 89% of the mothers of under fives had good knowledge on hand hygiene (>70% knowledge score), while 12% of the mothers had moderate knowledge on hand hygiene (>30%-70%score).

The study also revealed that 100%of the mothers attitude towards hand hygiene was neutral (>30%-70% Attitude score).

The study also revealed that 53% of the mothers had good practice of hand hygiene (>70% practice score), while 47% of the mothers had moderate practice of hand hygiene (>30%-70% practice score).

This study revealed that most of the mothers of under fives had good knowledge on hand hygiene and that they shared a neutral attitude towards hand hygiene, however hand hygiene practices need to be promoted as only 53% of the mothers had good hand hygiene practices .

Keywords: Knowledge, Attitude, Practice, Hand hygiene, Mothers, Under fives.

Introduction

Hand hygiene is the leading measure to prevent cross transmission of microorganisms. This concept

has been aptly used to improve understanding, training, monitoring and reporting hand hygiene among health care works. Because they spend more time with patients than any other HCWs, their compliance with hand washing guideline seems to be more vital in preventing the disease transmission among patients **D. Pittetetal 2000¹**.

Hand hygiene is the important element of infection control activities. This is because enough scientific evidence supports the observation that if properly implemented, hand hygiene along can significantly reduce the risk of cross transmission of infection in health care facilities (HCFs) **Boyce JM 2002²**.

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Hygiene behavior influences the transmission of water and sanitation related diseases. Hand hygiene is globally accepted as the single most effective measure to interrupt the chain of transmission Nurul A Mohamed et al 2016³.

The Global Burden of Disease Study notes unsafe water, sanitation and poor hand hygiene as a major risk factor driving death and disability resulting from these conditions **Institute for Health Metrics and Evaluation 2017⁴**.

According to World Health Organization (WHO), hand hygiene refers to any action of hand cleansing, ie, act of cleaning one’s hands with or without the use of water or another liquid, or with the use of soap, for the purpose of removing soil, dirt and/or microorganisms Boyce JM et al 2002⁵.

Hand hygiene is critical to prevent leading causes of death and diseases in children, particularly diarrhea and acute respiratory infections (ARI) .

Globally, more than 3.5 million children younger than 5 years of age specially in the developing countries die from diarrhoea and acute lower respiratory tract infections Ergin A Matthews Z 2005^{6,7}. According to Indian facts and statistics 2016, around 6.3 million children die under age five due to diarrhoea and acute respiratory infection .

A meta-analysis on 30 hand hygiene studies found that improvements in hand washing reduced the incidence of upper respiratory tract infections by 21% and gastrointestinal illnesses by 31% **Dyer DL et al 2000⁸**.

Material and Method

Research Approach and Design: A cross sectional community based study with a descriptive design was used in this study.

Research Setting: The study was conducted at Pooncheri, rural community setting, at Kanchipuram District, Tamil Nadu, India.

Population: The population for the study included all the mothers at Pooncheri,rural community setting.

Sample: The sample included the mothers of under fives.

Sample Size Estimation:

Community	No of Streets	Prevalence of mothers of under fives
Pooncheri	5	150

According to open source epidemiologic statistics for public health, Scaeffe Mendenhall W et al 1990¹⁶.

Sample Size for Frequency in a Population:

Population size (for finite population correction factor or fpc (N):	150
Hypothesized % frequency of outcome factor in the population (p):	50%+/-5
Confidence limits as % of 100(absolute +/-%) (d):	5%
Design effect (for cluster surveys-DEFF):	1
Sample Size (n) estimation at 95% Confidence Level 109	

Sampling Technique: A Convenient sampling technique was used to select the samples.

Sample Criteria:

Inclusion Criteria: Mothers of under fives

Exclusion Criteria: Mothers not willing to participate in the study.

Research Tool:

1. Knowledge Questionnaire on hand hygiene consisted of 15 statements which was assessed as No (1 mark), Not Sure (2 marks) and Yes (3 marks), Maximum score — 45

Categorization of level of knowledge on hand hygiene by percentage:

S.No.	Level of knowledge on hand hygiene	(%)
1.	Poor Knowledge	0-30%
2.	Moderate Knowledge	>30%-70%
3.	Good Knowledge	>70%

2. The opinionnaire on Attitude towards Hand hygiene consisted of 12 statements of which 7 were positive statements and 5 were negative statements which were assessed using a five point likert scale.

The positive statements on Attitude was scored in the forward direction as (Strongly disagree = 1, disagree = 2, Not sure = 3, agree = 4, strongly agree = 5). While the negative statements towards Attitude was scored in the reverse direction as (Strongly disagree = 5, disagree = 4, Not sure = 3, agree = 2, strongly agree = 1).

Maximum score — 60

Categorization of level of Attitude towards Hand hygiene in percentage:

S.No.	Level of Attitude towards hand hygiene	(%)
1.	Negative Attitude	0-30%
2.	Neutral Attitude	>30%-70%
3.	Positive Attitude	>70%

3. The Questionnaire on Hand hygiene practices consisted of 24 statements under three domains (cleansing agents used for hand washing, use of soap as a cleansing agent at critical times, use of only water as a cleansing agent at critical times and reasons for not washing hands).

The Questionnaire on Hand hygiene practices were assessed using a five point likert scale (Never -1, Seldom-2, Sometimes -3, Always -4 and Almost Always-5).

Maximum score — 120

Categorization of level of Hand Hygiene Practices in percentage:

S.No.	Level of practice on hand hygiene	(%)
1.	Poor practice	0-30%
2.	Moderate practice	>30%-70%
3.	Good practice	>70%

Reliability of the research tools: The reliability of the research tools developed were assessed, the Karl Pearson's correlation coefficient "r" was computed and it was found to be above 0.70 for the all the three questionnaires developed for the study namely structured questionnaire on knowledge, structured opinionnaire on attitude and structured questionnaire on practice of hand hygiene respectively. As the research tools were found to be reliable the same were used in the main study .

Findings and Discussions

The Discussion is Presented as Follows:

- 1. Assess Knowledge on hand hygiene, including importance of hand hygiene, critical times for hand hygiene and appropriate ways to clean hands.**

In the study it was observed that 89% of the samples had good knowledge on hand hygiene, while 12% of the samples had Moderate knowledge on hand hygiene and only 0% of the samples had poor knowledge on hand hygiene.

Manandhar P, chandyork 2017⁹, in their study found that all the students had knowledge about the hand washing technique before meal and after defecation. Almost all (99.4%) students reported that they wash hand before meal and 92.4% students reported that they practiced hand washing after defecation although students had hand washing knowledge; proper hand washing practices was lagging behind.

2. Assess hand hygiene facilities at the household level.

Hand washing spaces in the household premises:

In the study it was observed that in majority of household nearly 71% were in the in/near the kitchen, while 14% were in the in/near the toilet, 12% were in the in/near the front/back yard and remaining of them were in the Other places, specify dining room, garden area.

Water availability at hand washing sites: In the study it was observed that in majority of the household nearly 61% had facilities of running water (pipe/overhead tank/hand pump), while in 21% of household were not available in close proximity/brought from elsewhere, among 14% of household water was stored in storage container and remaining in remaining 4% of household no water was available.

Hand washing agent available at hand washing sites: In the study it was observed that in majority of household, nearly 74% water and soap was available at hand washing sites, while in 12% of household there was only Water available at hand washing site only, while in 9% of household Hand sanitizer was available, in 4% of household there was Ash available near hand washing site and in 1% of household Other's such as sand, mud, hand washing solution, hand anti-septic solution and glycerin.

3. Assess Attitude towards hand hygiene.

Table 1: Distribution of the Mother's Attitude towards Hand hygiene. N=109

Demographic Characteristic	Category	Frequency	Percentage
Attitude towards hand hygiene	Negative Attitude 0-30%	0	0%
	Neutral Attitude >30-70%	109	100%
	Positive Attitude >70%	0	0%

Table 1 describes that 100% of mothers have neutral attitude towards hand hygiene

4. Explore hand hygiene practices.

Table 2: Distribution of the samples with reference to practice on hand hygiene. N=109

Demographic Characteristics	Category	Frequency	Percentage
Hand hygiene Practices	Poor practice 0-30%	0	0%
	Moderate practice >30%-70%	51	47%
	Good practice >70%	58	53%

Table 2 describes that 53% of the mothers have Good hand hygiene practices, while 47% of the mothers have moderate hand hygiene practices.

5. Correlate the Knowledge with Attitude and Practice of hand hygiene among the mothers.

A positive correlation between mothers knowledge with attitude and practice of hand hygiene was found.

This indicates that the mothers with good knowledge on hand hygiene is more likely to have a neutral attitude towards hand hygiene and also have good practice on hand hygiene.

6. Associate the Knowledge, Attitude and Practice of hand hygiene with selected demographic variables of the mothers.

There was a statistical significant association between level of knowledge, Attitude and practice of hand hygiene among mother's of under fives. Its show that family type had significant association with knowledge levelof hand hygiene at ($P < 8.14$) and exposure to information hand hygiene had a significant association with knowledge on hand hygiene at ($P < 7.532$).

Conclusion

This study was carried out to assess the level of knowledge, attitude and hand hygiene practices among mothers of under fives. The study findings revealed that nearly 89% of the samples had high knowledge on hand

hygiene, 100% of samples had neutral attitude towards hand hygiene and 53% of the samples had Good practice on hand hygiene. There was a positive correlation ($r=0.32$) between knowledge and attitude towards hand hygiene. The Study concluded that mothers of under fives with good knowledge had a neutral attitude towards hand hygiene.

Acknowledgement: The Authors are grateful to all the mothers of Under fives who participated in the study.

Conflict of Interest: The Authors declare that there is no conflict of Interest.

Source of Funding: Self.

Ethical Clearance: The Study was done with the approval of the UG committee, Institutional Ethics Committee, HOD of community medicine department CHRI. Informed consent was obtained from the mothers of under fives, who were assured of strict anonymity and confidentiality during this survey.

Reference

- Pittet D, Hugonnet S, Harbarth S, Mouroug P, Sauvan V, Touveneau S, Perneger TV. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. The Lancet. 2000 Oct 14;356(9238):1307-12.
- Boyce JM, Pittet D. Guideline for hand hygiene in health-care settings: recommendations of the Healthcare Infection Control Practices Advisory

- Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *Infection Control & Hospital Epidemiology*. 2002 Dec; 23(S12):S3-40.
3. Nurul A Mohamed Nurn Zulkifli Amin, Shalinawati Pamli, Isahak, Nooriah Mohamed Salleh, Knowledge, attitudes and practices of hand hygiene among parents of preschool children, *Journal of Scientific and Innovative Research*. 2016;
 4. Arthur M. Institute for Health Metrics and Evaluation. *Nursing Standard (2014+)*. 2014 Jun 18;28(42):32.
 5. Boyce JM, Pittet D. Guideline for hand hygiene in health-care settings: recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *Infection Control & Hospital Epidemiology*. 2002 Dec;23(S12):S3-40.
 6. Ergin A, Bostanci M, Önal Ö, Ihsan Bozkurt A, Ergin N. Evaluation of students' social hand washing knowledge, practices and skills in a university setting. *Central European journal of public health*. 2011 Dec 1; 19(4):222.
 7. Matthews Z, World Health Report Make Every Mother and child count Geneva, World Health Report, 2005;33;409-411.
 8. Dyer DL. ShinderF Alcohol-free instant hand sanitizer reduces elementary school illness absenteeism. *Fam Med*. 2000;32:633-8.
 9. Manandhar P, Chandyo RK. Hand washing knowledge and practice among school going children in Duwakot, Bhaktapur: A cross sectional study. *Journal of Kathmandu Medical College*. 2017;6(3):110-5.

Assessment of Level of Depression, Anxiety and Stress among Hypertensive Patients

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Abstract

Assessment of the level of depression, anxiety and stress among hypertensive patients attending Medicine OPD, in selected Tertiary Care Hospital, Kanchipuram District, Tamil Nadu, India. The objectives were to assess the level of depression, anxiety and stress among hypertension patients and to associate the selected demographic variables with the level of depression, anxiety and stress of hypertension patients. 80 patients were selected using by purposive sampling technique. We have used DASS-21 standardized tool for our research study. The study findings showed that majority of the patients 64(80%) were normal, 13(16%) were mildly depressed and only 3(4%) were moderately depressed, On the aspects of anxiety majority 58(73%) were normal, 13(16%) were having mild anxiety and only 9(11%) were having moderate anxiety and on the level of stress majority 75(94%) were normal and 5(6%) were mildly stressed. Over all mean of level of depression of hypertensive patients were found to be (6.67), for the level of anxiety the mean was found to be (5.7) and (8.9) for the level of stress aspects of the of the hypertensive patients. Standard deviation aspects of the hypertensive patients for the level of depression (3.79), for the level of anxiety (3.08) and for the level of stress were found to be (3.77). There was significant association between the level of depression and type of diet ($\chi^2 = 22.84$) and the level of stress and age ($\chi^2 = 33.44$) of the hypertensive patients. The study concludes that most of the hypertensive patients were normal in the level of depression, anxiety and stress. Nurses when we confront patients with hypertension, if they have symptoms of depression, stress and anxiety, we have to refer them for psychiatric consultation and provide health education on stress management strategies.

Keywords: *Depression, Anxiety, Stress and Hypertension patients.*

Introduction

A global hypertension prevalence of 26% is projected to ascent to 29% by the year 2025. Patients with chronic conditions like hypertension may experience many negative emotions which increase their risk for development of mental health disorders particularly anxiety, stress and depression.¹

Hypertension or high blood pressure is generally defined as persistent elevation of Blood pressure above 140/90 mm of Hg. It is a major contributor to the mortality and morbidity. Hypertension is the single most important predictor of cardiovascular risk. It is also related to increased severity of the atherosclerosis, stroke, nephropathy, peripheral vascular disease, aortic aneurysms & congestive heart failure. When a Coronary Artery is narrowed or blocked. The area of the heart muscle supplied by that artery becomes ischemic and injured and infarction may result and also can lead failure of the heart.^(2,3)

Hypertension is the most important risk factor for cardiovascular disease, the consequences of which include death, stroke and myocardial infarction.

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Hypertension is also an important risk factor for chronic kidney disease, left ventricular hypertrophy and congestive heart failure and dementia. Severe and acute elevations in blood pressure may cause encephalopathy, retinopathy, acute decompensate congestive heart failure, aortic dissection and acute kidney injury. Globally, hypertension accounts for 13% of all deaths, 51% of deaths from stroke, 45% of deaths from ischemic heart disease and 4% of disability. So there is need to provide attention on studies on prevention of hypertension⁴.

Mohammad Shoaib et.al, (2018) conducted a study to determine the prevalence and factors associated with anxiety and depression among adult hypertensive outpatients in Afghanistan. 234 consecutive hypertensive patients were recruited to complete the Hospital Anxiety and Depression scale (HADS) questionnaire, which has scores for classifying the participants having anxiety and depression symptoms of the total 234 patients. 81(34.6%) were males and 153(65.4%) were females. As there is a relationship between mental and physical health, depression and anxiety are been linked with the development of several chronic diseases. The study conducted that anxiety and depression are highly prevalent among hypertensive patients in an outpatient clinic in Afghanistan. Several studies suggest that individuals experiencing anxiety and depression are at high risk for developing hypertension, as well as being predisposed to stroke and ischemic heart disease.⁵

Sushil Kumar Sharma and Vineeta Sawhney (2016) conducted a study to determine the level of Stress, Anxiety and Depression among hypertensive patients attending cardiac OPD in super specialty hospital in Jammu and Kashmir, India. 200 hypertensive patients were selected for this study. Data collection was done using Depression Anxiety Stress Scale – 21. The result shows that it was observed that most (72.5%) of the patients were aware of symptoms and its complications and regarding psychological symptoms mild to severe depressive symptoms was present in 10%, anxiety in 70% and stress in 10% of patients. There is need of psychiatric evaluation and counseling in these patients and support services to be made available to these patients.⁶

Methodology

Research Approach: Quantitative descriptive approach was used for the study. The present study was conducted to assess the level of depression, anxiety and

stress among hypertensive patients attending Medicine OPD, in selected Tertiary Care Hospital, Kanchipuram District, Tamil Nadu.

Research Design: Non-experimental descriptive research design was used.

Research Setting: The study was conducted at selected tertiary care hospital, Kanchipuram District, Tamil Nadu.

Population: The populations of the study to assess the level of depression, anxiety and stress among hypertensive patients attending Medicine OPD, in selected tertiary care Hospital, Kanchipuram District, Tamil Nadu

Sample Size: The sample size was 80 hypertensive patients.

Sampling Technique: Purposive sampling technique was used for the present study.

Sampling Criteria:

Inclusion Criteria:

- Hypertensive patients who were in the ages above 18 years
- Those who were diagnosed case of hypertension.
- Those who were on anti-hypertensive drugs for a minimum period of 2 months.
- Those who were willing to participate in the study.
- Those who can understand Tamil & English.

Exclusion Criteria:

- Patients with pre-hypertension.
- Hypertensive patients who were having known mental illness.

Description of the Tool:

It consisted of two sections.

1. Personal Information Sheet of the participant.
2. Depression, Anxiety and Stress Scale (DASS -21)

Section-A: It consisted of personal information about the participants which includes age, gender, educational qualification, occupation, monthly income, marital status, types of family, diet, presence of bad habits that affect health and co-morbid condition.

Section-B: Depression, Anxiety and Stress Scale (DASS -21) in the form of rating scale was used to assess the level of depression, anxiety and stress of the hypertensive patients. It is a public domain tool.

Scoring and Interpretation of the Tool: DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.. Each of the three DASS-21 scales contains 7 items, divided into subscales.

S (Stress) Q1, 6, 8, 11, 12, 14, 18

A (Anxiety) Q2, 4, 7, 9, 15, 19, 20

D (Depression) Q3, 5, 10, 13, 16, 17, 21

S score x 2 = Stress

A score x 2 = Anxiety

D score x 2 = Depression

The obtained scores were interpreted as follows

Level of Symptoms	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Method of Data Collection: The data was collected using Depression, Anxiety and Stress Scale (DASS - 21)

in the form of rating scale was used to assess the level of depression, anxiety and stress of the hypertensive clients. The researcher filled the demographic data sheet and Depression, Anxiety and Stress Scale by conducting interview of the participants. The interview was conducted for 10 minutes in the month of April 2019.

Statistical Analysis: The data was analysed using descriptive statistics like frequency distribution, percentage, mean and inferential statistics was used to find out the association between the level of depression, anxiety, stress and selected personal information of the hypertensive patients.

Results and Discussion

The study reveals that majority of the hypertensive patients were males (55%),majority of the hypertensive patients were in the age group of 61years & above (40%).Majority of the hypertensive patients were completed primary school (50%).Majority of the hypertensive patients are self employed (39%).Majority of the hypertensive were getting monthly income is less than 5000(51%).Majority of the hypertensive patients were married (92%).Majority of the hypertensive patients were belongs to nuclear family (59%). Majority of the hypertensive patients were in the type of mixed diet (85%).Majority of the hypertensive patients were having the habits that affecting health (80%). Majority of the hypertensive patients were having the co-morbid condition (55%).

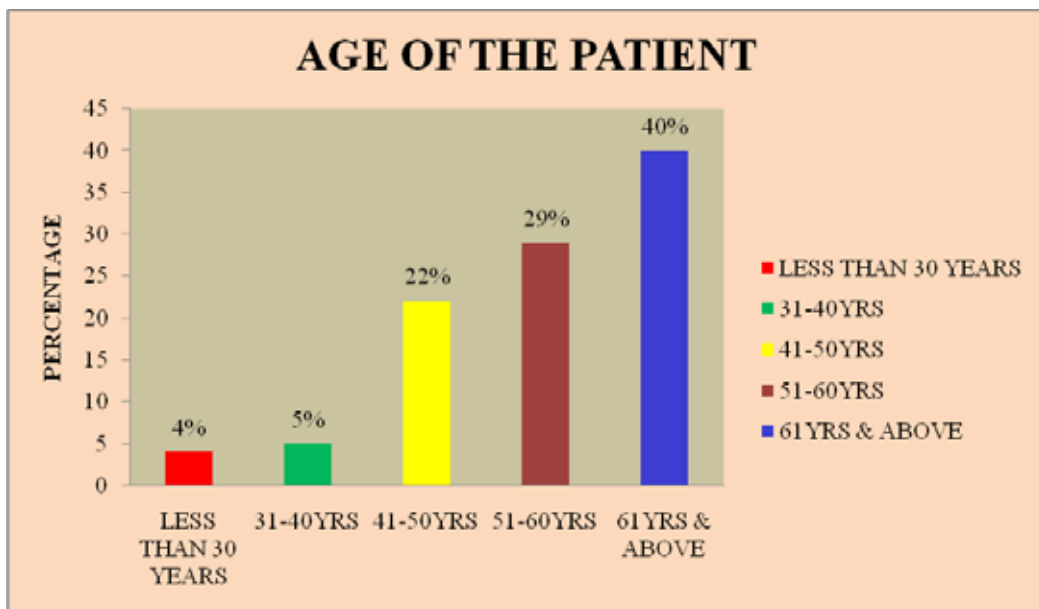


Figure 1: Percentage distribution of the patients with hypertension based on their age

Table 1: Mean and Standard Deviation of the hypertensive patients in the level of depression, anxiety and stress.

S.No.	Aspects of Hypertensive Patients	Mean	Standard Deviation
1	DEPRESSION	6.67	3.79
2	ANXIETY	5.7	3.08
3	STRESS	8.9	3.77

The study findings showed that majority of the patients 64(80%) were normal, 13(16%) were mildly depressed and only 3(4%) were moderately depressed, on the aspects of anxiety majority 58(73%) were normal, 13(16%) were having mild anxiety and only 9(11%) were having moderate anxiety and on the level of stress majority 75(94%) were normal and 5(6%) were mildly stressed. There was significant association between level of depression and type of diet ($\chi^2 = 22.84$) and level of stress and age of the patient ($\chi^2 = 33.44$).

It also reveals that there was no significant association between the level of depression and gender ($\chi^2 = 1.53$), age ($\chi^2 = 12.67$), educational qualification ($\chi^2 = 14.42$), occupation ($\chi^2 = 3.308$), monthly income ($\chi^2 = 2.321$), marital status ($\chi^2 = 2.525$), type of family ($\chi^2 = 1.44$), do you have any habits that affect health ($\chi^2 = 0.386$) and presence of any co-morbid condition ($\chi^2 = 0.61$).

The study concluded that most of hypertension patient were normal in the level of depression, anxiety and stress. Nurses who are working in hospital play a vital role in teaching about the symptoms of depression, anxiety, stress and its effects on hypertension. The nurses can give health education related to coping strategies to hypertensive patients to manage stress.

Conclusion

The study concluded that most of hypertension patient were normal in the level of depression, anxiety and stress. Nurses who are working in hospital play a vital role in teaching about the symptoms of depression, anxiety, stress and its effects on hypertension. The nurses can give health education related to coping strategies to hypertensive patients to manage stress.

Conflict of Interest: Nil

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References

- Irene A Kretchy (2014) mental health in hypertension: assessing symptoms of anxiety, depression, stress on anti-hypertensive medication adherence. *International journal of mental health system* 2014, 8:25
- Joyce M. Black and Matassarin, *Medical Surgical Nursing, Clinical Management for Continuity Care*, 5th edition, 1998, Page No.1387,1238.
- Alonso A, Mosley THJ, Gottesman RF, et al. Risk of dementia hospitalization associated with cardiovascular risk factors in midlife and older age: the Atherosclerosis Risk in Communities (ARIC) study. *Journal of Neurology, Neurosurgery & Psychiatry* 2009 Nov;80(11):1194-201.
- Lawes CM, Vander HS, Rodgers A. Global burden of blood-pressure-related disease, 2001. *Lancet* 2008 May 3;371(9623):1513-8.
- Mohammed Shoiab Hamrah et.al. Anxiety and depression among hypertensive outpatients in Afghanistan. *International Journal of Hypertension* 2018; 2018(): .
- Sushil Kumar Sharma and Vineeta Sawhney. Awareness, stress, anxiety and depression among hypertensive patients attending cardiac outpatient department in a super specialty hospital. *Asian Journal of Pharmaceutical and Clinical Research* 2016; 9(5): 62-64.

Knowledge and Awareness of Medical Students on Orthodontics: A Cross Sectional Study

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Abstract

Healthcare providers are the primary caregivers for a variety of health-related complaints. If they are unaware of the relationship between the malocclusion and orthodontics on general well-being of the patient, they may not educate, motivate and refer patients for orthodontic care. Considering that the present-day medical students are the future healthcare providers; we have assessed their level of orthodontic awareness. This cross sectional survey was conducted in Sree Balaji Medical College & Hospital, Bharath Institute of Higher Education & Research. The total sample size includes 375 male and female medical students selected by simple random sampling technique. A pre-piloted validated self-administered questionnaire was used and the collected data was subjected to statistical analysis using SPSS software version 24.0. Response rate was 70.4% (n=264) of which 49.2% were males (n=130) and the rest others were females. Half of the respondents (50.1%, (n=131) know the term 'orthodontics'. 31.4% (n=81) knew that orthodontics is related to correcting malocclusion. 40.1% (n=106) had received orthodontic treatment. Around half of the respondents (54.5%, (n=144) have relatives who are undergoing orthodontic treatment during the study period and 47.4% (n=125) felt aesthetics is the most important criteria affected by malocclusion. Similarly, 56% (n=148) would make referrals and 38.6% (n=102) cited duration of treatment as a discouraging factor. The medical students surveyed had only less awareness of orthodontics as a separate speciality. The female students showed a higher level of awareness towards oral health, aesthetics and orthodontics as compared to the male students. So a basic introduction to the dental sub-specialties, especially orthodontics would enable them to identify and educate on malocclusions and make informed referrals appropriately.

Keywords: Malocclusion, medical students, orthodontics.

Introduction

The term 'malocclusion' refers to incorrect relationship between the upper and lower arches and malalignment of teeth^[1]. Malocclusion is the third common oral health problem in the world and it is often associated with improper oral hygiene, periodontal disease, temporo-mandibular joint disorders, speech problems, mouth breathing and many other

complications^[2]. The orthodontic treatment often can correct these complications or at least prevent them from progressing on early detection; by ensuring proper alignment of the teeth and thereby achieving harmonious occlusal and jaw relationships^[3].

Orthodontic problems are usually not well associated with high mortality or morbidity; hence, they are often overlooked by most health care providers to be less important. However, studies indicate that malocclusion has significant impact on the psychosocial health and social activities of the affected person^[4]. General practitioners and physicians are the primary care givers and their role in oral healthcare delivery is very important in educating and motivating for proper oral hygiene due to the lack of awareness of patients concerning on the

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treatment of oral health problems. Prevention of oral diseases is possible to be effective if the physicians in developing countries are actively participated in screening and prevention of oral diseases^[5]. The prevalence of malocclusion has been ranging from 20 to 43% in India^[6], 20 to 35% in the United States^[7], 88.1% in Colombia^[8] and 76 to 87.7% in Nigeria^[9]. A prevalence rate ranging from 46.4% to 69.3% was reported in the Kingdom of Saudi Arabia (KSA)^[10]. Furthermore, prevention of oral diseases is not a high priority in Chennai and majority visit dental clinics only when they suffer from toothache^[11]. Knowledge stuffed at the undergraduate level from the curriculum influences the style and orientation of medical practice after the graduation^[5]. Considering that the present-day medical students are the future healthcare providers, the present study sought to assess their level of orthodontic knowledge and awareness.

Materials and Method

This cross sectional survey was conducted in Sree Balaji Medical College & Hospital, Bharath Institute of Higher Education & Research. Taking into account the role of sum of awareness of 50% and the confidence interval of 95% and an absolute precision of 5%, the sample size needed for the present study was calculated to be 375 male and feminine students. The sample was selected from second to final year medical students by simple random sampling technique. A pre-piloted and validated self-administered questionnaire (Table 1) was formulated to collect the information and was distributed to the students during class intervals. Verbal and written informed consent were obtained from the participating students after informing them the objective of this study. The students were instructed to return the questionnaire once they have completed. Participation was purely voluntary and the overall response rate was 70.4%. The statistical software package SPSS, version 20 for Windows was used for the data analysis. If the questionnaire was not completely filled up, they are not excluded as a whole, but the answered questions were taken into consideration for statistical analysis. Pearson's Chi square test was used and a *p* value less than or equal to 0.05 was considered to be statistically significant.

Results

Questionnaires were returned by 264 participants after completing, giving a response rate of 70.4%. 49.2%

(n=130) were males and 51.8% (n=134) were females. The participants range of age was 18-25 years with mean (SD) of 22 (7.7). The demographic characteristics of respondents are summarized in Table 2. 73.8% of the respondents (n=195) had visited the dental physician within the past six months. Concerning the rationale for visiting the dentist, 76.4% (n=149) of them had visited with tooth pain, 11.2% (n=22) for a routine check-up, 12.3% (n=24) for other reasons, in which only 3% (n=6) of the study population had consulted dentist for orthodontic treatment (Fig. 1). Only 50.1% (n=131) of the population were acquainted with the term 'orthodontics' and only 31.4% (n=81) of the population correctly answered that orthodontics involves correcting malocclusion. 40.1% (n=106) of the study population have received orthodontic treatment and 54.5% (n=144) of them had relatives who have received orthodontic treatment either in past or at present. Majority of the respondents (47.4%, n=125) felt aesthetics is mostly affected by malocclusion, followed by mastication (30.6%, n=81) and speech (22%, n=58) (Fig. 2). 38.6% (n=102) of them felt increased treatment time period discourages them from either undergoing or advising treatment (table 2). 56% (n=148) of them would refer relatives with malocclusion for orthodontic treatment and 48.1% (n=127) would suggest orthodontia as a career choice for their close relatives. Pearson's Chi square test was used and a *p* value less than or equal to 0.05 was considered to be statistically significant. There was a statistically significant difference between male and female students awareness of orthodontia. Gender differences among the respondents values are summarized in Table 2.

Table 1: Demographic characteristics of the participants

Characteristics	Frequency	Percent
Age (Years)		
18-19	56	21.3
20-21	102	38.6
22-23	67	25.3
24-25	39	14.8
Gender		
Females	134	49.2
Males	130	51.8

Table 2: Frequency, Chi square values and statistical significance among the variables.

Questions	Gender		Total n (%)	Chi-square	P-value
	Male n (%)	Female n (%)			
Dental visit in last 1 year (n=264)					
Yes	83 (31.4%)	112(42.4%)	195(73.8%)	13.3	0.001
No	47 (17.8%)	22 (8.4%)	69(26.2%)		
Reason for the recent visit (n=195)					
Routine checkup	0(5.1%)	12(6.1%)	22(11.2%)	23.4	0.001
Pain	79(40.5%)	70(36%)	149(76.5%)		
Orthodontic treatment	0(0%)	6(3%)	6(3%)		
Any other	0(0%)	24(12.3%)	24(12.3%)		
Know the term "Orthodontics" (n=261)					
Yes	46(16.6%)	88(33.6%)	131(50.2%)	24.2	0.001
No	84(32.2%)	46(17.7%)	130(49.9%)		
Orthodontic treatment nature (n=258)					
Dentures	46(17.8%)	24(9.3%)	70(27.1%)	34.3	0.001
Restorations (fillings)	69(26.7%)	48(18.7%)	117(45.4%)		
Correcting malaligned teeth	15(5.8%)	56(21.7%)	71(27.5%)		
Received orthodontic treatment present or past (n=264)					
Yes	55(20.8%)	51(91.3%)	106(40.1%)	0.496	0.481
No	75(28.4%)	83(31.5%)	158(59.9%)		
Relatives received orthodontic treatment past or present (n=264)					
Yes	57(21.5%)	87(33%)	144(54.5%)	11.82	0.001
No	73(27.7%)	47(17.8%)	120(45.5%)		
Problems with the malaligned teeth Aesthetics (n=264)					
Food	57(21.6%)	68(25.8%)	125(47.4%)	30.1	0.001
Grinding	56(21.2%)	25(9.4%)	81(30.6%)		
Speech	13(4.9%)	45(17.1%)	58(22%)		
Referring close relatives with malaligned teeth (n=264)					
Yes	50(18.9%)	98(37.1%)	148(56%)	32.2	0.001
No	80(30.3%)	36(13.7%)	116(44%)		
Problems associated with orthodontic treatment (n=264)					
Cost	55(20.9%)	40(15.1%)	95(36%)	10.3	0.006
Duration	53(20.1%)	49(18.5%)	102(38.6%)		
Treatment discomfort	22(8.3%)	45(17.1%)	67(25.4%)		
Suggesting orthodontics as a career choice (n=264)					
Yes	48(18.1%)	79(30%)	127(48.1%)	12.8	0.001
No	82(31%)	55(20.9%)	137(51.9%)		

Discussion

The purpose of the present study was to assess the level of orthodontic knowledge and awareness among the undergraduate medical students in Bharath Institute of higher Education & Research, Sree Balaji medical college & hospital. Although dental malocclusion in itself is neither a disease nor a life-threatening condition, but it has some significant impact on the physical, emotional and psychosocial health of the person^[12]. People with severe malocclusions have more severe periodontal diseases, temporomandibular joint (TMJ) disorders and

decreased masticatory load efficiency^[13]. There are many benefits of orthodontic treatment including improved self-esteem, self-confidence and physical attractiveness, improvements in masticatory function and occlusion, maintaining good oral hygiene with reduced dental caries and periodontal disease relatively^[14]. Medical students in Sree Balaji Medical College & Hospital receive oral health education through continuing education programmes (CDE), healthcare camps. At the outset, this study was conducted as an attempt to assess the medical students level of knowledge and awareness

in orthodontics. 76.5% (n=149) of the study population visited a dentist in the last one year with dental pain and only 11.2% (n=22), for a routine checkup. The fact that only 50.2% (n=106) were familiar with the term 'orthodontics', indicates a sub optimal level of awareness of orthodontics among the study population. This is further highlighted by their inability to correctly identify the procedures carried out by an orthodontist. Many erroneously selected dentures and fillings as components of the orthodontist's treatment schedule and only 27.5% (n=71) could correctly identify the type of treatment offered by orthodontists. This may be because many of the respondents have had little exposure to dentistry. Female students, in comparison to males, showed significantly greater awareness in their familiarity with orthodontics, correct perception of the treatment offered by orthodontists and visits to dentist for routine dental checkups ($p=0.001$). In a society with a higher prevalence of malocclusion, it was not surprising to find 40% (n=106) of them by themselves and 54.5% (n=144) have relatives receiving orthodontic care. Despite this, their perception of orthodontics was largely incorrect, a finding confirmed by research suggesting that the public awareness of malocclusion differs widely from that of the dental professional^[15]. Only 56% of the respondents (n=148) considered referring their close relatives with malocclusion for orthodontic treatment. This number justifies the need for more educational opportunities to create more orthodontic awareness amongst medical students in order to ensure appropriate referral patterns in their future careers as medical doctors. There was no significant difference between male and female students in receiving orthodontic treatment either at present or in the past ($p=0.481$).

Majority (47.4%, n=125) felt aesthetics is most affected by malocclusion (Fig. 2). This may be due to the fact that demand for orthodontic treatment is motivated primarily by esthetic values and the high social premium placed on well-aligned teeth and attractiveness in general^[4]. 38.6% (n=102) of them felt treatment duration discourages them from either undergoing or advising orthodontic treatment (Fig. 3). 56% (n=148) of them would refer close relatives with malocclusion for orthodontic treatment and 48.1% (n=127) would suggest orthodontics as a career choice to their close relatives. There was significant difference between males and females regarding their suggestion of orthodontics as a career choice and referring close relatives with malocclusion ($p=0.001$). Chi square tests

revealed significant gender differences, with female students showing a higher level of awareness towards oral health and orthodontics as compared to male students, as evidenced in Table 3.

Limitations of the Study: The sample size used was small and therefore the results cannot be generalized to all medical students. In addition, cross-sectional studies are often limited by respondent bias, but can serve as impetus for further studies in this area. There is limited research conducted in this area; therefore, it was difficult to make comparisons. Despite these limitations, our results have important implications, as the findings prompt for an educational initiative to improve the orthodontic knowledge of medical students.

Conclusion

The medical students surveyed had limited awareness of orthodontics as a specialty. A basic introduction to dental subspecialties, especially orthodontics would improve their ability to identify malocclusions, educate the patients and make informed referrals appropriately. Incorporating oral health education into the medical curriculum is a natural way to make a positive impact on patients health and well-being. Formal training opportunities have to be offered to the students; thus helping them understand the concepts of oral health, orthodontics and health-related quality of life.

Conflict of Interest: None

Ethical Approval: Ethics committee approval obtained from Sree Balaji Dental college & Hospital (SBDCH/IEC/08/2015/5).

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References

1. Gruenbaum T. Famous figures in dentistry. *Mouth (ASDA)* 2010;30(1): 18.
2. Glans R, Larsson E, Gaard B. Longitudinal changes in gingival condition in crowded and noncrowded dentitions subjected to fixed orthodontic treatment. *Am J Orthod Dentofacial Orthop*, 2003; 124(6): 679- 682.
3. Lara-Carrillo E, Montiel-Bastida NM, Sánchez Pérez L, Alanís-Tavira J. Effect of orthodontic treatment on saliva, plaque and the levels of *Streptococcus mutans* and *Lactobacillus*. *Med Oral Patol Oral Cir Bucal*, 2010; 15(6): 924-29.

4. Shaw WC. Factors influencing the desire for orthodontic treatment. *Eur J Orthod*, 1981;3(3): 151-162.
5. Adeghe HA, Ehigiator O, Azodo CC, Ehizele AO. Nigerian clinical level medical students knowledge of dental specialty. *Ann Med Health Sci Res*, 2010;2(2): 157-160.
6. Sureshbabu KM, Chandu GM, Shafiulla MD. Prevalence of malocclusion and orthodontic treatment needs among 13-15 year old school children of Davangere city Karnataka, India. *J India Assoc Public Health Dent*,2005;6(1): 32-35.
7. Proffit WR, Fields HW Jr, Moray LJ. Prevalence of malocclusion and orthodontic treatment needs in the United States: estimates from NHANES III survey. *Int J Adult Orthodon Orthognath Surg*,1998; 13(2): 97- 106.
8. Thilander B, Pena L, Infante C, Parada SS, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. *Eur J Orthod*, 2001;23(2): 153-167.
9. Dacosta O. The prevalence of malocclusion among a population of northern Nigerian school children. *West Afr J Med*, 1999; 18(2): 91-96.
10. Jones WB. Malocclusion and facial types in a group of Saudi Arabian patients referred for orthodontic treatment: a preliminary study. *Br J Orthod*, 1987; 14(3): 143-146.
11. Alkawari H. Malocclusion, complexity and treatment urgency among Saudi patients seeking orthodontic treatment. *Cairo Dental Journal*,1998; 14(3): 377-382.
12. Adegbite KO, Ogunbanjo BO, Ajisafe OA, Adeniyi AA. Knowledge of orthodontics as a dental specialty: a preliminary survey among LASUCOM students. *Ann Med Health Sci Res*, 2012;2(1): 14-18.
13. LuxCJ. The objective and subjective sides of malocclusions – more justification for orthodontics *J Orthod*,2009;36(4): 213-214.
14. Hunt O, Hepper P, Johnston C, Stevenson M, Burden D. Professional perceptions of the benefits of orthodontic treatment. *Eur J Orthod*, 2001;23(3): 315-323.
15. Coote JD. Removable appliance therapy. Patient cooperation and assessment. *Br Dent J*, 1973; 134(3): 91-94.

Assessment on Incidence of Prehypertension and its Association with Stress among Students in Nursing College, Kelambakkam, Kancheepuram District, Tamil Nadu, India

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Abstract

Assessment on incidence of prehypertension and its association with stress among students in nursing college, Kelambakkam, Kancheepuram District, Tamil Nadu. A study was carried out among 80 nursing students to assess the stress level. The objectives were to assess the incidence of prehypertension, assess the level of stress and association of pre-hypertension with stress of nursing students with their selected demographic variables. The review of literature was done and organised under various aspects on studies related to pre-hypertension, stress and prehypertension and its association with stress among students. The research approach used for the study was quantitative approach and the design selected was descriptive research design 80 samples were participated in the study by using the convenient sampling technique. Demographic variables were assessed by using the statistical measurement. The level of significance selected was $p < 0.05$ level. The study showed that there is no significant association between level of stress and demographic variables like socio economic status ($\chi^2 = 7.302$), types of diet, type of stay, height, weight, BMI, habits and co-morbidity. But age shows statistically significant with level of stress and statistically significant of association between prehypertension and stress.

Keywords: Pre hypertension and stress (first year nursing students).

Introduction

Mounting from adolescence to adulthood, students are facing challenges with academics and change of environment today to day. This forces a change in lifestyle and thereby makes them vulnerable to hypertension. As Pre-hypertension is an early pointer to hypertension, our focus remained the same to establish an association of Pre-hypertension with stress and anxiety, the major contributors to clinical hypertension. Stress is one of the

contributors to hypertension by recurrent blood pressure (BP) fluctuations as well as by stimulation of the sympathetic nervous system to produce large amounts of hormones causing vasoconstriction. Factors influencing BP through stress include white coat hypertension, nature of job, race, environmental factors and emotional status. In addition when one factor is coupled with other factors contributing to stress, the consequence is that BP is multiplied. The second important factor that influences hypertension is anxiety and is under study for several years. Anxiety causes activation of the autonomic nervous system through hypo-thalamo-pituitary axis thereby increasing circulating catecholamines⁽¹⁾.

Hypertension and prehypertension have been increasing among children and adolescents since the 1990s. During 2003–2006, among children and adolescents aged 8–17 years, the prevalence of prehypertension was approximately 14% in boys and approximately 6% in

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girls and the prevalence of hypertension was estimated to be 3%–4% in various studies . During 1997–2006, hospitalization rates for children and adolescents with a diagnosis of hypertension doubled, from approximately 18 cases per 100,000 pediatric hospital discharges in 1997 to approximately 35 cases per 100,000 in 2006 . Among children and adolescents with hypertension, as many as one in three has target organ damage, especially left ventricular hypertrophy . Accumulating evidence supports the theory that elevated blood pressure levels in adolescence are a precursor of elevated blood pressure in adulthood, making it important to identify elevated blood pressure in childhood . An analysis of the National Childhood Blood Pressure database found that 14% of adolescents with prehypertension developed elevated blood pressure within 2 years .⁽²⁾

Using the recent 2017 American Academy of Pediatrics Clinical Practice Guideline, a new CDC study shows that many more youth are now considered to have hypertension. High blood pressure during childhood and adolescence is linked to health problems later in life. The good news is that it is controllable and treatable. Medical guidelines define hypertension as a blood pressure higher than 130 over 80 millimeters of mercury (mmHg), according to guidelines issued by the American Heart Association (AHA) in November 2017. Hypertension and heart disease are global health concerns. The World Health Organization (WHO) suggests that the stress and anxiety also plays an important role in hypertension⁽³⁾.

Statement of the Problem: Assessment on Incidence of Prehypertension and its Association with Stress Among Students in Nursing College in Kelambakkam, Kanchipuram District, Tamil Nadu, India.

Objectives:

1. To assess the incidence of Pre hypertension among Nursing students
2. To find out the stress level of students in selected Nursing College
3. To find out the association between the incidence of Pre-Hypertension and its association with stress of Nursing students with their selected demographic variables.

Materials And Method

This study is a quantitative approach. Descriptive design was used. This study conducted on Annai-velankanni college of nursing, Kancheepuram District. 1st year nursing students were used as population of the study. In this study we used 80 samples by convenient sampling technique for this study. The inclusion criteria is students belonging to 1st year in nursing, students who can read and write. And we have excluded other year students. We have two parts in tool description. Part 1 is questionnaire on demographic variable. Part 2 is questionnaire on stress scale. The researcher got clearance from under graduate committee and clearance from institutional human ethical committee. After getting permission from college we got prior permission and consent from the samples, after getting prior permission self administered questionnaire on demographic variables and standard questionnaire on stress . They read and answered the questions. Biophysical measurement were uses to assess the prehypertension. Sphygmomanometer was uses to measure Bloodpressure. The date collecting duration was one week.

Result

Table 1: N=80

S.No.	Demographic variables	Category	No of sample	STRESS			X ² P Value
				No stress	Slight stress	A lot of stress	
1	Age in years	17	3	0	0	3	34.510 11.07 S
		18	14	4	6	4	
		19	51	27	22	2	
		20 above	12	4	8	0	
2	Socio-economic status	Lower	4	0	4	0	7.302 12.59 NS
		Upper lower	6	4	2	0	
		Lower middle	60	27	26	7	
		Upper middle	10	4	4	2	

S.No.	Demographic variables	Category	No of sample	STRESS			X ² P Value
				No stress	Slight stress	A lot of stress	
3	Type of diet	Vegetarian	6	2	3	1	0.366
		Mixed	74	33	33	8	5.99 NS
4	Family history of hypertension	Yes	6	1	5	0	3.935
		No	74	34	31	9	5.99 NS
5	Types of stay	Hostel	39	16	18	5	0.318
		Day scholar	41	19	18	4	5.99 NS
6	Height in cm	140-150 cm	13	6	6	1	4.305
		150-160 cm	55	21	26	8	9.49
		160cm above	12	8	4	0	NS
7	Weight in kg	30-40kg	17	9	6	2	10.123
		40-50kg	38	15	20	3	12.59
		50-60kg	17	10	6	1	NS
		60kg above	8	1	4	3	
8	BMI	Below 19	31	14	14	3	3.089
		19-20	35	14	15	6	
		Above 25	14	7	7	0	
9	Habits	Onychophagy	14	3	9	2	9.49
		Crackling joints	6	4	1	1	NS
		No other	60	28	26	6	
10	Co- morbidity	Thyroid problem	4	2	0	2	
		PCOS	3	1	2	0	
		Any other	73	32	34	7	

Table 1 shows the association of demographic with level of stress . The age is significant with stress other than the demographic variables such as socio

economic status, type of diet, type of stay, family history of hypertension, height, weight, BMI, habits and o-morbidity are non significant.

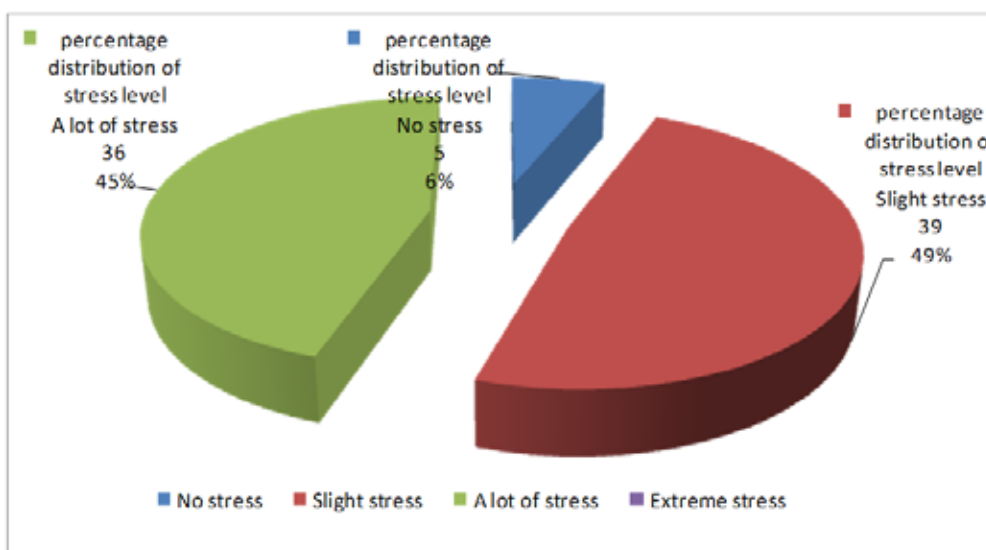


Fig. 1: Percentage distribution of stress level

This fig shows that the level of stress among the nursing students.

Table 2: N=80

S.No.	Variables	Categories	Frequency	Percentage
1.	Blood pressure	No hypertension	5	6.25
		Prehypertension	39	48.75
		Stage 1 hypertension	36	45

This table shows the level of blood pressure among the selected samples

Table 3: N=80

S.No.	Variables	Category	No of samples	Blood Pressure			X ² p value
				No hypertension	Pre-hypertension	Stage 1 hypertension	
1	Level of stress	No stress	5	0	2	3	9.49
		Slight stress	39	14	20	5	12.895
		A lot of stress	36	16	18	2	S

Table 3 shows that statistically association between the level of stress with blood pressure. It proved that stress has an effect on prehypertension. The association between the stress level and prehypertension is significant, x² value is 12.895 and DF is 4. The p value of 0.05 for DF 4 is 9.49.

Conclusion

This chapter deals with the discussion of major findings of the study. The study findings were presented based on objectives and hypothesis. Discussion of the findings under three main section viz. assess the prevalence of prehypertension, assess the stress level of the nursing students, assess the association of nursing students with demographic variables.

The main study was conducted in the month of April in Annaivelankanni college of nursing, Tamil Nadu. 80 samples were selected by non probability convenient sampling method. Collected information on demographic variables of nursing students and assessed the level of stress and blood pressure was monitored. The collected data were analysed by using descriptive and inferential statistics and further interpreted in terms of the objectives form. This chapter deals with the summary of the study and conclusion clarifies the implication for further research in the field

Hypothesis 2 was selected suggesting that there was significant association between prehypertension and stress among 1styr nursing students and hypothesis 1 was rejected suggesting that there was no significant association between stress of Nursing students with

their selected demographic variables among 1st year nursing students, except age. The student researcher found that there was significant association between the prehypertension and stress among 1st yr nursing students

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 04/02/2019.(Proposal No:324/IHEC/1-19).

Reference

1. Senthil S, Krishnadasa SN. Prehypertension and its determinants in apparently healthy young adults. J ClinDiagn Res 2016; 10:CC05-8.
2. Kulkarni S, O’Farrell I, Erasi M, Kochar MS. Stress and hypertension. WMJ 1998;97:34-8.
3. Player MS, Peterson LE. Anxiety disorders, hypertension and cardiovascular risk: A review. Int J Psychiatry Med 2011;41:365-77.
4. Whitworth JA. World health organization, international society of hypertension writing group. World Health Organization (WHO)/International Society of Hypertension (ISH) statement on management of hypertension. J. Hypertens. 2003; 21(11):1983-92.
5. Yadav S, Boddula R, Genitta G, Bhatia V, Bansal B, Kongara S et al. Prevalence & risk factors of pre-hypertension & hypertension in an affluent north Indian population. Indian J Med Res. 2008; 128:712-20.

Effectiveness of Video-Assisted Teaching Program on Knowledge and Attitude Regarding Temporary Family Planning Method among Postnatal Mothers

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Abstract

The present study was intended to evaluate the effectiveness of video-assisted teaching program on knowledge and attitude regarding temporary family planning method among postnatal mothers. Objectives were to assess the knowledge and attitude regarding temporary family planning method among postnatal mothers, evaluate the effectiveness of video-assisted teaching program on knowledge and attitude and to find out its association with socio personal variables. The theoretical framework adopted for the study was Betty Neuman Systems Model. The investigator adopted quantitative pre experimental approach and the research design used was one group pre test post test design. The study was conducted in the postnatal ward and family planning OPD of Govt. T.D. Medical College Hospital, Alappuzha. Fifty sample were selected by purposive sampling. The socio personal variables were gathered by self reporting. The knowledge and attitude were assessed by Structured Questionnaire and Modified Likert scale respectively. The sample were provided with a video-assisted teaching program on second postnatal day in the postnatal ward and the post test were conducted on 45 days after normal vaginal delivery in the family planning OPD. The findings revealed that there was a significant difference in the level of knowledge and attitude among postnatal mothers after video-assisted teaching program at $p < 0.001$. Thus it was concluded that video-assisted teaching program had a significant effect in improving the level of knowledge and attitude regarding temporary family planning method among postnatal mothers.

Keywords: Video-assisted teaching program; Knowledge; Attitude; Socio personal variables.

Introduction

India will surpass China to become the most populous nation in the world by 2022. Currently, the population of China is approximately 1.38 billion compared with

1.31 billion in India. The contraceptive acceptance rate according to national family health survey 2011 is 56%. Contraceptive acceptance needs to be increased, if population growth needs to be controlled. The extend of acceptance of contraceptive method still varies within societies, among different castes, religious group, at an individual, family and community level with their root in the socioeconomic and cultural milieu of Indian society.¹

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It is cited in the report that globally over 10% of all women do not have any access to or are not using any contraception. It is estimated that satisfying the unmet need for family planning alone could reduce the number of maternal death due to induced abortion.² Family planning in India is based on efforts largely sponsored by Indian government. In the 1965-2009

period, contraceptive usage has more than tripled (from 13% of married women in 1970 to 48% in 2009) and the fertility rate more than halved (from 5.7% in 1966 to 2.4% in 2012), but the national fertility rate is high enough to cause long term population growth. India adds up to 1000000 people to its population every 20 days.³

The ineffective use of contraceptives or failure to use contraceptives result in medical termination of pregnancies. Such as unplanned pregnancies among adult women and young girls will also end in medical termination of pregnancies. An unwanted pregnancy may lead to induced abortion. Abortion outside the medical setting (criminal abortion) is one of the most dangerous consequences of unwanted pregnancy. Such termination of pregnancies could have been prevented if contraceptives had been used consistently and appropriately.⁴

A study was conducted on contraceptive knowledge, practices and utilization of services in the rural areas of India among 1, 17, 465 eligible women selected from 28 districts. The study found that out of 1, 17, 465 eligible women 14, 276 were using contraceptives and 17, 082 were not using any family planning method. Among contraceptive users only 26% of women were using spacing method. Almost all women 98.8% were using a contraceptive method with the knowledge of their husband and had their support for continuing the same. The most common reason given for not using any family planning method was family not completed (34.6%) and fear of side effects (10.1%).⁵

According to 2011 census, the population of India is 1210.19 million comprising 586.47 million (48.5%) females and 623.72 million (51.5%) males. India is one of the largest populous country in the world next to China. The higher fertility rate in India is attributed to limited use of contraceptives, low level of literacy and traditional way of life.⁶

Awareness of contraception is limited to married women in India. However the vast majority of married Indian women's reported significant problems in assessing a choice of contraceptive method.⁷ In 2009, 48.3% of married women were estimated to use a contraceptive method, that is more than half of all married women did not. About three fourth of these were using female sterilization which is by far the most prevalent birth control method in India. Condoms at a mere 3% were the next prevalent method.⁸

According to world health organization, every year in the world there are an estimated 40-50 million abortions. This corresponds to approximately 125000 abortion daily.¹⁸ Unsafe abortions are killing a women every 2 hours in India (approximately 4000 death a year) according to estimates and calculations by sample registration system(SRS). A lancet paper on 2007 said that there were 6.4 million abortion, of which 3.6 million were unsafe.⁹ According to 2011 census induced abortion rate is 5,00,793, were institution wise abortion varies from 32.0% -73.9%.¹⁰

In our setting the knowledge regarding the temporary contraception is poor and this result in abortion and delivery of unwanted child, in this circumstance the temporary contraceptive device like copper T can be encouraged. The multipara mothers are encouraged to use temporary contraceptive devices till their child reaches 5 years due to the increased susceptibility of diseases in that age group. By providing adequate information about temporary contraception, MPT's due to unplanned pregnancy can be reduced and there by MMR.

As government of India has put forward many programs for implementing family planning services to the community, majority of people are not utilizing the method properly due to the lack of knowledge, misconceptions etc. resulting in unplanned pregnancies and legal abortions. So the investigator planned to conduct a video assisted teaching program regarding temporary family planning method to postnatal mothers of Govt. T.D. Medical College Hospital Alappuzha, because audio visual aids play a very constructive role in today's society. It plays an important role in increasing of public awareness and collect the views, information and attitude towards certain issue. It is the most powerful tool of communication in emerging world and increased the awareness and presents the real stage of society.¹¹

Materials and Method

Research approach: Quantitative Approach

Research design: Pre experimental design, one group pre testpost test design.

Variables: Dependant variable-Knowledge and attitude, Independent variable: Video-assisted teaching program

Setting: Postnatal wards and family planning OPD of Government TD Medical College Hospital Alappuzha

Population: All the primiparous mothers in Alappuzha.

Sample Size: 50 postnatal mothers

Sampling technique: Purposive sampling technique was used for the study¹².

Inclusion Criteria:

Postnatal mothers who

1. were primiparous
2. gave birth to one live child
3. were on 2nd day after normal vaginal delivery.
4. were able to understand Malayalam
5. were willing to participate in the study.

Exclusion Criteria:

Postnatal mothers who

1. were deaf and blind
2. had psychiatric problems

Description of research tool

Tool 1: Socio personal data sheet to assess the socio personal variables: It consists of age, education, occupation, monthly family income, place of residence, source of information regarding contraception.

Tool 2: Structured questionnaire to assess the knowledge regarding temporary family planning method: The questionnaire consists of 30 questions, with five domains including awareness about temporary contraception, copper T, condom, oral contraceptive pills and calendar method. Each question has a score of 1. The total score for this section is 30.

Tool 3: Modified Likert scale to assess the attitude regarding temporary family planning method: Modified Likert scale consist of 20 statements with 15 positive statements and 5 negative statements.

Reliability: The reliability was checked by split half method. The reliability of knowledge questionnaire was calculated and found to be 0.89 and for modified Likert scale was found to be 0.7 which indicated an acceptable level of reliability of tool.

Findings: The present study is aimed to evaluate the effectiveness of video-assisted teaching program on knowledge and attitude regarding temporary family planning method among postnatal mothers.

- Among 50 postnatal mothers 92% had poor knowledge and 8% had average knowledge.
- Among 50 postnatal mothers 62% had positive attitude and 38% had negative attitude regarding temporary family planning method.
- There was a significant difference in the knowledge score regarding temporary family planning method among postnatal mothers after video-assisted teaching program at $p < 0.001$. So it was inferred that video-assisted teaching program had a significant effect improving the level of knowledge regarding temporary family planning method among postnatal mothers .

Table 1: Mean, standard deviation and t value of post test knowledge scores regarding temporary family planning method among postnatal mothers. (n=50)

Knowledge score	Mean	SD	t
Pre test	7.2	4.89	
			20.49***
Post test	24.50	2.88	

*** Significant at 0.001 level

- There was a significant difference in the mean attitude score of postnatal mothers regarding temporary family planning method after video-assisted teaching program at $p < 0.001$.So it was inferred that video-assisted teaching program had a significant effect on modifying the attitude from negative to positive regarding temporary family planning method among postnatal mothers.

Table 2: Mean, standard deviation and t value of post test attitude scores regarding temporary family planning method among postnatal mothers . (n=50)

Attitude Score	Mean	SD	t
Pre test	64.20	10.19	
			12.11***
Post test	85.12	10.03	

***Significant at 0.001 level

Conclusion

The video-assisted teaching program had a significant effect in improving the knowledge and attitude regarding temporary family planning method among postnatal mothers. Since there were significant improvements, it is considered that the video- assisted

teaching program regarding temporary family planning method could be imparted to postnatal mothers. These nursing interventions yield good improvement in knowledge and attitude of postnatal mothers without any side effects and financial burden.

Conflict of Interest: Nothing specific-can use the study findings with proper citation of authors name.

Source of Funding: Self-finance

Ethical Clearance: Research proposal was presented before the research committee of Govt Medical college Hospital, Alappuzha. The permission was obtained from the respective head of Obstetrics and Gynecology department to conduct the study. The informed consent was obtained from the subjects before data collection. Confidentiality of data collected was ensured.

References

1. India to surpass China by 2022 to become world's most populous nation. [Internet]. Available from <http://indianexpress.com/article/india/india-others/indiato-surpass-china-by-2022-to-become-worlds-most-populous-nation/>
2. Maternal health. Health topics. World health organization. 2013 [Internet]. [cited 2015]. Available from; <http://www.who.int/topics/maternal-health/en>.
3. Trends in maternal mortality 1990-2012. WHO, UNICEF, UNFPA and the world bank estimates. 2012. [Internet]. [cited 2015 jun 15] Available from; http://www.unfpa.org/webdav/site/global/shared/documents/publications/2012/trends-in-maternal-mortality_A4-1.pdf.
4. Medical termination of pregnancy.[internet].[cited 2013 mar 12]. Available from <http://www.rchips.org>.
5. Chandhick N, Dhillon BS, Kambo I, Saxena NC. Contraceptive knowledge, practices and utilization of services in the rural areas of India (an ICMR task force study). Indian Journal of Medical Sciences. 2003 Jul 1;57(7):303-10. Available from <http://www.bioline.org.br/request?ms03005>
6. Contraception today [Internet]. Available from <http://www.ncbi.nlm.nih.gov/pubmed/10894258>
7. Park K. Textbook of preventive and social medicine. 23th ed. Jabalpur: M/S. Banarsidas Bhanot Publishers. 2015.
8. Usha R. Contraceptive Use among Young Married Women in India [Internet].[cited 2015 mar 14]. Available from http://fpconference.org/2009/media/DIR_169701/15f1ae857ca97193ffff82bdffffd524.Pdf
9. Family planning; find expert advice. [Internet] [cited on 2015 mar 13]. Available from http://www.quikr.com/All/y0?imageAds=Y & utmsource=yahoo & utm_medium=cpc & utm_term=family+planning & utm_content.
10. Unsafe abortion killing a women every two hours. [Internet]. Available from <http://www.thehindu.com/news/national/unsafe-abortions-killing-a-woman-everytwo-hours/article4686897.ece>
11. Birth spacing today's perspectives [Internet] [cited on 2015 mar 12]. Available from a <http://www.unicef.org/lifeskills/files/9thStandard-Grade.pdf>
12. Mathew RM, Anju Philip T, Sreejamol MG. Perceived postpartum stress and coping strategies among postnatal mothers at aims, Kochi. Asian J Pharm Clin Res 2017; 10(12):116-119

Effectiveness of Structured Computer Based Education Programme to Develop & Enhance the Knowledge on Coronary Artery Disease among Patients with Hypertension

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Abstract

Coronary artery disease is one of the major causes of morbidity and mortality all over the world. Here is a need to identify the gap in knowledge among public which is assumed as a reason for the high prevalence of the disease. An experimental study to assess the effectiveness of structured computer based education programme to develop and enhance the knowledge on CAD among Hypertensive population. A quantitative evaluative pretest post test design was adopted for the study. The study was conducted North & South Mahabalipuram in Kanchipuram District. The samples of the study were hypertensive patients who are fulfilled the sampling criteria between the age group of 35-65 years. The purposive sampling technique was used to select the 142 samples for the study. In that 71 samples were consider experimental group and 71 samples were control group. The data collection instrument was the structured questionnaire to assess the knowledge on CAD. The results revealed that in the post test of the experimental group, the overall mean and SD was 18.99 ± 1.56 . In the control group, overall mean and SD was 9.08 ± 3.219 . The t test value was $t=28.408$ which was greater than the table value and revealed that there was a high significant difference between the experimental and control group. So it depicts that the computer based education programme is effective.

Keywords: Computer based education, Develop & Enhance knowledge, Coronary artery disease, Hypertension.

Introduction

The heart is the engine of human life and it begins to beat automatically and rhythmically almost 1,00,000 times a day, more than 36 million times each year from the early embryonic life and beat until death¹ Coronary artery disease (CAD), also called heart disease or ischemic heart disease, results from a complex process

known as atherosclerosis, fatty deposits (plaques) of cholesterol and other cellular waste products build up in the inner linings of heart's arteries. It is the failure of coronary circulation to supply adequate blood to cardiac muscles and surrounding tissues².

Department of Health Research and Director General ICMR 2018 reported that, "Hypertension or raised blood pressure is one of the leading causes for premature deaths in India. It is directly responsible for 29% of all stroke and 24% of coronary artery diseases in India. The study was conducted to assess the systematic review on the prevalence, risk factors and outcomes of coronary artery disease among Indian's from Jan 1969 to Oct 2012. Initial search yielded 3885 studies and after review 288 observational studies were included. The results of review stated that the prevalence of CAD in

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urban areas was 2.5%-12.6% and in rural areas, 1.4%-4.6%. The prevalence of risk factors was smoking (8.9-40.5%), hypertension (13.1-36.9%) and diabetes mellitus (0.2-24.0%).

A pilot study was conducted to assess the prevalence and risk factors for coronary artery disease in Nepal. Totally 140 adults selected by simple randomization from all wards in the community in Dharan, a small city located in the foothills in eastern Nepal, in that 119 subjects who were age ranged from 35 to 86 included for the final analysis. Results depicts that the prevalence of various risk factors for coronary artery disease was found to be hypertension **42(35.3%)**⁵. Public awareness programme is the best instrument in the prevention of occurrence of coronary artery disease by helping people to take care of their own health. Today, coronary artery disease is the most prevalent non-communicable disease; therefore educating the patients with hypertension will helps them to know about the risk factors which enhance their treatment follow up and life style modification the way to prevention of coronary heart disease⁴.

A pre- experimental one group pre- test, post -test design study was conducted to determine the effectiveness of planned teaching programme on knowledge regarding risk factors of coronary artery disease and find out the association between pre-test knowledge score among patients with stable angina with their selected demographic variables (age, gender, education and residence).50 samples was selected by purposive sampling technique. Results of the study revealed that The Mean and SD of post-test knowledge score is (30.00±5.07) was greater than Mean and SD pre-test knowledge score is (21.24± 4.96) with Mean difference 8.76 which was highly significant (p<0.001). Therefore it is evident that planned teaching programme was effective in increasing the knowledge of patients with stable angina regarding risk factors of coronary artery disease⁵.

Methodology

Research Approach: A quantitative evaluative research approach was used in the present study.

Research Design: An experimental, pretest post test control group design was used in this study.

Research Setting: The present study was conducted at North & South Mahabalipuram. North Mahabalipuram was selected for control group and South Mahabalipuram

for experimental group. As per the census of India 2011, the population of both North & South Mahabalipuram is 15172 out of which 8,036 are males and 7,136 are females.

Population: The population comprises of patient with hypertension residing at North & South Mahabalipuram, Kanchipuram District, Tamil Nadu.

Sample Size: The estimated sample size was 142. Experimental and Control group were assigned 71 samples in each group respectively.

Sampling Technique: Purposive sampling technique was used for the present study.

Sampling Criteria:

Inclusion Criteria:

- Patients with hypertension age from 35 years to 65 years
- Patients with diabetes mellitus
- Patients with hypertension who are all willing to participate in this study and present at the time of data collection.
- Patients with hypertension who can read and understand Tamil or English.
- Both male and female patients.

Exclusion Criteria:

- Patients with uncontrolled hypertension.
- Patients with hypertension who are critically ill.
- Patients with hypertension diagnosed have complications.

Description of the Tool:

It Consists of Three Sections:

Section-A: Questionnaire to collect demographic details of the samples: The structured questionnaire consists of closed ended questions to elicit the information on demographic data such as age, gender, education, occupation, marital status, type of family, diet, smoking habits, alcoholism, tobacco chewing, high cholesterol, BMI, waist circumference, blood pressure, family history of heart diseases.

Section-B: Structured knowledge questionnaire regarding coronary artery disease: The structured questionnaire consists of closed ended questions to elicit

the knowledge on coronary artery disease among patients with hypertension. It consists of 20 questions. Out of which the first 10 consists of general aspects on coronary artery disease and next 10 questions on preventive aspects of coronary artery disease. Each question has one correct response and each correct response carries '1' mark and each wrong answer carries '0' mark.

SCORING AND INTERPRETATION

Level of Knowledge	Score Interval	Percentage
Adequate knowledge	16 – 20	76 – 100%
Moderate knowledge	11 – 15	51 – 75%
Inadequate knowledge	1 – 10	1 – 50%

Section-C: Computer based education programme on coronary artery disease: Computer based education programme was focused on educating the patients with hypertension for about 30 minutes with the help of computer. The teaching module consists of modifiable or non modifiable risk factors, symptoms of coronary artery diseases, preventive measures such as diet, exercise, yoga and life style.

Method of Data Collection: The study was conducted in Mahabalipuram at Kanchipuram District from 17.09.2018-17.10.2018. The data collection period were about four weeks. The pretest knowledge was assessed to experimental and control group by using structured knowledge questionnaire. Each individual was given 10 to 20 minutes to answer the questionnaire. After pretest experimental group participants made into small groups consisting 5 – 6 in a group. Computer based education was conducted separately for each group. Control group did not receive any intervention. On the 7th day handbook on coronary artery disease was given as reinforcement to the experimental group only. On 15th day post test was conducted to both the experimental and control group. After the post test to the control group imparted with computer based education on CAD as well as handbook on coronary artery disease was also given.

Statistical Analysis: A statistical software programme (SPSS) was used for data analysis. Descriptive statistics was used to analyze Frequency, Percentage and Mean in all the aspects such as demographic variables, level of knowledge among experimental & control group. Chi-square used to identify the association between the selected demographic and the level of knowledge.

Results

Among the experimental 44% and control group 45% hypertensive patients age group ranges between 46-55 years, most of the hypertensive patients are females in both the group (56%) (54%), Majority of the hypertensive patients (49%) (62%) were completed secondary/Higher secondary school, majority of the hypertensive patients are a self employed (47%) (61%), (86%) (89%) were not had a habit of smoking, (94%) (99%) of the patients were not having previous knowledge on CAD and there is no family history of heart disease (72%) (88%) in both groups. Also majority of the patients have hypertension for last 3-5 years in both the groups (50%) (49%), maintaining normal BMI (61%) (82%) and having mild hypertension (79%) (75%). The study revealed that there is significant association between selected demographic variables such as age, educational status and family history of heart disease, with the knowledge of the hypertensive patients. Majority of the hypertensive patients belongs to Nuclear family in both experimental (76%) and control group (83%), (24%)(17%) of the patients belongs to joint family. **(Figure-1)**. In experimental group 94% of the samples are had adequate knowledge after structured computer based education on CAD and 7% of the samples in control group had adequate knowledge on CAD in post test **(Figure-2)**.

Discussion

The study findings first of all suggest that the structured computer based education is very effective to improve the knowledge. The findings of the study are consistent with various previous studies ^{6,7,8,9}. In this study the knowledge is compared with the variables such as age, gender, education and habitat of the subjects. The pre experimental study found a non-significant difference in level of knowledge regarding prevention of CAD among males and females. The finding is similar to the findings of the study conducted by Almas (2008)¹⁰ which showed no significant association between gender and knowledge. Over all knowledge pertaining to coronary artery disease concluded that only very few numbers of patients in both groups having the adequate knowledge in pretest (Experimental group 3% & Control group 4%). The overall posttest score on knowledge of coronary artery disease among hypertension patients shows that 94% adequate knowledge and 6% of them gained moderately adequate knowledge which suggests that structured computer based education was effective.

Also the results are highly significant at the level of $P < 0.005$.

Conclusion

As coronary artery disease is growing as significant problem in developing countries. Thus identifying knowledge regarding coronary artery disease and its management, preventive measures, life style modifications has utmost importance to bring change in health behavior of people. The finding of the study proved that there was a significant improvement in the level of knowledge among hypertensive patients in the experimental group after the administration of computer based education.

Ethical Consideration: The Ethical Committee approval was received from IHEC, Chettinad Academy

of Research and Education (CARE) on 13.04.2018 proposal No.102/IHEC/3-18. A formal written permission was obtained from the HOD of Community medicine department and Medical officer from Chettinad Rural health center. Individual permission obtained from the samples. Content validity was received from the MEDICAL & Nursing experts.

Confidentiality: Confidentiality and anonymity pledge was ensured.

Justice: The hypertensive patients of the control group were also given intervention after the posttest.

Source of Support: Nil

Conflict of Interest: None declared.

Results

Table 1: Comparison of level of knowledge in the pre and post test for experimental and control group N=142

Parameter	Group	Pre Test			Post Test			MD	t' Value
		Mean	SD	SE	Mean	SD	SE		
Level of knowledge on CAD	Experimental	6.31	3.49	0.41	18.99	1.56	0.18	12.68	28.408*
	Control	6.17	3.59	0.42	9.08	3.21	0.38	2.91	7.749

*Significant at $P < 0.05$

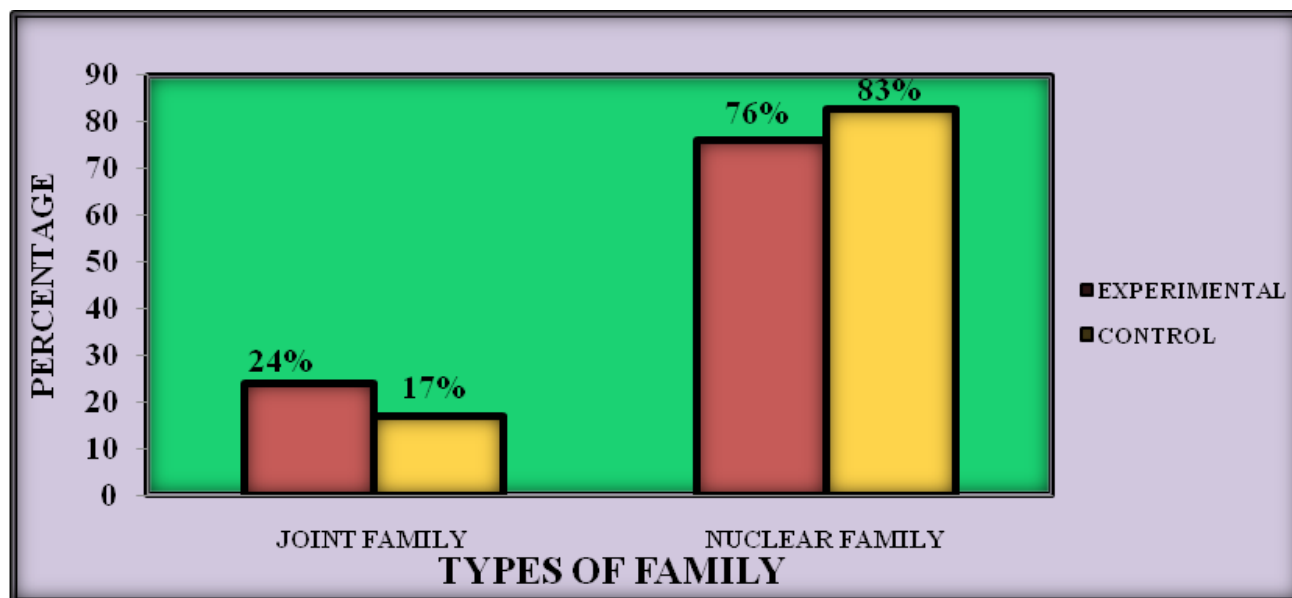


Figure 1: Percentage distribution of samples reference to Types of family

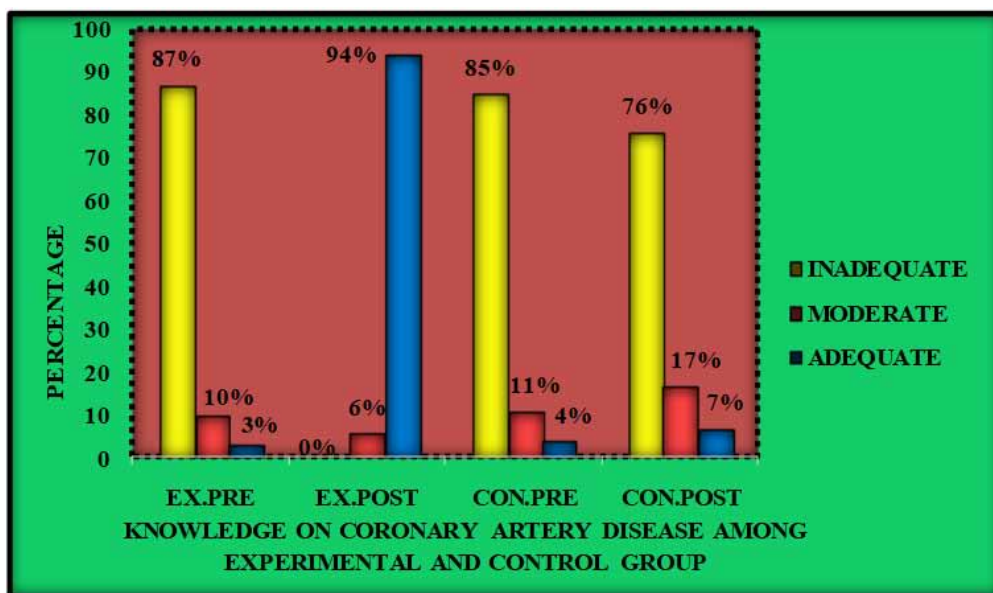


Figure 2: percentage distribution of sample according to the pre and post test level of knowledge on coronary artery disease among samples in experimental and control group.

Reference

- Falk E, Shah PK, Fuster V. Coronary plaque disruption. *Circulation* 2003;92:657–71.
- Black, J M. et al., *Text Book of Medical Surgical Nursing*. (8th ed.). Philadelphia: Lippincott Publications; 1987.
- Jyotikapoor . A descriptive exploratory study to assess knowledge regarding risk factors of coronary artery disease. *International Journal of Medical and Health Research* . November 2017;3(11): 124-128.
- Nihatgowhar. A Study To Assess The Effectiveness Of Planned Teaching Program On Knowledge Regarding Risk Factors Of Coronary Artery Disease. *Indian Journal of Applied Research*. July 2018;8(7): 27 - 31.
- Nimanjaligurung, anbarasi K, K.J. C. Knowledge on Risk Factors for Coronary Artery Disease among OPD Patients at Selected Hospital, Bangalore. *International Journal of Health Sciences and Research*. 2016;3(1): .
- Rajesh kumarsharma. Effectiveness of planned teaching programme, on risk factors of coronary artery disease (CAD) to create knowledge and preventive health behaviour. *IOSR Journal of Nursing and Health Science*. Aug 2013; 1(6): 17-21.
- Namratha R. Kandula, Mansi A. Tirodkar et al. Knowledge gaps and misconceptions about coronary heart Disease among U.S. South Asians. *Am J Prev Med*. 2010;38(4): 439-442. Doi: 10.1016/j.amepre.2009.12.034
- WEI- Chein Chen, Yi – Cheng Yu et al. The knowledge and attitude of coronary Heart disease Prevention among middle and older aged people in a community in Taipei. *Taiwan Geriatrics and gerontology*; 4(4): 38-44
- Abhinav Vaidya, Araya Umesh Raj et al. Cardiovascular health knowledge, attitude and practice/behaviour in an urbanising \ community of Nepal: a population based cross sectional study from Jhaukhel- Duwakot health demographic Surveillance Site. *BMJ open*;2013. doi:10.1136/bmjopen-2013-002976
- Almas, A. Knowledge of coronary artery disease (CAD) risk factors and coronary intervention among uni- versity students; 2008: Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18998308>

Effectiveness of Video Assesed Teaching Progamme on Prevention of Domestic Violence among Adolescent Boys at Selected College, Kanchipuram District,Tamil Nadu

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Abstract

A study to assess the effectiveness of video assessed teaching programme on prevention of domestic violence among adolescent boys at selected college. The objectives were to assess the pre and post test effectiveness regarding prevention of violence among adolescent boys, to determine the effectiveness of video assessed teaching programme on prevention of violence and to find out the association between post-test knowledge score and selected demographic variable. A quasi experimental study was used and non probability purposive sampling technique with the sample of 60 adolescent boys. Questionnaire was formulated and used to assess the knowledge . The collected data was tabulated and analyzed. Descriptive and inferential statistics were used. The man value is 4.66 and h standard deviation value is o.3252. Adolescent boys were having adequate knowledge 46.6%,moderately adequate knowledge 33.3% and inadequate knowledge 20%,video assessed teaching programme so, it shows improvement in the knowledge was shown after administering the teaching programme. So such research studies will help to increase the knowledge level of the adolescent boys thereby prevention of domestic violence.

Keywords: Assess, Effectiveness, Video Assesed Teaching, Prevention, Domestic Violence,Adolescent Boys.

Introduction

Only recently has gender-based violence been recognized as a health issue and introduced as an object of scientific study⁴. Constructed since the 1980's in the context of the feminist fight to lend social visibility to and promote the political inclusion of this phenomenon, the body of knowledge on violence in the field of health has been in-creasing significantly². The issue has also been introduced into the scope of health policies in Brazil. Most studies on intimate partner violence investigate violence in conjugal relationships between adults³. However, more recently, these studies have given rise to investigations focused on intimate violence among young adults, also known as dating violence. ¹

Research Methodology

Research Approach: Descriptive research approach

Research Design: Quasi experimental descriptive research design

Research Setting: The study conducted in a selected college

Population: Adolescent boys (14-18) at selected college

Sample: The age group between 14 to 18 years in a selected college

Sample Size: 60 Samples

Sampling Technique: Non probability purposive sampling

Results

Section-A: Distribution of demographic variables of the factors influencing the prevention of domestic violence among adolescent boys in selected college.

Age of the boys (years), in which majority (60%) were belongs to the age between 16-17 years. (3.3%) were in the age group of 14-15.

Father’s education in which majority (60%) of the samples fathers education is higher secondary and (13%) of samples father’s education is PG degree.

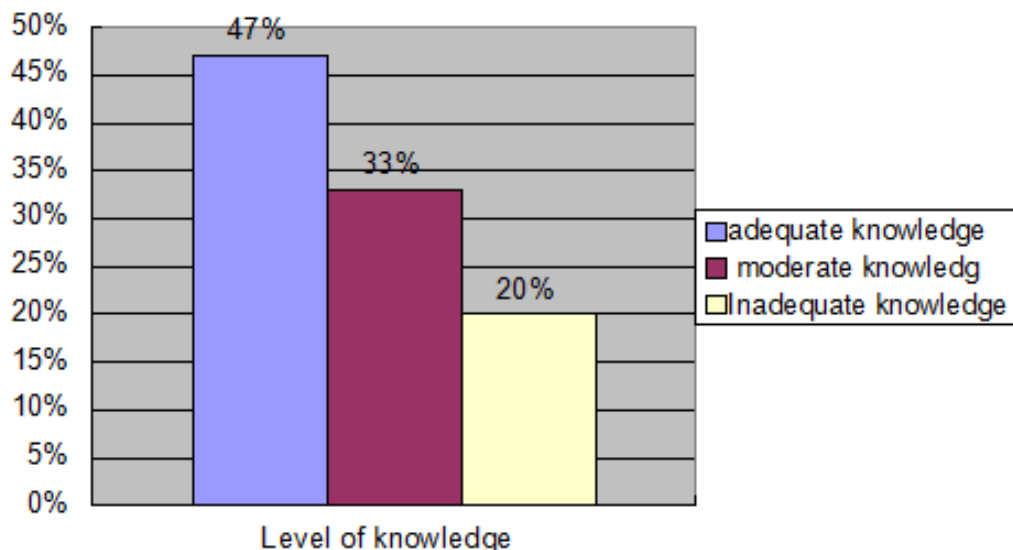
Father occupation in which majority (43%) of the samples father’s occupation sedentary workers. (10%) samples father’s occupation is moderate worker and heavy worker

Year of study in which majority (43.3%) of the samples belongs to the first year. (13.3%) were in the second year.

Source of Information in which majority (63) of the samples belongs to the sources of knowledge from relation. (3%) were in the television.

Section-B: Distribution of knowledge on the factors influencing the prevention of domestic violence among adolescent boys in selected college.

The study finding revealed that the frequency distribution in the study shows that majority 47% were having adequate knowledge, 33% of them having moderate knowledge and 20% of them having Inadequate knowledge on the prevention of domestic violence among adolescent boys.



Section-C: Association on knowledge on the factors influencing prevention of domestic violence among adolescent boys with demographic variables:

Regarding association there is significant association of factors influencing prevention of domestic violence among adolescent boys with demographic variables: like age, father’s education, father’s occupation and sources of information.

Summary: This chapter has dealt with the analysis and interpretation of the collected data from the adolescents on the knowledge regarding prevention of domestic violence . The collected data was tabulated and analyzed using descriptive and inferential statistics. Statistics diagrams like, conical graph, pie chart were used to represent the important data of the study.

Source of Funding: Nil

Ethical Consideration: Chettinad Academy of Research and Education, Institution Human Ethics Committee

Conflict of Interest: Nil

Reference

1. Donna D. Ignatavicius, Kathy A. Hausman., Medical Surgical Nursing across the Health Continuum, 3rd edition., Philadelphia, WB Saunder’s Company., 1999, P.No 104-105.
2. Joyce M. Black, Jane Hokanson Howks., Medical Surgical Nursing 7th edition., St. Louis, Saunder’s Publications, 2005, P.No: 1092-1093.

3. Shyamala D Manivannan, Text book of Community Health Nursing-I, 1st edition, CBS Publisher, 2017, P.No 225
4. Prem Sharma, Introduction to Sociology, 2nd edition, Lotus Publisher, 2012, P.No 120
5. K. Park, Park's Textbook of Preventive and social medicine, 23rd Edition, Banarsidas Bhanot Publishers, 2015, P.No 409.

A Study to Assess the Compliance to Medication among Type 2 Diabetic Patients at Selected Rural Community in Kanchipuram District, Tamil Nadu

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Abstract

The Diabetis is one of the most common chronic disorder across the world and the number of diabetic patients is on the rise .Majority of patients with type 2 diabetics fail to control glycaemia with diet and exercises .Lack of adherence to diabetic medication causes glycemic control and causes and can lead to treatment failure, development of complications and increases mortality.

The objectives of the study were to assess the compliance to medications among type 2 diabetic patient and the demographic variables. A non-probability- purposive sampling technique is used to collect data from the samples. The sample size was 60 samples at selected rural community.

The research design used in this study is Non experimental, Descriptive Research Design where Morisky Medication Adherence Scales is to determine the level of compliance of medication . The level was assessed by questionnaires. The result shows 1(2%) of sample had low adherence, 12(20%) of the sample had medium adherence, 47(78%) of sample had high adherence. There was significant association between the age, no significant association between other demographic variables.

Keywords: Assess, Morisky Adherence, Diabetic patient, Compliance, medication.

Introduction

Diabetic is one of the most common chronic diseases across the world and the number of diabetic patient is on the rise. In 2011, there were 366 million people with diabetic globally and this is expected to rise 552 million by 2030. In recent years, newer anti diabetic drugs have been introduced to optimally control diabetic, which have increased the complexity of diabetes treatment

algorithms leading to multiple second-line and third-line options. The management of diabetes mellitus is multi-pronged. Glycemic control in type 2 diabetes is essential to prevent complications. Hence the holistic approach to the control of diabetes is vital.¹¹

Keeping in mind the predictable future of this disease, this study aims to recognize various causative factors which can affect the compliance in the diabetic patients. This will not only equip us to formulate a sustainable and convenient treatment module but also give us insights to improve the quality of life in these patients in general.¹⁴

Studies have shown that there is improvement in compliance to treatment and decrease in the complications associated with the disease with increase in patients knowledge about the disease and its complications. A few studies have been done on assessment of the knowledge of diabetic, its complications and treatment

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adherence among diabetics in Karnataka the present study has been taken up in a rural community with the objectives of a) assessing the knowledge of diabetes and its complications among patients with type 2 diabetes mellitus b) assessing treatment adherence of the above patients and c) to determine any association of their knowledge with treatment adherence.⁶

Non adherence with medication in patients with diabetes resulted in poor glycemic control and hence an increased risk of developing chronic complication, such as diabetic neuropathy. So medications adherence is necessary for the effective management of diabetes and its complications.¹⁰

The present study is one of a number of worldwide studies that show the significant relationship between medication adherence and diabetic peripheral neuropathy.¹²

To our knowledge, no previous study of patients in India has been conducted to understand the relationship between medications adherence and diabetic peripheral neuropathy.¹⁶

Materials and Method

Research methodology deals with the description of the method and different steps in collection and organization data from the investigation. It includes description of the research approach, research design, setting, population, samples and sample size, the sample technique, sampling criteria, development and description of the tool, data collection procedure and the plan or analysis in the study.

The research design used in this study is Non experimental, Descriptive Research Design, A non-probability- purposive sampling technique is used to collect data from the samples. The sample size was 60 samples at selected rural community.

The Morisky Medication Adherence Scales is used to determine the level of compliance of medication. The present study was conducted to assess of compliance to medication among Type 2 diabetic patients at selected rural community in Kanchipuram District, Tamil Nadu.

Sampling Criteria:

- **Inclusion Criteria:**

Patients already diagnosed as type 2 diabetes mellitus for at least 1 year of duration.

Diabetic patients who are under treatment for at least 6 months.

- **Exclusion Criteria:**

Diabetic patient who are having other chronic diseases

Diabetic patient who cannot speak and understand Tamil/English.

By using questionnaires 60 samples were selected the tool used for the study consist of the demographic variables like Age, Gender, Education status, Types of family, Socio economic status, where medication taken, Regular of medication taken. To assess the compliance to medications. Morisky Medication Adherence Scale was used.

Study Findings:

- Maximum no of diabetic patients were in the age group of 51-60 years 28(47%)
- Maximum male 32(53%) are diabetic patients.
- Majority of education status was Non formal education 34(57%)
- Majority of family of diabetic patients are joint family 33(55%)
- Majority of socio economic status of the diabetic patients are Rs 5001-10000 per month 35(58%)
- Majority of person from which they are getting medication for diabetic patients are 54(90%)
- Majority of taking diabetic medication regularly 53(88%)

Regarding assessing patients compliance to medications, the study shows that 47(78%) of diabetic patients are following high compliance to medications and 12(20%) of the patients are having medium compliance to medication and 1(2%) of the patients are having low compliance to medication.

Regarding association with demographic variables factors like age are highly associated with compliance to medication and other factors like gender, education status, types of family, socio economic status, regular medication taken, place of medication taken were non significant with regarding to compliance to medication.

Discussion

Diabetic has been increasing world wide due to

dietary pattern and life style of the people. Thus to reduce the compliance medication plays a vital role in maintaining the important role to the people of different age. Thus to modified the diabetic we should make clear of the medication use and their importance.

Non adherence to therapeutic strategies is a serious concern that posses a great challenge to successful delivery of health care. This is widespread and has been reported from all over the world. Adherence to Diabetes management includes adherence to medication to medication life style modification and dietary changes.

CONCLUSION:

Diabetic is the most prevalent causes for almost most diseases, affecting at least 600 million people worldwide and is an important contribute to mortality. Compliance to anti diabetic medication has been found to be a major concern.

The mean proportion of control diabetic among all diabetic patients being only 13% because of poor medication compliance and is one of the leading causes of failure to achieve diabetic control. Ensure that the government health care facilities have health care infrastructure, service personnel and quality of health care services to the need in education the public on prevention of diabetic patients.

Efforts to be made enhance the capabilities of the doctors, village health nurses and other paramedical through pre-services and in service training programmed a prevention of diabetic in patients.

Conflict of Interest: Nil

Source of Funding: Self funding

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee.

Reference

1. Kasturi Sundar Rao. A Text book of community health nursing. 3rd ed. India: BI publisher; 2000.
2. Kamala S. Essential in community health nursing practice 1st ed India; BI publisher; 2005.
3. MC Gupta, Mahaiian BK. Text book of prevention and social medicine, 3rd ed. New Delhi: Jaypee brothers :2003.
4. K.K. Gulani, Principle and practice of community health nursing 2nd New Delhi: Kumar Publishing House; 2014.
5. Suitha Pathey. Text book of community health nursing. 1st ed. Delhi; CBS Publisher; 2013.
6. Willims hopper Understanding medical surgical nursing. 3rd ed. P. A Davis Publication.
7. Kishor Khotkar, Sameer Chaudhari, Pradeep R Jadhav, Yeshwant A Deshmukh. Assessment of Medication Adherence In Type II Diabetic Patient: A Cross-sectional Study. MGM Journal of Medical Science. 2017;4(2):65-69.
8. Prashant Shukla, Shikha Palta, Anita Gupta, Vijay K Sehgal. A Study to evalute compliance in patients of diabetic mellitus in a North-Indian tertiary care hospital. International Journals of Basic Clinical Pharmacology 2018.
9. Deepali B.S., Mangala Subramanian, Soumya G., Vikyath B.R., Aarudhara P., Ankitha M., Deepashree R., Nagashree N. Knowledge of Diabetic, its Compliance and treatment adherence among diabetic patients. International Journals of Community Medicine and Public Health 2017.
10. Aruna Sharma, Juhi Kalra. DC Dhasmana, Harish Basera. Poor adherence to treatment :A major challenges in diabetes. Indian Academy of Clinical Medicine. 2014
11. Manobharathi M. Kalyani P., John William Felix A., Arumani A. Factor associated With The reputeicon compliance among type 2 diabetes mellitus patient in Chindambaram, Tamil Nadu, India. Internation Journals Of Community Medicine and Public Health 2017.
12. Anu M Samy, Palanisamy S, Amirthalingam and Osatma S. Mohammed. Assessment of the patient medication adherence among type 2 diabetes mellitus population with peripheral diabetes neuropathy in South India. JTaibah University Medicine Science 2017;12(2):164-168
13. Tarig Mohammed EL-Hadiyah, Abhelhaleem Mustafa Madani, Hisham Mohammed Abhelrahim, Abubakar Khidir Yousif. Factor affecting Medication Non adherence in thpe 2 Sudances Diabetic Patients. Pharmacology & Phamacy, (7), 141-146.
14. S.Z. Inamdar, R.V. Kulkarni, S.R. Karajgi, F.V. Manvi, M.S. Ganachari, B.J. Manhendra Kumar. Medication Adherence in Diabetes Mellitus :An Overview on Pharmacist Role. American Journal Of Advanced Drug Delivery 2017;238-250

15. Divya S, Prathiba Nadig. Factor Contribution to non adherence to Medication among type 2 Diabetes Mellitus in Patient Attending Tertiary Care Hospital In South India. *Asian J Pharmacology Clinical Res*, Issue 2,2015,274-276
16. Awuni Prosper Mandela Amaltinga. Non Adherence to Diabetic Medication Among diabetic Patient, a Case Study of Dormaa Hospital Ghana. *Science Journal of Public Health* 2017:5(2):88-97.

Prevalance and Risk Factors of Hyperemesis Gravidarum: A Retrospective Study

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Abstract

A Retrospective study was conducted to assess the **prevalence and risk factors of hyperemesis gravidarum among antenatal mothers in a selected tertiary care hospital, Kelambakkam, Kanchipuram District, Tamil Nadu, India**. The objectives were to assess the prevalence and risk factors of hyperemesis gravidarum among antenatal mothers by collecting the data from the medical records of the patients and to find the association between risk factors of hyperemesis gravidarum with the selected demographic variables among patients with hyperemesis gravidarum. The literature review was done and organized under various aspects on studies related to prevalence and risk factors of hyperemesis gravidarum among antenatal mothers with hyperemesis gravidarum. The research approach used for the study was quantitative research approach and the design was retrospective design, 47 samples were participated in the study by using convenient sampling technique. Demographic variables are assessed by using the statistical measurement, prevalence and risk factors of hyperemesis gravidarum among antenatal mothers with hyperemesis gravidarum. The level of significance selected was $p < 0.05$ level. The collected data was tabulated and analyzed by using SPSS Statistics -21, descriptive and inferential statistics. The study showed that there is significant association between risk factors of hyperemesis gravidarum with selected demographic variables.

Keywords: *Hyperemesis Gravidarum(HG), Nausea and Vomiting (NVP).*

Introduction

Motherhood is an inevitable part of a woman's life. It's a natural law that a woman should carry her baby in her womb for 9 months to undergo the process of labor. From the time the mother starts conceiving the baby, it is called pregnancy and the mother elicits undifferentiated changes in the physical and physiological process of

life. The mother experiences some signs and symptoms from the first trimester of pregnancy. As each woman are unique, different mothers experience different signs and symptoms and it is not a must that all women should have the same manifestations.

Background of the Study: Hyperemesis gravidarum refers to intractable vomiting during pregnancy that leads to weight loss and volume depletion, resulting ketonuria and ketonemia.^[1]

Hyperemesis gravidarum is defined as persistent vomiting in pregnancy, which causes weight loss (more than 5% of body mass) and ketosis. In severe cases, if inadequately or inappropriately treated hyperemesis may cause Wernicke's encephalopathy, central pontinemyelinolysis and maternal death.^[2]

Infants of mothers with Hyperemesis gravidarum have a higher incidence of intrauterine growth restriction

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and are significantly smaller at birth. HG affects 1% of pregnant women.^[3]

Hyperemesis gravidarum is most often characterized by severe nausea and vomiting that interferes with nutritional intake and metabolism, causes fluid and electrolyte imbalances and commonly requires hospital management.^[4]

Hyperemesis gravidarum represents a more severe condition and is potentially lethal if not treated.^[5]

Hyperemesis gravidarum affects both the mother and the fetus if the mother has severe intractable nausea and vomiting it leads to many fetal and maternal consequences. If the mother has severe form of hyperemesis gravidarum it may result in maternal complications like nutritional deficiency, psychological impact, electrolyte imbalances and metabolic disturbances were as the fetal complications is behavioral and psychiatric problems, abnormal placentation and risk of malignancy.^[6]

The exact cause of hyperemesis gravidarum is unknown but having a history of migraine, hormonal changes (increased human chorionic gonadotropin level), gastrointestinal changes (incidence of gastro esophageal reflux disease), two genes GDF 15 and IGFBP 7 potentially linked with the development of hyperemesis gravidarum.^[7]

Hyperemesis gravidarum as persistent and excessive vomiting starting before the end of the 22nd week of gestation and further subdivides the condition into mild and severe, with severe being associated with metabolic disturbances such as carbohydrate depletion, dehydration, electrolyte imbalances.^[8]

Hyperemesis gravidarum is characterized by excessive nausea and vomiting in early pregnancy is reported to be associated with the increased risks for low birth weight, preterm birth, small for gestational age and perinatal death. HG is a potentially life threatening condition that occurs between 0.8-3.2%.^[9]

Medical complications of hyperthyroidism, psychiatric illness, previous molar disease, gastrointestinal disorders, history of asthma, pre gestational diabetes were significantly has independent risk factors for hyperemesis gravidarum where as pregnancies with multiple fetus has increased risk and decreased risk for maternal age older than 30 and

maternal smoking in a review of 1,301 cases from Canada.^[10]

Hyperemesis gravidarum is founded to be common in young aged mothers. Women affected by NVP are mostly nonsmoker the incidence of hyperemesis gravidarum is higher in multiple pregnancy, molar pregnancy, fetus with down syndrome and primi gravidity are common obstetric risk factors.^[11]

Statement of the Problem: Prevalence and Risk factors of Hyperemesis Gravidarum in a selected Tertiary Care Hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India.

Objectives of the Study:

1. Assess the prevalence of Hyperemesis Gravidarum with in last two years (2016 to 2018) in a selected hospital.
2. Associate demographic variables with the risk factors of Hyperemesis Gravidarum.

Operational Definitions:

Prevalence: Prevalence is the number of records of mothers diagnosed with Hyperemesis Gravidarum with in last two year (2016-18) in a selected tertiary care hospital.

Risk Factors: Risk factors as taken from the records of mothers diagnosed with Hyperemesis Gravidarum from 2016-2018 like age, weight, history of motion sickness, history of migraines, history of previous molar pregnancy, history of gastro intestinal disorders, history of asthma, multiple pregnancies, gravida, Trimester, psychological disorders (anorexia nervosa or bulimia), History of thyroid disorders, Increased HCG.

Hyperemesis Gravidarum: Hyperemesis gravidarum is a condition causing severe nausea and vomiting in early pregnancy often resulting in hospital admission.

Material and Method

Research Approach: Quantitative research approach was adopted in the study.

Research Design: Retrospective design was used to conduct the study.

Research Setting: Present study was conducted at Medical Record Department in Chettinad Hospital

and Research Institute, Kelambakkam, Kanchipuram District, Tamil Nadu, India. Permission got from the Medical Record Department to check the records for specified data was obtained from the Dean, CHRI.

Population: Data related to antenatal mothers who have got admitted with hyperemesis gravidarum and associated risk factors was obtained from the Medical Records at Medical Record Department.

Sample: The sample in the present study will be records of antenatal mothers with Hyperemesis Gravidarum who had admitted in Antenatal ward at CHRI.

Sample Size: The data was collected from the medical records of mothers with Hyperemesis Gravidarum with in last two year (2016-2018).

Sampling Technique: Convenient sampling technique was adopted in the study.

Sampling Criteria:

Inclusion Criteria: The medical records of mothers with Hyperemesis Gravidarum with in last two year (2016-2018).

Selection and Development of Study Instrument: In the present study the study instrument was medical records.

Data Collection Procedure:

- After obtaining ethical committee clearance and written permission from the Dean and Medical Superintendent, the main study was conducted in Medical record department, Chettinad Hospital and Research Institute.
- The case sheet was selected through convenient sampling technique, the necessary data regarding Risk factors was taken from the records of mothers diagnosed with Hyperemesis Gravidarum from 2016-2018 like age, weight, history of motion sickness, history of migraines, history of previous molar pregnancy, history of gastro intestinal disorders, history of asthma, multiple pregnancies, gravida, Trimester, psychological disorders (anorexia nervosa or bulimia), History of thyroid disorders was collected.
- Investigation like urine analysis, thyrod function test was assessed from the records.

- The duration of data collection was one week from 01.04.2019 to 07.04.2019 at 8.30am to 4.00pm in Medical Record Department. The data was collected on all the days and data confidentiality was maintained.

Findings:

Objective: To assess the prevalence of Hyperemesis Gravidarum with in last two years (2016 to 2018) in a selected hospital.

According to age group:

- Majority of the antenatal mother with hyperemesis gravidarum is 18 to 25 years (44.7%)
- Minority of the antenatal mother with hyperemesis gravidarum is 32 to 38 years (12.8%)

According to weight:

- Majority of the antenatal mother with hyperemesis gravidarum is (42.6%)
- Minority of the antenatal mother with hyperemesis gravidarum is (27.7%)

According to dietary pattern:

- Majority of the antenatal mother with hyperemesis gravidarum is (97.9%)
- Minority of the antenatal mother with hyperemesis gravidarum is (2.1%)

According to gravida:

- Majority of the antenatal mother with hyperemesis gravidarum is (51.1%)
- Minority of the antenatal mother with hyperemesis gravidarum is (48.9%)

Objective 2:

To find out the association between Demographic Variables and risk factors of Hyperemesis Gravidarum

- The finding shows that there is a significant association between age in history of motion sickness.
- The finding shows that there is a significant association between age in history of asthma.
- The finding shows that there is a significant association between dietary pattern in history of migraine

- The finding shows that there is a significant association between gravida in history of molar pregnancy and history of asthma.

The study reveals that there was a significant association of selected demographic variables with risk factors of hyperemesis gravidarum and there is no significant association with other risk factors.

The Mean difference and standard deviation for risk factors and investigation

- The maximum value of mean \pm standard deviation in risk factors 1.21 ± 0.508 and the minimum value of mean \pm standard deviation in risk factors 0.09 ± 0.282 .
- The maximum value of mean \pm standard deviation in investigation 1.49 ± 1.196 and the minimum value of mean \pm standard deviation in investigation 1.32 ± 0.471 .

Conclusion

The study findings reveals that there is an significant association between the risk factors of hyperemesis gravidarum and selected demographic variables like age, dietary pattern, gravida.

Conflict and Interest: Nil

Source of Funding: Self funding and no external funding.

Ethical Clearance: Obtained clearance from institutional human ethical committee on 04.02.2019.

References

1. Erick M, Cox JT, Mongensen KM. ACOG Practice Bulletin 189: Nausea and Vomiting of Pregnancy. *Obstet Gynecol.* 2018 May; 131 (5):935 [Pub med]
2. Anne-Marie Neill, Catherine Nelson- Piercy. Hyperemesis Gravidarum. *The Obstetrician and Gynaecologist* 2003; Vol.59:204
3. Bente Vilming and Britt-Ingjerd Nesheim.
4. Hailemariam Segni, Dereje Ayana, HabtamuJarso. Prevalence of Hyperemesis Gravidarum and Associated factors Among Pregnant Women at Jimma University Medical Center, South West Ethiopia: A Cross-Sectional Study. *EC Gynaecology* 2016; 3(5): 376-387.
5. Ase Vikanes, Andrej M, Griibovski, Siri Vangen, Per Magnus. Length of Residence and Risk of Developing Hyperemesis Gravidarum among First Generation Immigrants to Norway. *European Journal of Public Health* 2008; Vol. 18 (No.5): 461-462.
6. AbanoubGabra. Complications of Hyperemesis Gravidarum: A disease of Both Mother and Fetus, Review Article. *Critical Care Obstetrics and Gynecology* 2018; Vol. 5 No 1: 1 (ISSN 2471-98-3): 1-5
7. Linsey K. Jennings. "et al". *Hyperemesis Gravidarum. Stat Pearls [Internet]* 2019:.
8. Fergus P Mc Carthy. Jennifer E Lutonski and Richard Agreene. Hyperemesis Gravidarum: Current Persepectives. *International Journal of Women's Health* 2014; Vol.6 (PMC4130712): 719-725.
9. 20. Vikanes AV Magnus P, Grjibovski AM. "et al". Hyperemesis Gravidarum and Pregnancy Outcomes In the Norwegian Mother and Child Cohort-A Cohort Study. *Pubmed* 2013; Vol. 13 (169).
10. Aruna Chhabra. Knowledge of Primigravida Mothers Regarding Management of Hyperemesis Gravidarum in Selected Hospitals at Bangalore.
11. Abanoub Gabra (2018) 'Risk factors of hyperemesis gravidarum: review article', *Health Science Journal*, Vol. 12 No. 6:603 (ISSN 1791-809 x) pp. 1-5.

Use of Current Therapeutic Devices in the Treatment of Restless Legs Syndrome: A review

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Abstract

Introduction: Restless legs syndrome (RLS), a current neurological sensory processing disorder in developing countries, characterized by physical discomfort or painful feelings in the thighs, calves and feet resulting in causing strong urge to move one's legs to alleviate pain. RLS is commonly found in older people and females. RLS is closely associated with iron deficiency, pregnancy and uremia. The pathophysiological pathways are still unknown.

Methodology: Related Studies has been taken out from databases, MEDLINE (PubMed), Pedro and the Cochrane Database of Systematic Re-views.

Result and Discussion: The various therapeutic devices are used to treat the Restless legs syndrome (RLS) such as whole body vibration (WBV), pneumatic compression therapy (PCT) and near-infrared light (IR) for enhancement of circulation & for enhancement of counter stimulation use transcutaneous electrical nerve stimulation (TENS) and the vibration Relaxis pad (VRP).

Conclusion: The Relaxis Pad is more effective as compared to other therapeutic devices to relieve periodic limb movements & quality of sleep.

Keywords: Restless legs syndrome, Therapeutic Devices, circulation, counter-stimulation.

Introduction

Karl Ekbom proposed the term RLS, which is also called as Ekbom's syndrome in 1945. Restless legs syndrome or Willis-Ekbom Disease is a common neurological sensory-motor condition characterized by predominantly abnormal night pain & abnormal sensations relieved by limb movement. Till now, There is

lot of difficulties in diagnosing the restless legs syndrome or willis-ekbom disease. There is no any evidence of biomarkers & no final distinct clinical findings has been found that help in making diagnosing RLS. Broadly, the nature of chief complaints of patient determine the diagnosis & it can be treated with pharmaceuticals or conservatively.¹

The purpose of this article to review available conservative treatment through using therapeutic device such as WBV, PCT and IR use enhancement of circulation & TENS and VRP use counter stimulation.

Epidemiology: The prevalence rate of RLS is estimated as 5% in the general population.² The prevalence in women is almost twice as often as men and in women, it is increasing with age drastically.³

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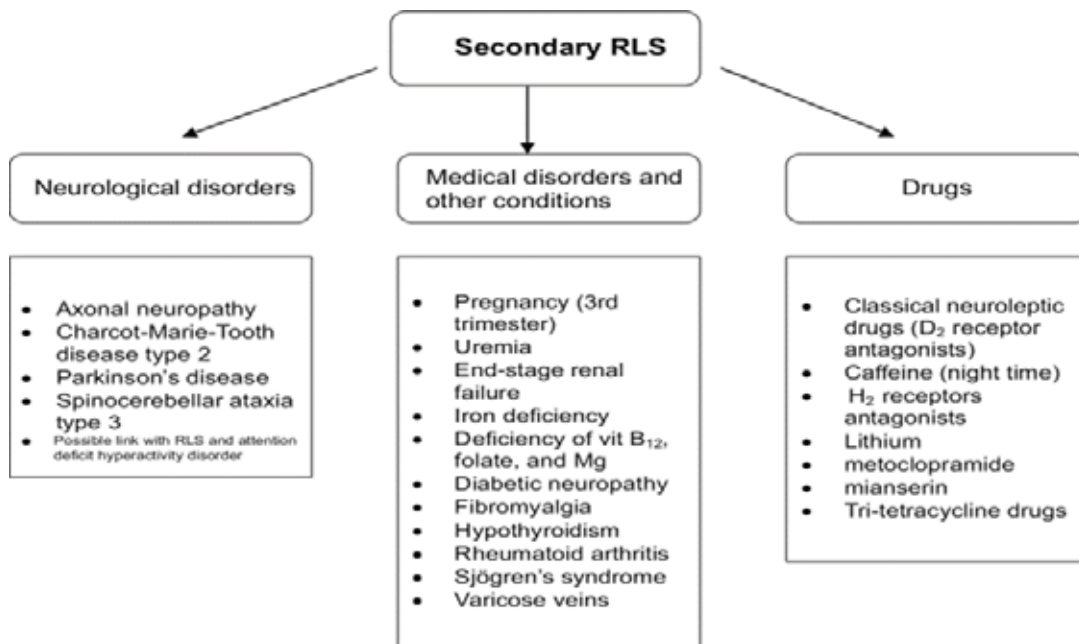
Pathophysiology: A lot of research studies understood the three factors for the cause of RLS: brain concentration of iron, brain dopamine concentrations and genes.

Diagnosis: International RLS study group in 1995 published the first approved criteria was following diagnostic criteria are as follows^{4,5}

1. Whenever patient may feel uncomfortable or unpleasant sensations in the legs, patient may have urge to move the legs.
2. Whenever patient may feel unpleasant sensations during the periods of rest or slowness in activities such as lying down or sitting, Patient may have a strong desire to move the legs.

3. Patient may get partially or totally relieved by movement such as walking or stretching from unpleasant sensations.
4. Whenever patient feels any unusual & bad sensations during rest or limited activity or become worse in the evening or night than during the day, patient may have urge to move the legs.

Related Conditions and Exposures: Sometimes RLS is related with general medical conditions referred to as secondary RLS such as renal failure, iron deficiency and pregnancy.^{6,7} O’Keffe et al. experimented a study and concluded that Low levels of ferritin (a sensitive indicator of body iron stores) in experimental group (RLS patients group) was more significant than in control group.⁸ Increased prevalence of RLS in pregnancy was firstly noted by Ekbom.⁹



Treatment: Restless legs syndrome can be treated on the basis of chief complaints of patients by Drug related therapy (eg, dopaminergic drugs).¹⁰ & Non-drug related treatment.¹¹ Nondrug-related treatment options includes therapeutic devices.

Whole body Vibration: RLS/WED patients having an urge to move the extremity (arms or legs) is the result of a feedback mechanism originating in the muscle or other tissue that signals low oxygenation and that the co whole-body vibration (WBV) devices deliver vibration through oscillating plates using two different systems: either reciprocating vertical displacements on

the left and right side of a fulcrum, or the whole plate oscillating uniformly up and down.¹³ Investigations using healthy individuals have shown that WBV results in endothelial shear stress¹⁴ that is sufficient to produce nitric oxide (NO), a powerful vasodilator. It decreases vascular resistance, an increase in skin blood flow & consequent movement and muscle contractions lead to the desired enhanced oxygen supply.^{14,15} The vibrations are transmitted through the axial and appendicular skeleton and the related potential damage to vision and hearing.^{16,17} No information on patient satisfaction is available.¹⁸

Pneumatic compression devices: PCT is a therapeutic modality that consists of inflatable cuffs for axilla, arms, hands & foot to improve the blood circulation for the management of lymphedema and venous insufficiency Intermittently.¹⁹

It is proposed that the release of endothelial mediators i.e. Nitric oxide, that promotes blood flow to get rid of RLS/WED symptoms by activation of vascular compression & also improve venous and lymphatic drainage and decreases ischemia.²⁰ On the note on safety concern, according to recent studies, Patients continued to have poor outcomes after using pneumatic compression devices. Some patients have experienced pain, discomfort, sweating & itching in the compression sleeve.^{21,22}

Near-infrared light: As we know that the range of wavelength of near infra-red light (750-1,000nm) is far greater than visible light (380-740 nm), therefore it penetrates deeply into the dermal layers of skin than IR and improves circulation. The NIR therapy is based on the principle that it activates the enzyme Nitric oxide synthase 3 (NOS-3) and it produces Nitric oxide in the endothelium to improve blood circulation. The results shown in the experimental studies by assessing the heating in underlying tissues at deeper layers of skin (0.5, 1 & 1.5 cm) and found that the increased temperature on the skin surface (approximately 40°C).²⁷ Therefore, NIR is efficacious for RLS.^{28, 29}

TENS: Transcutaneous electrical nerve stimulation (TENS) is the non-invasive electrotherapeutic technique to relieve pain by the application of an electrical current through electrodes placed on the skin.³⁰ Low frequency TENS is well-known as acupuncture TENS by activating A-Delta nerve fibres to release the endorphins for relieving pain.^{31,32} TENS treatment is found to be safe & effective. According to recent case study a treatment of TENS and vibration when applied in combination, it was much more effective.³³

Vibration (Relaxis) Pad: The various sizes of Relaxis pads are available in variable sizes, controller and power supply and RLS/WED patients receive 35-minute therapy cycle. This pad is exclusively known to improve the sleep quality and quality of life.^{34,35} The Relaxis pad is found to be safe & effective. This device is strongly contra indicated in deep venous thrombosis to prevent the free-floating of blood clot.³⁶ Approximately 10% of the patients eventually develop skin irritation

from VRP.³⁷ According to recent Studies concluded that improvement in sleep was remarkably higher in VRP group as compared to sham pad group.^{38,39, 40}

Conclusion

The relaxis pad is the most safe & effective among all these therapeutic devices which are discussed above for the treatment of symptoms of restless legs syndrome.^{41,42,43}

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Ethical Clearance: Nil

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References

1. Tatlow WFT, Restless legs, CMAJ, 1954;71:191–2
2. Ondo WG, Restless Legs Syndrome. In: Jankovic J, Tolosa E (eds), Parkinson's Disease and Movement Disorders, 5th edition, Philadelphia: Lippincott, Williams and Wilkins, 2007; 409–20
3. David B Sommer, Mark Stacy, epidemiology and pathophysiology of restless legs syndrome, Neurology, 2007;4(1)
4. Allen RP, Picchiatti D, Hening WA, et al, Restless legs syndrome: diagnostic criteria, special considerations and epidemiology: A report from the restless legs syndrome diagnosis and epidemiology workshop at the National Institutes of Health, Sleep Med, 2003;4:101–19
5. Garcia-Borreguero D, Larrosa O, de la Llave Y, et al., Correlation between rating scales and sleep laboratory measurements in restless legs syndrome, Sleep Med, 2004;5:561–5.
6. Ali M Bozorg, Selim R Benbadis, Medscape, 2017
7. Winkelman JW, Chertow GM, Lazarus JM, Restless legs syndrome in end-stage renal disease, Am J Kidney Dis, 1996;28:372–8
8. O'Keefe ST, Gavin K, Lavan JN, Iron status and restless legs syndrome in the elderly, Age Ageing, 1994;23:200–203
9. Manconi M, Govoni V, De Vito A, et al., Pregnancy as a risk factor for restless legs syndrome, Sleep Med, 2004;5:305–8
10. Skomro RP, Ludwig S, Salamon E, Kryger MH, Sleep complaints and restless legs syndrome in adult type 2 diabetics, Sleep Med, 2001;2:417–22

11. Mitchell UH. Nondrug-related aspect of treating Ekbom disease, formerly known as restless legs syndrome. *Neuropsychiatr Dis Treat.* 2011;7: 251–257
12. Coccagna G, Vetrugno R, Lombardi C, Provini F. Restless legs syndrome: an historical note. *Sleep Med.* 2004;5:279–283
13. Cardinale M, Wakeling J. Whole body vibration exercise: are vibrations good for you? *Br J Sports Med.* 2005;39(9):585–589; discussion 589
14. Lohman E, Petrofsky J, Maloney-Hinds C, Betts-Schwab H, Thorpe D. The effect of whole body vibration on lower extremity skin blood flow in normal subjects. *Med Sci Monit.* 2007; 13(2): CR71–CR76
15. Games KE, Sefton JM, Wilson AE. Whole-body vibration and blood flow and muscle oxygenation: a meta-analysis. *J Athl Train.* 2015;50(5): 542–549. and augmented muscle blood volume.19
16. Muir J, Kiel DP, Rubin CT. Safety and severity of accelerations delivered from whole body vibration exercise devices to standing adults. *J Sci Med Sport.* 2013; 16(6):526–531
17. Caryn RC, Hazell TJ, Dickey JP. Transmission of acceleration from a synchronous vibration exercise platform to the head. *Int J Sports Med.* 2014;35(4):330–338.
18. Hadi SC, Delparte JJ, Hitzig SL, Craven BC. Subjective experiences of men with and without spinal cord injury: tolerability of the juvent and WAVE whole body vibration plates. *PM R.* 2012;4(12):954–962
19. Manfredini F, Malagoni AM, Felisatti M, et al. Acute oxygenation changes on ischemic foot of a novel intermittent pneumatic compression device and of an existing sequential device in severe peripheral arterial disease. *BMC Cardiovasc Disord.* 2014; 14:40
20. Sun D, Huang A, Recchia F, et al. Nitric oxide-mediated arteriolar dilation after endothelial deformation. *Am J Physiol Heart Circ Physiol.* 2001; 280:H714–H721
21. Manfredini F, Malagoni AM, Felisatti M, et al. Acute oxygenation changes on ischemic foot of a novel intermittent pneumatic compression device and of an existing sequential device in severe peripheral arterial disease. *BMC Cardiovasc Disord.* 2014; 14:40
22. Moore K, Nichols-Willey J, Orlosky-Novack J. Enhancing patient outcomes with sequential compression device therapy. *Am Nurse Today.* 2013;8(8). Available from: <http://www.americannursetoday.com/enhancing-patient-outcomes-with-sequential-compression-device-therapy/>. Accessed August 25, 2015
23. Eliasson A, Lettieri C. Sequential compression devices for treatment of restless legs syndrome. *Medicine.* 2007;86(6):317–323.
24. Rajaram S, Shanahan J, Ash C, Walters A, Weisfogel G. Enhanced external counter pulsation (EECP) as a novel treatment for restless legs syndrome (RLS): a preliminary test of the vascular neurologic hypothesis for RLS. *Sleep Med.* 2005;6:101–106
25. Rajaram S, Rudzinskiy P, Walters A. Enhanced external counter pulsation (EECP) for restless legs syndrome (RLS): preliminary results in a parallel double-blind study. *Sleep Med.* 2006;7:390–391
26. Matsunga K, Furchgott R. Interaction of light and sodium nitrite in producing relaxation of rabbit aorta. *J Pharmacol Exp Ther.* 1989;248(2): 687–695. Buga G, Gold M, Fukuto J, Ignarro L. Shear stress induced release of nitric oxide from endothelial cells grown on beads. *Hypertension.* 1991; 17:187–193).
27. Mitchell UH, Johnson AW, Myrer JW, Hager RL, Eggett DL. A randomized single-blind controlled trial comparing two monochromatic near-infrared light devices: implications for tissue heating and safety. *Am J Phys Med Rehabil.* 2012;91(9):789–796.
28. Mitchell UH, Myrer JW, Johnson AW, Hilton SC. Restless legs syndrome and near-infrared light: an alternative treatment option. *Physiother Theory Pract.* 2011;27(5):345–351
29. Guffey JS, Motts S, Barymon D, et al. Using near infrared light to manage symptoms associated with restless leg syndrome. *Physiother Theory Pract.* 2015.
30. DeSantana JM, Walsh DM, Vance C, Rakel BA, Sluka KA. Effectiveness of transcutaneous electrical nerve stimulation for treatment of hyperalgesia and pain. *Curr Rheumatol Rep.* 2008; 10(6):492–499
31. DeSantana JM, Walsh DM, Vance C, Rakel BA, Sluka KA. Effectiveness of transcutaneous electrical nerve stimulation for treatment of hyperalgesia and pain. *Curr Rheumatol Rep.* 2008; 10(6):492–499

32. Basbaum AI, Fields HL. Endogenous pain control mechanisms: review and hypothesis. *Ann Neurol.* 1978;4(5):451–462
33. Pallett EJ, Rentowl P, Johnson MI, Watson PJ. Implementation fidelity of self-administered transcutaneous electrical nerve stimulation (TENS) in patients with chronic back pain: an observational study. *Clin J Pain.* 2014;30(3):224–231
34. Burbank F, Buchfuhrer M, Kopjar B. Sleep improvement for restless legs syndrome patients. Part I: pooled analysis of two prospective, double-blind, sham-controlled, multi-center randomized clinical studies of the effects of vibrating pads on RLS symptoms. *J Parkinsonism Restless Legs Syndrome.* 2013;2013(3):1–10
35. Melzack R, Wall PD. Pain mechanisms: a new theory. *Science.* 1965; 150:971–979
36. Stop your restless legs symptoms; 2015. Available from: <http://myrelaxis.com/us/>. Accessed August 27, 2015
37. Burbank F, Buchfuhrer M, Kopjar B. Improving sleep for patients with restless legs syndrome. Part II: meta-analysis of vibration therapy and drugs approved by the FDA for treatment of restless legs syndrome. *J Parkinsonism Restless Legs Syndrome.* 2013;3:11–22
38. DeSantana JM, Walsh DM, Vance C, Rakel BA, Sluka KA. Effectiveness of transcutaneous electrical nerve stimulation for treatment of hyperalgesia and pain. *Curr Rheumatol Rep.* 2008; 10(6):492–499
39. Basbaum AI, Fields HL. Endogenous pain control mechanisms: review and hypothesis. *Ann Neurol.* 1978;4(5):451–462
40. Guieu R, Tardy-Gervet MF, Blin O, Pouget J. Pain relief achieved by transcutaneous electrical nerve stimulation and/or vibratory stimulation in a case of painful legs and moving toes. *Pain.* 1990;42(1):43-48.
41. Kushida C, Allen R, Atkinson M. Modeling the causal relationship between symptoms associated with restless legs syndrome and the patient-reported impact of RLS. *Sleep Med.* 2004;5:485–488
42. Allen RP, Kosinski M, Hill-Zabala CE, Calloway MO. Psychometric evaluation and tests of validity of the Medical Outcomes Study 12-item Sleep Scale (MOS sleep). *Sleep Med.* 2009; 10(5):531–539
43. Burbank F, Buchfuhrer M, Kopjar B. Sleep improvement for restless legs syndrome patients. Part I: pooled analysis of two prospective, double-blind, sham-controlled, multi-center randomized clinical studies of the effects of vibrating pads on RLS symptoms. *J Parkinsonism Restless Legs Syndrome.* 2013;2013(3):1–10

Awareness of Forensic Odontology among Legal Professionals: An Institutional Study

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Abstract

Forensic odontology deals with victim identification and providing evidence in criminal cases by analyzing the dentition of deceased. Human dentition remains a vital tool for identification of the deceased individual. Forensic odontology has evolved as a new ray of hope but, this vital and integral field of forensic medicine is still in a state of infancy in India. Hence, the aim of this survey is to find the level of awareness and value of forensic odontology among the legal professionals. Questionnaire was conducted among the legal professionals in private institution in Chennai which comprised of 14 questions related to knowledge in forensic odontology, application of its technique, law pertaining to dentistry and in handling of forensic cases in their practice. From the present study, it is evident that there was lack of awareness on forensic odontology among legal professionals which reflects the current situation of our country.

Keywords: Forensic Science, Legal Professionals, Forensic odontology, Knowledge, Lawyers, Forensic medicine.

Introduction

In today's world, crimes are becoming more sophisticated. Hence a branch of science which deals with the improvement in method and procedures used in solving criminal cases is the need of the hour. Such a branch exists and it is termed as forensic medicine. Forensic medicine applies science and technology for the detection and investigation of crimes and the administration of justice. According to Keiser-Nielson, forensic odontology is a branch of forensic medicine that deals with the proper handling, examination and presentation of dental evidence in the best interest of

justice. [1] Their main aim includes identification of a dead individual by assessing, comparing their anti-mortem and post-mortem dental records, identifying the criminal after analysis of bitemarks on the victim's body and is being considered as a specialist in a court of law.

Forensic odontology is of utmost importance because teeth are considered as an important biological evidence due to their resistance to any type of damage. This along with the fact that every human dentition is morphologically unique improves their validity as a powerful evidence. Similarly, dental procedures done on a patient serve as a single biggest contributor for identification, as every dental procedure done in patient is unique, making it the key to enabling identification of the dead. [2],[3]

Dental identification has been a vital tool for identifying deceased individuals since 66 AD. [4],[5],[6] The first case that was accepted in a court of law was in the year 1849. Forensic odontology was very useful in identifying dead bodies of major historical figures like Adolf Hitler, [7] and Jai Chand. [8] Also it was used in providing evidence for the first time in the Indian history of criminal prosecution in India, leading to the death

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sentences of the accused in the infamous Delhi gang rape case.^[8] There are cases in which the victim's body is disfigured beyond recognition especially in cases of fires, automobile accidents and violent homicides. In these cases, human dentition remains a vital tool for identification of the deceased individual.

Recently, forensic odontology has evolved as a new ray of hope in assisting forensic medicine, but, this vital and integral field of forensic medicine is still in a state of infancy in India.^[9] This is because India lacks many institutions offering specialized training in forensic odontology. This leads to a decrease in job opportunities which leads to decrease in the scope of the field. Also, tampering of evidence at the crime scene, lack of proper equipment for analysis of the evidence collected and a general disregard for rules and protocols further push the field away from being in the mainstream.

In India, every legal professional has to have a major understanding of forensic odontology as this enables them to solve high profile cases with the co-ordination of a forensic odontologist. Therefore, the aim of this survey was to evaluate and analyze the level of awareness of forensic odontology among the legal professionals of private institution in Chennai, Tamil Nadu, India.

Materials and Method

Study design and participants: A pre-validated questionnaire was distributed to 34 lawyers in a private institution, Chennai. Both male and female lawyers were included in this study. The questions were framed to evaluate and analyze the level of awareness of forensic odontology among these lawyers. An informed consent was obtained from the participants before taking part in the survey.

Questionnaire design: The questionnaire had a set of 14 questions. The first part of the questionnaire consisted of the demographic's details including name, gender, age, specialty and work experience. The second part comprised of questions related to knowledge in forensic odontology, application of its technique, law pertaining to dentistry and in handling of forensic cases in their practice. The questions on knowledge on forensic odontology included whether or not they were aware of forensic odontology, whether the lawyers knew that forensic odontology was a part of forensic medicine, whether forensic dentistry play a role in victim/deceased and criminal identification in criminal and civil cases, whether teeth can be used as a tool of identification,

whether gender determination can be done with the help of teeth & facial bones and whether age estimation in children can be done by examining teeth. The application of forensic odontological techniques includes DNA analysis with the help of the tooth, bitemark analysis, lip print analysis and rugae analysis. The data was collected, analysed manually and graphs were plotted according to the result gained.

Questionnaire:

1. Have you heard of the term forensic odontology? (Yes/No)
2. Forensic odontology/dentistry is a branch of forensic medicine? (Yes/No)
3. Does Forensic dentistry play a role in victim/deceased & criminal identification in criminal and civil cases? (Yes/No)
4. Have you encountered any cases involving forensic odontology? (Yes/No)
5. Do you know that teeth can be used as a tool of identification? (Yes/No)
6. Gender determination can be done with the help of teeth & facial bones? (Yes/No)
7. Can age estimation in children be done by examining teeth? (Yes/No)
8. Can teeth serve as a source of DNA? (Yes/No)
9. Do you think bite marks analysis can be used for assessing a criminal scene? (Yes/No)
10. Are you aware of lip print analysis? (Yes/No)
11. Are you aware of rugae analysis? (Yes/No)
12. Does the court of law accept the statement of dentist as an expert witness involving civil and criminal cases? (Yes/No)
13. Dental jurisprudence is the application of principles of law to practice of dentistry (Yes/No)
14. Loss or fracture of tooth is a grievous injury under IPC 320 clause 7 (5) (Yes/No)

Result

A total of 34 individuals participated in the study and the response rate was 100%. The study group comprised of lawyers in the age group between 23-68 years. Males comprised 32% while females comprised of 68% of the total. Lawyers between the second and

third decade of age comprised of 56%, between the third and fourth decade of age comprised of 18% and more than fourth decade accounted for 26%. Depending on the field of specialty, 3% were in criminal law, 18% in civil law, 71% in both criminal and civil law and 9% had

a specialty in other fields of law. The practitioners with less than 10 years of experience included in the study were 71% while 29% practitioners included in the study had more than 10 years of experience (Figure 1).

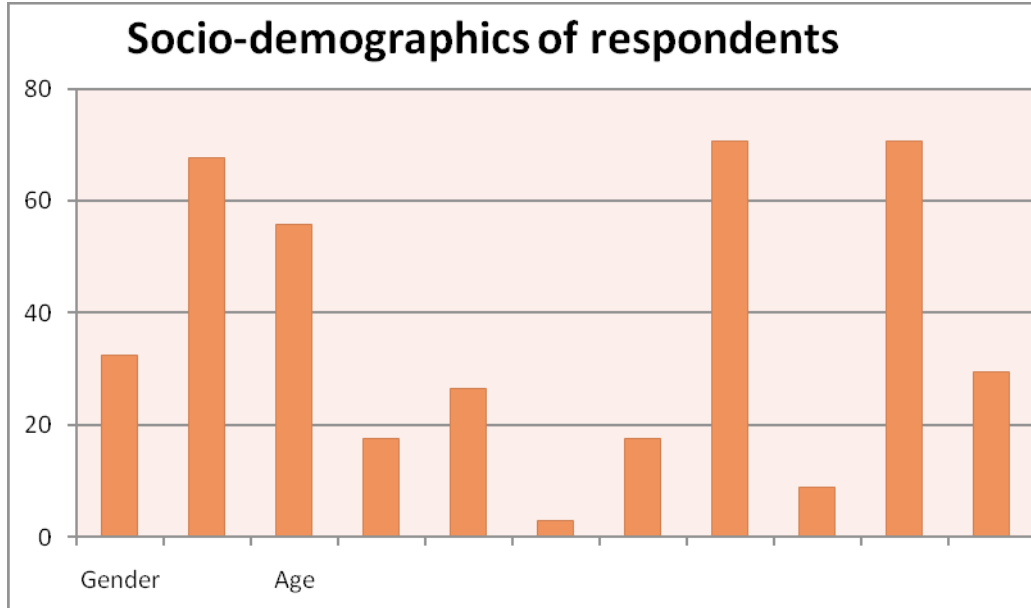


Figure 1: Socio-demographics of respondents

Lawyers aged between the second and third decade had more knowledge regarding forensic odontology as a part of forensic medicine, handled cases, understood teeth as a tool for identification, bite mark analysis and

lip print analysis when compared with those lawyers between 30-40 years and lawyers aged more than 40 years. Among the lawyers above fourth decade of age, 7.7% of them were aware of rugae analysis (Figure 2).

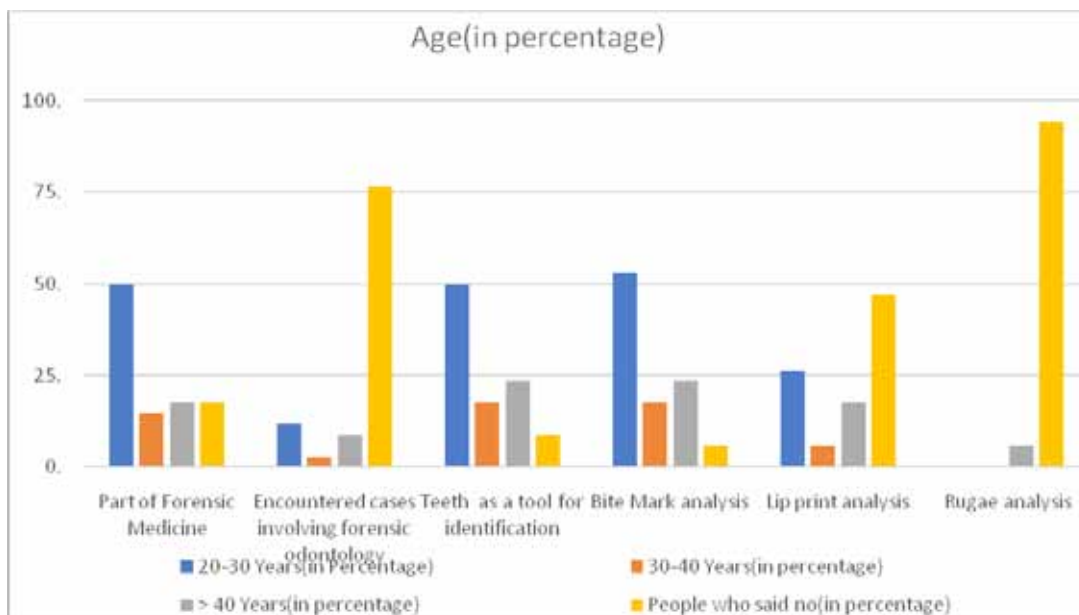


Figure 2: Awareness of forensic odontology related to Age

Awareness of knowledge about the term forensic odontology, role of forensic odontology in criminal or deceased identification, teeth as a tool of identification,

gender determination with teeth & facial bones and teeth as a tool for age estimation was more among the female lawyers in the study (Figure 3).

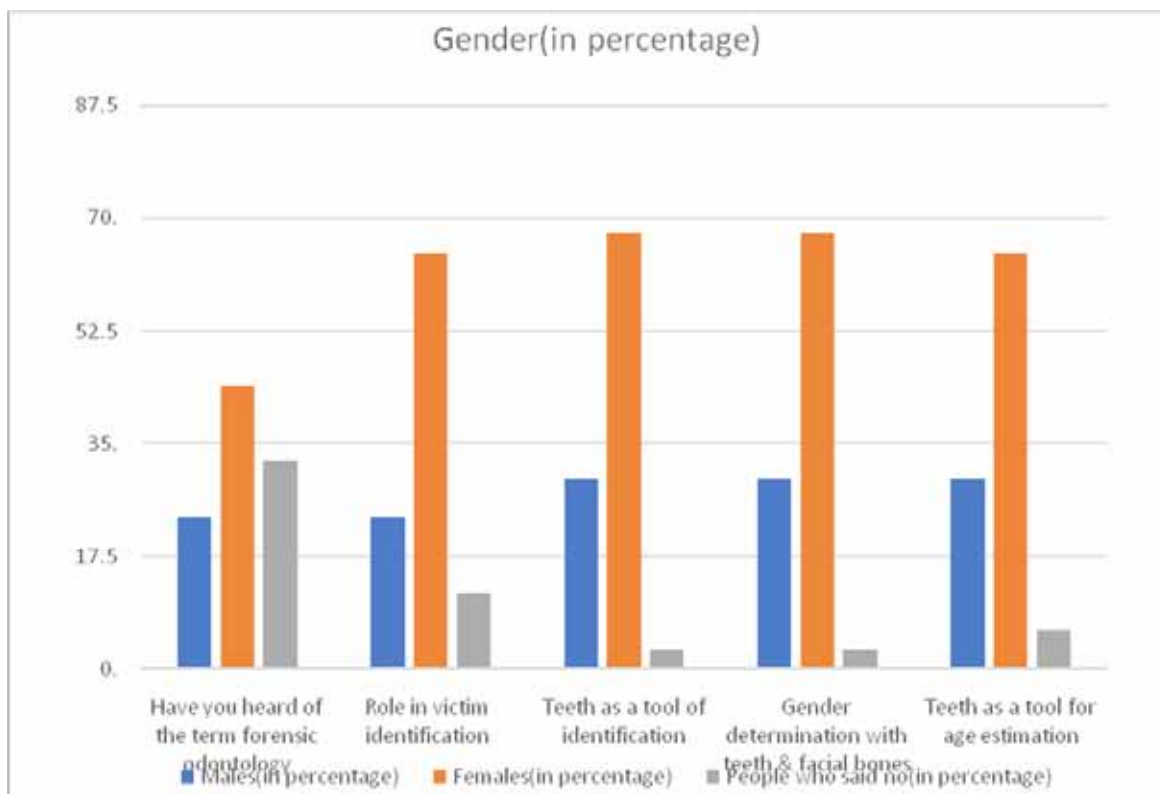


Figure 3: Awareness of forensic odontology related to gender

Lawyers, who had less than 10 years of experience, had more knowledge regarding forensic odontology as a part of forensic medicine, role in criminal/victim deceased identification, teeth as a tool for identification, gender determination using teeth and facial bones and teeth as a tool for age estimation. They even had more

knowledge regarding the availability of DNA from teeth. Equal number of lawyers with more than 10 years of experience and less than 10 years of experience have dealt with cases involving forensic odontology. (Figure 4).

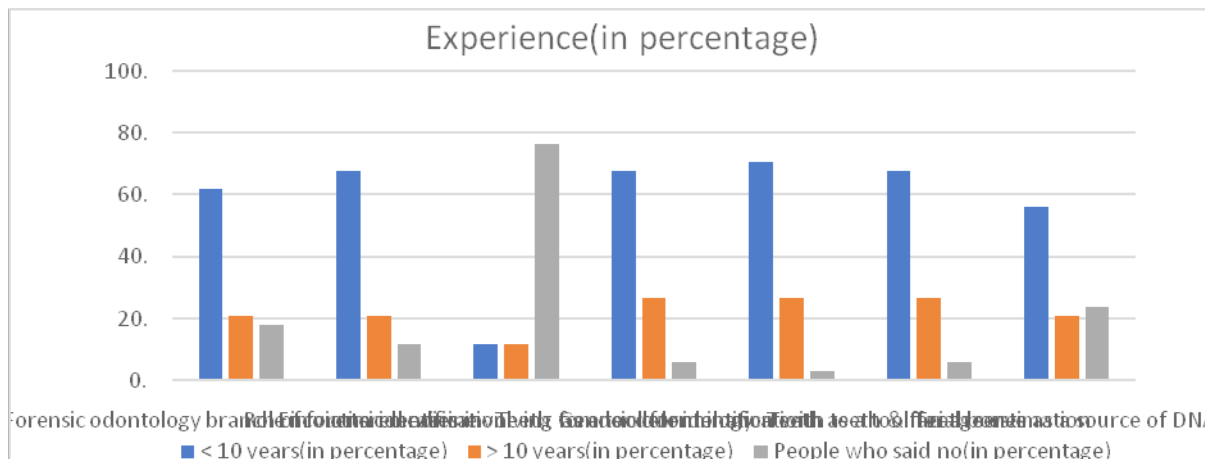


Figure 4: Awareness of forensic odontology related to Experience

The lawyers practicing in both civil and criminal cases were more aware of bite mark, lip print analysis, rugae analysis, dentist as expert witness in a court of

law, dental jurisprudence and loss or fracture of tooth is a grievous injury under IPC clause 7 (5). (Figure 5).

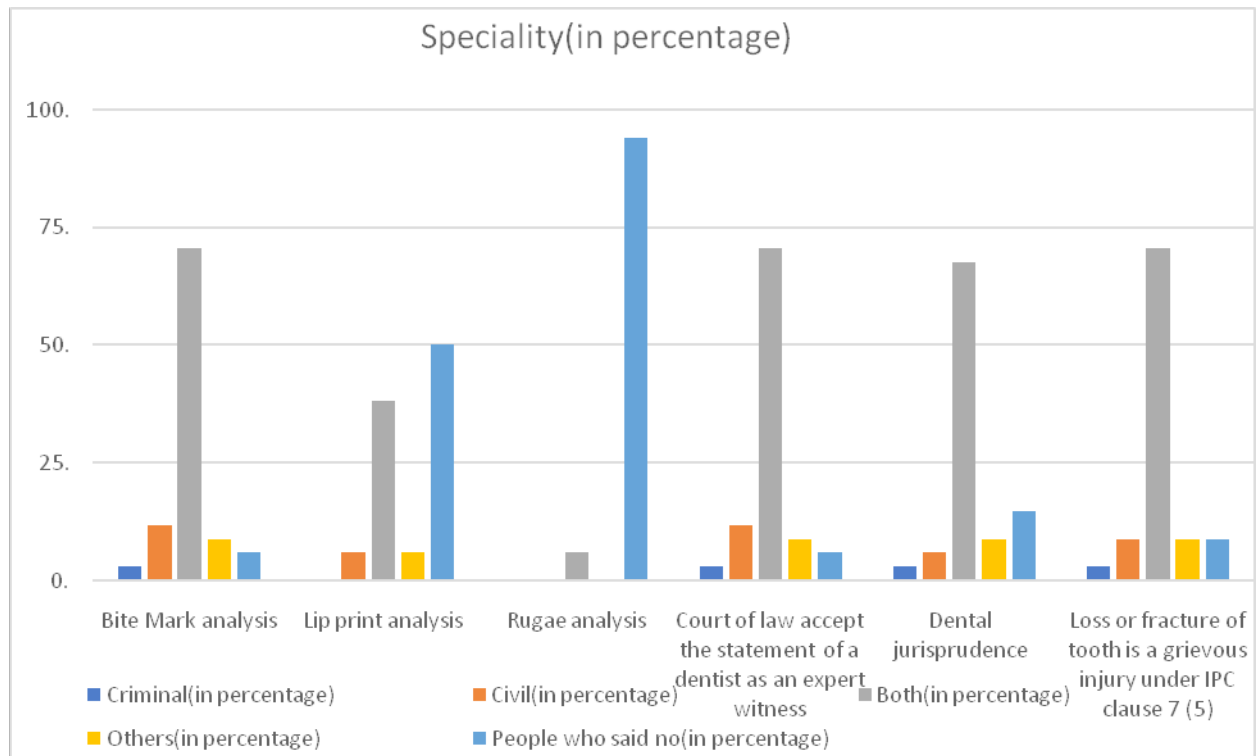


Figure 5: Awareness of forensic odontology related to Specialty

Discussion

Forensic odontology has a key role in identification of persons in mass disasters for example, aviation, earthquakes or tsunamis, crime investigations and identification of decomposed and disfigured bodies like that of drowned persons, fire victims and victims of motor vehicle accidents.^{[10],[11]} Forensic odontologists play a significant role through the examination of anatomical structures, dental appliances and dental restorations. Teeth and the associated structures have a major role in forensics, from 66AD to the current cases.^[4] Forensic odontology has been gaining recognition in the world in a rapid momentum but its growth is still stagnant in India.

Although we are well prepared to deal with our patients' medical needs, we are less aware of their forensic and legal needs. Often these additional aspects of patient care are overlooked. Of note is that "their legal issues" may ultimately become "our legal issues." A consequence of inadequate preparation to deal with

forensic issues is that many physicians are intimidated by them. Such intimidation can lead to avoidance, which confounds the problem. Common misperceptions do little to help the situation.^[12]

It is necessary for a lawyer to have the knowledge required for dealing with cases involving forensic sciences as investigations play a very important role in any criminal case. In our present study, 97% knew about estimation of age and 94% knew about gender determination using teeth and facial bones. A similar study done by Selvajothi *et.al* showed that 91% lawyers knew about estimation of age and 76% knew about gender determination.^[11] Another study done by Bhaskar *et.al* showed that majority of the advocates were aware of bite mark analysis in all the groups of years of experience which increased with increase in years of experience with almost 66% of the advocates with 35-41 years of experience. Advocates with the superlative years of experience were furthermore aware of both rugae and lip mark analysis when equated to the other groups.^[13]

Similarly, dentists also have the responsibility of knowing about the subject in detail. A study done by Almutairi *et.al* showed that dentists had high level of knowledge on most of the important aspects of forensic dentistry, which are investigations of physical violence, estimation of individuals' age and bite-mark analyses but dentists had knowledge deficiencies that were mainly related to the significance of forensic odontology on other aspects such gender discrimination and child-neglect investigations.^[14] According to a study done by Avon *et.al*, a forensic dentistry plays a major role in identification of those individuals who cannot be identified visually or other means. The unique nature of our dental anatomy and the placement of custom restorations ensure accuracy when the techniques are correctly employed.^[15]

Lawyers in the second to third decade of age, who were specialized in both criminal and civil law were aware of bite mark analysis. Lawyers in the second to third decade of their age and who were specialized in both criminal and civil law were aware of lip print analysis. Only lawyers in the second to third decade of their age, who were specialized in both criminal and civil law were aware of rugae analysis. Lawyers having experience below 10 years of age were aware that teeth can be used as a source of DNA.

Legal professionals who lack knowledge of forensic odontology will be unable to competently assess and handle scientific evidence and hence the pursuit of justice can be seriously hampered potentially, leading to factual errors.^[16] Currently, the law curriculum does not include forensic odontology as a subject. Just the basic knowledge of forensic odontology to lawyers can be beneficial to them for solving cases independently regarding this subject.

Conclusion

From the present study, it is evident that there was lack of awareness on forensic odontology among legal professionals which reflects the current situation of our country. A sound basic knowledge on forensic odontology and its applications in the court of law is mandatory for legal professionals to provide unbiased justice.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: The study was approved by the Institutional Review Board.

Références

1. Keiser-Nielsen S. Forensic odontology. *Int Dent J*. 1968; 18:668-83.
2. Rathod V, Desai V, Pundir S, Dixit S, Chandraker R. Role of forensic dentistry for dental practitioners: A comprehensive study. *J Forensic Dent Sci*. 2017;9:108-9.
3. Furness J. A general review of bite-mark evidence. *Am J Forensic Med Pathol*. 1981;2:49-52.
4. Chandra Shekar BR, Reddy CV. Role of dentist in person identification. *Indian J Dent Res* 2009;20:356-60.
5. Rahman J, Routray S, Mishra SS, Mohanty I, Mohanty N, Sukla N. Knowledge, awareness and practice of forensic odontology among dental surgeons in Bhubaneswar, India. *J Unexplored Med Data* 2017;2:26-33.
6. Preethi S, Einstein A, Sivapathasundharam B. Awareness of forensic odontology among dental practitioners in Chennai: A knowledge, attitude, practice study. *J Forensic Dent Sci*. 2011;3:63-6.
7. Riaud X (2014) Dental Identifications of Adolf Hitler and Eva Braun. *J Dent Probl Solut* 1(1): 006-010.
8. Balachander N, Babu NA, Jimson S, Priyadharsini C, Masthan KM. Evolution of forensic odontology: An overview. *J Pharm Bioallied Sci*. 2015;7(Suppl 1):S176-80.
9. Bagi BS. Role of forensic odontology in medicine. *J Indian Dent Assoc*. 1977;49:359-63.
10. Kavitha B, Einstein A, Sivapathasundharam B, Saraswathi TR. Limitations in forensic odontology. *J Forensic Dent Sci*. 2009; 1:1.
11. Selvajothi P, Lavanya C, Joshua E, Rao UK, Ranganathan K. Awareness of forensic odontology among legal professionals, Chennai, India. *N Am J Med Sci*. 2014;6:553-7.
12. Ryan MT. Clinical forensic medicine. *Ann Emerg Med*. September 2000;36:271-273.
13. Bhaskar, Varsha & V Bharathwaj, V & Manipal, Sunayana & Prabu, D and Rajmohan & A H Harini, Priya. (2018). An Insight into the Forensic Cognizance among advocates. 16-22.

14. Adel F. Almutairi, Bayan A. Alkhtheri, Hattan N. Aleidan, Asma A. Alhabib, Eid A. Alotaibi, Mahmoud Salam. Examining the perceived versus the actual knowledge about forensic odontology: A cross-sectional survey among dentists. *Clin Exp Dent Res*. 2018 Dec; 4(6): 297–304.
15. Avon SL. Forensic odontology: The roles and responsibilities of the dentist. *J Can Dent Assoc*. 2004;70:453-8.
16. McCartney C, Cassella J. When science doesn't meet the law: Addressing the absence of forensic skills in law degrees. *New Dir*. 2008;4:1-4.

Assessment of Level of Anxiety among Diabetes Mellitus Patients in Selected Tertiary Hospital in Kelambakkam, Kanchipuram District, Tamil Nadu, India

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Abstract

The objectives were to assess the level of anxiety among diabetes mellitus patients and to associate the level of anxiety with demographic variables among diabetes mellitus patients. The convenience sampling was used to select 73 diabetes mellitus patients. The data collected tools were validated and reliability was established. The data were collected by Hamilton anxiety rating scale. The collected data was Tabulated and Analyzed. Descriptive and Inferential statistical method were used. The study showed that maximum diabetes patients were above 60 years (34%); Majority of the patients were females (58%); Majority of the diabetes patients were moderate workers (37%); Majority of the patients were married (86%); Majority of the diabetes patients were duration of diabetes 1-3 years (48%); Majority of the diabetes patients not worried about health condition; But (48%) of the patients says that they worried about complication (43%). The study showed that 48% of diabetes patients have mild anxiety, 36% of diabetes patients have mild to moderate anxiety 16% of diabetes patients have moderate to severe anxiety. It showed that there is no significant association between level of anxiety among diabetes patients with selected demographic variables like age ($\chi^2=5.635$), gender ($\chi^2=2.105$), occupation ($\chi^2=3.969$), marital status ($\chi^2=5.671$), duration of diabetes ($\chi^2=0.263$). There is significant association between level of anxiety among diabetes mellitus patients with selected demographic variables like Are you worried about the health condition ($\chi^2=8.68$)

Keywords: Level of anxiety, patients with diabetic mellitus.

Introduction

In India 69.2 millions peoples living with diabetes 2015. Nearly 98 million people in India may have type 2 diabetes by 2030¹. Anxiety disorders are common among patients with diabetes and appear to recur in a substantial proportion of cases. The presence of generalized anxiety

disorders is associated with poorer glucose control and the increased report of clinical symptoms of diabetes.²

Patients with diabetes are twice exposed to the risk of psychiatric diseases compared to the normal population. Diabetes is metabolically active disease which can influence the psychological state. One of the most common and significant psychological problem faced now-a-days is anxiety³.

Anxiety is 'being afraid' and occurs as a result of danger. Anxiety turns to disorder when a person becomes physically, psychologically or emotionally symptomatic, fearful or distraught because of it. If it does became a disorder, it can reversed.

Anxiety is not only something which is genetically inherited or an illness which can be contracted.

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Essentially people with anxiety live more stressfully and fear fully than others and as a result the body produces symptoms of stress or 'anxiety symptoms'⁴.

Diabetes is the rapid gaining status in India, more than 62 millions of individuals currently diagnosed with diabetes in 2000, India (31.7million) top the word with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7million) is in second and third place respectively⁵.

There are over 100 symptoms of anxiety. Each person have unique chemical make up so the type, number, intensity and frequency of anxiety symptoms will vary from person to person. For example, one person have just one mild anxiety symptom, whereas another may have all anxiety symptoms and to greater severity⁶.

Hamandmaqsood, Hassan Abdullah shakes (2017) conducted study to evaluate the anxiety levels among diabetics (Insulin users versus non-insulin users) along with its relation to certain demographic factors like age, sex, education, type of medication and medication compliance IN this study, 170 (91%) had type 2 diabetes while 17 (9%) suffered from Type 1 Diabetes. 66.66% of the patients in the sample were insulin users while 34.34% were non-insulin users. The overall mean anxiety level in insulin users have 24.55 and non-insulin users have 23.92. Study showed a high prevalence of anxiety levels in insulin users as compared to non-insulin users. Strine et al. (2006) reported that smoking, physical inactivity, obesity and heavy drinking are significantly associated with lifetime diagnosis of anxiety; these behaviors are known to increase diabetes risk⁷.

Statement of the Problem: Assessment of level of anxiety among diabetic mellitus patient in selected tertiary hospital in Kelambakkam, Kanchipuram District, Tamil Nadu, India.

Objectives:

To assess the level of anxiety among diabetes mellitus patients.

To associate the level of anxiety with demographic variables among diabetes mellitus patients.

Operational Definition:

Assess: In this study it refers to a systematic way of identification of level of anxiety among patient with diabetes mellitus by using Hamilton anxiety rating scale.

Anxiety: Anxiety is an emotion characterized by feeling of tension, worried thoughts & physical changes like increased blood pressure. People with anxiety disorder usually have recurring intrusive thoughts or concern. They may avoid certain situation out of worry.

Level of Anxiety: The level of anxiety by Hamilton Anxiety Rating Scale.

Mild anxiety - <17.

Mild to Moderate anxiety - 18 to 24.

Moderate to Severe anxiety - 25 to 30.

Diabetes Mellitus Patients: Diabetes mellitus is a long term metabolic disorder that is characterized by high blood sugar, insulin resistance and relative lack of insulin.

Materials and Method

A Quantitative approach with descriptive design was used in the study. The study was conducted in tertiary hospitals. A purposive sampling technique was used to select 73 samples with following inclusion criteria. Patients with diabetic mellitus who are willing to participate in the study, who all available during the time of the study and patients who can understand Tamil or English language.

Patient with known history of severe or long term psychiatric illness and patients who are having gestational diabetes mellitus were excluded from the study. Self structured administered questionnaire was used to elicit demographic variables and Hamilton Anxiety Rating Scale was used to assess level of anxiety among patients with diabetic mellitus and the score was interpreted as follows <17 mild; 18-24 mild to moderate; 25-30 moderate to severe.

Finding and Discussion

Frequency and percentage distribution of demographic variables of patients with diabetes mellitus.

Majority 25(34%) were in the age group of above 60 years, 42(58%) were female, 27(37%) were occupation, 63(86%) were married, duration of diabetes 35(48%) were 1-3 years, Are you worried about health condition 38 (52%) belongs to the no option. In that yes category 15(43%) of the patients worried about complication.

Table 1 Mean, Standard deviation of level of anxiety among diabetes mellitus patients.

Level of Anxiety	Frequency	Percentage	Mean	Standard Deviation
Mild	35	48%	18.60	6.50
Mild to Moderate	26	36%		
Moderate to severe	12	16%		

Association of level of anxiety among diabetes mellitus patients with demographic variables: The chi square association revealed there is no significant association between level of anxiety among diabetes patients with selected demographic variables like age ($\chi^2=5.635$), gender ($\chi^2=2.105$), occupation ($\chi^2=3.969$), maritalstatus ($\chi^2=5.6$) duration of diabetes ($\chi^2=0.263$). There is significant association between level of anxiety among diabetes mellitus patients with selected demographic variables like Are you worried about the health condition ($\chi^2=8.68$).

Conclusion

On the basis of conducted research it can be concluded the assessment of level of anxiety among diabetes patients as an importance in determination of early prompt treatment. Further study can focus on the intervention that will helps to reduce anxiety among diabetes mellitus patients.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 4/02/2019.(Proposal No:323/IHEC/1-19).

References

1. Latest News, Breaking News Today - Bollywood, Cricket, Business, Politics - IndiaToday [Internet]. India Today. 2019 [cited 1 July 2019]. Available from: <http://www.indiatoday.in>
2. National Center for Biotechnology Information [Internet]. Ncbi.nlm.nih.gov. 2019 [cited 29 June 2019]. Available from: <http://www.ncbi.nlm.nih.gov>
3. Maqsood H, Shakeel H, Khan A, Ali B, Shah S. The descriptive study of anxiety levels among diabetics: insulin users versus non-insulin users. International Journal of Research in Medical Sciences. 2017;5(7):3204.
4. [Internet]. Iddtinternational.org. 2013 [cited 1 July 2019]. Available from: <https://www.iddtinternational.org/wp-content/uploads/2016/02/carbohydrates.pdf>
5. National Center for Biotechnology Information [Internet]. Ncbi.nlm.nih.gov. 2019 [cited 29 June 2019]. Available from: <http://www.ncbi.nlm.nih.gov>
6. Google Books [Internet]. Books.google.co.in. 2019 [cited 29 June 2019]. Available from: <http://books.google.co.in>
7. Maqsood H, Shakeel H, Khan A, Ali B, Shah S. The descriptive study of anxiety levels among diabetics: insulin users versus non-insulin users. International Journal of Research in Medical Sciences. 2017;5(7):3204.

Assessment of Psychosocial Problems among College Students in Selected Educational Institution, Kancheepuram District, Tamil Nadu

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Abstract

Assessment of Psychosocial Problems Among College Students in Selected educational institute, Kancheepuram District, Tamil Nadu. Aim of the study is to assess the prevalence of psychosocial problems among college students. Objectives of the study to assess the level of psychosocial problems among college students, to find out the association between the level of psychosocial problems with their selected demographic variables. Non experimental descriptive design used for this study. The samples were selected by using convenient sampling 120 college students from selected educational institution. Self structured demographic questionnaire used to assess the demographic variables and Standardised General Health Questionnaire (GHQ-28) used to assess the level of psychosocial problems in college students.

Data collected from 01-04-2019 to 06-04-2019. The data collected from 120 college students (Girls and Boys) in the age group between 18 to 22 years in selected Educational institution. Dhanalakshmi Srinivasan Engineering College (Pooncheri), Tamil Nadu. The study result shows psychosocial problems among college students 8 (6.6%) have faced somatic symptoms, 62 (51.6%) anxiety/insomnia, 97 (80.83%) social dysfunction and 79 (65.83%) severe depression.

Study shows that there was significant association between the level of psychosocial problems faced by college students with occupation status of parents, education status of parents, average family income and any history of mental illness (p value =<0.05).

Keywords: Assess, Psychosocial Problems, somatic symptoms, anxiety/insomnia, social dysfunction, severe depression.

Introduction

College is a new space and time period for the students-most of them in the late adolescent age, physically getting mature and psychologically unstable.

During this period students are undergoing confusion and ambivalence. There will be a lot of opportunities and challenges available in that colleges. This may lead to some competitions or conflict among the students and within the student. The unhealthy levels of stresses can have the capacity to hinder the students abilities to socialize and achieve the academic goals.⁽¹⁾

College students can easily feel anxious trying to balance studies, work, friends and family while also trying to figure out the rest of their lives. In India there are 3300 engineering colleges, Tamil Nadu there are 552 engineering colleges, 17 engineering colleges in Kancheepuram and 6 colleges in Kelambakkam. Among

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these colleges, Anxiety disorders are one of the most common mental health problems on college campuses. 41.6% stated anxiety as the top presenting concern among college students.

Narman David Nsereka, (2017) conducted a study on, Evaluation of psychosocial problems among African university students in Uganda, Development and validation of a screening instruments. The psychometrically sound psychosocial instrument used to identify psychosocial problems among university students. The resulting 17 item university students evaluation of psychosocial problems (USEPP) scale was interpreted as a multidimensional measure of psychosocial problems namely, emotional problems, trauma experience, antisocial behaviour and academic problems among university students. USEPP cut off point was established at 18 and it reported sensitivity at 99.1% (95%CI=95-100), specificity at 98.03% (95%CI=96-99). Area Under Curve (AUC)=0.997. It has an internal consistency of 0.81. If was validated with HSCL -10 a psychological distress instrument.⁽²⁾

The Report on workforce need in India (2001) Vaibhav Jain, documented that throughout the 20th century, many reports addressed the magnitude of the emotional, behavioral and developmental problems in the nation's children, adolescents and their families. Consistently, these reports stated that 16-20% of the population of children and adolescents had some psychosocial disturbance; 4-7% suffered significant functional impairment. All these psycho-social problems include conduct disorders, educational difficulties, depression, anxiety, substance abuse, psychosomatic disorders, delinquency, truancy, insomnia, fatigue, antisocial behaviors and low self-esteem.⁽³⁾

MUMBAI: Malathy Iyer (February 25, 2017) As per Times of India, Not only do 56 million Indians - or 4.5% of Indian's population suffer from Depression at this moment, another 38 million Indians suffer from Anxiety disorders. Thus, according to latest World Health Organization report on Depression. Almost 7.5% of Indians suffer from major or minor mental disorders that require expert interventions.⁽⁴⁾

Half of lifetime mental disorders begin before the age of 14 years and 75% begin by the age of 24 years (4,5). In developing countries, such as Nepal and south Asian countries, scenario of mental health and its care system is worse than compare to developing countries. Similarly

lack of mental health-related evidence in Nepalese context; available evidence from hospital settings does not represent the situation accurately and this situation highlights lack of serious effect on adolescent health. In the Indian context, 14-45% of adolescent students are assumed to have mental health problems.⁽⁵⁾

Statement of the problem: Assessment of Psychosocial Problems among college students in selected educational institution, Kancheepuram District, Tamil Nadu.

Aim: To assess the prevalence of psychosocial problems among college students.

Objectives:

1. To assess the level of psychosocial problems among college students
2. To find out the association between the level of psychosocial problems with their selected demographic variables.

Operational Definition: Psychosocial problems refers to person's welfare, happiness, advantages, interest, utility and quality of life.

Assess: Refers to assessment of psychosocial problems among college students by using General Health Questionnaire (GHQ-28).

Psychosocial Problems: Psychosocial problem include the broad spectrum of everything that is not strictly medical-somatic. They affect the functioning of the patient in daily life and concern is environment and/or biography.

College Students: It refers to students who undergoing under-graduate program in educational institute.

Materials and Method

Research Approach: Quantitative research approach.

Research Design: Non experimental, Descriptive research design.

Research Setting: The study was conducted in selected Educational Institution, Kancheepuram District, Tamil Nadu.

Population: Undergraduate students of selected Educational Institution, Kancheepuram District, Tamil Nadu.

Sample Size: The technique will be used,

$$n = \frac{DEFF * NP [1-P]}{[(d^2/z^2 1-\alpha/2 *(N-1)+p*(1-p)]}$$

n=120 samples

Subject Selection: Convenient sampling.

Inclusion Criteria:

- Both male and female students.
- Students who are willing to participate in this study.

Exclusion Criteria:

- Who are absent during data collection period.
- Students with existing mental illness.

Tool Description:

Section-A: Self structured demographic questionnaire.

Section-B: Standardised General Health Questionnaire (GHQ-28)

Data Collection Procedure: In this present study the researcher will obtain written consent from the samples. The sample were instructed to fill the data. Each sample will take 30 min for completion of their data. Data collection for the period of 1 week.

Data Analysis: Frequency and percentage distribution of problem faced by the college students with psychosocial problems.

**Table 1:
(N=120)**

S.No.	Level of with psychosocial problems	Frequency	Percentage %
1.	Somatic symptoms	8	6.6%
2.	Anxiety/insomnia	62	51.6%
3.	Social dysfunction	97	80.83%
4.	Severe depression	79	65.83%

In regard to psychosocial problems (80.83%) of college students have faced social dysfunction, 79 (65.83%) severe depression, 62 (51.6%) Anxiety/insomnia and 8 (6.6%) somatic symptoms.

Table 2: Frequency and percentage distribution of without psychosocial problems.

S.No.	Level of without psychosocial problems	Frequency	Percentage %
1.	Somatic symptoms	112	93.3%
2.	Anxiety/insomnia	58	48.3%
3.	Social dysfunction	23	19.16%
4.	Severe depression	41	34.16%

In regard to without psychosocial problems 112(93.3%) of college students without somatic symptoms, 58 (48.3%) without Anxiety/insomnia, 41 (34.16%) without severe depression and 23 (19.16%) without social dysfunction.

Discussion

In assessing the level of psychosocial problems with there was selected demographic variables: That was significant association between the level of psychosocial problems faced by college students with occupation status of parents, education status of parents, average family income and any history of mental illness (p value =<0.05). The other demographic variables does not had significant association with the level of psychosocial problems faced by college students.

Conclusion

On the basis of conducted research it can be concluded that assessment of psychosocial problems among college students as an importance in early determination of mental health problems and prevention.

Conflict of Interest: Nil

Sources of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 04-02-2019

References

1. E. Rajkumar, K V Sooraj, B H Sandeep, C Harish. Assessment of Psychosocial problem among college student of central university of Karnataka a comparative study. International journal 2015; 3(9): <http://www.fullwebaddress.com> (accessed december 2015).

2. P. Udhayakumar P. Ilango . Psychological Wellbeing Among College Students in Thiruvarur District. *Journal of Social Work Education and Practice* 2018; 3(2)(2456-2068): <http://www.fullwebaddress.com> (accessed 1 April 2018).
3. Vaibhav jain, Mayank Singh, Khursheed Muzammil, Jaivir Singh. Prevalence of psychosocial Problems Among Adolescents in Rural Areas of District Muzaffarnagar, Uttar Pradesh. *Indian journal of Community Health* 2014; 26(9): <http://www.fullwebaddress.com> (accessed 2014).
4. Malathy Iyer in Mumbai. World Health Organization report on Depression. *Times of India* (accessed 2017).
5. Bihungum Bista, Puspa Thapa, Diksha sapkota, Suman B. Singh and Paras K. Pokharel. Psychosocial problem among adolescent student: An exploratory study in the central region of Nepal. *National journal* 2016;4(): e.g. 18. <http://www.fullwebaddress.com> (accessed 4 august 2016).

A Descriptive Study to Assess the Knowledge on Fetal Well Being among Antenatal Mothers with Selected Tertiary Care Hospital at Kelambakkam, Kanchipuram District, Tamil Nadu, India

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Abstract

Objectives: To assess the knowledge on fetal well being among antenatal mothers in selected tertiary care hospital at Kelambakkam, Kanchipuram District, Tamil Nadu.

Methodology: Thenon probability purposive sampling technique sampling technique with the sample of 45 antenatal mothers and questionnaires were formulated structured questionnaire schedule were used to assess the knowledge.

Results: Majority of antenatal mothers are inadequate knowledge about fetal well being.

Conclusion: The study was conclude improve the knowledge on antenatal mothers about fetal well being.

Keywords: Assess, knowledge, fetal well being, antenatal mothers.

Introduction

Pregnancy is considered as a very precious event in every women's life. Fetal movement counting is a method by which a woman quantifies the movements she feels to assess the condition of her fetus. The recording of fetal activity serves as an indirect measure of central nervous system integrity and function indicating that fetal movements are a reliable sign of fetal wellbeing³.

Fetal movement counting – often called ‘kick counting’⁵ Fetal movements have been defined as any discrete kick, flutter swish or roll. This is an indicator

of fetal health and has been used. By 20th week of the gestation most mothers are able to feel the fetal movements. Quickening⁴ is the first point at which the women experiences fetal movements in early pregnancy. Inprimigravida, it may be felt from 18-22 weeks and in multigravida, from 16-20 weeks.

The decreased fetal movement has been associated with poor pregnancy outcomes about 50% of women with still birth⁶, they reported that they felt to gradual decrease of fetal movement before intrauterine death. At this current rate of India to reach the target of less than 39 per 1,000 live births by the end of 2015. In India every year¹ 1.34 million children was die before the completing five years, of which 7,48,000 die within the first months of their life. Since 75 percent of fetal death occur in the ante partum should focus on reducing neonatal deaths². It is estimated that 7.3 million perinatal deaths occur annually in the world to developing countries.

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A pregnant women regarding the value of maternal

monitoring of fetal movements⁸. A fetal movement chart records the frequency of fetal movements and assesses the condition of the fetus. The result demonstrates that the maternal monitoring of fetal movement during period to identified the Kick count and assess the fetal position that maternally-perceived fetal movements around 28 weeks. Every 10000 births the perinatal mortality is 37.7, varies from 24.8 in Kerala . At term,⁷ to describe the movements, including pushing, rolling, wriggling and pulsing are seen in the earlier pregnancy. The results concluded most of the women unable to feel fetal movements seen on ultrasound,⁹ 80% of fetuses were in an anterior position of mother side.

The fetal movement pattern is characterised by increased activity in the evenings and increased fetal movement in the mornings, which is consistent with maternal accounts of fetal activity patterns to assess the fetal movements count every evening.¹⁰ The results increased fetal activity to present that evening for assessment should it take longer than two hours to count 10 movements to maternal reports of increased activity in the evening to maternal inattention to movements during the day.

The studies of fetal activity to some movements are appear at 10 weeks and 9 weeks maturity of the fetus, such as fetal breathing, eye movements, jaw movements and sucking and swallowing to increase in frequency as gestational period¹⁴ to reduced amniotic fluid has also been shown to effect on fetal movement. In results 19 cases of premature rupture of membranes to decrease fetal movement, liquor volume and reduced amniotic fluid is an indication of placental insufficiency¹². In case of fetal distress to identify the decrease fetal movement count, audible heart rate to visit the doctor and regular treatment assess the fetal movement and to prevent the fetal neurological development¹¹ the monitoring the fetal movement count movements three times a day, an hour in the morning, an hour at midday and an hour in the evening and the Cardiff 'Count-to- Ten Kick Chart' method,¹³.

Objectives:

1. To assess the knowledge on fetal well being among antenatal mothers in selected tertiary care hospital at Kelambakkam, Kanchipuram District, Tamil Nadu.
2. To find out the association between the level of knowledge on fetal well being among antenatal mothers with selected demographic variables.

Method

Research Approach: Quantitative research approach was used.

Research Design: A Descriptive research design was used.

Research Setting: The research was conducted in Antenatal OPD and admitted in ward with selected tertiary care hospital, Kanchipuram (District), Tamil Nadu.

Population: Antenatal mothers in above 32 weeks for gestational age that are included in the study.

Sampling technique: Non probability purposive sampling technique was used for the study.

Sample Size: Sample size was calculated using the formula $N=4pq/d^2$. (p=95%). The final sample size was 45.

Data collection instruments: A structured questionnaire was developed as a tool for data collection. It was consist of demographic profile of mother. Age of Marriage, Types of family Educational status of mother, Occupational status, Monthly income, Religion, Working hours/weeks, Gestational Age, Pregnancy category, Number of antenatal visits. A self administered questionnaire which consist of 20 questions related to knowledge regarding fetal well being among antenatal mothers.

Scoring and Interpretation: Each correct answer carries one mark & wrong answer carries "0" mark the maximum score is 15 & minimum score is 0 the level of knowledge on fetal well being among mothers is interpreted as below:

Scoring	Level of Knowledge
Above 76%	Adequate Knowledge
51- 75%	Moderate Knowledge
Below 50%	Inadequate knowledge

Data Collection Procedure: Data was collected over one week.

Results

The study showed that mean value is 11.13 and the standard deviation is 1.408. The study showed that 15.5% of antenatal mothers had adequate knowledge, 46.6% of antenatal mothers had moderate knowledge, 37.7% of

the antenatal mothers had inadequate knowledge on fetal well being and there was a significant association of the knowledge with demographic variables.

Organization and Presentation Data: The data collected was tabulated and resulted as follow:

Section-1: Distribution of level of knowledge on fetal well being among antenatal mothers

Table 1: Frequency and percentage distribution of knowledge of antenatal mothers regarding fetal well being

S.No.	Level of Knowledge	Frequency	Percentage
1	Adequate Knowledge (Below 50%)	07	15.5%
2	Moderate Knowledge (51-75%)	21	46.6%
3	Inadequate Knowledge (Above 76%)	17	37.7%
	Total	45	100%

Table 1; Show that majority of 21(46.6%) of antenatal mothers had moderate knowledge, 17(37.7%) of antenatal mothers had inadequate knowledge, 07(15.5%) of antenatal mothers had adequate knowledge.

Results

The study showed that mean value is 11.13 and the standard deviation is 1.408. The study showed that 15.5% of antenatal mothers had adequate knowledge, 46.6% of antenatal mothers had moderate knowledge, 37.7% of the antenatal mothers had inadequate knowledge on fetal well being and there was a significant association of the knowledge with demographic variables.

Discussion

The study discuss the antenatal mothers about fetal well being like definition, antenatal visits, investigation, fetal monitoring, method, complication Finally to improve the knowledge .

Limitation: Antenatal mothers above 5 month are only included in the study

Conclusion

This study conclude to assess the knowledge on antenatal mother about fetal well being to provide pamphlet otherwise to improve the knowledge on antenatal mother about fetal well being.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Issues: Obtained clearance from the obstetrical gynaecological nursing department, Chettinad College of Nursing. UG committee clearance obtained; Institutional human ethical committee clearance obtained from Chettinad University; written permission obtained from the Dean and HOD of obstetrical gynaecological nursing department–CHRI; the written consent will be obtained from the study subject before collecting the information.

Reference

1. Nitanjali patel “et al”. Text book of obstetrics including perinatology and contraception, 6th ed. Calcutta: New central book agency; 2013.
2. Dr. Gagan Gupta. A Text book for Nurses and Midwives, 1st ed. New Delhi: Jaypee Publications; 2015.
3. Suraj Gupta. Obstetrics and Gynecology, 1st ed. Delhi: Peepee Publication; 2009.
4. Raynes-Greenow et al. Cross over trial comparing maternal acceptance of two fetal movement charts. Journal of maternal and neonatal medicine 2013; 14().
5. Marzano & Hanlon-Lundberg. Text Book of Maternal and Child Health Nursing, 3rd ed. Canada: Saunders Publication; 2004.
6. Arms Grannbarm. A compliance with fetal movement chart by high risk obstetric patients in a Peruvian hospital. American journal of perinatolog 2014; 24().
7. Greenow et al. A Text Book for Nurses and Midwives, 1st ed. New Delhi: Jaypee Brothers Publications 1; 2013.
8. Steen Neldam, A study of fetal movements and antenatal advice in general pregnant population using a qualitative frame work. Journal of pregnancy and childbirth 2011; 13():
9. Tuffnell’s. Current concepts in contraception and women’s health, 1st ed. New Delhi: Jaypee Brothers Publications; 2012.
10. Fisher, & Heazell. The practice of Nursing Research, Conduct, Critique and Utilization, 1st ed . New Delhi: Philadelphia: Lippincott Company publications; 2012.

11. Gardosi, Giddings, Clifford “et al”.. Myles Text book for Midwives, 15th ed. London: Churchill Livingstone Elseiver; 2011.
12. Sival et al. Obstetrics and Gynecology, 1st ed. New Delhi: Peepee Publications; 2012.
13. <http://www.onlinelibrary.com> . (accessed 2018).
14. www.babymed.com. (accessed 2015).

Knowledge and Practice of Observing Daily Fetal Movement among Primigravid Women in Kellambakkam, Kanchipuram District, Tamil Nadu, India

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Abstract

A study to assess the Knowledge and practice of observing daily fetal movement among primigravid women under the selected tertiary care hospital, Kanchipuram District, Tamil Nadu, India. The objectives to assess the level of knowledge and practice of daily fetal movement, to determine the association of knowledge and practice of daily fetal movement in the primigravid women, selected tertiary care hospital. The convenience sampling was 53 in the Obstetrical and Gynaecological OPD . The data collection tool was validated and reliability was established. The data were collected by structured questionnaire . The collected data was tabulated and analysed. Descriptive and inferential statistical method were used. That study shows that the majority of 18(33.96%) primigravid women has Moderate knowledge 32(60.37%) of primigravid women has Inadequate knowledge 3 and (5.6%) of primigravid women has Adequate knowledge. Hence the result frequency and distribution of knowledge and practice of observing daily fetal movement among primigravid women (60.37%) Inadequate knowledge there is a risk of intrauterine death. Thus there is a need of assessment of knowledge of daily fetal movement among primigravid women.

Keywords: Daily Fetal Movement, Primigravid Women.

Introduction

“There is no better feeling than movement of life inside of you”

Mother can usually feel that their babies, moving in their wombs, around 16 to 20 weeks. Babies’ activities in the womb can vary considerably, some being very active and some being not so active. A decrease in a baby’s normal pattern of movements may be a sign that

the baby is struggling for some reason and it might be better for the baby to be born early. Hence, it has been suggested that if the mother her babies’ movements each day and there are several ways of doing this, she may be able to identify a decreased movement in her baby. It is further suggested that if the mother informs to caregivers of this, then the caregivers can do additional tests and some babies can be prevented from dying before birth. However, sometimes fetal movement tests may cause considerable anxiety for women and it is not easy for some women, especially when a mother is busy at work or caring for other children, so it is important to assess if these tests are helpful in identifying babies in difficulty in time.

The review of trails found (WHO 2016) five studies, which involving 71,458 women, comparing two fetal movement method, fetal movement versus hormonal analysis and routine fetal movement which is compared with standard antenatal care, as defined by trail authors.

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In studies that compared routine of baby's movements in the womb with mixed or undefined, there was no difference in stillbirths, caesarean sections, birth weight less than 10th centile and mother – baby attachment; there was reduction in women anxiety in the group the baby's movements. There was a tendency to more antenatal admissions. When baby's movement which was compared with hormonal analysis, there were fewer hospital visits among women who were and fewer babies in the hormonal analysis group who had low Apgar scores, which assess the baby's condition after birth. There was no difference between the groups in terms of caesarean sections was done and other outcomes. 'Perinatal death or severe morbidity' was not reported. When different types of fetal movement method (once a day compared to more than once a day) were compared, women were more compliant in using the once a day method, citing less interruption with daily activities as one is the reasons; the incidence of caesarean section did not differ and perinatal death or severe illness was not reported. The numbers and the methodological quality of studies were insufficient to assess stillbirths accurately. Further trails are suggested and it would be very important to assess women's anxiety and views in addition to the ability to prevent stillbirths.⁽¹⁾

Need for the Study: Since biblical times, fetal movements have been viewed as a reassuring sign of a healthy pregnancy. By the fetal movements in utero are an expression of fetal wellbeing. By the fetal movement's patient can therefore; monitor the condition of the fetus. Assessment of fetal movements is a non invasive method of monitoring the wellbeing of the fetus. 'Quickening' is the first point at which the women experiences fetal movements in early pregnancy. It is a significant point in pregnancy for many women. A fetal movement chart records the frequency of fetal movements and thereby assess the condition of the fetus. It is simple, valuable, effective, reliable and harmless screening of fetal well being in low and high risk pregnancies.^[2]

Obstetrical & Gynecological survey–England, 2016 Decreased fetal movements are present in 6% to 15% of pregnancies and are associated with intrauterine fetal death and intrauterine growth restriction.⁽³⁾

MOMS (Maternal Observing and memories of still births) study showed that mother perceived gradual decreased fetal movements seven days prior to death of the fetus and 56% of the mother reported decreased fetal movement as the first reason to believe that the

baby is not doing well. Only 50% of mothers were told to do kick by their doctor. The current scientific research conference—about decreased fetal movement in Norway revealed that fetal deaths are not sudden; 50% of unexplained stillbirths are growth restricted, suggesting that there is time window for intervention and prevention of deaths.⁽⁴⁾

FEMINA (Fetal Movement Intervention Assessment) is an outgoing International Research Collaboration to improve pregnancy outcome. The findings reveal that women still do not get enough information on the importance of fetal activity to act in such a way to protect their baby. They reported that 50% of affected mother waited more than 24 hours without any fetal activity before contacting health professional – one in there waited more than 48 hours.⁽⁵⁾

NFHS Survey (2018), the IMR in India is 57/1000 live births. Still birth is a high global burden and according to survey (2003), the still birth rate of India is 9/1000 and that of Tamil Nadu is 20/1000 deliveries, which is highest among all other states. Some still births are unexplained and some are unavoidable. But in some cases, still births can be preventive if the mother is highly aware of her fetal movements.⁽⁶⁾

I LUDWICK 2015 in his study in Denmark among 2250 pregnant women regarding the value of material monitoring of fetal movements. Half of the women were taught to fetal movement methodically and contact the hospital if they felt less than 3 fetal movements per hour. The controls were not given any specific instructions about fetal movements. The result demonstrates that the material monitoring of fetal movement can aid the opportune delivery of infants, who are at increased risk of intrauterine death. ⁽²⁾

St. John's Medical college hospital 2017 census showed 84 (38/1000 deliveries) still births in the year 2015 and 79 37/1000 deliveries) in the year 2016. The number of stillbirths in 2017 (January – September) is 87 (52/100) which is alarming. The still birth rate is higher than the national rate of 9/1000, as it is a referral hospital, catering to high pregnancy cases. The investigator from her experience of working in the hospital have found that the mother, who had still birth, experienced decreased fetal movements few days before the event could occur, but they failed to report to the health personnel. It is also seen that there are many unnecessary hospital admissions of antenatal due to lack of awareness about normal and abnormal fetal activity.⁽⁷⁾

Discussions with experts and review of literature also helped investigator to realize that giving information on the importance of monitoring fetal activity to mother is essential to reduce the perinatal mortality and morbidity rates. During the literature review the investigator found that, studies in these areas are rare, especially in India, which shows the increasing need of this study.

Materials and Method

Research approach and design: A research approach is frame work or guide used for the planning, implementation and analysis of the study. It also involves the plan to investigate the phenomenon under the study and research design is a master plan specifying a method and procedure for collecting and analyzing the needed information in a research study.

Quantitative approach and Descriptive design.

Research Setting: A research setting is a physical, social and cultural site in which the research conduct the study. Obstetric and Gynecological outpatient department.

Population: Population is a aggregation of all units in which a researcher is interested in other words, population is a set people or entities to which a results of a research to be generalized.

All antenatal mother.

Sample: Sample is a representative unit of a target population, which is to be worked upon by the researcher during the study in other words sample consists of subsets of unit which comprise the population selected by the researcher to participate in the research project.

Primigravid women, between the gestational age of 30- 39 weeks.

Sampling Technique: Non probability convenience sampling.

Sampling Size: According to open source Epidemiologic statistics for public Health.

Population size (n) =60

Hypothesis%frequency (p) =50%+/-5

Confidence limits (d) =5%

Design effect (DEFF) =1

Sample size (n) for 95%confidence level=53

Sampling Criteria

Inclusion Criteria:

1. Primigravid women between 30-39 weeks of gestation, attending to Antenatal OPD.
2. Primigravid women, who are able to read Tamil or English.

Exclusion Criteria:

1. Women, who are health professionals.
2. Multi gravid mother are not included in this study.

Description Tool: A structured questionnaire was developed as a tool for data collection . The tool consists of the following–

Section-1: consists of demographic profile of mother

Section-2: A structured questionnaire to assess the level of knowledge and practice on primigravid mother regarding daily fetal movement.

Data Analysis Plan: Data analysis was done by using descriptive and inferential statistics.

Level of knowledge and practice Score in Percentage (%)

Level of Knowledge	Percentage
Adequate Knowledge	≥75%
Moderately adequate Knowledge	51-74%
Inadequate Knowledge	<50%

Objectives 1: Assess the level of knowledge and practice on daily fetal movement among primigravid women.

The findings of the present study refers that:

- 5.66% has adequate knowledge
- 33.96% has moderate knowledge
- 60.37% has inadequate knowledge

Objectives 2: The level of knowledge and practice on daily fetal movement among primigravid women with selected demographic variables.

Findings: Including of the study was presented under the following headings based on study objectives.

Findings 1: Knowledge on daily fetal movement at the time of marriage among primigravid women was

13 has inadequate knowledge among the age group of (20-25) and 8 has inadequate knowledge among the age group of(26-30).

Finding 2: Knowledge on daily fetal movement among primigravid women between the type of education qualification 8 has inadequate knowledge among higher school, degree and 4 has inadequate knowledge among middle school.

Finding 3:

Knowledge on daily fetal movement among primigravid women between the occupation 17 has inadequate knowledge among the housewife and 3 has inadequate knowledge among self employee and 1 has inadequate knowledge among private employee.

Finding 4: Knowledge on daily fetal movement among primigravid women between the type of family 11 has inadequate knowledge among joint family and 10 has inadequate knowledge among nuclear family.

Finding 5: Knowledge on daily fetal movement among primigravid women between the duration of marital life 14 has inadequate knowledge among less than one year and 6 has inadequate knowledge among 2-3years 1 has inadequate knowledge in above five years.

Finding 6: Knowledge on daily fetal movement among primigravid women information regarding Daily Fetal Movement among primigravid women 17 has inadequate knowledge.

Finding 7: Knowledge on daily fetal movement among primigravid women source of information 8 has inadequate knowledge health professional 4 has inadequate knowledge among relative 3 has inadequate in mass media.

Finding 8: The level of knowledge on daily fetal movement among primigravid women with regard to Gestational age in weeks and the level of knowledge of daily fetal movement among praimigravid women 11 has inadequate knowledge above 32 week and 10 has inadequate knowledge 29-32 week.

Finding 9: The level of knowledge on daily fetal movement among primigravid women with the complication of daily fetal movement in Obesity 13 has inadequate knowledge, In hypertension 5 has inadequate knowledge and In Diabetes mellitus 3 has inadequate knowledge

Finding 10: The level of knowledge of daily fetal movement among primigravid women with the hobbies watching Television 17 has inadequate knowledge and reading books 4 has inadequate knowledge.

Finding 11: The level of knowledge of daily fetal movement among primigravid women with the number of TT injection received has 15 inadequate knowledge .

Finding 12: The level of knowledge of daily fetal movement among primigravid women regarding past medical illness 17 has inadequate knowledge

Finding 13: The level of knowledge of daily fetal movement among primigravid women with the use of drugs 19 members has inadequate knowledge regarding uses of drugs.

Finding 14: The level of knowledge of daily fetal movement among primigravid women about present medical illness was 20 members has inadequate knowledge regarding present medical illness.

Conclusion

That study shows that the majority of 18(33.96%) primigravid women has Moderate knowledge 32(60.37%) of primigravid women has Inadequate knowledge 3 and (5.6%) of primigravid women has Adequate knowledge. Hence the result frequency and distribution of knowledge and practice of observing daily fetal movement among primigravid women (60.37%) Inadequate knowledge there is a risk of intrauterine death. Thus there is a need of assessment of knowledge of daily fetal movement among primigravid women.

Conflicts of Interest: No conflict interest

Source of Funding: No funding sources

Ethical Clearance: The study was done with the approval of the institutional ethics committee informed consent was obtained from the primigravid women who were assured of strict anonymity and confidentiality during this study.

Reference

1. World health organization .Fetal movement method versus hormonal analysis:: 2016.
2. Ludwick. 2015 Meternal Movements of Monitoring Fetal Movements 2015;64:212-13. Available from August 02, 2016

3. Maria Cenizal and Leo Francis (Obstetrical & Gynaecological survey- England) reviews. 2014(1).
4. Swithwardaz MOMS (maternal observation and memories of still birth)conferences-about decreased fetal movement. Available from: Accessed August 11, 2017.
5. Lelia Zen Jousha FEMINA (Fetal Movement Intervention Assessment Tool)- A valuable assessment tool. Journal of Nurse Midwifery 1987 Jan-Feb;32(1):11-19.
6. Heazelletal. NFHS survey of knowledge and management of women presenting with decreased fetal movements. Obstetrical and Gynaecological survey. 2018 Aug;63(8):484-86.
7. WSchmidt, I Csch and F Kubli St Johns Mediacl College Hosptial.. Maternal perception, tocodynamometric findings and real time ultrasound assessment of total fetal activity. International journal of Gynaecology & Obstetrics 2017;22: 85-90.

Assessment of the Incidence and Associated Risk Factors of Urinary Tract Infection among children- A Retrospective study.

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Abstract

A study to assess the Incidence and Associated Risk Factors of Urinary Tract Infection among children at selected tertiary care hospital, Kanchipuram District, Tamil Nadu. The objectives is to determine the incidence of UTI among children, estimate the types of bacteria causes UTI among children with UTI, to estimate the incidence of urinary tract infection among children and find out the Association between the UTI and selected risk factors of children. The convenience sampling was used to 50 paediatric medical records from January 2017 to December 2018. The data collection tool was validated and reliability was established. The data were collected by structured questionnaire. The collected data was tabulated and analysed. Descriptive and Inferential Statistical method were used. The study shows that the higher frequency of 0-6 years (58%) and the lower frequency 13-18 years (18%). In Gender, Male is the highest frequency (56%) and Female is the lowest frequency (44%) and the history of birth defect of structure/deformity or blockage in one of the organ (20%), Vesico Ureteral Reflux (60%), Pelvic uretero junction (10%), Exstrophy of bladder system (10%). The highest frequency Vesicoureteral Reflux (60%) and the lowest frequency is Pelvic uretero junction (10%) and exstrophy of bladder system (10%). It is found that E.coli (86%), Klebsiella (10%), Proteus (2%), Pseudomonas (2%). The highest frequency E. Coli (86%) and the lowest frequency Proteus (2%), Pseudomonas (2%) most causative organism of UTI. The incidence rate for urinary tract infection in our study was 11.7%. There was a significant Association between the selected demographic variables and risk factors of UTI.

Keywords: Urinary tract infection, Incidence, Types of organism, Associated risk factors, Children (0-18 Years).

Introduction

Urinary Tract Infection (UTI) is an infection that affects mostly the part of the urinary tract of human

body. Common symptoms and signs of UTIs in children include pain and urgency with urination, blood in the urine, abdominal/pelvic pain, fever, flank pain and vomiting.

In young children, the only symptom of a Urinary Tract Infection (UTI) may be a fever, due to the lack of more symptoms, while females under the age of two or uncircumcised males child who are less than a year exhibit a fever, a culture of the urine is recommended by many medical associations, Therefore Infants may feed poorly, vomit, more sleep, or be having signs of jaundice. In older children, urinary incontinence may occur resending symptom for the child with uti.

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⁶One study in August 2016, Children with fever were the major proportion in outpatient department of Paediatric. The emphasis on identification of Urinary Tract Infections in febrile children is minimal. Very often, children receive antibiotics empirically, without any adequate evaluation for Urinary Tract Infection.

⁶Recent most studies has shown that the Urinary Tract Infection have revealed that more than 75% of children under 5 years of age with the febrile Urinary Tract Infection have pyelonephritis. Pyelonephritis leads to renal scarring in 27% to 64% of children with Urinary Tract Infections in this age group, even in the absence of underlying urinary tract abnormalities. It is essential to identify Urinary Tract Infections in febrile children and institute prompt treatment to reduce the potential for life long morbidity.

A UTI may be classed as either: An upper UTI – if it is a kidney infection or an infection on the ureters. A lower UTI it's a bladder infection or an infection of the urethra. Most of the UTIs in children are caused by organism *E. coli* followed by *Klebsiella*, *Proteus*, *Pseudomonas*.

In some studies, mostly child wipes their bottom and then the toilet paper comes into contact with their genitals areas which is more of a problem for girls comparing to the boys, whereas babies

Even gets small defects in their urethra when they soil with their nappies particularly when it squirm and being changed. Some of the risk factors for a UTI include:

1. A problem in the urinary tract like as a malformed kidney or a blockage somewhere along the tract).
2. An abnormal backward flow (reflux) of urine from the bladder up the ureters and toward the kidneys. This is known as Vesicoureteral Reflux (VUR).
3. Poor toilet and hygiene habits.
4. Family history of UTIs.

¹⁰Urinary Tract Infections include 10% of all febrile children along with 13.6% of febrile infants and 7% of febrile newborns. Mostly the children younger than five years of age, most Urinary Tract Infections lead to a diminished kidney growth.

⁷One study that was carried out in Government general hospital. In that prospective study 60 cases of Urinary Tract Infection who were admitted in paediatric

medical and paediatric surgical wards of Government general hospital was with signs and symptoms suggestive of Urinary Tract Infection.

⁸In 2008, Knowledge of baseline risk of Urinary Tract Infection can help clinicians make informed diagnostic and therapeutic decisions. We conducted a meta-analysis to determine the pooled Prevalence of Urinary Tract Infection (UTI) on children by age, gender, race and circumcision status.

Urinary Tract Infection (UTI) is a significant health problem that commonly affects children. It is estimated to be the third most common cause of fever in children after gastrointestinal infections and respiratory diseases.² The Possibility of Urinary Tract Infection must to be considered in all febrile children and urine culture specimen must be collected as a part of diagnostic evaluation.

¹One studies shows that the management of children with urinary tract infection doesn't stop with treating that episode with antibiotics, whereas is has higher chance of associated urinary tract abnormalities like vesicoureteric reflux, pelvioureteric junction obstruction, ureterocele that may result in recurrent infections and permanent damage to kidneys in the form of renal scarring.

UTI at this critical and vulnerable age group is associated with considerable morbidity because it can lead to serious complications such as hypertension, renal scarring and end-stage renal failure. Clinically, children with acute pyelonephritis often present with high fever, abdomino-pelvic pain and urinary symptoms. However, these symptoms are not specific and they may occur in lower Urinary Tract Infections such as Cystitis. On clinical basis, the differentiation between both conditions is challenging. Therefore, further investigations were required to determine the accurate diagnosis and prognosis.

Statement of the Problem: A Retrospective study to assess the Incidence and Associated Risk Factors of Urinary Tract Infection among children at selected tertiary care hospital, Kanchipuram District, Tamil Nadu, India.

Objectives:

1. To determine the incidence of UTI among children.
2. To estimate the types of bacteria causes UTI among children with UTI.

3. To estimate of incidence of urinary tract infection among children.
4. To find out the Association between the UTI and the Selected Risk Factors of children.

Operational Definitions:

Incidence: Incidence is the rate of new UTI cases. It is generally reported as the number of new cases occurring within a period of January 2017 to December 2018.

Urinary tract infection: A Urinary Tract Infection (UTI) is the presence of infective agents that exists anywhere between the renal cortex and the urethral meatus. Urinary tract infections (UTIs) are common in childhood.

Associated Risk Factors: In this present study the researcher included the selected available related risk factors in the medical records of children diagnosed with UTI.

Children: In this present study the researcher focused on children in the age of 0-18 years diagnosed with UTI during the period of January 2017 to December 2018.

Materials And Method

Research Approach: Quantitative-non interventional-evaluative approach was adopted in this study.

Research Design: Descriptive-retrospective research design was used to conduct the study.

Research Setting: Present study was conducted at Medical Record Department in Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu, India. Permission to pursue the Medical Record Department document for specified data was obtained from the Dean, CHRI.

Population: Data related to Urinary Tract Infection and Association Risk Factors among children was obtained from Medical Records at Medical Record Department on Urinary Tract Infection from January 2018 to December 2018.

Sampling Size: Data on Urinary Tract Infection and Associated risk factors among children was collected for

the period of 1 Year (January 2018- December 2018) with Sample size of 50.

Sampling Technique: Purposive sampling technique was adopted for this study.

Sampling Criteria

A. Inclusion Criteria:

The inclusion criteria were:

- Data on children from 0 to 18 years.
- Data for the period of January 2018 to December 2018.

B. Exclusion Criteria:

The exclusion criteria was:

- Data of children with other urinary disease.

Selection and Development of the Study Instrument:

Tool Description:

Part 1: Determine the age, gender, area of residence, history of birth defect, types of organism causing urinary tract infection.

Data Collection Procedure: Data collection are observable and measurable facts that provide information about the phenomenon under study. The data collection was done for period of 1 week from 01.04.2019 to 07.04.2019 at 8:30 am to 4:00pm in Medical Record Department. In Medical Record Department they provided all the cases file diagnosed by Urinary Tract Infection from month of January 2018 to December 2018 for all age group. We separate and took the case file from 0-18 years which was needed for our study. Data confidentially was maintained.

Findings: The demographic variables shows that the Urinary Tract Infection is mainly occurring in children with the age group of highest 0-6 years (58%) in male children (56%), with the history of birth defect Vesicoureteral reflux (60%). In findings, shows that types of organism the most incidence rate is E.coli (86%) among children. The incidence of urinary tract infection in our study was 11.7%. This shows that there is association between the Demographic Variables and Risk factors of Urinary Tract Infection, according to age, gender, history of birth defect and types of organisms.

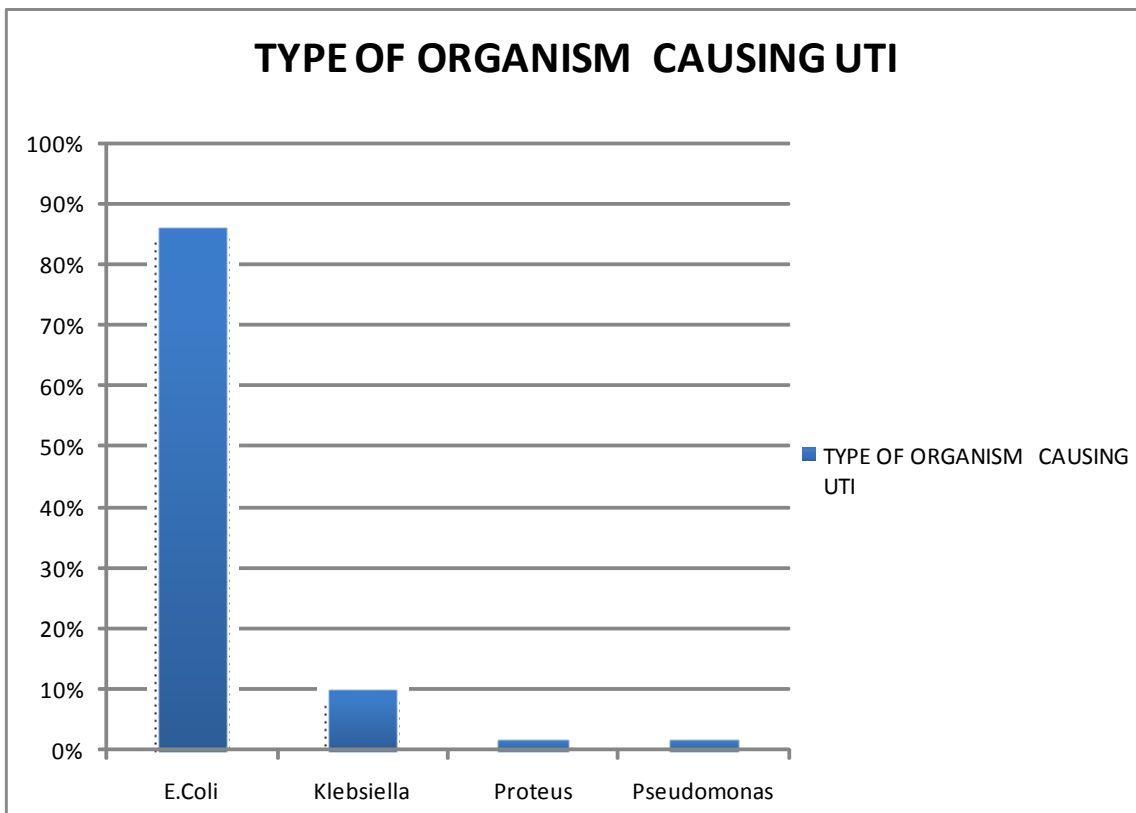


Figure: Showing Types of organism in UTI among paediatric children.

Discussion

Objectives of the study was:

1. Frequency and percentage distribution of demographic characteristics of UTI.
2. Percentage distribution of type of bacteria.
3. Estimation of incidence of urinary tract infection among children.
4. Association of Demographic Variable with Risk Factor of UTI.

Frequency and percentage Distribution of demographic variables of UTI:

Discussion between this study and others study includes:

⁴Palak Gupta, Jharna Mandal, Sriram Krishnamurthy, Deepak Barathi and Nandini Pandit (2015): Studys has founded that of the 524 children, 186 (35.4%) had culture proven UTI with 105 (56.4%) being infants, 50 (27.4%) between 1-5 yr, 30 (16.12%) between 5-13 yr and 129 (69.35%) males.

⁹Raya Mohammad Hussein Sawalha(2009): Studys has shown that the Prevalence of UTI was calculated to be 4%, 7.5% among girls and 0% among boys .

³Rima H. Hanna-Wakim, Soha T. Ghanem, Mona W. El Helou, Sarah A. Khafaja, Rouba A. Shaker, Sara A. Hassan, Randa K(2015): Studys has shown that. Vesico-ureteral Reflux and previous antibiotics use were founded to be independent risk factors for ESBL-producing **E. coli** and **Klebsiella**.

This Study findings revealed that the Frequency and Percentage Distribution of Demographic Characteristics like In paediatric age in year,

- 0-6 years of age group is the highest frequency (58%).
- 13-18 years of age group is the lowest frequency (18%).

UTI among gender,

- The highest frequency (56%) male.
- The lowest frequency (44%) female.

History of birth defect:

- The highest frequency (60%) Vesicoureteral Reflux.
- The lowest frequency (10%) Pelvic Uretero Junction, Exstrophy of bladder system.

Percentage distribution of type of bacteria:

⁵Dr. kavitha (2013):studys has shown that the urinary tract infection occurred more in male children than in female children. Most common causative organism were found E. coli (45.8%) followed by Klebsiella, Proteus and Pseudomonas constituting 23.8%, 9.8% and 6.1% respectively.

This Study findings revealed that the types of organism causing UTI:

- The highest frequency (86%) E.coli.
- The lowest frequency (10%) Proteus, pseudomonas.

Estimation of incidence of urinary tract infection among children: This Study findings revealed that the incidence rate of urinary tract infection in our study was 11.7%

Association of demographic variable with risk factors of UTI:

This Study findings revealed that

The Association between demographic variables in relation with urinary tract infection among children. It shows that age in history of defect had some significant association with risk factors of urinary tract infection with x^2 value $< p$ value ($x^2 = 4.5, p = 12.59$) at $df=6$, also shows that the age in type of organism had some significant association with risk factors of urinary tract infection with x^2 value $< p$ value ($x^2 = 4.5, p = 12.59$) at $df=6$, With this regard the hypothesis H2 stated accepted.

Conclusion

We have conducted a research topic on A study to assess the incidence and associated factors of urinary tract infection among children at selected tertiary care hospital, Kelambakkam, Kancheepuram District, Tamil Nadu, India. The quantitative descriptive retrospective design was used to conduct the study on data obtained on urinary tract infection from July 2018 to December 2018. 50 samples were collected.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 04.02.2019.

Reference

1. Sundar S, Chinnasami B, Sadasivam K, Pasupathy S. Role of imaging in children with urinary tract infections. *International Journal of Contemporary Pediatrics*. 2017 May;4(3):751. <https://pdfs.semanticscholar.org/c3bb/e39e26d441445c23e92a4d65e322a1e4a1a7.pdf>
2. Ahmed SM, Avasarala AK. Urinary tract infections (UTI) among adolescent girls in rural Karimnagar District, AP KAP STUDY. *Indian J Prev Soc Med*. 2008;39(1-2):67-70. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4173959/>
3. Hanna-Wakim RH, Ghanem ST, El Helou MW, Khafaja SA, Shaker RA, Hassan SA, Saad RK, Hedari CP, Khinkarly RW, Hajar FM, Bakhsh M. Epidemiology and characteristics of urinary tract infections in children and adolescents. *Frontiers in cellular and infection microbiology*. 2015 May 26;5:45. https://www.ncbi.nlm.nih.gov/pubmed?db=pubmed & cmd=link & linkname=pubmed_pubmed & uid=20151161
4. Gupta P, Mandal J, Krishnamurthy S, Barathi D, Pandit N. Profile of urinary tract infections in paediatric patients. *The Indian journal of medical research*. 2015 Apr; 141(4):473. <https://www.ncbi.nlm.nih.gov/pubmed/26112850>
5. Dr. Kavitha. Clinico Demographic Profile of UTI in Children Between 2-12 Years and Analysis of Factors Predisposing of UTI. Chennai, India : April 2013. <https://pdfs.semanticscholar.org/accd/9f853c28eb65832aa019601a32bb69464d9b.pdf>
6. Dr. K. Visalakshi. Study of prevalence of urinary tract infection in febrile children less than 5 years of age. 2018. <https://www.ijpediatrics.com/index.php/ijcp/article/download/1894/1424>
7. O'Brien K. The prevalence of urinary tract infection (UTI) in children under five years old presenting with an acute illness in UK general practice (Doctoral dissertation, Cardiff University) (2013). <https://orca.cf.ac.uk/47309/1/2013O%27BRIENKAPhd.pdf>
8. Shaikh N, Morone NE, Bost JE, Farrell MH. Prevalence of urinary tract infection in childhood: a meta-analysis. *The Pediatric infectious disease*

- journal. 2008 Apr 1;27(4):302-8. <https://www.ncbi.nlm.nih.gov/pubmed/18316994>
9. Sawalha RM. Prevalence of urinary tract infection among children of primary schools in Nablus (Doctoral dissertation). (2010). <https://www.semanticscholar.org/paper/Prevalence-of-Urinary-Tract-Infection-among-of-in-Taha/c9be67c1b364a8c1fedc5d406d21867d97f5f913>
 10. Saheb SA. Prevalence of urinary tract infections in febrile children less than five years of age: a chart review. *International Journal of Contemporary Pediatrics*. 2018 Mar; 5(2):359. <https://pdfs.semanticscholar.org/665e/0663959262e0f654fd658b079440efbc00bf.pdf>

A Study to Assess Mental Health among IT Professionals in Selected Company, Kancheepuram District, Tamil Nadu

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Abstract

Software industry is a human capital intensive industry. A study was conducted to assess mental health among IT professionals. The objectives were 1). To assess the mental health among IT profession and 2). To find out the association between IT profession's mental health and their selected demographic variables. Majority of the clients who scored positive for social dysfunction, anxiety & depression and loss of confidence were between 20-30 years of age, females, software engineers, had undergraduate education, had total work experience in software between 4-7 years and in the current company, followed Hindu religion, were married, residing in urban locality and had job satisfaction. Age and experience in the current company were associated with anxiety and depression.

Keywords: *Mental health, IT professionals, software, company, stress, depression, distress.*

Introduction

Software industry is a human capital intensive industry. IT professionals fulfill the demands of industry and provide customized software according to the need and requirements of the client organizations, by using latest available technology and skills in the market^{3,2}.

Science and technology is changing at a rapid pace that it is becoming difficult for the professionals to keep abreast with the upcoming technology along with the daily chores of the workplace. Routine hassle contributing to occupational stress is the major cause of stress. IT professionals experience a lot of stress, anxiety, depression and loneliness pertaining to their work environment and reveal feelings of inadequacy, lowered self-esteem and dissatisfaction, which results in social, marital and sexual problems^{3,4}.

IT professionals experience numerous stressors related to work including quantitative work overload, time pressure, qualitative work load, speed and diffusion of technological innovation and technological divergence, low discretionary power, underdeveloped career pattern, low earnings/reward from jobs, difficulties in managing a project team for software development and establishing support system, difficulties in customer relations and personality characteristics³.

Naveen, Bobby, Pretesh et al., (2016), reported that majority of the samples were between 26 - 30 years of age (44.96%), men (74.5%) and were with 1-5 years of work experience (45%). Minority of them had moderate stress (8.72%) and majority had no stress (91.27%). And none were stressed needing immediate intervention. The researchers reported that majority of the software engineers (62%) had mental complaints and 31% mental ill-health. The researchers reported of depressive symptom (32% - 43.4%), professionally stressed (51.2%), psychological distress (23%), fatigue (20%), job dissatisfaction (44%), intentions to leave (35%), adjustment disorders (19%), major affective disorders (6%), psychological factors affecting physical condition (5%) and dysthymic disorder (3%) among software engineers. Career and future ambiguity

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were the most important predictor of the subjective health status. Insufficient evaluation systems and poor supervisor's support were important predictors of productive behavior. Age and experience was associated with the overall stress and depression experienced. IT professionals experience severe mental stress and health issues¹. Nurses should be knowledgeable and skillful in handling health issues among IT professionals at primary, secondary and tertiary level of preventive care.

Objectives:

- To assess the mental health among IT profession
- To find out the association between IT profession's mental health and their selected demographic variables.

Method

Research Approach: Non-experimental research approach was used.

Research Design: A Descriptive research design was used.

Research Setting: The study was conducted at a private IT company, Kanchipuram District.

Population: IT professionals employed in a private IT company, Kanchipuram District.

Sample Technique: A convenience sampling technique was employed to select 100 samples for the study.

Sample Size: Sample size was calculated using the formula $N = 4pq/d^2$. With $p = 31\%$ and $d = 9$. The calculated sample size was 106. The estimated range was 97 to 115. The final sample size was 100.

Data Collection Instruments: Demographic variables proforma and The twelve-item General Health Questionnaire (GHQ-12) were used. GHQ12 was used to assess the mental health among IT profession. The GHQ-12 is a standard tool which has been widely validated and found to be reliable. The GHQ-12 was modelled to measure the three correlated dimensions of psychiatric disturbance: *social dysfunction*, *anxiety* and *depression*.

Scoring and Interpretation: The GHQ 12 consists of 12 items, each assessing the severity of a mental problem over the past few weeks using a 4-point scale (from 0 to 3).

Sum of the items 1, 3, 4, 7, 8 and 12 loaded on social dysfunction, sum of items 2, 5, 6 and 9 on anxiety and depression and sum of items 10 and 11 on loss of confidence.

The score was used to generate a total score ranging from 0 to 36.

Table 1: Scoring and interpretation

Mental Health	Score
Distress	12-24
Severe problems and psychological distress	25-36

Data collection procedure: Data was collected over one week.

Ethical Issues: Department clearance was obtained from Department of Mental Health Nursing, Chettinad College of Nursing. UG committee clearance was obtained from UG Research Screening Committee. Institutional Human Ethics Committee clearance was obtained from Chettinad University. Formal permission was obtained from the Principal, Chettinad College of Nursing. Formal consent was obtained from the study samples before collecting the information. Confidentiality of the study was maintained.

Statistical Method: Descriptive statistics like frequency distribution, percentage and inferential statistics chi-square test was used to analyze the data.

Results

Majority of the clients were between 20-30 years of age (67%), females (61%), software engineers (37%), had undergraduate education (78%), had total work experience in software between 4-7 years (41%) and in the current company (37%), followed Hindu religion (59%), were married (53%), residing in urban locality (74%) and had job satisfaction (89%).

Discussion

Clients scored positive for social dysfunction, anxiety & depression and loss of confidence. The causes are extreme diverse, may be due to change in technology, communication, fear of uselessness, poor family support, long working hours, work overload, stress, work pressure, frequent changes of shift, lack of sleep, heavy work demand, peer pressure, performance appraisal, more time spent on technology and virtual media, threat to job security and imposter syndrome.

Limitation: Data collection is limited to one week. And the sample size is small. In future studies larger sample size should be studied for generalizability.

Conclusion

Higher rates of professional stress pose risk to mental health. Compromising of mental health on the long run can negatively influence the individual's personal, family, occupational and social life and significantly increase the incidence of psychiatric disorders. Hence nurses should be equipped to promote mental health among IT professionals. Concurrently the managing members of the IT industry should develop stress management strategies and training program to aid their employees cope with stress and promote mental wellbeing.

Conflict of Interest: Nil

Source of Funding: Self

Reference

1. Darshan MS, Raman R, Rao TS, Ram D, Annigeri B. A study on professional stress, depression and alcohol use among Indian IT professionals. *Indian journal of psychiatry*. 2013 Jan;55(1):63.
2. Ramesh N, Joseph B, Kiran PR, Kurian J, Babu AT. Perceived Professional Stress Levels among Employees in an Information Technology Company, Bangalore. *Stress*. 2016;9(10):11-2.
3. Nayak RD. Anxiety and mental health of software professionals and mechanical professionals. *International Journal of Humanities and Social Science Invention*. 2014;3(2):52-6.
4. Ahuja MK, Thatcher JB. Moving beyond intentions and toward the theory of trying: effects of work environment and gender on post-adoption information technology use. *MIS quarterly*. 2005 Sep 1;29(3):427-59.

A Retrospective Study to Assess the Prevalence of Type 2 Diabetes Mellitus among Patient with Chronic Liver Disease at a Selected Hospital in Kancheepuram District, Tamil Nadu

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Abstract

A Retrospective study was conducted to assess the prevalence of type 2DM among chronic liver disease in a selected hospital at Kelambakkam, Tamil Nadu. The objectives were to assess the prevalence of type 2DM among patient with chronic liver disease by collecting the data from the medical records of the patients and to find the association between type 2 diabetes mellitus with the selected demographic variables among patient with chronic liver disease. The literature review was done and organised under various aspects on studies related to prevalence of type 2DM among patients with CLD. The research approach used for the study was quantitative approach and the design was non- experimental retrospective design, 50 samples were participated in the study by using convenient sampling technique. Demographic variables are assessed by using the statistical measurement and prevalence of type 2DM among patient with chronic liver disease. The level significance selected was $p < 0.05$ level. The collected data was tabulated and analysed by using inferential statistics. The study showed that there is significant association between type 2DM with selected demographic variable.

Keywords: *Diabetes mellitus, chronic liver disease.*

Introduction

Liver disease has increased over the last few decades, with its incidence estimated to be 39.4 per 100,000 inhabitants. Mortality trends from liver disease have increased considerably¹. For example, in 2002 liver diseases represented the fifth leading cause of death in the general population, whereas in 2007 liver disease became the third leading cause of death, after cardiovascular disease and T2DM. The most common liver diseases include fatty liver disease, such as alcoholic and NAFLD, infection with HAV, HBV and HCV, hemochromatosis

and advanced disease states such as NASH, cirrhosis, liver failure and HCC. Autoimmune hepatitis and drug induced liver disease also have an important impact on the liver². With the increase in the elderly population, the prevalence of various chronic diseases including type 2 diabetes mellitus (T2D) and chronic liver disease (CLD) are also rising. CLD consists of various liver diseases with recurring damage and recovery of hepatic parenchyma, resulting in fibrosis of liver and eventually leading to liver cancer³. Causes of CLD include toxins, viral infections, alcohol and nonalcoholic fatty liver that increase with obesity. Cirrhosis of liver exemplifies end-stage chronic liver disease and its prevalence is rising worldwide⁴. In China, major known causes for cirrhosis of liver include hepatitis B virus (HBV) or hepatitis C virus (HCV) infection and excessive alcohol consumption. In particular, HCV infection is a significant health problem and differs from other hepatitis viruses in that it is a systemic disease, rather than just a liver disorder⁵.

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Recently, numerous extrahepatic manifestations of HCV infection have been reported; these include cardiovascular, central nervous system, renal and metabolic diseases. Studies that have assessed the association between DM or insulin resistance (IR) and HCV infection clearly demonstrated a significantly higher incidence of DM in patients with chronic HCV than in the general population and showed that HCV is significantly more common in patients with DM. The prevalence of diabetes is increasing worldwide and it is expected to affect around 300 million adults all over the world and around 57 million in India by the year 2025⁶. Chronic liver diseases (CLDs) are arising in a diabetic patient as a cause or effect of diabetes⁷. Association between diabetes mellitus (DM) and liver cirrhosis was first described by Bohan and named as hepatogenous diabetes by Megyesi et al in which 57% of cirrhotic patients showed increased insulin resistance. Up to 80% of patients with cirrhosis may be glucose intolerant and between 10% and 20% may be clinically diabetic⁸.

Objectives:

1. To determine the prevalence of type 2 diabetes mellitus among the adult population.

2. To correlate the presence of diabetes with clinical features of selected demographic variables.

Method

Research Approach: Non-experimental research approach was used.

Research Design: Aretrospective research design was used.

Research Setting: The study was conducted at a selected Hospital, Kanchipuram District.

Data collection procedure: Data was collected over one week.

Statistical Method: Descriptive statistics like frequency distribution, percentage and inferential statistics chi-square test was used to analyze the data.

Result

The study revealed that from this year 2017, 50 patients suffered from chronic liver disease from those 24 patients had type 2 diabetes mellitus.

Table 1: Demographic distribution N=50

Si.No.	Characteristics	Category	Sample	
			Frequency	Percentage
1	Age	30-60	39	78%
		60 Above	11	22%
2	Gender	Male	35	70%
		Female	15	30%
3	Glycemic Status	FBS	29	58%
		PPBS	12	24%
		RBS	15	18%
4	HbA1C	Normal	20	40%
		Abnormal	30	60%
5	Albumin	Normal	38	76%
		Abnormal	12	24%
6	Globulin	Normal	21	42%
		Abnormal	29	58%
7	Bilirubin	Normal	11	22%
		Abnormal	39	78%

Majority (78%) of the samples belonged to age group of 30-60 years, whereas only (22%) were in age group of above 60 years. (70%) of the samples belonged

to male gender and (30%) of the samples belonged to female gender. The large proportion of laboratory findings of fasting blood glucose is of (58%) among

the sample (24%) has laboratory value of post prandial blood glucose. Among the sample laboratory value of random blood glucose is of (18%)having laboratory value of HBA1C normal (40%) and abnormal (60%). globulin is of normal(48%) abnormal (52%) albumin is of normal (76%) abnormal (24%). Bilirubin is of normal (22%) abnormal (78%).

It shows the frequency and percentage distribution of prevalence of type 2 diabetes mellitus among chronic liver disease, 44%of sample were occur type 2 diabetes mellitus among chronic liver disease, 56%of sample were not occur type 2 diabetes mellitus among chronic liver disease.

Table 2: Occurrence of type 2 diabetic mellitus among chronic liver disease

Sl.No.	Occurrence of type 2 diabetic mellitus among chronic liver disease	Frequency	Percentage
1.	Present	22	44%
2.	Absent	28	56%

Table 3 : Association with type 2 diabetes mellitus and demographic variables

Characteristics	Category	Yes	No	CHI Square Value P Value
Age	30-60	26	13	X ² =0.938 P=0.3328 (The result is not significant)
	Above 60	9	2	
Gender	Male	24	11	X ² =0.344 P = 0.5577 (The result is not significant)
	Female	9	6	

It shows that in 2017,50 patients suffered from chronic liver disease from those 24 patients had type 2 diabetes mellitus. There is no significant association between type 2 diabetes mellitus with the selected demographic variables of patients with chronic liver disease like age, gender, albumin and globulin. There is a significant association between type 2 diabetes mellitus with the selected demographic variables of the patients with chronic liver disease like blood glucose test (fasting blood glucose, post prandial glucose, random blood glucose) HBA1C, bilirubin.

Conclusion

The findings of the study revealed that there shows that in 2017,50 patients suffered from chronic liver disease from those 24 patients had type 2 diabetes mellitus. There is a significant association between type 2 diabetes mellitus with the selected demographic variables of patients with chronic liver disease like age, gender, albumin and globulin. There is a significant association between type 2 diabetes mellitus with the selected demographic variables of the patients with chronic liver disease like blood glucose test (fasting blood glucose, post prandial glucose, random blood glucose) HBA1C, bilirubin.

Source of Funding: Self

Conflict of Interest: Nil

Reference

1. Mukhopadhyay J. Use of insulin in chronic liver disorders. *Medicine Updates*. Mumbai: Physicians Association of India. 2005:203-5.
2. Bohan EM. Diabetes mellitus and cirrhosis of the liver; a case report. *Delaware medical journal*. 1947 Nov; 19(11):212-5.
3. Megyesi C, Samols E, Marks V. Glucose tolerance and diabetes in chronic liver disease. *The Lancet*. 1967 Nov 18;290(7525):1051-6.
4. Bagyalakshmi R, Therese KL, Madhavan HN, Gaudio PA, Gopinathan U, Sangwan V, Hughes TE. *Indian journal of. Indian Journal of Ecology*. 2016;43(1):1.
5. Trombetta M, Spiazzi G, Zoppini G, Muggeo M. type 2 diabetes and chronic liver disease in the Verona diabetes study. *Alimentary pharmacology & therapeutics*. 2005 Nov; 22:24-7.
6. Kobashi-Margáin RA, Gutiérrez-Grobo Y, Ponciano-Rodríguez G, Uribe M, Méndez-Sánchez

- N. Prevalence of type 2 diabetes mellitus and chronic liver disease: a retrospective study of the association of two increasingly common diseases in Mexico. *Ann Hepatol.* 2010 Jul;9(3):282-8.
7. Méndez-Sánchez N, Villa AR, Vázquez-Elizondo G, Ponciano-Rodríguez G, Uribe M. Mortality trends for liver cancer in Mexico from 2000 to 2006. *Annals of Hepatology.* 2008;7(3):226-9
 8. Aguilar-Salinas CA, Monroy OV, Gómez-Pérez FJ, Chávez AG, Esqueda AL, Cuevas VM, Rull-Rodrigo JA, Conyer RT. Characteristics of patients with type 2 diabetes in Mexico: results from a large population-based nationwide survey. *Diabetes care.* 2003 Jul 1;26(7):2021-6.

A Descriptive Study to Assess the Quality of Life of Patient with Type 2 Diabetes Mellitus in a Selected Rural Community at Kancheepuram District Tamil Nadu, India

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Abstract

Diabetic 2 mellitus is also known as non-insulin dependent diabetic mellitus. It is associated with abnormalities in carbohydrate, fat and protein metabolism and may result in the chronic complication including micro vascular, macro vascular and neuropathic disorders. The reality is that diabetes influences patients' lives. The mere presence of diabetes deteriorates a person's quality of life. When diabetes coexists with other chronic illnesses the effect is even worse. The objectives of the study is to assess the quality of life of type 2 diabetes mellitus patient in a selected rural area and association between the quality of life and the demographic variables. A purposive sampling technique is used to collect drug from the samples. The sample size was 93 type 2 diabetes patients at selected rural community area. The quality of life was assessed by final quolid questionnaires. The result shows that 6(6%) of sample had low level of quality of life, 79(85%) of the sample had average level of quality of life, 8(9%) of sample had high level of quality of life.

Keywords: Assess, type 2 diabetes mellitus, quality of life.

Introduction

Type 2 Diabetic mellitus is result from a decrease in the sensitivity of the cells to insulin and decreased in the amount of insulin produced. Diabetic 2 mellitus is also known as non-insulin dependent diabetic mellitus.¹

The reality is that diabetes influences patients' lives. The presence of diabetes deteriorates a person's quality of life. When diabetes coexists with other chronic illnesses the effect is even worse. The worldwide interest is reflected on the 1950000 articles and reviews published in the last five years on diabetic complication

are between 15000 and 28000². Notably only one article was found to assess family functioning. Due to population growth, aging, urbanization and increasing prevalence of physical inactivity and obesity the risk of diabetes continues to increase worldwide. The highest rate of diabetes prevalence in the world is in the Middle east and north Africa was recently said by international diabetes federation. In this region about 12.5% of adults aged 20–79 years or 32.8 million people had diabetes in 2011 year and this number is expected to double in less than 20 years.¹

Material and Method

Research Design: Descriptive design

Research Approach: Non experimental study

Research Setting: The study to conduct in a selected rural community.

Population: It includes type 2 diabetes mellitus patient in a selected rural community.

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Sample Size: $n = \frac{DEFF * Np(1-p)}{[(d^2/Z^2)1 - \alpha/2 * (N-1) + p*(1-p)]}$ 93 samples

Sampling Technique: Purposive sampling technique.

Findings:

Section-A: Frequency and percentage distribution of demographic variables to assess the quality of life of Type 2 diabetes mellitus among type 2 diabetes mellitus patient in Poonchery.

- **Gender:** Majority of 55(59%) of population belongs to male and 38(41%) of population belongs to female
- **Age:** Majority of 37(40%) of the population belongs to the age 55-65 yrs and 36(39%) of the population belongs to the age 45-54 yrs, 20(22%) of the population belongs to the age 35-44.
- **Education:** Majority 39(42%) of the population completed primary education (1st-4th), 35(38%) of the population are illiterate, 15(16%) of the population completed secondary (6th-7th), (4-4%) of the population completed higher secondary (8th-12th).
- **Occupation:** Majority 35(37%) of the population are self-employee, 16(20%) of the population were daily wage, 15(16%) of the population were private employee, 25(27%) of the population were house wife.
- **Family Monthly Income:** Majority of 49(53%) of the population earn below Rs5000 and 40(43%)

of the population earn above Rs5001-10,000 and 2(2%) of the population earn above 10,001-15,000, and 2(2%) of the population earn 15,001 and above

- **Types of Family:** Majority of 57(61%) of the population are nuclear, 36(39%) of the population are joint
- **Marital Status:** Majority of 87(94%) of the population are married, 6(6%) of the population are unmarried
- **Duration of Diabetes:** Majority of 43(46%) of the population were 0-5 years, 42(45%) of the population were 5-10 years, 8(8%) of the population were above 10 years
- **Types of Medication:** Majority of 54(58%) of the population take OHA, 18(19%) of the population are insulin, 13(14%) of the population were in OHA+insulin, 8(8%) of the population were life style
- **Sources of Information:** Majority of 88(95%) of the population get information from health personnel, 5(5%) of the population were by friends.

Section-B: Distribution of knowledge on quality of life of Type 2 diabetes mellitus among type 2 diabetes mellitus patient in Poonchery.

It shows that mean percentage (53.97) and standard deviation (21.24) aspect of quality of life of type 2 diabetes mellitus patient. Overall mean in the quality of life among n=93 type 2 diabetes mellitus patient found to be (21.24) and according to the quality of life of type 2 diabetes mellitus patient 6(6%) of population were in low level, 79(85%) of population were in average level, 8 (9%) of population were in high level.

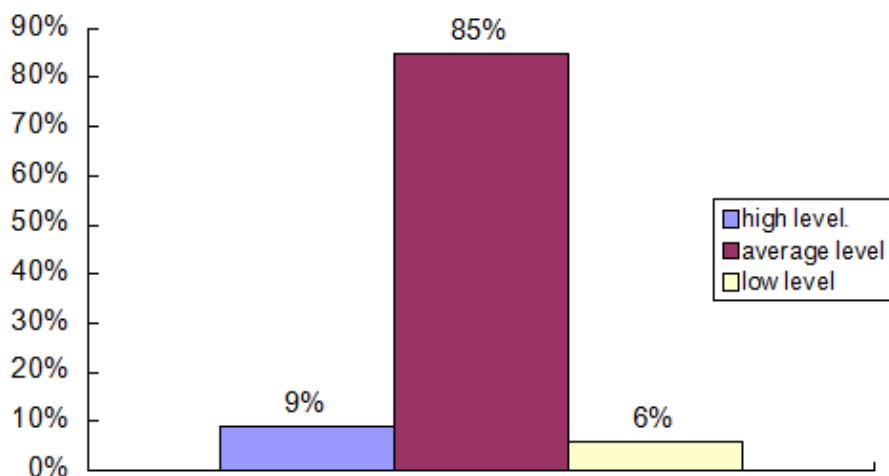


Fig. 1: Distribution of knowledge on quality of life of Type 2 diabetes mellitus among type 2 diabetes mellitus patient in Poonchery

Section C: Association of level of knowledge on quality of life type 2 diabetes mellitus with the demographic variables:

Regarding association shows that the education, family monthly income, duration of diabetes and type of medication is significant and the gender, age, occupation, type of family, marital status and source of information is non-significant with quality of life of patient in type 2 diabetes mellitus.

Summary: This chapter deals with the analysis and interpretation of the collected data from the quality of life of type 2 diabetes mellitus patient. The data collected was tabulated and analyzed using descriptive and inferential statistics, frequency and percentage were compared to summarize the sample characteristics. Mean, mean percentage and chi square were used to compare the quality of life.

Source of Funding: Nil

Ethical Consideration: Chettinad Academy of Research and Education Institution Human Ethics Committee

Conflict of Interest: Nil

Reference

1. Harish Kumar somappa. Quality of life of assessment among type 2 diabetic patient in rural teritary center. International journal of science and public health 2014; 3(4): 415-417. (accessed 26.03.2014).
2. Harsimran sing, clarebradley. Quality of life in diabetes. Int j diabdevctries 2006; 28(1).
3. Manjunath k et.al. Quality of life of a patient with type 2 diabetes; a cross sectional study in rural south india. Journal of family medicine and primary care 2014; 3(4): 396-399.
4. Jitendernagpalet.al . The development of quality of life instrument for Indian diabetes patient (QOLID). The journal of the association of physicians of indiaMay 2010; 58(5): 295-304.
5. Praveen kumar, Manu krishna. Quality of life in diabetes mellitus. Science journal of public health 2015; 3(3): 310-313.

A Descriptive Study to Assess the General Well-Being among Married Women with Domestic Abuse in Selected Community Area of Kanchipuram District, Tamil Nadu

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Abstract

Intimate partner violence is any act of gender-based violence that results in, or is likely to result in, physical, sexual, or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life. A study was conducted to assess IPV and to find the association between IPV and selected demographic variables. Majority of the samples experienced IPV. Duration of marital life, age of the woman, spouse's occupation, family monthly income were associated with IPV.

Keywords: *Intimate partner, Violence, Domestic, Physical Violence, Controlling Behavior, Insulting Behavior, Neglecting Behavior, Economic Restriction, Behavior, IPV = Intimate partner violence.*

Introduction

Intimate partner violence (IPV)/domestic violence is “any act of gender-based violence that results in or is likely to result in, physical, sexual, or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life”⁶, reported that 35% (1 in 3) of women have experienced physical/sexual violence by a partner and/or sexual violence by a non-partner in their lifetime, 30% (one third) of ever partnered women globally have experienced physical or sexual violence by a partner in their lifetime and 7% of women globally have experienced sexual violence by a non-partner in their lifetime. Worldwide, as many as 38% of murders of women are committed by a male

intimate partner. National Family Health Survey (2017)⁴, reports 29% prevalence rate for lifetime physical and/or sexual intimate partner violence in India. Violence negatively affect women's physical, mental, sexual and reproductive health and may increase the risk of acquiring HIV in some settings².

Men are at risk to perpetrate violence if they have low education, a history of child maltreatment, exposure to domestic violence against their mothers, harmful use of alcohol, unequal gender norms including attitudes accepting of violence and a sense of entitlement over women. Women are more likely to be exposed to intimate partner violence if they have low education, exposure to mothers being abused by a partner, abuse during childhood and attitudes accepting violence, male privilege and women's subordinate status⁶.

IPV results in injuries, unintended pregnancies, induced abortions, gynaecological problems, sexually transmitted infections, miscarriage, stillbirth, pre-term delivery and low birth weight babies, depression, post-traumatic stress and other anxiety disorders, sleep difficulties, eating disorders and suicide attempts, drug and alcohol abuse, headaches, back pain, abdominal pain, gastrointestinal disorders, limited mobility

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and poor overall health. Intimate partner violence is associated with higher rates of infant and child mortality and morbidity. Women suffer isolation, inability to work, loss of wages, lack of participation in regular activities and limited ability to care for themselves and their children. Children growing-up in violent families suffer behavioural and emotional disturbances which in turn is associated with perpetrating or experiencing violence later in life⁶.

The reported that 34% of respondents had experienced IPV, with 21.4% reporting sexual and or physical forms, experience of emotional and economic IPV were 24.6% and 7.4% respectively. Senior high school education or higher was protective of IPV. Depression, disability, witnessing abuse of mother, experience of childhood sexual abuse, having had multiple sexual partners, control by male partner, male partner alcohol use and male partner infidelity were significantly associated with increased odds of physical or sexual IPV experience¹.

Significant factors associated with experiencing physical violence were being currently/ever married, being younger age, women with young partners, low level of education, disparity in educational attainment, farmer, knowing women in neighborhood whose husband to beat them, being a Muslim, having a drunkard partner, harmful use of alcohol and drugs, witnessing maternal abuse in childhood, having given birth two or more times and being in a polygamous partnership, personality disorders, acceptance of violence, conflict or dissatisfaction in the relationship, male dominance in the family, economic stress, poverty. Having a husband/partner with tertiary education and both parties choosing each other were protective factors⁴.

Objectives:

- To assess IPV.
- To find the association between IPV and selected demographic variables.

Method

Research Approach: Non-experimental research approach was used.

Research Design: A Descriptive research design was used.

Research Setting: The study was conducted at Pooncheri, Kanchipuram (DT), Tamil Nadu.

Population: Married women who fulfill the sampling criteria.

Sampling Technique: The non- probability, purposive sampling technique was used for the study.

Sample Size: Sample size was calculated using the formula $N = 4pq/d^2$. ($p = 33.5\%$). The final sample size was 135.

Data Collection Instruments: Demographic variables proforma and Intimate Partner Violence questionnaire were used. The Intimate Partner Violence questionnaire is a 20-item questionnaire, to identify IPV over the past 1 month, was developed based on expert opinion. Six items loaded on physical violence, 4 on controlling behavior, 3 on insulting behavior, 3 on neglecting behavior and 2 on economic restriction.

Scoring and interpretation: Report of the married woman about the presence of IPV in any of the 5 sub-classification of IPV was given a score 1 and absence 0.

Data collection procedure: Data was collected over one week.

Results

Majority of the samples were between 31- 40 years of age (42.2%), home-makers (88.9%) and had higher secondary education (29.6%). Majority of their spouse were between 31- 40 years of age (50.4%), skilled workers and had undergraduate education (35.6%). Majority had two children (61.5%), had history of drug/alcohol/substance abuse/abuse in the family (40.7%), lived in nuclear families (75.6%), were married for 6 to 10 years (38.5%) and had monthly income between Rs. 10,000/- – 15,000/- (83.7%)

Majority of the samples reported of controlling behavior (97.0%), insulting behavior (60.0%) and economic restriction (97.0%). Minority of the samples reported of physical violence (37.0%) and neglecting behavior (3.7%) (Table 1).

Table 1: Intimate Partner Violence N=135

S.No.	Intimate Partner Violence	Present		Absent	
		No.	%	No.	%
1	Physical Violence	50	37.0	85	63.0
2	Controlling Behavior	131	97.0	4	3.0
3	Insulting Behavior	81	60.0	54	40.0
4	Neglecting Behavior	5	3.7	130	96.3
5	Economic Restriction	131	97.0	4	3.0

Discussion

Majority of the samples experienced IPV in one or more of the sub-categories like physical violence, controlling behavior, insulting behavior, neglecting behavior and/or economic restriction. Duration of marital life, age of the woman, spouse's occupation, family monthly income were associated with IPV. Similar findings were reported earlier².

IPV is one of the most common forms of violence against women which includes physical abuse, sexual abuse, emotional abuse and controlling behaviors. Most common perpetrators of violence against women are male intimate partners or former partners. Physical abuse include slapping, hitting, kicking and beating. Sexual abuse include forced sexual intercourse and other forms of sexual coercion. Emotional abuse include insults, belittling, constant humiliation, intimidation, threatening to harm, threatening to take away children⁷. Controlling behaviors include isolating the individual from family and friends, monitoring their movements and restricting access to financial resources, employment, education or medical care. IPV can result in physical injury, sexually transmitted diseases, violence during pregnancy, suicide and homicide⁸.

Nurses should organize media and advocacy campaigns to raise awareness on legislation with regard to the current law, help line and availability of advocacy social groups. Strengthen women's civil rights in relation to divorce, property, child maintenance and child custody⁶.

Limitation: Data collection is limited to one week. And the sample size is small. In future studies larger sample size should be studied for generalizability.

Conclusion

IPV is found to be high and is a serious problem among women. Multifaceted interventions such as male counseling, increasing awareness on the consequences of intimate partner violence, empowering the women and creating awareness on organizations such as International Foundation for Crime Prevention and Victim Care working to support IPV clients will help to prevent and reduce IPV.

Source of Funding: Self.

Conflict of Interest: Nil.

Ethical Issues: Department clearance was obtained from Department of Mental Health Nursing, Chettinad College of Nursing. UG committee clearance was obtained from UG Research Screening Committee. Institutional Human Ethics Committee clearance was obtained from Chettinad University. Formal permission was obtained from the Principal, Chettinad College of Nursing. Formal consent was obtained from the study samples before collecting the information. Confidentiality of the study was maintained.

Reference

1. Alangea DO, Addo-Lartey AA, Sikweyiya Y, Chirwa ED, Coker-Appiah D, Jewkes R, Adanu RM. Prevalence and risk factors of intimate partner violence among women in four districts of the central region of Ghana: Baseline findings from a cluster randomised controlled trial. *PLoS one*. 2018 Jul 19; 13(7):e0200874.
2. Feseha G, Gerbaba M. Intimate partner physical violence among women in Shimelba refugee camp, northern Ethiopia. *BMC public health*. 2012 Dec; 12(1):125.
3. Makayoto LA, Omolo J, Kamweya AM, Harder VS, Mutai J. Prevalence and associated factors of intimate partner violence among pregnant women attending Kisumu District Hospital, Kenya. *Maternal and child health journal*. 2013 Apr 1; 17(3):441-7.
4. Kapiga S, Harvey S, Muhammad AK, Stöckl H, Mshana G, Hashim R, Hansen C, Lees S, Watts C. Prevalence of intimate partner violence and abuse and associated factors among women enrolled into a cluster randomised trial in northwestern Tanzania. *BMC public health*. 2017 Dec; 17(1):190.
5. Joachim J. Framing issues and seizing opportunities: The UN, NGOs and women's rights. *International Studies Quarterly*. 2003 Jun; 47(2):247-74.
6. World Health Organization. Understanding and addressing violence against women: Intimate partner violence. World Health Organization; 2012. Crenshaw K. Mapping the margins: Intersectionality, identity politics and violence against women of color. *Stan. L. Rev*. 1990; 43:1241.
7. World Health Organization. Global health observatory (GHO) data. https://apps.who.int/iris/bitstream/handle/10665/77432/WHO_RHR_12.36_eng.pdf;jsessionid=2AD67ADC7161CCECE5E7397AC2D4478B?sequence=1

Assessment of the Knowledge on Breast Self-Examination among Women in Selected Tertiary Hospital at Kelambakkam District, Tamil Nadu, India

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Abstract

The research approach used for the present study was **descriptive research design** which involves the assessment of the knowledge on breast self-examination among women in selected tertiary hospital, Kelambakkam, Kancheepuram District, Tamil Nadu, India. The sample of the study was chosen by purposive sampling technique, which includes 256 women who are in hospital.

The data collection was validated and reliability was determined and pilot study was conducted, following which the data collection was carried out. Data procured was interpreted by descriptive and inferential statistics. Analysis of data was executed in terms of frequency percentage distribution, mean and standard deviation, chi-square test for the assessment of knowledge on breast self-examination among women.

The study finding was revealed that 17.58% had inadequate knowledge, 56.64% had moderate knowledge and 25.78% had adequate knowledge. Most of the women had a moderate level of knowledge on breast self examination practices. In assessing associate the level of knowledge on breast self-examination with the selected demographic variables among women with age 30-50 years it shows various frequency and percentages and it is very important to do find the association of level of knowledge . In regarding to any history of level of knowledge on breast self-examination among women with age 30-50 years is significant association between age, number of childrens, education and occupation (p value =<0.05). There is no significant association with the other demographic variables with the level of knowledge on breast self-examination among women.

Keywords: Knowledge, breast self-examination, women.

Introduction

Breast Self-Examination (BSE) is a screening method used in an attempt to detect early breast cancer.

The method involves the women herself looking at and feeling each breast for possible lumps, distortions or swelling.

Breast self-examination were once promoted heavily as a means of finding cancer at a more curable stage, but large randomized controlled studies were found that it was not effective in preventing death and were actually caused harm through needless biopsies, surgery and anxiety. Breast awareness is an informal alternative to structured breast self-examinations.

Breast cancer is the second leading cause of cancer deaths in women and poses a global public health concern⁽¹⁾. There is an increased burden of breast

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cancer were in both developed and developing countries including Uganda^(1,2). Globally, over one million breast cancer cases were diagnosed annually⁽¹⁾. These amount to a total 411,000 deaths from breast cancer accounting for 14% of female cancer deaths worldwide^(3,4). It is estimated that about half (60%) of breast cancer deaths occur in economically developing countries^(4,5).

The incidence of breast cancer in Uganda is unknown, although reports show that breast cancer is the third most common cancer among women with a low five-year survival rate estimated at 56%⁽⁶⁾. This is attributed to breast cancer were being an invasive and aggressive disease and is associated with a poorer prognosis in older women⁽⁶⁾. Early detection rates were through breast self-examination (BSE) plays an important role in decreasing the morbidity and mortality rates in addition to several other factors⁽⁷⁾. Contributory factors to breast cancer mortality rates were include genetics and poverty and unequal access to prompt quality treatment coupled with inadequate awareness and knowledge of the disease⁽²⁾. Inadequate knowledge about breast cancer were documented as an important factor in preventing women visiting screening facilities, engaging in BSE and delayed treatment and thus contributes to the high morbidity and mortality rates^(3,8,9).

Numerous studies have indicated the need for conducting more research on breast cancer knowledge, screening practices and factors such as lifestyle changes to address the increasing morbidity and mortality rates⁽¹⁰⁾. Such studies should be extended to female university students to strengthen BSE behaviors and practice to reduce breast cancer-related deaths in women under the age of 35⁽¹¹⁾.

Hemalathakumarasamy et al, (2017) conducted study on Determinants of awareness and practice of breast self examination among rural women in Trichy, Tamil Nadu. The aim of the study is to assess knowledge and practice of breast self-examination among females. A cross-sectional study was carried out among a total sample of 200 women. And the data were collected using the structured interviewer-administered questionnaire variables. The mean age of the study group was 36.9 ± 8.8 years. Eighty percent were literates. Most of the women 89% had aware of breast cancer. Only 26% of the women were aware of breast self examination . Only 18% of the females had ever checked their breast and 5% practiced it regularly. Awareness of breast self examination was found to be significantly associated with

age and educational attainment. The level of knowledge and practice of breast self examination among females were unacceptably low and efforts should be made to increase level of knowledge and practice of breast self examination through health education programs⁽¹²⁾.

Statement of the Problem: Assessment of the knowledge on breast self examination among women on selected tertiary hospital at Kelambakkam, Kancheepuram District, Tamil Nadu, India

Objectives:

- To assess the knowledge on breast self-examination among women who came for hospital
- To determine the association between the selected demographic variables with level of knowledge on breast self-examination among women.

Operational Definitions:

1. **Effectiveness:** The degrees to which objectives are achieved and the extent to which targeted problems are solved. It is the capability of producing a desired result among women in selected tertiary hospital.
2. **Knowledge:** Knowledge is a familiarity with someone or something and it can include facts, information, descriptions, or skills acquired through experience or education. It can refers to the theoretical or practical understanding of a subject.

In this study knowledge refers to the awareness and familiarity about breast self-examination among women in selected tertiary hospital.

3. **Breast self-examination (BSE):** A Breast self-examination (BSE) is an inspection by a woman of her breasts to detect breast cancer early.

In this study BSE refers to gain knowledge regarding Breast self-examination among women on Kelambakkam.

4. **Assess:** Determine or evaluate the knowledge on breast self-examination among women.

Materials and Method

Research Approach: The choice of the appropriate research depends on the purpose of the study. The main objective was to assess the level of knowledge on breast self-examination among women in selected tertiary hospitals with the structured questionnaires. Hence an experimental approach was adopted by the investigator.

Research Design: The term research design refers to the plan of organization of scientific investigations. The research design selected for the present study is descriptive research design. The variables are clearly identified and defined in the study.

Research Setting: The study was conducted among women on selected tertiary hospital at Kelambakkam, Kancheepuram District, Tamil Nadu, India.

Population: Population refers to comprised of women those who are getting treatment in Chettinad hospital and research institute, Kelambakkam, Kancheepuram District, Tamil Nadu, India.

Sample: The women those who are getting treatment in Chettinad hospital and research institute, Kelambakkam, Kancheepuram District, Tamil Nadu, India.

Sample Size: Sample size consist of 256 samples who fall under inclusion criteria

Sampling Technique: As the selection of sample depends on availability of patients, purposive sampling technique was adopted based on inclusion criteria.

Criteria for Sample Selection:

Inclusion Criteria:

- Who are all present during data collection
- Women with age between 30-50 years

- Women who are willing to participate
- Who can understand english/tamil

Exclusion Criteria:

- Who have underwent breast surgery.
- Who have exposed to previous teaching programme about breast self examination.

Procedure for the data collection: The investigator obtained prior permission from head of the department of medical surgical nursing to conduct the study. 256 samples were selected by non probability purposive sampling technique with minimum of 52 cases per day from 8.30am – 12.30pm and from 1.15pm – 4.00pm.

The names of the patients were obtained. The investigator introduced to each participants and explained the purpose of the study and took a written consent. The investigator administered structured questionnaire to the patients. The data collection took 10- 20 minutes for each patients. After the completion of the data collection the investigator educated the participants regarding the breast self examination and thanked the participants for their co-operation.

Findings: In assessing level of knowledge on breast self examination among women

- 45 (17.58%) of women have inadequate knowledge.
- 145(56.64%) of women have moderate knowledge.
- 66(25.78%) of women have adequate knowledge.

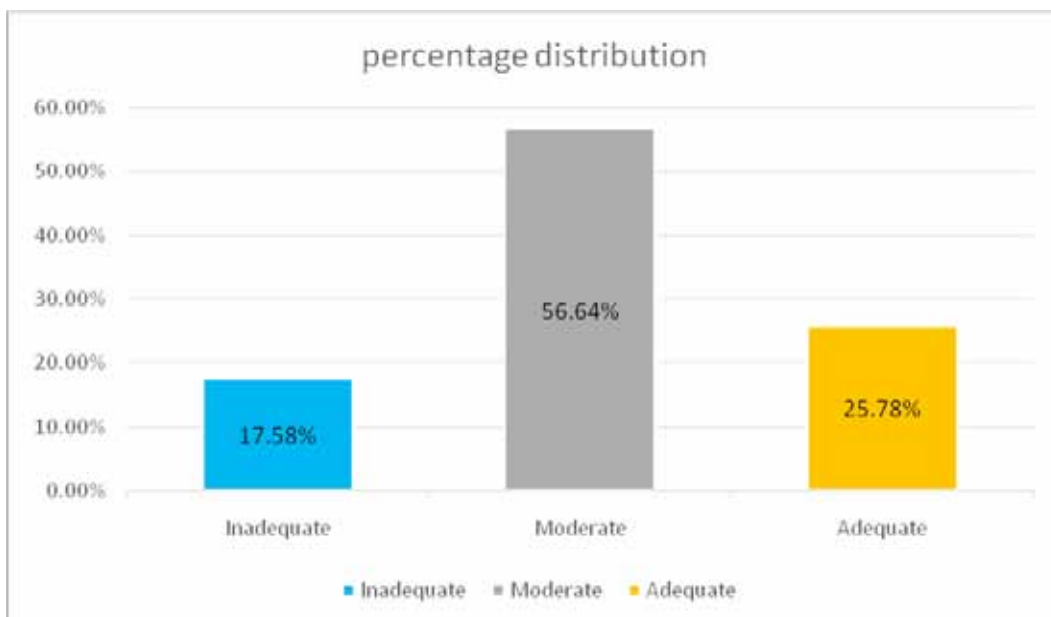


Figure 1: Frequency and percentage distribution of level of knowledge on breast self examination among women

Table 1: Mean, Mean% and Standard deviation of level of knowledge on breast self examination among women. N=256

S.No.	Level of Knowledge	Mean	Mean%	Standard Deviation
1	INADEQUATE	13.01	13.01%	4.55
2	MODERATE			
3	ADEQUATE			

From the above table 1: It showed that the mean (13.01), mean % (13.01%) and standard deviation (4.55) aspect of level of knowledge on breast self examination among women. The maximum knowledge level is moderate (56.65%).

Table 2: Association between demographic variables with the level of knowledge on breast self examination N=256

Characteristic	Category	No. of Sample	Level of Knowledge			X ² value	P value
			Inadequate	Moderate	Adequate		
Age	20-25 years	10	3	5	2	36.61	12.59 Significant
	26-30 years	39	15	18	6		
	31-35 years	128	10	69	49		
	Above 35 years	79	17	53	9		
Marital status	Married	238	40	135	63	4.96	12.59 Not significant
	Single	10	4	4	2		
	Divorced	7	1	5	1		
	Widow	1	0	1	0		
No of childrens	No children	25	6	14	5	16.66	12.59 Significant
	One children	80	11	49	20		
	Two children	112	15	59	38		
	More than two child	39	13	23	3		
Education	No formal education	57	12	37	8	15.91	12.59 Significant
	High school level	57	12	37	8		
	Higher secondary school level	64	8	35	21		
	Graduate & above	78	13	36	29		
Occupation	Student	4	2	1	1	16.41	12.59 Significant S
	Business women/civil servant	78	5	45	28		
	Farmer	8	3	4	1		
	Housewife	166	35		36		

In regarding to any history of level of knowledge on breast self examination among women with age 30-50 years is significant association between age, number of children, education and occupation (p value =<0.05). There is no significant association with the other demographic variables with the level of knowledge on breast self examination among women.

Discussion

Most of the women had moderate knowledge (56.64%) on breast self examination. There is a

significant association between age, number of children, education and occupation (p value =<0.05). There is no significant association with the other demographic variables with the level of knowledge on breast self examination among women.

In assessing associate the level of knowledge on breast self examination with the selected demographic variables among women with age 30-50 years.

In regarding to age (3.91%) belongs to the age group of 20 to 25 years, (15.23%) belongs to the age group of

26-30 years, (50%) belongs to the age group of 31-35 years, (30.86%) belongs to the age group of above 35 years .

In regarding to marital status, (92.97%) belongs to the married, (3.91%) belongs to the single, (2.73%) belongs to the divorced, (0.39%) belongs to the widow.

In regarding to number of children, (9.77%) belongs to the no children, (31.25%) belongs to the one children, (43.75%) belongs to the two children, (15.23%) belongs to the more than two child.

In regarding to education, (22.27%) belongs to the no formal education, (22.27%) belongs to the high school level, (25%) belong to the higher secondary school level and (30.46%) belongs to the graduate & above .

In regarding to occupation, (1.17%) belongs to the student, (30.47%) belongs to the business women/civil servant, (3.13%) belong to the farmer and (65.23%) belongs to the house wife.

Conclusion

The study findings revealed that, majority of women were having inadequate and moderate knowledge and most of the demographic variables were statistically significant and concluded the assessment of level of knowledge on breast self examination among women as an importance in determination of early prompt treatment.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee on 04/02/2019. (Proposal no. 318/IHEC/1-19).

References

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, method and major patterns in GLOBOCAN 2012. *Int J Cancer* 2015. Mar; 136(5):E359-E386. 10.1002/ijc.29210 [PubMed] [CrossRef] [Google Scholar]
2. Parkin DM, Nambooz S, Wabwire-Mangen F, Wabinga HR. Changing cancer incidence in Kampala, Uganda, 1991-2006. *Int J Cancer* 2010. Mar; 126(5):1187-1195. 10.1002/ijc.24838 [PubMed] [CrossRef] [Google Scholar]
3. Akpo EE, Akpo MO, Akhator A. Breast cancer knowledge and screening practices among Nigerian medical students. *Int J Health* 2010; 11(2).
4. Battaglia F, Plotti F, Zullo MA, Panici PB, Plotti G, Brown LA, et al. Gynecologic cancer. *Cancer* 2006; 16:29-35. [Google Scholar]
5. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin* 2011. Mar-Apr; 61(2):69-90. 10.3322/caac.20107 [PubMed] [CrossRef] [Google Scholar]
6. Gakwaya A, Kigula-Mugambe JB, Kavuma A, Luwaga A, Fualal J, Jombwe J, et al. Cancer of the breast: 5-year survival in a tertiary hospital in Uganda. *Br J Cancer* 2008. Jul; 99(1):63-67. 10.1038/sj.bjc.6604435 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
7. Tavafian SS, Hasani L, Aghamolaei T, Zare S, Gregory D. Prediction of breast self-examination in a sample of Iranian women: an application of the Health Belief Model. *BMC Womens Health* 2009; 9(1):37. 10.1186/1472-6874-9-37 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
8. Ramirez AJ, Westcombe AM, Burgess CC, Sutton S, Littlejohns P, Richards MA. Factors predicting delayed presentation of symptomatic breast cancer: a systematic review. *Lancet* 1999. Apr; 353(9159):1127-1131. 10.1016/S0140-6736(99)02142-X [PubMed] [CrossRef] [Google Scholar]
9. Ma J, Jemal A. Breast cancer statistics. *Breast Cancer Metastasis and Drug Resistance: Springer*; 2013; p. 1-18. [Google Scholar]
10. Howell A, Anderson AS, Clarke RB, Duffy SW, Evans DG, Garcia-Closas M, et al. Risk determination and prevention of breast cancer. *Breast Cancer Res* 2014; 16(5):446. 10.1186/s13058-014-0446-2 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
11. Fry RB, Prentice-Dunn S. Effects of a psychosocial intervention on breast self-examination attitudes and behaviors. *Health Educ Res* 2006. Apr; 21(2):287-295. 10.1093/her/cyh066 [PubMed] [CrossRef] [Google Scholar]
12. Kumarasamy H, Veerakumar A, Subhathra S, Suga Y, Murugaraj R. Determinants of awareness and practice of breast self examination among rural women in Trichy, Tamil Nadu. *Journal of Mid-life Health*. 2017; 8(2):84

Structural Transformation and Learning Paradigms-Global Strategic Approach in Clinical Legal Education

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Abstract

Technological changes have profound impact on all the existing system and surroundings. Digitalization has brought the transformation in all the routine activities and the way to earn, learn, shop and play. In a collective way production and contours of work are being changed, vis a vis social and political actions, in the forms of rules, regulations and policies, are determined to unfold the future.

To view clinical legal education from global perspective, it is a movement with objective to educate lawyers for social justice. This area of law education is most influential across the world. If common essential elements are followed throughout the globe, it may transform legal education into justice education in real sense and can contribute to future growth. When everything is within the ambit of globe, it is time to develop professional skills and experiential teaching method to promote new concepts of greater global relevance and impact.

With the change of global trends and merging national boundaries, goals of clinical movement is also changing, consisting of three aspects – increasing access to justice, training future lawyers in professional skills and values and promoting a more diverse skilled legal profession committed to serving social needs. There is need to have global network and to support emerging global concept with clinical movement with the capacity to stimulate contribution and interest in clinical legal education far beyond the capacity of any group of individual clinical expertise.

Keyword: *Clinical legal education, Global, professional skills, technological revolution, neo liberalization, digitalization.*

Introduction

Digital revolution has unfolded the age of neo-liberalization, which emerged corporate power and reduced social contract. As far as India is concerned and as it is on the path of growth Indian legal education should also be reformed with the same pace to strengthen the legal profession and to take on the challenges of the 21st cent of neo capitalism, economic liberal policies, WIPO and WTO. Legal profession in India has to cater to the needs of new brands of legal consumer, need to identify the techniques of this.

Globalisation and Academic Potential:

Globalisation means as an interaction with the global, interacting with the communication and everything, interacting and making a proper definition for the term legal education in law but learning all about life.

Hon'ble Mr. Justice A.P. Mishra said "lawyers are the mother", Judges come out of the lawyers. If the legal education is not properly done, the product will not be good. Globalisation, concerning the legal education in the combination of every aspect comprising legal issues prevailing in the Global level. International Treaties, WTO, International Conventions increases the trade related activities across the world. As a result there is shift in litigation. Therefore, legal education should concentrate on policy planning, business activities, negotiating abilities, communication skills, mediating skills, economic advisory, political advisory, constitution expertise financial wizard, taxation and labour law expertise, all at Global level. To achieve the above, legal education should help to assimilate many factors such as improvement and introduction of global curriculum, potential academicians.¹

Legal education in India has seen a sea of changes. The competition in the field of law has also increased manifold. It is now a global platform and every student who steps into the shoes of a lawyer is expected to handle different fields. The concept of specialization is diminishing at the advent of Corporate Law Firms. Advancement and development in economies are becoming increasingly sluggish and fractured.

With the emerging concepts of artificial intelligence, Blok chain, Education 4.0, along with digital technology, capabilities and potential must develop and efforts are to be made at school and university level for upgrading the digital skills, running special basic and advanced skill based programs. More comprehensive strategy and a much fuller range of policy measures are needed in compatible with industrial policy.

Technological Revolution of 21st Century: With the ongoing technological revolution, to build a 21st century model for higher education of high quality, the need of Indian Universities to raise the level to be in world ranking, not just the best in the world but the best for the world. In view of the socio-economic imperatives – there is also need to generate greater awareness, reducing of disparity in geographic, economic and social groups. Then it is essential to attach the law education research focused to deliver high quality output. As per the vision 2030 Indian Higher Education Policy, the focus should be on the critical thinking and problem solving attitude, industry oriented courses, entrepreneurship skills, faculty with industry experience and alumni linkages across the education etc.

As a foundation of the society or a nation law is considered to be the means for social progress and economic growth. Since ancient times, “Law Education”, has always played a crucial function by not only making disciplined society, but also producing brilliant academicians, visionary judges and astounding lawyers. In present scenario, law education is not confined to the boundaries of producing lawyers only. Its scope and impact is growing in every sphere of human life. Law education is considered as a multidisciplinary subject, who involves basic knowledge of science, philosophy, arts, humanities and social sciences.

Now these days Law is one of the most preferred career option at par with Medicine and Engineering. It is no more considered as last resort. There has been a huge transformation in the legal field. Although substantial

changes have been made in law education sector but still there is a room for improvement to enhance the level in every term. The quality of an institute depends upon the incorporation of current changing dynamics and challenges of environment. With the economy undergoing rapid changes, if institute fail to keep pace with these changes, they will be perceived as progressively irrelevant. Time is running short when law schools has to add value to the society and shaping and grooming the future leaders who can contribute in accelerating sustainable economic development in creative ways.²

Global Advancements and Impact on Clinicallegal Education: Advancements of technology and impact of globalization have increased the importance of legal studies. Law is dealt and connected with other disciplines so it cannot be taught in isolation. It is to develop and nurturing the students in such manner to make them socially sensitized leaders inculcating in them the intellectual, entrepreneurial and ethical values that can give them enough courage to confront the challenges thrown up by an increasingly industrialized and complex milieu in the society.³ Appropriate mix of substance, skills and ethics in the law, has been debated for several decades. It is the responsibility of law institute to cultivate competency in the students to make them effective, ethical and responsible in their profession.

With the growing economy, boundaries in knowledge is disappearing and in the present scenario, legal education is becoming more innovative, flexible and responsive as business and corporate world in the 21st century by the dictates of the changing environment. Internationalization, technology and social responsibility are the essential parts of education.

With the liberalization and globalization, there is transformation in political economy of the countries. There was a major shift in trends and culture. This change had major impact on the legal system. There is growing demand for new laws, new regulations and new skills to interface with the broader global economic and political environments and social needs.⁴ There are some important aspects of India’s historical and cultural context – social structure, legacy of colonization, deep seated stratification, legal regulatory structure, diversity, demographic structure etc., which interplays with global responses.

Today is the digitalized Z generation and Law Schools

are responsible to prepare students for professional life and practice ready to fulfil needs of society to contribute, which is very complex and fast transforming due to technological innovations. Law professionals have to contribute to society in forms of legislative, judiciary, executive, academia and corporations.⁵

As technology is fast growing, tasks that conventionally have been going to professionals would be transferring to computers and in future case might be resolved by computers working with algorithms so that outcomes may be predicted through artificial intelligence. This gives the signal to legal professionals to upgrade their knowledge and to develop skills to be able to match and to redefine professional ethics. In this way Law schools should contribute to prepare students for tasks and challenges in times to come..

Two factors, which academic legal education is confronting with:

1. The increase in technology new concepts in education.
2. Global trends and transformations

To cope with these two giants, question is raised here-which research to pursue and how to acquire new knowledge.

As per the latest concepts lawyers not only to interpret law but also to deal with social economic, financial or medical data. Clients may certainly expect from their Lawyers about the predictions of the outcome of the case and to assess the success rate. Clients may ask for probability of the witness's truthfulness and certainly of case judgement. If lawyers are not yet trained to calculate these complex and multidiscipline components and the aspects of legal dispensaries, lawyers will be very much into contemporary risks. Lawyers hold much power while interpreting data, but they must learn to use that power well with the application based knowledge of technology.⁶

Due to this difficulty of risk assessments and uncertain truth demand, legal education should be provided in such manner which covers all disciplines, all nations and all geographic boundaries. There must not be boundaries between different disciplines as students must know that every problems can be evaluated from multiple and sometimes incompatible perspectives.

It is essential to extend the boundaries to acquire

knowledge through new concepts, courses and communication with professionals from different areas to create hothouses for emerging ideas and solutions and it will reduce blind spots within their own professional fields. Various global dimensions which are manifested in the growth of networking, inter connectedness and interdependence leading to changes in global politics.⁷ Globalization enables progress, wealth and freedom. It empowers international collaboration and is beneficial for economic trade. Same way to a great extent globalization cause significantly structural changes in law. Legal education is facing confrontation in this transition phase of globalization⁸ Specifics skills and method are needed to develop in law aspirants to flourish in the globalized world and Global Law Clinics are very much required as the only solutions.⁹

The United Nations Organization (UNO) can be, best, trusted by all nations to do the Job. Let the laws, lawyers and Jurisdictions of international concern be jealously earmarked and expertly coded for universal and worldwide, applicability, without any exception. The follow-up patterns and parameters of judicial system and legal fabric are to abide by the said internationally acclaimed laws with rules & regulations, If any. The local laws should, to the extent as internationally covered, stand eclipsed to all intents and purposes. The distinction between and among the barristers, attorneys advocates and counsel etc. is to be eschewed, so as to enable any lawyer of any country to appear and plead before any court in any country. The decrees and punishments are to be executed accordingly.

UNO Initiatives: To start the ball rolling, the UNO, after a 'Resolution' in that behalf, constitute a 'Committee of Experts' to draft the necessary laws, rules or regulations. They said 'Committee' may comprehend one expert from each and every country likely to be affected or have selective basis on motion of unanimity.. The final draft is to be implemented, after being green-signaled by the unanimous 'Resolution' of the UNO in General Assembly, to its subsequent adoption by the law of the land of every unit.

Some snags are bound to intervene but need be faced with impunity. Some countries might hail, while others break away. Be that as it may, still, the plan need be started in right earnest and with hot and shot pursuit. They say and rightly so that good work, well begun, is half done and that work, half done is well done. Frankly speaking, such an attitude is the sign of

a person/institution great. Needless to say that the UNO is already, a celebrated great being, always, avowed to execute the greater and greatest for the welfare of the humanity at large.

In sooth, past bears testimony to such excellences on part of the UNO. To exemplify, reference can run through: Conventions.

There are some other factors to be borne in mind for the target:

(a) President of Yale University, Professor Richard Levin, in 2005, at JNU, opines: “The globalization of the university is in part, an evolutionary development, but creating the global university is a revolutionary creation signaling distinct changes in the substance of teaching and research, the demographic characteristics of students and scholars, the scope and breadth of external collaboration and the engagement of the university with new audiences.

When I speak of a global university, I envision a curriculum and a research agenda permeated by awareness that political, economic, social and cultural phenomena in any part of the world can no longer be fully understood in isolation.”

- (b) When globalization becomes the central focus for reforms in higher education, there is a need to be innovative in promoting global collaborations and interactions between and among the universities. Making and signing of numerous MoUs are a vain exercise for reaping practical benefits and concrete forms in the field. The forging and availing of appropriate opportunities of collaborative interactions is important to illumine the requisite perspectives.
- (c) The curriculum to be prescribed and faculty to be inducted deserve dynamic dimensions as germane to the globalizing world.
- (d) As many of the law schools, colleges and universities in Australia, Canada and Hongkong are in the fore front for innovation, India should also, be associated in the plunge.
- (e) The ever mounting competitiveness on the globe is hurtful to the uplift of less developed countries including India.
- (f) The eradication of poverty and improvement of

human life the world over is the concern of all and each individual of every country on the planet.

- (g) Legal education has, already, waded through transnational and international-cum-global paradigms of various sorts.
- (h) The concept of promoting the lot of every nation is constantly, on rise of the graph.
- (i) The UNO is deemed to provide the desired space and platform for international, interactional and collaboration.
- (j) The globalization of standards appears to be the only panacea for all evils apportionable to legal education in every nook and corner of the world.

In nutshell, the ushering-in of such a legal world of universalization of law and legal system would meet all the above and more challenges of globalization. In this context, Prof. David E Van Zandt of North West University School of Law can be quoted with profit for the idea envisioned:

“Whether a lawyer is working for multinational clients in Hongkong, Frankfurt, London, or New York, the set of practices is largely the same. This enables a skilled lawyer to move effortlessly around the world.”

The culturing and nurturing of the spade-work by a well-groomed team(s) for the purpose desired is the next step to march ahead. That is, also, a task apportionable to the UNO, which should determine and coordinate, by appropriate rules and regulations, the institutional design (s), location, infrastructural decors, quantity- cum- quality of faculty, desirable method(s) of lecturing, period(s) of pursuit, type (s) of admission tests and pass-out examinations, medium of instruction and examination, curriculum of core/compulsory/ optional subjects, with syllabus for individual courses, necessity of the knowledge of a foreign language, exchange tie-ups, clinical training, award of degrees and diplomas and rigors of entry into legal profession and allied professional jobs the world over. In such a backdrop, the entire legal profession will bristle with ‘cherishment from all sides and sections to the (a) pre-emption of mushrooming of uniform schools, colleges and universities of law and overcrowding of professional markets and (b) outcome of more bridges than walls and, also, elimination of country-wise brands and benchmarks and rankings and accreditations in the world of legal education.¹⁰

Conclusion

Thus, there must be rise in fundamental education and professional aspiration out of the national diversity to reinforce worldwide clinical legal responsibility to transform legal education into justice education and must be realistic in the face of varying technological resources and global ambitions. It acknowledges the reflections of globalization and technology on law and its impact on clinical and therapeutically based legal education to produce lawyers with social justice and global vision.

Let it be a dream to be realized for sure and not forgotten. Why can't we embark on such a direction, as mooted, in thought, word and deed? Sooner, the better-the word 'impossible' to lie in the dictionary of fools!

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from Research Committee, Amity Law School, Amity University, U.P. India

References

1. Sommerlad Hilary, Harris Short Steven Vaughan, Young Richard, *The Future Of Legal Education and the Legal Profession*, published by Oxford And Portland Oregon, 2015, pp1-23
2. Maj. Gen. Nilendra Kumar, 'Handbook On Clinical Legal education', published by Universal Law Publishing Co., 2013
3. Giddings Jiff & Lyman Jennifer, 'Bridging Different Interests: The Contributions of Clinics to Legal, The Global Clinical Movement-Educating Lawyers For Social Justice, Education' Edited by Bloch, S. Frank 2011, Ch. 20, pp297
4. Prof. Madhav Menon N.R., "The Transformation Of Indian Legal Education, A Blue Paper, Harvard Law School Program On The Legal Profession, 2012
5. Prof. Jayagovind A. 'Legal education in Twenty First Century- Digital Dimensions, Universal Law Publishing Co., 2014, Ch.9, pp103
6. Gold Neil & Plowden Philip, 'Clinical Scholarship and the Development of the Global Clinical Movement', *The Global Clinical Movement-Educating Lawyers For Social Justice, Education* Edited by Bloch, S. Frank 2011, Ch. 21, pp311
7. Chesterman Simon, 'The Globalization of Legal Education', *Vision of Legal Education*, 2015, Ch. 2, pp20
8. Prof. C. Rajkumar VC, OP Jindal Global University, 'Legal Education, Globalisation and Institutional Excellence: Challenges for the Rule of Law and Access to Justice in India, *Indiana Journal of Global Legal Studies*, Vol. 20, Issue 1, 2013
9. Santow Edward and George Mukundi Wachira, 'The Global Alliance for Justice Education', *The Global Clinical Movement-Educating Lawyers For Social Justice, Education* Edited by Bloch, S. Frank 2011, Ch. 25, pp371
10. Prof. Madhav Menon. N.R., 'A Handbook on Clinical Legal Education', Eastern Book Company, 2008 pp.7-8.

Assessment of Passive Smoking Exposure among Adults Population in a Selected Urban Community Area Kanchipuram District, Tamil Nadu, India

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Abstract

Assessment of passive smoking exposure among adults population in a selected urban community area, Kanchipuram District, Tamil Nadu, India. The objectives are to assess the passive smoking exposure among adults population in a selected urban community area, To associate the passive smoking exposure with demographic variables in selected community area. Purposive sampling technique was used to select 96 samples. The data were collected by using passive smoking exposure scale. The collected data were tabulated and analyzed. Descriptive and inferential statistics were used. The result showed that 51% of passive smoking exposure on adequate knowledge where as 43.75% of passive smoking exposure on moderate knowledge where as 5.2% of passive smoking exposure on inadequate knowledge. P value is S=Significant of gender is $p=0.17$, educational status is $p=0.31$, occupation is $p=0.95$. NS=Non Significant of age is $p=0.92$, residence is $p=0.92$.

Keywords: *Passive smoking, Exposure, Adult.*

Introduction

“Every life is a profession of faith and exercise an inevitable and silent influence”.

Smoking is an addiction of tobacco products, which is the second most preventable causes of premature death in India. Tobacco smoke is a major source of air pollution in indoors and public places.^[1]

Nearly one-third of all the world population is regularly exposed to second hand smoking. This

exposure is responsible for about 1% of the global burden of disease in the form of respiratory infections, ischemic heart disease, lung cancer and asthma and is causing around 600,000 premature deaths globally. The association between second hand smoke and health outcomes, such as frequent respiratory infections, ischemic heart disease, lung cancer, asthma and stroke. Non-smokers who are exposed to second hand smoke have an increased risk of developing heart disease at least by 25%, stroke by 20% and lung cancer 20%.^[2]

Cigarette smoke is an inherently dynamic mixture that changes in characteristics and concentration depending on when is formed and how far it has travelled. The smoke particles change in size and composition as gaseous components are volatilized and moisture content changes; gaseous elements of SHS may be absorbed onto materials and particle concentrations drop with both dilution and impactions on surfaces. Because of its dynamic nature, SHS cannot be quantitatively defined, although such a definition is not needed for either research or public health purposes. A variety of

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indicators of smoking as the source of SHS and SHS itself can be measured.^[3]

Exposure to second hand smoke (SHS) occurs when non- smokers inhale tobacco smoke from burning cigarettes or from smokers exhaled smoke. Subjects may be exposed to SHS in multiple sites, such as the home, public places, cars, homes of relatives and the workplace.^[4]

Need for the Study: London University effects of passive smoking the mortality associated with passive smoking was evaluated in a 12 year study of 27,891 adult smokers and 19,035 non smokers identified in 1963. The research concluded that the passive smoking increase risk of death of adults it like active smoking.^[5]

Secondhand smoke causes approximately 7,330 deaths from lung cancer and 33,950 deaths from heart disease each year.^[6]

Passive smoking is the inhalation of smoke from tobacco products uses by others it also called as second hand smoke (SHS) or environmental tobacco smoke (ETS).^[6]

In Bangalore around 9% of total population suffered from asthma due to second hand smoke in 1979. In 2009 around 27% of population suffered from asthma due to passive smoking.^[6]

Between 1964 and 2014, 2.5 million people died from exposure to secondhand smoke, according to a report from the U.S. Surgeon General. The report also concluded that secondhand smoke is a definitive cause of stroke.^[7]

Statement of the Problem: Assessment of passive Smoking exposure among Adults population in a selected urban Community Area, at Kanchipuram District, Tamil Nadu, India.

Objectives:

- To assess the exposure of passive smoking among adults population
- To find the association between the exposure of passive smoking with selected demographic variables.

Operational Definition:

Exposure: Exposure is the state of having no protection from something harmful and the revelation of

something secret especially something embarrassing or damaging.

Passive Smoking: Environmental tobacco smoke that is inhaled involuntarily or passively by someone who is not smoking.

Adult: An adult is a person older than 18-59 of age.

Hypothesis:

H₁: There will be a significant association between passive smoking exposure among adults population in a selected area.

H₂: There will be a significant association between passive smoking exposure among adults population in a selected urban community area are selected demographic variables are age, gender, residence, educational level, occupation.

Assumptions: The abnormal passive smoking may prone to develop functional lung problems.

Delimitation:

- Adult’s population in selected Community Area.
- Data collection period for 10 days

Research Methodology

A Quantitative approach with descriptive design was used in the study. The study was conducted among Adults with the age group between 18 to 59 years residing in selected urban community area, Kanchipuram District, Tamil Nadu. A convenient sampling technique was used to select 96 samples with the following inclusion criteria. People who are all with the age group between 18 to 59 years, People who can understand Tamil and English language, Willing participate in the study, Those who have the exposure of passive smoking at home and environment. The data was analysed by using descriptive and inferential statistics.

Data Collection Procedure:

- i. The data collection procedure was carried out for a period of 10 days.
- ii. The study was initiated after obtaining prior permission from the Institutional Ethical Committee, Concerned area.
- iii. Informed Consent was obtained from the selected sample

iv. The self administered tool was distribute to the sample and collect data for 10 minutes.

Ethical Clearance:

- Departmental clearance was obtained from Department of Medical Surgical Nursing, Chettinad College of Nursing.
- U.G Committee clearance was obtained from UG Committee.
- Institutional Ethical Committee clearance was obtained from CARE.
- Formal permission was obtained from the authority of the selected Community area.
- Informed consent was obtained from the study samples.

Findings:

Objectives 1: Assess the frequency of passive smoking exposure among adolescents population

51% of adolescent’s population had adequate knowledge.

43.75% of adolescent’s population had moderate knowledge.

5.2% of adolescent’s population had inadequate knowledge.

Objectives 2: Association of demographic variables of the passive smoking exposure among adults population

Age and assessment of passive smoking exposure. There was no significant between the age and the assessment of passive smoking exposure $\chi^2=0.149$, $p(0.92)$. Gender and assessment of passive smoking exposure and there was significant between the Gender and the assessment of passive smoking exposure $\chi^2=3.509$, $p(0.17)$. Residence and assessment of passive smoking exposure and there was no significant between the residence and the assessment of passive smoking exposure $\chi^2=0.149$, $p(0.92)$. Educational level and assessment of passive smoking exposure and there was significant between the educational level and the assessment of passive smoking exposure $\chi^2=7.027$, $p(0.31)$. Occupation and assessment of passive smoking exposure and there was significant between

the occupation and the assessment of passive smoking exposure $\chi^2=1.601$, $p(0.95)$.

Source of Funding: Self

Conflict of Interest: Nil

Conclusion

This result from this study shows that the assessment of passive smoking exposure among adults population. This has to be taken into consideration. There may be some justifiable reasons for adequate knowledge on passive smoking exposure which can be improved upon.

The assessment of passive smoking exposure among adults population. The findings of the shows a significantly of passive smoking exposure among adults population.

Reference

1. Kelishadi R et al. joint association of active and passive smoking with psychiatric distress and violence behaviors in a representative sample of iranian children and adolescents. 2015.
2. Kruger J et al. smoke free rules and second hand smoke exposure in vehicles among US adults national adult tobacco survey. 2016 .
3. Kuntz B et al. smoking and passive smoke exposure among adolescents in germany. 2016.
4. Meenakshikalyan et al. effect of passive smoking as a risk factor for chronic obstructive pulmonary disease in normal healthy women. 2016.
5. Abdulmohsen H. Al Zalabani, Soliman M. Amer, Khaled A. Kasim, Reem I. Alqabshawi and Ayat R. Abdallah,second Hand Smoking among Intermediate and Secondary School Students in madinah, Saudi Arabia, International Journal .2015.
6. GongXet al. prevalence and associated factors of second hand smoke exposure among internal chinese migrant women of reproductive age. 2016.
7. Huda Gharaibeh, Linda Haddad, Sukaina Alzyoud, Omar Shahawy, Nesrin Abu Baker and Mary umlauf. Knowledge, Attitudes and Behaviour in Avoiding Second Hand Smoke exposure Among Non smoking Employed women With Higher Education. International journal: 2011.

Pleomorphic Adenoma of the Anterior Hard Palate: A Rare Case Report

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Abstract

Pleomorphic adenoma (PA) is a benign tumor of the salivary glands that has components of both epithelial and mesenchymal origin. The most common site for the PA is the parotid or submandibular glands. On rare occasions, the tumor may arise from the minor salivary glands and present as an intraoral swelling over the hard palate or lip. But the anterior hard palate is not the commonest site for PA. We report the case of a 42-year old man who came with a complaint of a swelling in the anterior region of the hard palate and later diagnosed as pleomorphic adenoma based on histopathological examination.

Keywords: *Pleomorphic adenoma, anterior hard palate, salivary gland.*

Introduction

The pleomorphic adenoma (PA) accounts for 73% of all salivary gland tumors, the palate being the most preferred intraoral site (specifically, the junction of the soft and hard palates), followed by upper lip, buccal mucosa, floor of the mouth, tongue, tonsil, pharynx and retromolar area. PA contains elements of both epithelial and mesenchymal origin.¹ Occasionally it may arise from the minor salivary glands confined in the hard palate and other parts of oral mucosa.² Patients age most commonly range between the fifth and sixth decade of life. About 60% of the affected individuals are women.³ The tumor is usually a slow growing, painless and firm mass on palpation. Possible complications to treatment include the risk of recurrence and malignant transformation.⁴ In the literature there are very few published case reports

of pleomorphic adenoma in the anterior hard palate. So this is an interesting case of a 42-year old man who came with a complaint of a swelling in the anterior region of the hard palate. The lesion was excised surgically and the specimen was sent for histopathological examination which gave the confirmatory diagnosis of pleomorphic adenoma.

Case Report: A 42 year old male patient reported to the dental college with a chief complaint of swelling in the anterior region of the palate. The duration of the swelling was 2 to 3 months. On examination there was a 2.5 × 2.5 cm sized, circular lesion which was soft and compressible present in the left anterior palatal region in relation to 21,22 and 23. Tooth number 21 & 22 had undergone root canal treatment earlier. The swelling was fixed to the underlying structure without any change in the colour of the overlying mucosa (Figure 1). There was no regional lymphadenopathy seen. The radiograph showed the bony invasion. The clinical differential diagnosis of radicular cyst and adenomatoid odontogenic tumor was made. An excisional biopsy was done after taking the informed consent of the patient and the sample was sent for the histopathological examination.

Hematoxylin and Eosin stained tissue section revealed the presence of well circumscribed tissue composed of numerous salivary gland ducts. The

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connective tissue surrounding the ducts was myxomatous in appearance (Figure 2). The main cell population included ductal and myoepithelial type with other areas also showing plasmacytoid type of cells. The ductal lumen was filled with mucin (which was confirmed by special stain PAS) (Figure 3). Periphery of the lesion also showed prominent chondroid and osseous like areas (Figure 4). Overall features were diagnostic of pleomorphic adenoma.

Discussion

PA is the most common tumor of salivary glands.¹ The term pleomorphic describes the embryogenic origin of these tumors, which contains both epithelial and mesenchymal tissues.⁵ It has been postulated that these tumors arise from intercalated and myoepithelial cells.¹ Pleomorphic adenoma accounts for 50-70% of parotid tumors, 53-72% of submandibular tumors and 33-41% of minor salivary gland tumors.⁶ Most common intraoral location is the palate (specifically, the junction of the soft and hard palates), followed by upper lip, buccal mucosa, floor of the mouth, tongue, tonsil, pharynx and retromolar area. Palatal tumors are usually dome shaped mass with smooth-surface found on posterior lateral part of the palate.⁷ In the present case the swelling was located in the left anterior region of the hard palate. Usually the PA does not show the symptoms of pain, tenderness and ulceration. Although it is a benign tumor, the recurrence rate is high and few cases, have shown to transform into a malignant tumor.^{1,2} Differential diagnosis for the swellings in the palate includes palatal abscess, odontogenic cysts, fibroma, lipoma, neurofibroma, schwannoma, mucoepidermoid carcinoma and oral papilloma.^{8,9}

Tumors of the minor salivary glands show a variety of symptoms, depending upon the site. Such symptoms may include dysphagia, epistaxis and difficulty in mastication. The pleomorphic adenomas vary in their consistency which ranges from soft in cases of mucinous lesions to hard in cases where there is extensive chondroid or collagenous components.¹⁰ In the present case, the swelling was soft in consistency due to the excessive ductal proliferation along with mucin.

Histologically, pleomorphic adenoma shows a great variety in morphology. The mesenchymal components

may be myxoid, cartilaginous, osseous, or hyalinized. The myxoid stroma undergoes chondroid metaplasia to form prominent chondroid like areas. Long standing cases show increased hyalinization which is the characteristic feature of pleomorphic adenoma.¹¹

The treatment for PA includes complete surgical resection of the tumor with a surrounding adjacent normal tissue.^{1,2} PA of the minor salivary glands have low recurrence rate, while the recurrence rate of parotid gland is up to 44%.¹²



Figure 1: Swelling in the anterior part of the palate

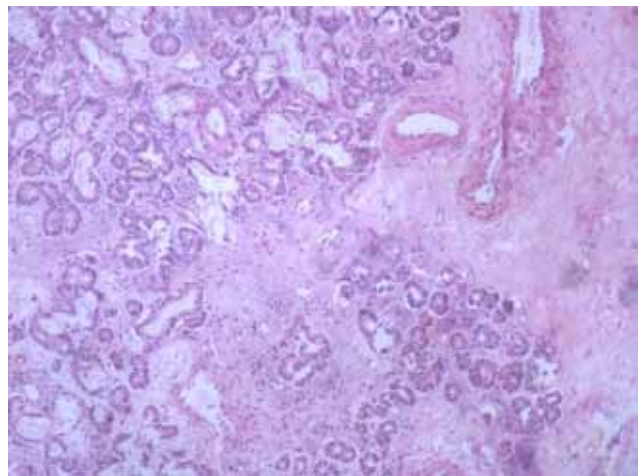


Figure 2: Section showing presence of numerous salivary gland ducts with myxomatous area (10x magnification)

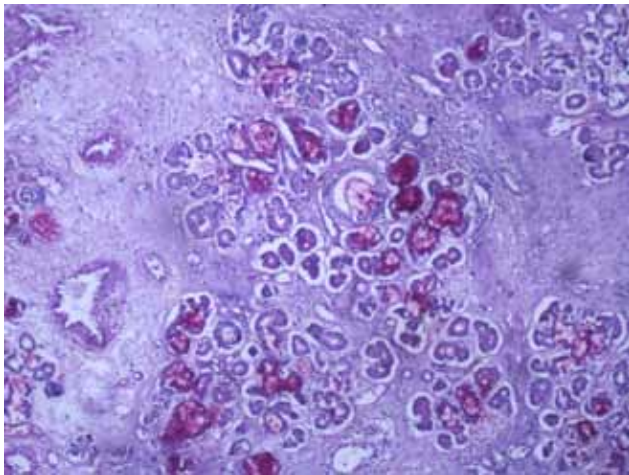


Figure 3: PAS staining showing the presence of mucin

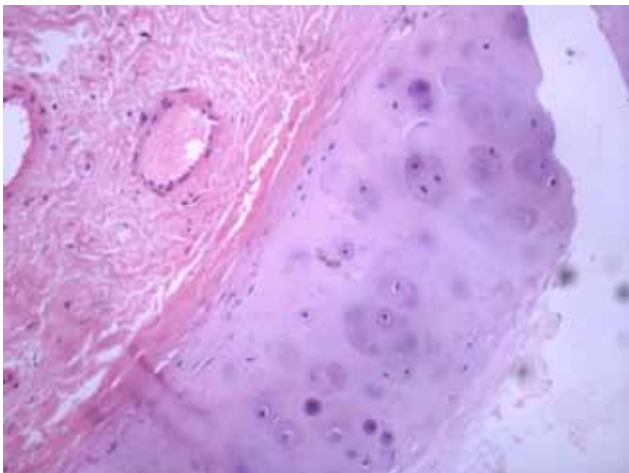


Figure 4: Prominent chondroid like areas (20x magnification)

Conclusion

The PA of the hard palate is a most common neoplasm of small salivary glands. Clinically it is very difficult to diagnose it and do proper treatment plans. A painless and a slow growing palatal mass can only be diagnosed by histopathological examination because of its different clinical diversity. Even in the present case clinical differential diagnosis of radicular cyst and adenomatoid odontogenic tumor was made which eventually turned out to be a pleomorphic adenoma histopathologically.

Ethical Clearance: Since it was a case report, there was no need for the ethical clearance from the committee.

Source of Funding: Nil

Conflict of Interest: Nil

References

1. Suen JY, Synderman NL. Benign neoplasms of the salivary glands. In: Cummings CW, Fredrickson JM, Harker LA, Krause CJ, Schuller DE, editors. *Otolaryngology—Head and Neck surgery*. 2. St. Louis: Mosby Year Book; 1993. pp. 1029–1042.
2. Feinmesser R, Gay I. Pleomorphic adenoma of the hard palate: an invasive tumour? *J Laryngol Otol*. 1983;97:1169–1171. doi: 10.1017/S002221510009616X.
3. Frazell EL. Clinical aspects of tumors of the major salivary glands. *Cancer* 1954;7:637-59.
4. Reiland MD, Koutlas IG, Gopalakrishnan R, Pearson AG, Basi DL. Metastasizing pleomorphic adenoma presents intraorally: A case report and review of the literature. *J Oral Maxillofac Surg* 2012;70:e531-40.
5. Batsakis JG (1981) Neoplasms of the minor and ‘lesser’ major salivary glands. In: *Tumors of the head and neck*. The Williams and Wilkins, Baltimore, pp 38–47.
6. Friedrich RE, Li L, Knop J, Giese M, Schmelzle R. Pleomorphic adenoma of the salivary glands: analysis of 94 patients. *Anticancer Res*. 2005; 25:1703-1705
7. Sreenivas DS. Pleomorphic adenoma of the palate: A case report. *J Indian Dent Assoc*. 2011; 5: 557–558.
8. Dhanuthai K, Sappayatosok K, Kongin K. Pleomorphic adenoma of the palate in a child: a case report. *Med Oral Patol Oral Cir Bucal*. 2009; 14:73–75.
9. Gupta M, Gupta M. Pleomorphic adenoma of the hard palate. *BMJ Case Rep*. 2013; 9: 1-2.
10. Daniels JS, Ali I, Al Bakri IM, Sumangala B. Pleomorphic adenoma of the palate in children and adolescents: A report of 2 cases and review of the literature. *J Oral Maxillofac Surg* 2007;65:541-9.
11. Margaritescu C, Raica M, Surpateanu M, Jaubert F, et al. Tumoral stroma of salivary pleomorphic adenoma – Histopathological, histochemical and immunohistochemical study. *Rom J Morphol Embryol* 2005;46:211-23.
12. Rahnama M, Orzędala-Koszel U, Czupkałło L, Lobacz M. Pleomorphic adenoma of the palate: a case report and review of the literature. *Contemp Oncol (Pozn)*. 2013; 17: 103-106.

A Cross Sectional Study on the Awareness on the Bio-Medical Waste Management among Medical Students in a Tertiary Care Hospital Chennai

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Abstract

Introduction: Biomedical waste (BMW) collection and proper disposal have become a substantial issue for both the general and the medical community. In the present-day scenario, approximately 25% of biomedical waste is found to be hazardous and may affect the health of both general community and medical personnel. Medical students as future professionals are soon going to be an integral part of health care system. They should have proper and sufficient knowledge on BMW management. Moreover, the awareness about various aspects of BMW management has to be assessed frequently too.

Objective: The objective of the study was to assess the awareness of know on biomedical waste management at tertiary care hospital, (Saveetha Medical College) among medical students.

Methodology: This was a cross-sectional study done at Saveetha Medical College and Hospital. A total of 100 MBBS students were included in the study with their prior consent. A pre tested semi structured questionnaires was given to participants. The data was analyzed using software SPSS.

Results: 53% were boys and 47% were girl students. Among various questions asked in the Questionnaire, the overall knowledge on the awareness of biomedical waste disposal among medical students was 46.8%.

Conclusion: There is a lack of appropriate knowledge about biomedical waste management, awareness and practices of proper waste disposal. Hence, there is a need of training and programmes regarding health care waste management.

Keywords: *Biomedical management, healthcare, waste disposal, awareness, biohazards infectious, hospital.*

Introduction

With the growing industrialization and advancement in the medical technology, a greater population is having access to health services than before^[1]. The increased accessibility of healthcare facilities has not only significantly improved lifestyle of general population but also harms the community health due to the release of tremendous amount of biomedical waste. Hospitals are those institutions which have existed since time immemorial in one form or the other and have become more complex in the present time frequently visited by people without any distinction between sex, age, caste or religion. Biomedical waste is forming approximately 1%–2% of the total municipal solid waste stream^[2]. Bio-medical waste (BMW) refers to the waste generated during the diagnosis, treatment or immunization of human beings or animals or in the research activities pertaining thereto or in the production or testing of biological and including categories viz., pathological waste, general waste, chemical waste, radioactive waste, infectious waste, sharps, pharmaceutical waste and pressurized containers^[3]. Certain types of health care waste cause a greater risk. These include infectious waste (15-25% of health care waste) among which are body part waste (1%), sharp waste (1%), pharmaceutical or chemical waste (3%) and radioactive and cytotoxic waste or broken thermometers (less than 1%) BMW generated in the hospital fall under two major categories– non-hazardous and biohazards. Elements of non-hazardous waste are cardboard, non-infected plastic, packaging material, paper Etc.

Biohazards waste again falls into two types: (a) infectious waste (b) noninfectious waste. Inappropriate

treatment and disposal of waste can transmit diseases. Legal provisions [Biomedical Waste (management and handling) Rules 1998] exist to minimize the damage of hazardous and infectious hospital waste on the public. This law is also applicable to people who receive, store, treat, collect, dispose, generate, or handle BMW, types of waste and treatment and disposal options under rule 1998. The BMW should be segregated into containers/bags at the point of generation of the waste. The issue of waste management has risen up recently in countries that are developing where there is a small part of the application of formal and informal community environmental education awareness program^[4]. It is estimated that 10-25% of the healthcare waste generated is hazardous & causes serious health problems^[5]. The hospital waste management has diverse ramifications as it not only affects the health of patients but also of healthcare workers (doctors, nurses, sanitary staff, etc.) and public. Health care waste is a diverse mixture, which is very problematic to manage as such. A major issue related to present biomedical waste management is that many hospitals dispose their waste in an inappropriate, random and indiscriminate manner which results in wide spread of serious diseases like hepatitis, human immunodeficiency virus etc. A novel guideline consists of 1–17 rules, I–VI schedules and I–VI forms. The 2011 draft demarcated 8 categories of biomedical waste (down from 10 categories in the 1998 notification)^[6]. Each institution has its own guidelines and protocol for supervision of biomedical waste. These guidelines and protocols should strictly be followed at every level of transportation, storage, generation, collection, disposal and treatment. At the level of generation itself, biomedical waste should be segregated into color-coded bags or containers. All those involved in different levels from generation to disposal are potentially at risk of serious health consequences. The risk group includes doctors, nurses, auxiliaries, hospital staffs and workers handling and disposing such waste^[7]. Due to negligence in implementation of the rules and insufficient training to healthcare personnel, there is an indiscriminate disposal of biomedical waste^[8].

Thus, the present study was aimed to assess the awareness of biomedical waste management among medical students.

Materials and Method

This study was conducted among medical students of **Saveetha Medical College and Hospital, Chennai**.

A total of 100 MBBS students were included in the study with their prior consent. The study period was from 21st January 2019 to 30th march 2019. This cross-sectional study was done by using a semi-structured questionnaire which included questions related

- To evaluate the BMW education/awareness
- To evaluate awareness of BMW hazards and legislation
- To evaluate the awareness of BMW management practices.

The validity of the questionnaire was checked. It had 20 questions and they were asked to tick the right option. The participants were assured that it is voluntary and confidentiality would be maintained. The approval from ethics committee was taken prior. The questionnaires were given after to participants after explaining the importance of this study. Informed consent was obtained from the study participants. The questionnaires were anonymously collected from participants after the completion.

Inclusion Criteria:

1. Those who are consenting for the study.
2. 2nd professional and 3rd professional Medical students of Saveetha medical college were included.
3. Age group between 20 - 22.

Exclusion Criteria:

1. Those who are not available at the time of study
2. Those who are not willing to participate.
3. The study participants who didn't give their responses to certain questions.
4. Students of 1st professional was excluded since they don't have clinical knowledge or practice.

The data was entered in Microsoft Excel sheet and analyzed using Statistical method like percentages and chi square test with the help of Statistical Package for Social Sciences (SPSS) software.

Result

A total of 100 students participated in this study. Out of which 53 were male and 47 were female.

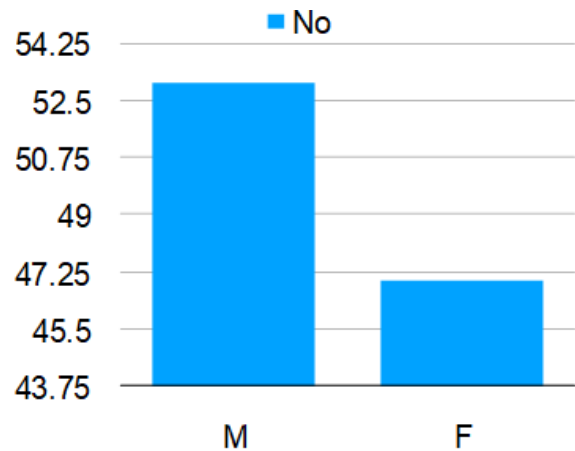


Figure 1. Sex ratio among participants

Majority (94%) participants were aware there is a guideline for biomedical waste disposal in India.

Table 1. Awareness of guideline present

Yes	94
No	1
Don't know	4
Not attempted	1

91% participants practice the color coding for waste disposal. 7% practice sometimes, not often.

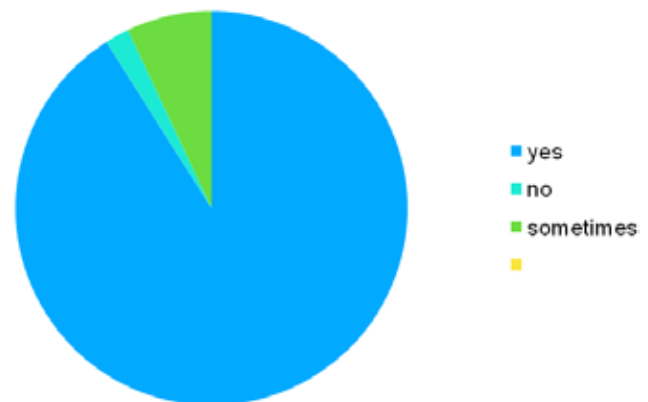


Figure 2. Practice of color coding

96% of participants had knowledge on the definition of biomedical waste management. 3% were unaware and remaining 1% was not sure.

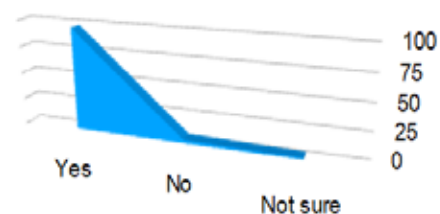


Figure 3. Knowledge of basic definition of BMW

64% students are only interested to take part in training or education program.

Table 2. Willingness to participate in programmes based on BMW

Yes	64
No	14
Cannot comment	22

85% are aware of biomedical health hazards.

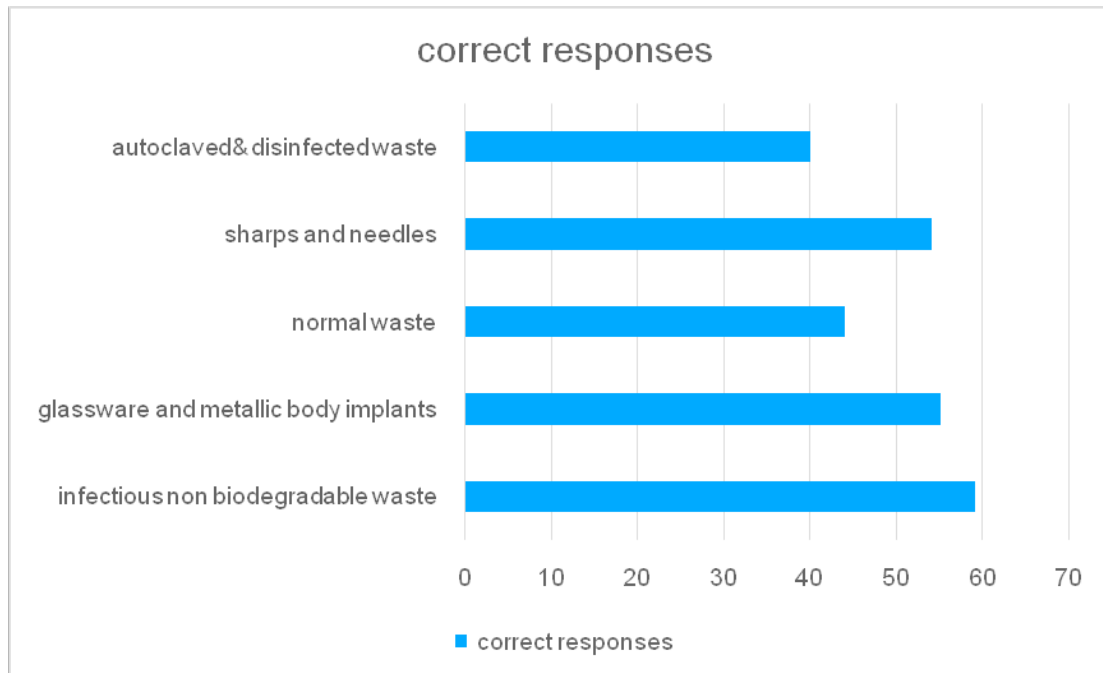


Figure 4. Awareness on health hazards

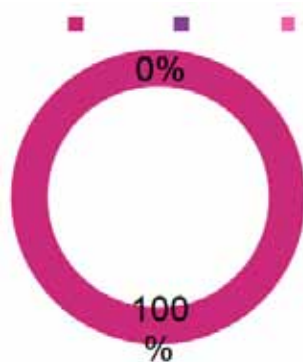


Figure 5. Responses of segregation of waste disposal

Discussion

In this study we assessed the awareness of biomedical waste management among medical students. 53% were male participants and 47% were female participants (fig 1), compared to previous study done by **Prakriti Vohra** showed, 70% were boys and remaining 30% were girls.

In our study 94% knew that there is legislation (table 1) whereas 42% of MBBS students had knowledge about BMW rule, 1998 in the above-mentioned study. In a study done by Saini et al [9], 99.1% of study participants knew that there is a guideline for BMW. This difference could be due to 2 reasons:

1. Increase in level of awareness
2. Maybe the study population is entirely different between 2 studies in terms of education level. Awareness regarding health hazards related to improper BMW in this study was found to be 85% (fig 4). Another study by Narang et al [10] showed (100%). The study piloted by Dr. Monika Bhardwaj, showed 107% knew about health hazards associated with BMW. In this study it showed 95%. Study done by Radha et al [11] revealed that 30% were aware that improper waste management can cause serious health hazards. Majority (96%) had the knowledge

on the basic definition of BMWM compared to previous study (fig 3). Our study showed that 91% students follow color coding for segregation (Fig 2) compared to previous study done by Dr Madhu Kumar ^[12] where 65% of medical students agree with segregation and follow the color coding for bio medical waste management. Majority (64%) were interested in taking part in training programmes conducted by college (table 2). In the previous study done by Dr Madhu Kumar, more than 90% were interested in training programmes. This difference could be because of the lack of interest. A perusal of earlier studies conducted on awareness of BMW in various states of India also reveals that the awareness among health professionals about the hazards and its appropriate management techniques are unsatisfactory ^[13,14 and 15]. The current study showed that 40% had knowledge on normal waste disposal compared to other studies (fig 5). Majority only had the knowledge on the disposal of infectious non-biodegradable (Fig 5) compared to previous study where 61% had knowledge done by Ananthachari k.r. 56.75% had knowledge on proper biomedical waste disposal (Gini Garima3). 65% of participants knew about various method of disposal of biomedical waste in the previous study. While, in a study by Bharadwaj et al; only 20.9% of students could accurately determine various method of disposal of biomedical waste. In this study 46.8% only knew about various method of disposal. This percentage is less compared to previous and other studies conducted. This difference may be due to less number of repeated training imparted to students. In year 2002, the World Health Organization (WHO) reported biomedical waste practices in India. WHO reported that 50% reuse of biomedical waste products such as needles and syringes, which are meant for single use^[16]. The main intention of BMW is to basically reduce waste generation, to guarantee its well-organized gathering, management, as well as safe disposal. Lack of awareness and inadequate knowledge has led to the hospitals becoming hub for spreading illness. Stringent biomedical waste treatment facility in every metropolitan city should be implemented. It is the primary responsibility of Health administrators to formulate hospital waste in most harmless and eco-friendly way. The United Nations Conference on Environment and Development in 1992 recommended the following

Measures:

- a. Prevent and minimize waste production
- b. Recycle or reuse the waste to the extent possible
- c. Manage waste by harmless and environmentally sound method and 7
- d. Dispose of the final residue by landfill in confined and carefully designed sites^[17].

WHO stated that 85% of hospital wastes are actually non-hazardous, around 10% are communicable and around 5% are non-infectious but harmful wastes. The World Health Organization (WHO) has classified medical waste into eight categories such as General Waste, Radioactive, Chemical, Pathological and Infectious to potentially infectious waste, Pharmaceuticals, Sharps and Pressurized Containers. In the year 1990, report by the U.S. Agency for Toxic Substances and Disease Registry decided that the general public is not expected to be adversely affected by biomedical waste produced in the conventional healthcare setting. They understood, however, that biomedical waste from those surroundings may cause an injury and exposure perils via occupational contact with medical waste for nurses, doctors and laundry, janitorial and refuse workers. Further, there are chances for the general public to come into interaction with medical waste, such as needles used illegally outside healthcare settings, or biomedical waste generated via home health care ^[18].

Difficulties involving biomedical waste: A major problem related to current Bio-Medical waste management in many hospitals is that the application of Bio-Waste regulation is substandard as some hospitals are eradicating of waste in a messy, inadequate and indiscriminate manner. Lack of separation practices, causes the mixing of hospital wastes with general waste causing the whole waste stream unsafe. Inappropriate separation ultimately results in an improper method of waste disposal. Inadequate Bio-Medical waste management thus will cause environmental pollution, growth, unpleasant smell and multiplication of vectors like rodents, insects and worms and may lead to the spread of diseases like cholera, typhoid, hepatitis and AIDS through injuries from needles and syringes contaminated with human^[19]. Due to unsuitable managing of the biomedical waste this infectious waste gets diversified with solid waste. During the rainy season infectious substance may get added to the ground water and spreads hazardous diseases. Medical waste

should be separated into containers/bags at the start of generation. Lack of proper waste management, absence of awareness about the health hazards from biomedical wastes, inadequate financial and human resources and reduced regulation of waste disposal are the most critical problems connected with healthcare waste [20].

The findings from this study:

1. Though all the medical students were having the relevant knowledge, they were lacking the knowledge on waste disposal of different types of waste.
2. The willingness to participate in programmes was poor among students.
3. The total knowledge on biomedical waste disposal management was 46.8%. This study has certain limitations due to its cross-sectional type. Only the awareness regarding biomedical waste could be assessed in the present study.

Conclusion

Based on the result obtained regular and effective training of the medical students is important. Frequent awareness campaigns and classes should be conducted to improve the knowledge about safe handling and disposal of bio medical waste among medical students for future practical application. There can be training sessions conducted which could help the students in future. This would eventually increase the effectiveness of BMW management among future budding doctors. It can be made mandatory to conduct programmes so that it would help students gain better knowledge and understanding of importance of biomedical waste management and also the practice of safe disposal.

Conflict of Interest: Nil

Source of Funding: SELF

Ethical Clearance: Obtained

References

1. M. Fett, Technology, Health and Health Care, Occasional Papers: Health Financing Series Volume 5, 2008.
2. Kishore J, Goel P, Sagar B and Joshi TK, Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi, India, *Indian J Dent Res*, 11, 2000, 157-161.
3. Gujarat Pollution Control Board, Gandhinagar. Biomedical Waste Management, 2005,
4. Ehrampoush MH, Baghiani Moghadam MH. Iranian Journal of Environmental Health Science Engineering 2005; 2:26.
5. Safe management of waste from health care activities. WHO, Geneva; 1999.
6. Sharma A, Sharma V, Sharma S, Singh P. Awareness of Biomedical Waste Management Among Health Care Personnel in Jaipur, India. *Oral Health Dent Manag*. 2013; 12:32–40. [PubMed]
7. A.Prüss-Üstün, E. Giroult and P. Rushbrook, “Safe management of wastes from health-care activities,” In Safe management of wastes from health-care activities, 1999.
8. I. M. Ismail, A. G. Kulkarni, S. V. Kamble et al., “Knowledge, attitude and practice about biomedical waste management among personnel of a tertiary health care institute in Dakshina Kannada, Karnataka,” *Al Ameen Journal of Medical Sciences*, vol. 6, no. 4, pp. 376–380, 2013. View at Google Scholar
9. Saini S, Nagarjun SS, Sharma RK. Knowledge, Attitude and Practices of BioMedical Waste Management amongst staff of a tertiary level hospital in India. *J Acad. Hosp. Adm.*2005; 17:1-1
10. Narnag RS, Manchanda A, Singh, Verma N, Padda S. Awareness of biomedical waste management among dental professionals and auxiliary staff in Amritsar, India. *Oral health Dent Manag* 2012; 11:162-8
11. Radha KV, Kalaivani K and Lavanya R. A Case Study of Biomedical Waste Management in Hospitals. *Global Journal of Health Science* 2009; 1(1):82-8.
12. Kumar, Madhu. Knowledge, awareness attitude regarding bio medical waste management among medical students in a tertiary care center: A cross sectional study. *Paripex Indian journal of research*. 2017
13. Mathur V, Dwivedi S, Hassan M and Misra R, Knowledge, attitude and practices about Biomedical Waste Management among Healthcare Personnel: A Cross-sectional Study, *Indian J Community Med*, 36, 2011, 143-145.
14. Central Pollution Control Board, Environmental

- Standard and Guidelines for Management of Hospital Waste. CPCB, Ministry of Environment and Forest, New Delhi, Jun 1996.
15. Pandit NB, Mehta HK, Kartha GP and Choudhary SK, Management of bio medical waste: awareness and practices in a district of Gujarat, *Indian J Public Health*, 49, 2005, 245-247.
 16. Mattoo K, Singh V, Garg R. Are Dental Training Programs Heading towards Ecological Disaster – Results from a Survey. *J Atmos Pol.* 2014;2:17–21.
 17. Kahar A, Arora A, Radke U, Joshi J. Assessment of awareness regarding biomedical waste management among students and interns of dental institute 2017; 7:65-70
 18. The public health implications of medical waste: a report to Congress. Atlanta: US Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1990; document no. PB91-100271
 19. CEET: Biomedical Waste Management- Burgeoning issue (2008).
 20. Government of India. Biomedical Waste (Management and Handling) Rules. 1998. Extraordinary, Part II, Section 3, Subsection (ii). The gazette of India, No. 460, 1998.

Assessment on Effects of Electronic Media on Traditional Play among Higher Secondary Students in Selected Schools in Kelambakkam, Kancheepuram District, Tamil Nadu, India

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Abstract

Assessment on effects of electronic media on traditional play among higher secondary students in selected schools in Kelambakkam, Kancheepuram District, Tamil Nadu, India. The objectives were to assess the usage of Electronic Media (mobile phones, computers, video games & television) among Higher secondary students, to Assess the effects of Electronic Medias on Traditional Play and to Associate the effects of Electronic Media on Traditional Play with the selected demographic variables. Convenience sampling was used to select 80 Higher Secondary School children. The data collection tools were validated and reliability was established. The data were collected by self-administered questionnaire. The collected data was Tabulated and Analyzed. Descriptive and Inferential statistical method were used. The study shows that 56% of the Children had Moderate positive Impact, 41% of the Children had Optimum Positive Impact and 3% of the students had Minimum positive Impact of Electronic media on Traditional play. There was no significant association between the Effects of Electronic media on Traditional play and the selected demographic variables.

Keywords: *Effects, electronic media, traditional play and no association.*

Introduction

“If you believe that your thought originate inside your brain, do you also believe that television shows are made inside your television set?” –Warren Ellis

In today’s world, electronic media are thoroughly integrated into everyone’s life, with television, movies, videos, music, video games and computers central to both work and play. Recent studies indicate that even the youngest children are using a wide variety of screen media, many at higher levels than recommended by the child development Professionals. **(Rideout, Vandewater and Wartella, 2003)⁽⁵⁾**

School-aged children need a lot of physical activity after a busy school day. Play is the vision through which children experience their world and the world of others. **Goldstain, 2012**). If deprived of play, children will be suffering both in the present and in the long term. Play is vital in nurturing as it contributes to the cognitive, physical, social and emotional well-being of children and youth.

It also offers an ideal opportunity for parents to interact with their child. **(Goldstein, 2012)**.

Radio, television (TV), movies, video games, cell phones and computer networks have assumed major part in our children’s daily lives ⁽²⁾. The media has demonstrated impacts both positive and negative, on children’s cognitive, social and behavioral development. Considering the spiking exposure of children to new modes of media, Review on the current literature on the effects of media on child health both in the Western countries and India were made. It is widely accepted that media has mere influence on child health, including violence, obesity, tobacco and alcohol use and risky sexual behavior. Simultaneously, media have some positive effects on child health. . We need to understand better how to reverse the negative impact of media and make it more positive. **(Department of Pediatrics, Advanced Pediatric Center, Postgraduate Institute of Medical Education and Research, Chandigarh 160 012, India.)⁽¹⁾**

Background of the Study:

“Technology is a queer thing. Its brings you great gifts on one hand and it stabs you in the back with the other hand.”
—Charles Percy Snow

In today’s world, electronic media are thoroughly integrated into everyone’s life, with television, movies, videos, music, video games and computers central to both work and play. Recent studies indicates that even the youngest children are using a wide variety of screen media, many at higher levels than recommended by the child development Professionals. (RIDEOUT, VANDEWATER AND WARTELLA, 2003).

School-age children need lots of physical activity after a busy school day. Play is the vision through which children experience their world and the world of others. (Goldstain, 2012).⁽⁶⁾ If deprived of play, children will be suffering both in the present and in the long term. Play is vital to development because it contributes to the cognitive, physical, social and emotional well-being of children and youth. It also offers an ideal opportunity for parents to interact with their child. (GOLDSTEIN, 2012).⁽⁷⁾

The following are examples of activities enjoyed by school children: Arts and crafts can include weaving, clay, masks, costumes, puppets, sewing, knitting, jewelry making and other similar activities. School age children still enjoy the creativity of plain paper, markers, pens or paint to create items such as paper hats, masks, gift-wrapping or original artwork⁽⁴⁾. Games with Rules can include football, tennis, hockey or other favorite sports played outside⁽⁶⁾ Indoor games may include playing cards and board games (caroms, chess and scrabble). Activities using paper and pencil such as dot-to-dot, crossword puzzles, tic-tac-toe etc. can challenge the mind and build self-esteem. (SELINE KEATING, 2011).

⁽³⁾Technology has undergone a revolution which made humans lives easier and added many benefits .Everyday, technology is constantly being improved and there were new inventions developed to run million-dollar businesses. However, technology can be considered a two-sided sharp blade as it can be used for illegal purposes⁽⁸⁾

Objectives:

1. To assess the usage of Electronic Media (mobile phones, computers, video games & television)

among Higher secondary students in selected schools in Kelambakkam.

2. To assess the effects of Electronic Medias on Traditional Play among Higher Secondary Students in the selected schools in Kelambakkam.
3. To associate the effects of Electronic Media on Traditional Play with the selected demographic variables among Higher Secondary Students in selected schools in Kelambakkam.

Methodology

Research Approach: The research approach used for this study was Quantitative approach.

Research Design: A descriptive design was used for the present study.

Research Site: The study was conducted at a selected School at Kancheepuram District, Tamil Nadu, India.

Research Setting: The study was conducted in Higher Secondary school at Kancheepuram District, Tamil Nadu, India.

Population: The population were the students from Higher Secondary schools in Kelambakkam, Kancheepuram District, Tamil Nadu, India.

Sample: In this study the samples were Higher Secondary students (11th & 12th standard) who are studying in Higher Secondary schools in Kelambakkam, Kancheepuram District, Tamil Nadu, India.

Sample Size Estimation:

Formula: $Z^2p(1-p)d^2$

Z = Level of confidence standard 95% value is 1.96

P = expected prevalence

D = precision value is 0.05

The total number of sample selected for this study are **80 Samples**

Sampling Technique: In this study Convenient sampling technique was used by the researcher to select the sample.

Criteria for the Selection of Samples:

Inclusion Criteria:

- School students belonging to 11th & 12th standards from urban area.
- Both boys and girls.
- Students who can read and write .

Exclusion Criteria:

- Students who are not having android/smart phone.
- Students who are absent during Data collection.

Data Collection Tool: A self-administered questionnaire was used as a tool for data collection by the researcher. It consists of the following parts:

Part I: Questionnaire on demographic variables.

Part II: Questionnaire on electronic media and traditional play.

Part I: It consists of Demographic variables like age, gender, Family Income, type of family and number of siblings.

Part II: It consists of Questions Regarding electronic media and Traditional Play.

Data Collection Procedure: Data was collected over one week

Plan For Data Collection Procedure: The researcher got prior permission from the concern authorities. After getting the permission, the researcher gave instructions to the participants regarding Data Collection and its procedure and gathered consent form from them. After getting consent the researcher administered the self structured questionnaire to the participants. They have read the questions and carefully answered. 15 minutes duration was given to each participant. Duration of data collection was one week.

Statistical Method: Descriptive statistics like frequency distribution, percentage, mean, standard deviation & inferential statistics like chi-square test will be used to analyze the data.

Ethical Consideration:

- Departmental clearance was be obtained.
- UG committee clearance was be obtained.
- Ethical clearance was obtained from Institutional

Human Ethical Committee.

- Prior permission from the department of community medicine was be obtained.
- Informed consent was be obtained from each sample.

A Phamplet was issued regarding the effects of electronic media.

Source of Funding: Self Funding

Conflict of Interest: Nil

Assessment Scales:

Method of Scoring: A self structured questionnaire is used in this study. Scoring was based on the ‘5 - Point Likert Scale’, which includes 20 Questions. Each. The maximum score is 100 and minimum score is 20.

Score	Level of Effectiveness
20 - 49	Minimum Positive Impact
50 - 74	Moderate Positive Impact
75 - 100	Optimum Positive Impact

Result

Findings: Findings of the study were presented under the following headings based on the study objectives .

Objective 1:

- To assess the usage of Electronic Media (mobile phones, computers, video games & television) among Higher secondary students in selected schools in Kelambakkam.

The finding of the present study reveals that:

1. 64% of the adolescent children spent 2-3hrs a day on Electronic media
2. 16% of the children spend more than 6 hours a day on Electronic media.
3. 11% of children spend 3-4hrs each day and
4. 9% of the children spend 5-6hrs a day.

Objective 2: To assess the effects of Electronic Medias on Traditional Play.

Findings: The Impact percentage of Electronic media on Traditional play was assessed with a self structured questionnaire in this study. Scoring was based on the ‘5 - Point Likert Scale’, which included

20 Questions. Each. The maximum score is 100 and minimum score is 20.

The findings were:

1. 56%(45) of children had a Moderate Positive Impact of Electronic media on Traditional play.
2. 41%(33) had Optimum Positive Impact of Electronic Media on Traditional play
3. The rest 3%(2) had a minimum positive impact of Electronic Media on Traditional play.

Table 1: Frequency and Percentage distribution of Effects of Electronic Media on Traditional play among Higher Secondary School children.

Level of Effectiveness	Frequency	Percentage
Minimum Positive Impact	2	3%
Moderate Positive Impact	45	56%
Optimum Positive Impact	33	41%

Table 1 illustrates 56% of the students had Moderate positive Impact, 41% of the students had optimum positive impact and the remaining 3% had the least impact

Objective 3: To Associate the effects of Electronic Media on Traditional Play with the selected demographic variables.

On association of the demographic variables with the level of impact the probability value P was less than 0.05 which signifies that there were no significant association between the selected demographic variables and the effects of electronic media on traditional play.

Limitation: Only adolescent students from class 11th and 12th were covered in the study.

Recommendations:

- This study can be replicated on large sample, studies can be conducted in different settings to validate findings
- A study can be conducted on general public regarding effects of electronic media.

Conclusion

To conclude the Researcher would like to: Improve the knowledge on the Effects of Electronic media on Traditional play and to make sure that the students are aware of the ill Effects of Electronic media on Traditional play.

Reference

1. Agarwal V, Dhanasekaran S. Harmful Effects of Media on Children and Adolescents. Journal of Indian Association for Child and Adolescent Mental Health. 2012;8(2):38-45.
2. Arya K. Time spent on television viewing and its effect on changing values of school going children. The Anthropologist. 2004 Oct 1;6(4):269-71.
3. Hieftje K, Edelman EJ, Camenga DR, Fiellin LE. Electronic media-based health interventions promoting behavior change in youth: A systematic review. JAMA pediatrics. 2013 Jun 1; 167(6):574-80.
4. David-Ferdon C, Hertz MF. Electronic media, violence and adolescents: An emerging public health problem. Journal of Adolescent Health. 2007 Dec 1;41(6):S1-5.
5. Mathers M, Canterford L, Olds T, Hesketh K, Ridley K, Wake M. Electronic media use and adolescent health and well-being: cross-sectional community study. Academic pediatrics. 2009 Sep 1;9(5):307-14.
6. Moorhead SA, Hazlett DE, Harrison L, Carroll JK, Irwin A, Hoving C. A new dimension of health care: systematic review of the uses, benefits and limitations of social media for health communication. Journal of medical Internet research. 2013; 15(4):e85.
7. Huesmann LR. The impact of electronic media violence: Scientific theory and research. Journal of Adolescent health. 2007 Dec 1;41(6):S6-13.
8. Lampert T, Sygusch R, Schlack R. Use of electronic media in adolescence. Results of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS). Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz. 2007;50(5-6):643-52.
9. Cain N, Gradisar M. Electronic media use and sleep in school-aged children and adolescents: A review. Sleep medicine. 2010 Sep 1; 11(8):735-42.
10. Levine LE, Waite BM, Bowman LL. Electronic media use, reading and academic distractibility in college youth. Cyber Psychology & Behavior. 2007 Aug 1; 10(4):560-6.
11. Shochat T, Flint-Bretler O, Tzischinsky O. Sleep patterns, electronic media exposure and daytime sleep-related behaviours among Israeli adolescents. Acta Paediatrica. 2010 Sep;99(9):1396-400.

12. Worthen MR. Education policy implications from the expert panel on electronic media and youth violence. *Journal of Adolescent Health*. 2007 Dec 1;41(6):S61-3.
13. Coulter KS, Bruhn M, Schoenmueller V, Schäfer DB. Are social media replacing traditional media in terms of brand equity creation?. *Management Research Review*. 2012 Aug 3.

Pattern of Snake Bite Cases at Tertiary Health Care Centre and First Aid Treatment

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Abstract

Introduction and Objectives: Snake bite is one of the public health problem often neglected, especially in tropical and developing countries of the world. Demographic and clinical parameters changes in different parts of the world. In India it is more prevalent in Kerala, Karnataka, Maharashtra, Tamilnadu, etc. This study was conducted in a tertiary health care centre in Maharashtra to demonstrate the epidemiology, management and severity of snake bite as an acute medical emergency situation to create awareness regarding the first aid treatment and to formulate policies for ASV availability.

Materials and Method: Tertiary health care based retrospective study was conducted from June 2017 to July 2018 and data was collected, analyzed and presented as percentage.

Results: In this present retrospective study a total of 131 cases of snake bites were observed in a tertiary health care centre and the mortality rate was found to be 1.53%. More than 50% bites were of Vasculotoxic Snake leading to severe systemic complications in 15% of the victims and death of 2 patients, ASV was required in 68% cases of snake bites.

Conclusion: To lower the incidences of Snake bites, awareness and preventive measures such as avoiding tall grassy areas, keeping storage areas clear of rodents, removing rubbish, raise beds above floor level and avoiding areas known to harbor dangerous snakes. Use of gumboots and long pants for working outdoors is advised. First aid treatment and assurance to patients are the most important primary management of Snake bites.

Keywords: Snake bite, Tertiary care hospital, Retrospective study, Anti-snake venom (ASV), secondary manifestations.

Introduction

Snake envenoming is a critical health issue¹, in terms of incidence and severity at global level. According to

WHO records there are 5.4 million snake bites worldwide each year, out of which 1.8-2.7 million are venomous leading to death of 81,000-1,28,000 people (14.58-37.26%) and permanent disability in more than 400,000 and other severe health consequences, and psychological sequelae². Nearly 2.8 million people suffer from bitten by snake bite in India, of which, 46,900 deaths have been reported every year (WHO) accounting for about 2.85-5.3% of mortality of total hospital admission in India³.

There are more than 3500 species⁴ of snakes out of which 600 are venomous², but only 250 are of medical important. There are 216 species of Snake in India, out

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of which only 52 are poisonous, and the most venomous five species are- common cobra, king cobra, krait, Russell's viper and saw-scaled viper⁵.

This study of the pattern of Snake bite is essential to provide information to the concerned authorities in order to manage it appropriately. As Snake bite is a neglected, life-threatening emergency and demands immediate anti-venom therapy, hospital studies provide a key source of information⁶. But people in country like India prefer traditional healers rather than trained doctors, as a result of whom 80% of snake bite victims in rural areas die outside the health care set up. The victims can die at home rendering their deaths unrecorded. Hence, a reliable epidemiological data is not present related to morbidity and mortality, as there is no proper reporting system related to snake bites⁷.

The outcome of Snake bite depends on numerous factors including the species of snake and type of venom, the site of bite on the body, amount of venom injected, health condition of the victim. Venomous Snake bites can cause paralysis that may prevent breathing (in neurotoxic bites), bleeding disorders (in vasculotoxic bites) which can progress to fatal hemorrhage, tissue damage which can progress to permanent disability and require limb amputation, irreversible kidney failure⁸. Disseminated intravascular coagulation can result in serious life threatening systemic complications like hemorrhage, infarction and even death if the treatment is delayed.

Snake antivenom immunoglobulins are the only specific treatment for envenoming by Snake bite⁹. The unavailability of effective ASV to treat the snakebite envenomings are encountered in various regions of the world. The first challenge in unavailability of antivenom is less specification about the requirements for antivenom at an operational, local level. The second challenge is education of the 'at-risk' population. As most of snakebite victims go to traditional healers, rather than to health centers, to receive treatment, because of the cost of medical care is out of proportion to the average income of a family of farmers. The third challenge is to improve the accessibility of antivenoms. The fourth and

final challenge is training of health personnel, including physicians, nurses, and public health professionals¹⁰.

So, awareness, early diagnosis, assurance of patient, safe, affordable and effective treatment of Snakebite envenoming is essential to reduce the suffering and death due to Snake bite.

Aims and Objectives:

1. To find out various factors influencing snake bite cases.
2. To assess the mortality and morbidity due to snakebite with respect to species of snake, type of venom, site of bite and treatment with anti-venom.

Materials and Method

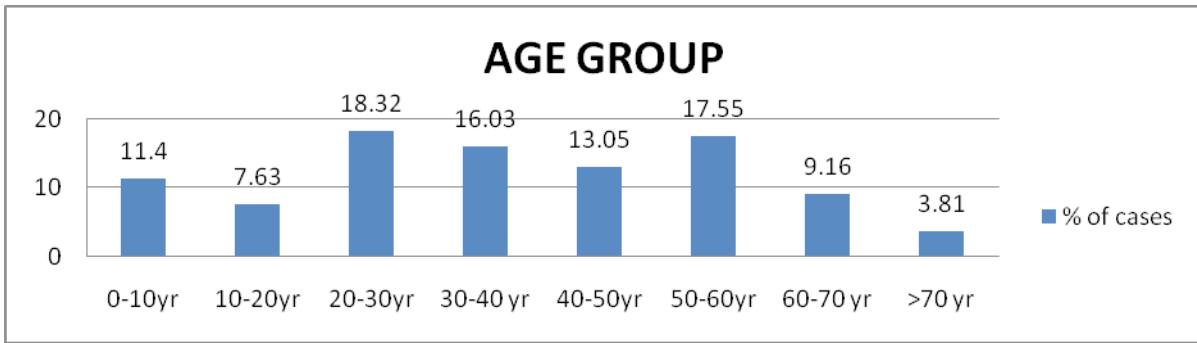
A tertiary health care centre based Retrospective study of snake bite was conducted from June 2017 to July 2018 and a total of 131 cases were analyzed. A detailed information was obtained regarding the factors influencing the snakebite related mortality and morbidity with reference to type of snake if identified, type of envenomation, victim's age, sex, residence, occupation, site of bite, place of bite, clinical manifestations of snakebite, first aid and management of snakebite, antivenom treatment from the hospital records they were investigated during the study.

Methodology: The record of retrospective data was collected from the institutional admission and death register. The data was collected from the hospital records using pretested proforma and analyzed using descriptive statistics and all results were expressed as percentage.

Findings: In this retrospective study of snake bite 131 cases were analyzed and death was observed only in 2 cases. Mortality rate was 1.53%.

The incidence of snake bite was reported in more in the season of monsoons -64.2% (June –September), followed by summer-18.2% (February-May) and less in winter-17.6% (October-January).

In this study 61.2% patients were male and 38.8% were female with the ratio of MALE: FEMALE -1.57:1.



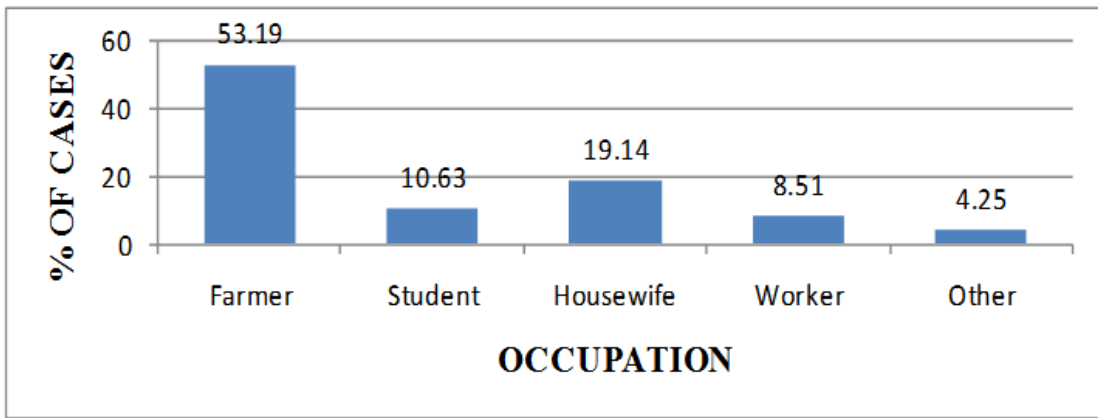
Graph 1: Age wise distribution of case’s related to snake bites.

Maximum incidences of bites were in the afternoon (44%- during day time), followed by morning (31%) accounting for 75.55% bites in the daytime followed by 24.45% bites in the night.

63% of victims arrived to the tertiary care centre within 6 hours, and most (70.21%) of them were referred either from primary health care centre/private hospital/

clinics. 75% of the victims were conscious at the time of hospitalization and majority of the patients were admitted in the hospital for 3-5 days (54.19%) followed by 6-10 days (29%) for observation, improvement and recovery.

In this study 67.93% of victims belong to rural population and rest 32% from urban area.



Graph 2: Distribution of snake bite cases related to occupation.

The snake bites were more in lower limbs (52.57%), followed by upper limbs (44.81%) and trunk (2.58%), in 56.88% cases both upper and lower limbs of left side were involved followed by right limbs in 40.5%.

48.93% of the victims were aware of first aid treatment, and in 10.63% of cases, patients were totally involved in either other traditional healing practices.

Local findings such as pain, swelling at the site, bleeding, tingling sensation and numbness, blackish

discolouration of skin were observed in 95.74% cases.

Severe secondary manifestations like kidney damage, necrosis, intracerebralhaemorrhage, retinopathy, cellulitis, respiratory failure, disseminated vascular coagulopathy were observed. In USG Findings in 6% of total cases there was acute kidney damage requiring for dialysis. With the available records it was found in this study that 13% of victims required blood transfusion in snake bite cases.

Table 1: Laboratory Findings

Lab parameters (Variation)	% of total cases
Increased urine albumin	46
Increased urine sugar	14
Increased Clotting Time	17
Leucocytosis	31
Thrombocytopenia	24
Increased Prothrombin time	57
INR	55
Decresed Hb	29
Hypokalemia & hyponatraemia	35
Increased Random Blood sugar level (No H/o of DM)	41

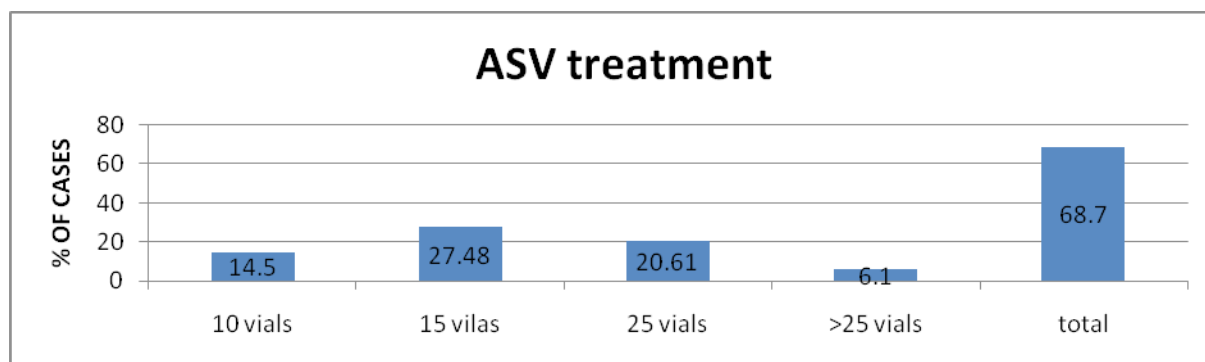
In 56.48% cases the snake were identified as venomous and russell’s viper was the major cause in 13.41% cases of vasculotoxic snake bites.

The 2 Deaths (both female patient) observed in the study were due to disseminated intravascular coagulopathy and respiratory failure due to vasculotoxic bite.

In patients treated with ASV only 7% showed hypersensitivity reaction and side effects like nausea, excessive sweating, and vomiting, itching, discomfort was noted in 21% cases.

Table 2: Distribution of cases related to type of bite

Type of Bite	% of Total Bites	% of Secondary Manifestations/Severe systemic complications	% of Deaths	% Of ASV Treatment
Unknown Snake Bite	38.93	4.58	0	22.13
Non Poisonous Snake Bite	4.58	0	0	0
Vasculotoxic Snake Bite	54.19	15.26	1.52	44.27
Neuroparalytic Snake Bite	2.29	1.52	0	2.29
Total	100	21.37	1.52	68.7



Graph 3: Distribution of cases based on amount of ASV treatment given.

Discussion

The higher incidences of Snakebite and its fatalities were at the peak during the monsoon season (64.2%), probably due to increased agricultural work, flooding caused, increased snake activity along with abundance of their natural targets. Similar finding were seen in studies conducted at Chitradurga, Karnataka¹² with 71.42 %, South Indian Study⁹ with 68.8%, and in contrast to the result of study conducted at hospitals of Kenya¹⁵, where

bites were more in dry season.

From this study it can be seen that higher incidences were in patients of middle age group i.e. 20-50 years (64.95%) and in males (61.2%) due to their active involvement in outdoor occupation, agriculture, and other labor works .Similar findings of incidences in middle age group were observed in studies conducted at Haldia¹¹ with 45.23%, Chitradurga, Karnataka¹² with 54.15%, South Indian study⁹ with 52.6%.The

findings of more incidences in males were observed in the international studies conducted at Srilanka¹⁴ with 59%. In Indian studies similar findings were observed in studies conducted at chitradurga Karnataka¹² with 58%, Haldia¹¹ with 64.29%, South Indian study⁹ with 74.4%, Malabar, North kerala¹³ with 65%.

The incidences of snakebites were more in the bites in the daytime i.e. 75.55% followed by 24.45% bites in the night due to occupational necessities. The studies with similar findings were seen at Chitradurga, Karnataka¹² with 51.42% and contrast to the observed results at Malabar, North Kerala¹³ with more bites were in evening, South Indian⁹ study with 64.44% bites in evening and night time. In this study the incidence of snakebites were more in rural population (68.2%) and in farmers(53.19%) as snakes hide near the fields and farms due to which their accidental contact occur while working in field barefooted, which is common phenomenon in India. Similar observations were seen with studies conducted at South Indian study⁹ with 79.25% rural population with 56.66%farmer, Haldia¹¹ with 69.04%farmers. The snake bites were more in lower limbs (52.57%), followed by upper limbs (44.81%) due to working without proper shoes. Similar results were observed at Malabar, North kerala¹³ with 77% bites in lower limbs, Chitradurga, Karnataka¹² with 59.32%, South Indian study⁹ with 65.17%, Haldia¹¹ with 64.28%.

Laboratory Analysis: Showed leucocytosis, thrombocytopenia, increased Prothrombin time & INR in 31%, 24%, 57%, 55% cases respectively, which suggest bleeding tendencies and clotting disorders in snake bites. Hb value was below normal (12.5 gm/dl) in 29% cases. Similar lab findings were observed in the study conducted at Malabar, North kerala¹³ with Leucocytosis in 36%, Thrombocytopenia in 29%, PT prolongation in 26.58%, Decreased Hb in 23% cases.

In the study, the victims who received first AID treatment before coming to the tertiary health care centre and those who didn't received first aid and had no Secondary manifestations were 40.42%, and 34.04% respectively. The findings were significant (Calculated $X^2=0.00366$, $df=1$, $p<0.05$). No ASV treatment was required in patients who received first AID treatment before coming to hospital was 14.89%, to those who didn't received First AID was 10.63%. These findings were also significant (Calculated $X^2=0.0083$, $df=1$, $p<0.05$). Out of the 131 cases, in 74 cases the snake venom was identified as vasculotoxic or neurotoxic. Mortality was

observed in 2.70 % vasculotoxic bites, whereas no deaths were recorded with neurotoxic bites. The findings were significant (Calculated $X^2=0.0144$, $df=1$, $p<0.05$).

Envenomations were observed in 56.48% cases consisting of 2.29% neurotoxic and rest vasculotoxic snake bites, most common with Russell's viper. Similar observations of vasculotoxic bites were seen in studies conducted at Malabar, North Kerala¹³ with 61%. In Srilankan¹⁴ study 44% of snakes were identified and Russell's viper as major cause of vasculotoxic bites in 70% cases was seen in the study conducted at Malabar, North Kerala¹³. Local findings were observed in 95.74% cases with similar findings in studies conducted at chitradurga, Karnataka¹² with 80%, srilanka¹⁴ with 89%.

Monovalent or polyvalent ASV is the ideal treatment in case of envenomation by snake bites. In India polyvalent ASV vials are available which are used according to manifestations of signs & symptoms and severity of the patient. In the study ASV was given to the 68% patients with usual dose of 15-25 vials in 48.09% cases. Similar results were found in studies conducted at South Indian Hospital Study⁹ with 52.22% ASV and usual dose of 11-20 vials.

Conclusion

This study emphasizes the importance of Snake bite as a medical emergency and significant threat to the community in the developing & tropical countries. In the present study Vasculotoxic Snakebites were more common leading to Severe Acute kidney injury, HTN retinopathy, Potential to cause renal necrosis, and even death. Disseminated Intravascular Coagulopathy in Vasculotoxic bites were the leading cause of mortality.

Lack of awareness, delay in coming to hospital and treatment by unqualified people add up to increase the risk of mortality. Under-reporting of Snake bite occurrences have contributed to the variations in observed incidences of it, so Surveillance of envenomations is essential for establishing guidelines, planning therapeutic supplies, and training medical staff on Snakebite treatment. Also it is observed that Snake bite still remains as a major occupational (farming) hazard affecting productive age group and predominantly males in rural area.

To lower the incidences of Snake bite, awareness and preventive measures such as avoiding tall grassy areas, keeping storage areas clear of rodents, removing rubbish, raise beds above floor level and avoiding

areas known to be inhabited by dangerous snakes, use of gumboots and long pants for working outdoors, can be advised to the people. First AID treatment and assurance to the patient are the most important primary management of Snake bite.

In most of the cases, bite marks are non identifiable as they are small and due to which the victim develops either neuroparalysis/hypovolemic shock or other severe systemic symptoms within hours. So, efforts should be done for identification of venomous Snake.

Conflicts of Interests: None

Source of Funding: Self

Ethical Clearance: Ethical clearance was obtained from the Institutional Ethical Clearance Committee of Krishna Institute of Medical Sciences, Karad.

References

1. WHO guidelines for the Production, Control and Regulation of Snake Anti-venom Immunoglobulins. [Internet] 2018 [cited 2018 July 18]. Available form: http://www.who.int/biologicals/ECBS_2016_BS2300_WHO_Guidelines_antivenom_clean1.pdf
2. Venomous snakes distribution and species risk categories [Internet]. 2018 [cited 2018 July 18]. Available form: <http://apps.who.int/bloodproducts/snakeantivenoms/database/>
3. Swaroop S, Grab B. Snakebite mortality in the world: Bull World Health Organ. 1998;35-76
4. Reddy KSN, Murty OP. The essentials of forensic medicine and toxicology. 34th ed. New Delhi: The health sciences publisher; 2017: 519-26
5. Rao GN. Textbook of forensic medicine and toxicology. 2nd ed. Bengaluru: Jaypee brother's medical publishers (P) LTD; 2010. 482-91
6. Prevalence of Snake bite envenoming.WHO. [Internet]. 2017 [cited 2018 July 18]. Available form: <http://www.who.int/snakebites/epidemiology/en/>;
7. H. Asita de Silva. Nicole MR, H. Janaka de Silva. Adverse reactions to snake antivenom, and their prevention and treatment. British journal of clinical pharmacology: 2016;81(3); 446-452
8. Addressing the burden of snakebite envenoming: SEVENTY-FIRST WORLD HEALTH ASSEMBLY WHA71.5.[Internet]. 2018 Jan. [cited 2018 July 28]. Available form: http://www.who.int/neglected_diseases/mediacentre/WHA_71.5_Eng.pdf?ua=1;
9. Nagaraju K, Kannappan N, Gopinath K. Survey on Pattern of Snake bite Cases Admitted in South Indian Tertiary Care Hospitals Coimbatore. 2015; 4362-67.
10. Chippaux JP. Snakebite envenomation turns again into a neglected tropical disease. Chippaux Journal of Venomous Animals and Toxins including Tropical Diseases: 2017; 23:38.
11. Ahmed Z, Hussain T. Snake Bites Profile in Haldia, Purba Midnapu. West Bengal: Indian Journal of Forensic Medicine & Toxicology. 2013, Jan; 7(1): 243-45.
12. Kumar HRS, Chandan RK, Sidramappa VG, Belodu R, Patil SB, Patil BS. Epidemiological and Clinical Study of Snake Bite Cases Admitted in Basaveshwara hospital, Chitradurga, Karnataka: Indian Journal of Forensic Medicine & Toxicology. 2013, Jan; 7(1): 58-61.
13. Kumar SKG, Narayanan S, Udayabhaskaran V, Thulaseedharan NK. Clinical and epidemiologic profile and predictors of outcome of poisonous snake bites – an analysis of 1,500 cases from a tertiary care center in Malabar, North Kerala.2018, June; 11: 209—16.
14. Shahmy S, Kularatne SAM, Rathnayake SS, Dawson AH. A prospective cohort study of the effectiveness of the primary hospital management of all snakebites in Kurunegala district of Sri Lanka. PLoS Negl Trop Dis. 2017; 11(8).
15. Francis Okumu Ochola. Mitchel OtienoOkumu. Gerald MwangiMuchemi. James Mucunu Mbaria. Joseph Kangangi Gikunju. Epidemiology of snake bites in selected areas of Kenya: Pan African Medical Journal. 2018, April; 209-17.
16. Bannur V, Jirli, PS, Honnungar RS, Koulapur VV, Pujar, SS. Pattern of Poisoning Cases at a Tertiary Health Care Centre--A Cross Sectional Study: Medico-Legal Update. 2019, Jan-Jun, 19 (1): 124-9.
17. Kokatanur CM. Pattern of acute poisoning in Karad. Medico-legal Update. 2016, Jan; 16(1): 178–81.
18. Raghavendra R, Kokatanur CM, Havanur BH, Devadass PK. Comprehensive analysis of fatal poisoning cases: An autopsy study. Indian J Forensic Med Toxicol. 2017, Jul; 11(2): 181–5.

Assessment of Adverse Symptoms of Menopause among Post Menopausal Women in a Selected Rural Community at Kancheepuram District, Tamilnadu, India

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Abstract

Concurrent psychological physical vasomotor and sexual changes occurring in the post menopausal period may disturb a women quality of life. Therefor the study was dont to Assess the adverse symptoms of menopause among post menopausal women in a selected rural community. The objectives was to assess the adverse symptoms of menopause among the post menopausal women and to associate the degree of adverse symptoms of menopause with selected demographic variables. A sample of 100 post menopausal women with adverse symptom of menopause were meet the inclusion criteria. An extensive review of literature and guidance by experts formed the foundation to the development of the study. The data was collected for the study and was tabulated and analyzed.

The mean and standard deviation aspect of post menopausal women with adverse symptoms of menopause was identified. Overall the mean founded to be 16 (mean percentage 36.3%) and standard deviation as 3.07. The frequency distribution in the study shows that majority of 95% were belongs to the low symptoms, 5% were moderate symptoms and 0% were high symptoms providing Health care services. And also women with more adverse effects of menopausal symptoms were directed for counseling and advised to practice relaxation techniques.

The association between demographic variable in relation with adverse effect of women with post menopause symptoms It shows that age of women, Age attaining menopause, No of children, Marital status, Educational qualification, Occupation, Monthly income does not have significant association with adverse effect of women aspect at p value < 0.05 level of significance

Keywords: Menopause, Post menopausal women, Adverse symptom of menopause.

Introduction

Menopause is the permanent cessation of menstruation resulting in the loss of ovarian follicle

development. The age at menopause appears to be genetically determined and is unaffected by race, socioeconomic status, age at menarche, or number of prior ovulation. Factors that are toxic to the ovary often result in an earlier age of menopause. For example, women who smoke experience an earlier menopause. Women who have had surgery on their ovaries, or have had a hysterectomy, despite retention of their ovaries, may also experience early menopause. Premature ovarian failure is defined as menopause before the age of 40 years. It may be idiopathic or associated with toxic exposure, chromosomal abnormality, or autoimmune disorder.^[1]

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According to the World Health Organization, "natural menopause" is defined as "no menses for 12 consecutive months with no obvious intervening cause, such as pregnancy, lactation, exogenous hormone use, dietary deficiencies or surgical removal of uterus or ovaries"^[1] With the general increase in life expectancy world wide, most women are likely to live for another 20-30 years after menopause, and approximately, one-third of their life in a state of estrogen deficiency.^{[1] [2]}

Mean age at menopause ranges in India women from 40.32 to 48.84 years and in developed countries from 48.0 to 51 years.^[9] Studies on menopausal issues and health demand priority in Indian scenario due to the growing population of menopausal women as a result of their increased life expectancy ^[7]

Concurrent psychological physical vasomotor and sexual changes occurring in the post menopausal period may disturb a women quality of life ^[10] Although menopause is associated with changes in the hypothalamic and pituitary hormones that regulate the menstrual cycle, menopause is not a central event, but rather a primary ovarian failure. At the level of the ovary, there is a depletion of ovarian follicles. The ovary, therefore, is no longer able to respond to the pituitary hormones, that is, follicle-stimulating hormone (FSH) and luteinizing hormone (LH), and ovarian estrogen and progesterone production cease. Androgen production from the ovary continues beyond the menopausal transition because of sparing of the stromal compartment.^[8]

Menopausal women continue to have low levels of circulating estrogens, principally from peripheral aromatization of ovarian and adrenal androgens. Adipose tissue is a major site of aromatization, so obesity affects many of the sequelae of menopause. The ovarian-hypothalamic-pituitary axis remains intact during the menopausal transition; thus, FSH levels rise in response to ovarian failure and the absence of negative feedback from the ovary. Atresia of the follicular apparatus, in particular the granulosa cells, results in reduced production of estrogen and inhibit, resulting in reduced inhibit levels and elevated FSH levels, a cardinal sign of menopause.^[4]

Menopausal transition, or 'peri-menopause', is a defined period of time beginning with the onset of irregular menstrual cycles until the last menstrual period, and is marked by fluctuations in reproductive hormones. This period is characterized by menstrual irregularities;

prolonged and heavy menstruation intermixed with episodes of amenorrhea, decreased fertility, vasomotor symptoms; and insomnia. Some of these symptoms may emerge 4 years before menses ceases. During the menopausal transition, estrogen levels decline and levels of FSH and LH increase ^[5].

The menopausal transition is characterized by variable cycle lengths and missed menses, whereas the postmenopausal period is marked by amenorrhea. The menopausal transition begins with variability in menstrual cycle length accompanied by rising FSH levels and ends with the final menstrual period^[6]

Materials and Method

Research methodology deals with the description of the method and different steps in collection and organization data from the investigation. It includes description of the research approach, research design, setting, population, samples and sample size, the sample technique, sampling criteria, development and description of the tool, data collection procedure and the plan or analysis in the study.

The research design used in this study is Non experimental, Descriptive Research Design, A non-probability purposive sampling technique is used to collect data from the samples. The sample size was 100 samples at selected rural community.

Title of the Study: Assessment of adverse symptoms of menopause among post menopausal women in a selected rural community at Kanchipuram district, Tamilnadu, India.

Objectives:

- To assess the adverse symptoms of menopause among the post menopausal women
- To associate the degree of adverse symptoms of menopause with selected demographic variables.

Methodology:

Research Approach:

Quantitative non Experimental–Descriptive Approach.

Research Design: Non Experimental, Descriptive Research Design.

Samples: 100 Samples

Sampling Technique: Non probability-purposive sampling technique was adopted.

Inclusion Criteria:

- Post-menopausal women with amenorrhea for minimum one year
- Post menopausal women who have attained menopause within five years

Exclusion Criteria: Women with a known history of chronic disease such as hypertension, diabetes, migraine, cardiovascular disease, tumors, tuberculosis, rheumatoid arthritis and osteoarthritis were excluded in the study

Tool Description:

- A. Selected demographic variables of women such as Age of women, Age at menopause, No of children, Marital status, Education, Occupation, Family income.
- B. Distribution and prevalence of menopausal symptoms by Menopause rating scale developed by Berlin center for epidemiology and health research

Data Collection Procedure:

- The researcher collected the data for the period of two weeks, per day 10-20 samples was collected
- Prior permission and consent was obtained from the participant before conducting the study. In this present study the researcher was assessed the menopausal symptoms among post menopausal women during home visit by Structured Interview Schedule.

Data Analysis: Descriptive statistics like frequency distribution, percentage, mean, standard deviation & inferential statistics like chi square was used to analyze the data.

Study Findings:

- It is observed that most of the post menopausal women in selected rural community had 95% were belongs to low level of symptoms, 5% of them moderate level of symptoms and 0% of them high level of symptoms.
- It was observed that the mean and standard deviation aspect of adverse effect of women with post menopause symptoms. Overall mean in adverse effect of women with post menopause symptoms

found to be 36.3% and standard deviation as 3.07.

- The association between demographic variable in relation with adverse effect of women with post menopause symptoms It shows that age of women, Age attaining menopause, No of children, Marital status, Educational qualification, Occupation, Monthly income does not have significant association with adverse effect of women aspect at p value < 0.05 level of significance.

Conclusion

In India, though various studies have been carried out to study menopausal symptoms, majority of them are either hospital based are focus on the urban population with not much work done on rural women, therefore this study proposes to assess the menopausal symptoms among rural women.

Information education and communication activities to increase awareness about menopause problems among general public, family members, and middle-aged women population should be undertaken^[1].

Conflict of Interest: NIL

Source of Funding: Self funding

Ethical Clearance: Chettinad Academy of Research and Education, Institutional Human Ethics Committee.

References

1. World Health Organization. Research on the menopause report of a WHO. Scientific group technical report series 670 Geneva: World Health Organization 1981. p. 11-32
2. World health organization. Research on the menopause in the 1990s – report of a WHO scientific group. Technical report series 866. Geneva: World Health Organization: 1996.p . 3-39.
3. Jeyasheela K., Emily D. Ebenezer, Vaibhav Londe, Thomas V. Paul, Bijesh Yadav, Aruna N. Kekre. Prevalence of metabolic syndrome among postmenopausal women in south india. International journal of reproduction, contraception, obstetrics and gynecology jeyasheela k et al.Int j reprodcontraceptobstet Gynecol. 2018 jun;7(6)2364-2370
4. NusratNisar, Nisar Ahmed Sohoo, (May 2010). Severity of menopausal symptoms and the quality of life at different states of menopause:

- a community based survey from rural Sindh, Pakistan. *International journal of collaborative research on internal medicine & public Health* vol. 2 no. 5 (May 2010) pg.no 118-130
5. Hassan M. Al-Musa, Razia Aftab Ahmed, Awad S. Alsamghan, et al. . . ., The prevalence of symptoms experienced during menopause influence of sociology demographic variables on symptoms and quality of life among women at Abha, *Biomedical Research* 2017;28 (6) November 5.
 6. Prof. Dr. Alakananda, Dr Nilanjana Das, et al. . . . Age of menopause and Menopausal symptoms among women attending Gauhati medical college and hospital, Guwahati, Assam. *Scholars Journal of Applied Medical Sciences(SJAMS) Sch. J. App. Med. Sci.*, 2015; 3(7C):2621-2629, October 2015
 7. ShilpaK, Amit R.Ugargol. A comparative study on postmenopausal symptoms in rural and urban women. *International journal of Community and public Health* shilpa k et al. *International journal of Community Med public Health*. 2015 Nov;2(4):604-609
 8. Khatoon F Parul S, Sana sahid, et al. Assessment of Menopausal symptoms using modified menopause rating scale in women of northern India, *International journal of reproduction, Contraception Obstetrics and gynecology*, 2018 Mar;7(3):947-951
 9. RuchikaGarg, RajaniRawat, Manishapathak et al. . . . Menopausal symptoms among post Menopausal women of North India, *Journal of South Asian Federation of Menopause Societies*, January-June 2015;3(1):3-5
 10. Dr. Sudeshna Ray and Professor Aparajita Dasgupta. An assessment of QOL and it's determining factors of postmenopausal women in a rural area of West Bengal, India . *International journal of medicine and public health* Vol.2 / issue 4 / oct-dec, 2012
 11. Marya Ahsan, Ayaz Khurram Mallick, Rashmi Singh, et al. . . . Assessment of menopausal symptoms during perimenopause and post menopause in Tertiary Care Hospital of basic and Clinical reproductive Sciences . *Journal of Basic and Clinical Reproductive science* January – June 2015. Vol 4 . Issue 1
 12. Nidhipathak, M.S. Shivaswamy. Prevalence of menopausal symptoms among postmenopausal women of urban Belagavi, Karnataka . *Indian journal of health sciences and biomedical research KLEU / published by Wolters Kluwer – Medknow* .November 21, 2018
 13. Avin Alva BR, Chethan TK, A study to assess the average age of menopause and menopause associated symptoms among rural women in Mangalore, Karnataka. *National journal of community medicine*, Volume 7, May 2016

Knowledge on Prevention of Carcinoma Cervix among Women in the Reproductive Age Group at Kokilamedu Village, Kanchipuram District, Tamil Nadu

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Abstract

The knowledge on prevention of Carcinoma Cervix among the reproductive age group women in Kokilamedu village at Kanchipuram District, Tamil Nadu, India. The objectives were to assess the knowledge on prevention of Carcinoma Cervix among women in Kokilamedu village at Kanchipuram District, Tamil Nadu and to find out the association between the level of knowledge with demographic variables. The convenience sampling was used to select 104 samples of reproductive age group women. The data collection tools were validated and reliability was established. The data were collected by self administered questionnaire. The collected data was tabulated and analyzed. Descriptive and inferential statistics method were used. The study shows that 45% of the women had poor knowledge, 59% of the mothers had moderate knowledge and non of the women had adequate knowledge regarding prevention of Carcinoma Cervix. There was no significant association between the knowledge and the selected Demographic Variables.

Keywords: Knowledge, prevention, carcinoma cervix, Reproductive age group women.

Introduction

Prevention is better than cure.

—Desiderius Erasmus

Cancer is a disease in which abnormal cells divide uncontrollably and destroy body tissue. It is caused by various factors such as tobacco, obesity, diet, lack of exercise, family history, and alcohol. Its possible symptoms include a lump, abnormal bleeding, prolonged cough, unexplained weight loss and a change in bowel movements. Tobacco is the main cause of about 22%

of cancer deaths. Another 10% are due to obesity, poor diet, lack of physical activity or excessive drinking of alcohol (WHO-1995)¹

Other infections include certain infections, exposure to ionizing radiation and environmental pollutants. In the developing world, 15% of cancers are due to infections such as helicobacter pylori, hepatitis B, hepatitis C, human papilloma virus, Epstein-barr virus and human immunodeficiency virus. Mostly 5-10% of cancers may be due to inherited genes from parents.

In 2015, about 90.5 million people had cancer. About 14.1 million new cases occur in a year. It caused about 8.8 million deaths. The most common type of cancer in males are lung cancer, prostate cancer, colorectal cancer and stomach cancer. In females, the most common types are breast cancer, colorectal cancer, lung cancer and cervical cancer (Alafifi R, kindratt TB)²

Carcinoma Cervix is a cancer arising from the cervix. It is the abnormal growth of cells that have the ability to invade or spread to other parts of the body. Early on,

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typically no symptoms are seen. Later symptoms include abnormal vaginal bleeding, pelvic pain, or pain during sexual intercourse. Human papilloma virus infection causes more than 90% of cases. Most people who have HPV infections, however do not develop Carcinoma Cervix. Other risk factors include smoking, a weak immune response, birth control pills, starting sex at a young age, and having many sexual partners.

Carcinoma Cervix typically develops from precancerous changes over 10-20 years. About 90% of cervical cancer cases are squamous cell carcinomas, 10% are Adeno carcinoma, and a small number are other types. Diagnosis is typically by Cervical screening followed by a biopsy, medical imaging is then done to determine whether or not the cancer has spread.

HPV vaccines are the only vaccines which protect against between two and seven high risk strains of this family of viruses and may prevent up to 90% of cervical cancers. Treatment of Carcinoma Cervix may consist of some combination of surgery, chemotherapy, and radiation therapy.

Worldwide, Carcinoma Cervix is both the fourth most common cancer cause of cancer and the fourth most common cause of death from cancer in women. In 2012, an estimated 528,000 cases of Carcinoma Cervix occurred, with 266,000 deaths. There is about 8% of the total cases and total deaths from cancer. About 70% of cervical cancers occur in developing countries and among them 90% of the deaths. In low income countries, it is one of the most common cause of cancer death (**Bjan Rivera J, Klug SJ**)³

The early stage of Carcinoma Cervix may be completely free of symptoms. Vaginal bleeding, contact bleeding, or a vaginal mass may indicate the presence of malignancy, moderate pain during sexual intercourse and vaginal discharge are symptoms of Carcinoma Cervix. In advanced stage of disease, metastases may be present in the abdomen, lungs and other organs. Symptoms of advanced cervical cancer may include loss of appetite, weight loss, fatigue, pelvic pain, back pain, leg pain, swollen legs, heavy vaginal bleeding, bone fractures, and leakage of urine or feces from the vagina.

The high disease burden of a preventable cancer of the uterine cervix is totally unwarranted. The magnitude of cases can be directly reduced by concentrated prevention and control effects in less developed regions of the world, including India. Some of the measures

of primary prevention of Carcinoma Cervix include quitting tobacco, delaying the age at initiation of sexual activity to above 18 years, restricting the number of sexual partners and the use of condoms.

Need for the Study: Carcinoma Cervix is the fourth most commonly occurring cancer in women and the eighth most commonly occurring cancer overall. There were over 500,000 new cases in 2018 (**WHO**)⁵

Swaziland had the highest rate of cervical cancer in 2018. As per standardized rate per 100,000 is (75.3%) (**WHO**)⁶

Carcinoma Cervix is the commonest cancer cause of death among women in developing countries. Every year in India, 1,22,844 women are diagnosed with Carcinoma Cervix and 67,744 die from the disease (*Indian journal of community medicine*)⁷

India has the highest age standardized incidence of Carcinoma Cervix in south Asia at 22 compared to 19.2 in Bangladesh, 13 in Srilanka, and 2.8 in Iran. Hence it is vital to understand the epidemiology of Carcinoma Cervix.

In Tamil Nadu the leading cancer among women are the Carcinoma Cervix (21.2%) accounting for over 47% of all cancers in the state. The age standardized Carcinoma Cervix mortality rate in Tamil Nadu is 35.7 per 100,000 compared to 16.0 per 100,000 nationally in 2010 (*state council of medicine*)⁸

In Kanchipuram, among 250 women, about six (2.4%) of them presented with pre-cancerous lesions such as atypical squamous cell of undifferentiated significance-five(2%) and mild dysplasia one(0.4%). Majority of women, about 178(71.2%) women had abnormal cervical findings (*Study on prevention of cervical cancer*)⁹

Hence the prevalence of Carcinoma Cervix is more common among the populations and their level of knowledge is very low. So the researchers proposed to conduct a study in the preventive measure of Carcinoma Cervix.

Statement of the Problem: Knowledge on prevention of carcinoma cervix among women in the reproductive age group at Kokilamedu village, Kanchipuram District, Tamil Nadu, India.

Objectives of the Study: Assess the knowledge on

prevention of carcinoma cervix among women in the reproductive age group.

Associate the level of knowledge with selected demographic variables on prevention of carcinoma cervix.

Research Methodology: This chapter deals with the description of research methodology adopted by investigator to study and analyze the outcome of structured questionnaire methodology is the most important part of any research which enables the researcher to form a blue print of the study.

Sampling Criteria:

A. Inclusion Criteria:

Women who are in the reproductive age group.

Women who are willing to participate in the study.

Women who can read and understand both English and Tamil.

B. Exclusion Criteria:

Women who have undergone Hysterectomy.

Women who are mentally challenged

Plan for Data Collection Procedure: The main study is going to be conducted in Kokilamedu village

Kanchipuram District in the month of April 2019. The data collection period was for one week. The investigators obtained written permission from the dean. Chettinad Hospital and Research Institute and the principal of Chettiinad College of Nursing and the written consent from the each student prior to the study. The investigators introduced them to the respondents to ascertain their cooperation for the study. Later, the investigators collect data from the samples after obtaining their consent. Data were collected from 104 women in the Reproductive age group who fulfilled the criteria. Demographic data was collected and the structured questionnaire was given to assess the knowledge on Carcinoma Cervix among the women.. They took 10-15 minutes to answer the questionnaire. After analyzing, the investigators provided a knowledge teaching about the prevention of carcinoma cervix for about 15 minutes. Again the questionnaires was given to them to assess the knowledge gained by the women. The investigators thanked the village people for their cooperation and support for the study.

Table 1: Score interpretation for knowledge on carcinoma cervix

Level of Knowledge	Score	Percent Age
Inadequate knowledge	0-9	<50%
Moderate knowledge	10-15	51%-75%
Adequate knowledge	16-20	76%-100%

Table 2: Association of level of knowledge of women regarding prevention of carcinoma cervix at selected demographic variables

S.No.	Characteristics	Category	No. of Samples	Knowledge			Chi Square	P Value
				Low	Moderate	High		
1.	Age	18-25 Years	32	13	19	0	1.95	0.05 NS
		26-30 Years	29	11	18	0		
		31-35 Years	24	14	10	0		
		36-40 Years	19	9	10	0		
2.	Marital Status	Married	49	22	27	0	0.159	0.05 NS
		Unmarried	55	23	32	0		
3.	Educational Qualifiaction	No Formal Education	25	14	11	0	2.37	0.05 NS
		Middle School	39	18	21	0		
		High School	40	15	25	0		
		Graduation	0	0	0	0		
4.	Occupation	Private Employee	41	20	21	0	0.64	0.05 NS
		Govern. Employee	34	14	20	0		
		Self Employed	28	12	17	0		

S.No.	Characteristics	Category	No. of Samples	Knowledge			Chi Square	P Value
				Low	Moderate	High		
5.	Income	Above 40,000	1	1	0	0	1.72	0.05 NS
		20,000 to 40,000	0	0	0	0		
		15,000 to 20,000	17	3	14	0		
		10,000 to 15,000	86	37	49	0		
6.	Family History	Yes	0	0	0	0	0	0.05 NS
		No	104	47	57	0		

Table 2 : Indicates the association of demographic variables of women with overall knowledge of women on carcinoma cervix was not significant.

Section A: Assessment of knowledge of reproductive age women on carcinoma cervix.

Table 3: frequency and percentage distribution of knowledge on carcinoma cervix among reproductive age group women.

Level of Knowledge	Frequency	Percentage
Low Knowledge	45	43.3%
Moderate Knowledge	59	56.7%
High Knowledge	0	0%

Result

The research findings reveal that.

Assess the knowledge on prevention of carcinoma cervix among reproductive age group women: The study result shows that the level of knowledge of women regarding prevention of carcinoma cervix was assessed by structured questionnaire and analyzed using descriptive statistics that indicates the mean pre test knowledge score with mean (XI = 7.7) and Standard Deviation (10).

The knowledge on prevention of carcinoma cervix among reproductive age group women.

The study result shows that there is a difference in knowledge of subjects regarding the prevention of carcinoma cervix. Data depicts that the Mean knowledge was much lower than the expected outcome.

Association of the knowledge on Prevention of Carcinoma Cervix with related demographic variables.

As there was no significance association of knowledge score with the selected demographic variables such as age, marital status, educational status,

occupation, income and their family history.

In conclusion, the discussion of the study findings obtained by the researchers shows that there was a significant low level of knowledge on Prevention of carcinoma cervix after the survey among reproductive age group women.

Conclusion

The result from this study shows that the level of knowledge on prevention of carcinoma cervix among women in the reproductive age group was inadequate and moderate. This has to be taken into consideration. There may be reason for early student inadequacy, which can be improved upon.

Conflict of Interest: Nil

Source of Funding: No source of funding

Ethical Clearance: Obtained from Chettinad Institutional human ethical committee.

References

- Owen J, Yost N, Berghella V, Thom et al, The study was conducted on Mid- trimester endovaginal sonography in women at high risk for spontaneous preterm birth. *JAMA* 2019;286;1340-48.
- Rozenberg p, Gillet A, Ville Y et al, The study was conducted on Transvaginal sonographic examination of the cervix in asymptomatic pregnant women. 2019;19: 475-77.
- Berghella V,Daly SF, Tolosa JE, Divito MM et al, The study was conducted on Predication of preterm delivery with transvaginal ultrasonography of the cervix in the patient with high-risk pregnancy: does cerclage prevent prematurity. 2018;181:809-15.
- Macdonald R, Smith P, Vyas S et al, The study was conducted on Cervical incompetence: the use of transvaginal sonography to provide an objective

- diagnosis. *Ultrasound Obstet Gynecology* 2018;18:211-16.
5. Rust OA, Atlas RO, Reed J et al, The study was conducted on The short cervix detected by trans vaginal ultrasound in the second trimester: why cerclage therapy may not help. 2017;185:1098-105.
 6. Benham BN Balducci J, Atlas RO, Rust OA et al The study conducted on risk factors for preterm delivery in patients demonstrating sonographic evidence of premature dilation of the internal os, prolapse of the membranes in the endocervical canal and shortening of the distal cervical segment by second trimester ultrasound *Aust N Z J Obstet Gynaecol* 2017; 42:46to50
 7. Groom KM, Shennan AH Bennett PR The study was conducted on ultrasound indicated cervical cerclage outcomes depend on preoperative cervical length and presence of visible membranes at time of cerclage *Am J Obstet Gynecol* 2017 187 445 to 49
 8. Bergelin I Valentin L et al The study was conducted on Normal cervical changes in parous women during the second half of pregnancy a prospective longitudinal ultrasound study *Acta obstet Gynecol Scand* 2016 81:31 to 38
 9. Yoshimatsu K, Sekiya T, Ishihara K et al, The study was conducted on detection of the cervical gland area in threatened preterm labor using transvaginal sonography in the assessment of the cervical maturation and the outcome of pregnancy.2015;53:149-56.
 10. Skentou C, Cicero S et al, The study was conducted on Cervical assessment at the routine 23-weeks, scan: problems with trans abdominal sonography.2015;15:292-96.
 11. Strauss A, Heer I, Fuchshuber S et al, The study was conducted on sonographic cervical volumetry in higher order multiple gestation.2014;16:346-53.
 12. Vendittelli F, Mamelle N, Munoz F et al, The study was conducted transvaginal ultrasonography of the uterine cervix in hospitalized women with preterm labour.2014;72:117-25.
 13. Dowd J, Premezel M, Garland S et al, The study was conducted on is the interaction between cervical length and cervical microbiology in the pathogenesis of preterm labour.2013;41:177-81.
 14. Gire C, Faggianelli P, Nicasise C et al, The study was conducted on ultrasonographic evaluation of cervical length in pregnancies complicated by preterm rupture of membranes.2012;19:565-69.
 15. Berhjella V, Haas, Chervoneva I et al, The study was conducted on patients with prior second-trimester loss:prophylactic cerclage or serial transvaginal sonograms.2012;187:747-51.
 16. Dumont A, Ravit M et al, The study was conducted on use of human papilloma virus testing in primary cervical cancer screening in rural Madagascar,2011; 34:231-234.
 17. Mapanga.W, Chipato t et al, The study was conducted on prevention of cervical cancer in HIV serotype women From developing countries through cervical cancer screening. 2010; 56:89-97.
 18. Lin AJ, Kidd E et al, The study was conducted on IMRT and image guided adapted brachytherapy for cervix cancer,2009: 56;34-39.
 19. Costales A, Michener C et al, the study was conducted on radical trachelectomy for early stage of cervical cancer,2009; 76:234-239.
 20. Ralaidovy AH, Gopalappa C et al, the study was conducted on cost effective interventions for breast cancer, cervical cancer and colorectal cancer new results from WHO-choice,2008; 98:123-145.
 21. Ziraba A, Orindi B, et al, A study was conducted on HIV risks among adolescent girls and young women in informal settlements of Nairobi, Kenya. A retrospective study, *journal of reproductive medicine*, 2006;8(6):12-23.
 22. Kaur R, Kaur K, et al, A study was conducted on menstrual hygiene, management and waste disposal: practices and challenges faced by girls/women of developing countries. A quasi experimental study, *journal of reproductive medicine*, 2006;23(9):456-67.
 23. Kumar G, Prasuna JG, et al, A study was conducted on assessment of menstrual hygiene among reproductive age women in south west- Delhi. A retrospective study, *Indian journal of community medicine*, 2005;45(15):234-56.
 24. Sumarah S, Widyasih H, et al, A study was conducted on effect of vaginal hygiene module to attitudes and behavior of pathological vaginal discharge prevention among female adolescents in pregnancy, Yogyakarta, Indonesia. A associative study, *journal of reproductive medicine*, 2005;23(12):98-104.

Bacteriological Finding in Chronic Suppurative Otitis Media and Antibiotic Sensitivity

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Abstract

Background: Chronic Suppurative Otitis Media (CSOM) is one of the most common infection and a major health problem in developing countries leads to serious complications if not treated properly.

Objective: The aim of this study is to identify the most common bacterial isolates causing CSOM in our setup to help guide the effective management of the disease. Its poor response to routine treatment and emergence of resistance strains were the factors responsible for undertaking this study

Materials and Method: Total 88 patients were included in the study with unilateral or bilateral discharge for more than 3 months at ending ear nose throat (ENT) outpatient department, AL-Hussein teaching hospital in AL-Samawa city from July 2018 to December 2018. Samples were taken by using sterile swabs and were cultured on aerobic media and their drug susceptibility was tested by using Kirby Bauer disc diffusion method.

Results: Overall microbiology of 88 samples was studied. Pseudomonas aeruginosa (32.95%) was the most common bacterial isolate, followed by staphylococcus (30.86%), Proteus mirabilis (15%), E coli (7.95%), streptococcus pyogen (4.54%) klebsiella sp and acinococcus sp (2.27%) enterococcus sp (3.27%).

Conclusion: Knowledge of the local bacteriological pattern and their antibiotic sensitivity is essential for the early, effective and cost saving treatment of CSOM and to prevent the complications and development of antibiotic resistance.

Keywords: Chronic suppurative otitis media, CSOM, Antibiotic susceptibility testing.

Introduction

Chronic suppurative otitis media (CSOM) is assumed to be a complication of acute otitis media (AOM), but the risk factors for CSOM are not clear. Frequent upper respiratory tract infections and poor socioeconomic

conditions (overcrowded housing and poor hygiene and nutrition) may be related to the development of chronic suppurative otitis media¹. However, a systematic review found no clear evidence that antibiotics are effective in preventing the progression of AOM to CSOM even among old age who are at high risk for the disease². Chronic discharging ears are highly prevalent in the tropical regions including South Asia. Complications of chronic suppurative otitis media³ septicemia, meningitis, brain abscess, facial paralysis and mental retardation⁴ and it is believed to be responsible for more than two-third of deafness in children. Unfortunately, the management of the chronic discharging ear is still limited to daily ear dressing until a dry ear is achieved⁵ and mastoidectomy

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is reserved for complications. Ear discharge had been the commonest ear problem presenting to the Ent department, over recent years. Identification of the etiological organisms not only aids in the diagnosis and improves the management of patients, but also assists in advising the patients about the modes of spread, method of prevention and anticipating the possible complications. Also, as certain etiological agents are more common in healthcare settings, the healthcare institutions can be directed regarding appropriate hygiene and sterility practice when relevant. Therefore in the present study we investigated the etiological agents (bacteria) for patients admitted with ear discharge.

Method

In this present prospective randomized study include a case series of 88 patients with clinical evidence of CSOM attending the Outpatient Department of ENT section of AL-Hussein teaching hospital Al- samawa city from July 2018 to December 2018 were studied. Patients suffering from ear discharge . Sterile swabs were used to collect pus samples. All care was taken to avoid surface contamination and the swabs were transported to microbiology section of Al-Hussein Teaching hospital. The swab was plated on 5% sheep blood agar (BA), Macconkey agar and chocolate agar (CA). The plates were incubated at 37°C for 48 h. The antimicrobial susceptibility was carried out using modified Kirby-Bauer disc diffusion technique using Mueller Hinton (MH) age.

Results

During the 5 month study period there had been 88 patients admitted for ear discharge to the ENT department for whom specimens had been sent for bacteriology and culture. Found females (52.90%) were more commonly affected than males (47.10%) and the sex ratio female: male was 1.2:1 (see figure1). The mean age was 55 years (age range from 40 to 70 years).The bacteria isolates from patients of CSOM is shown in (Table 1). *Pseudomonas aeruginosa* was the most common isolate followed by *Staphylococcus aureus*, *Proteus.sp*, *Ecoli* and *Klebsiella.sp*.

Table 1: Bacteria isolated from patient of CS

Isolated Bacteria	Number of Patient	%
<i>Pseudomonas Aeruginosa</i>	29	32.95%
<i>Staphylococcus Aurous</i>	27	30.86%
<i>Proteus sp</i>	14	15.9%

Isolated Bacteria	Number of Patient	%
<i>E.coli</i>	7	7.95%
<i>Streptococcus Pyogens</i>	4	4.54%
<i>Klebsiella sp</i>	2	2.27%
<i>Enterococcus sp</i>	3	3.27%
<i>Acinococcus sp</i>	2	2.27%

Table 2: Antibiotic sensitivity pattern of *Pseudomonas aeruginosa*

Antimicrobial Agent	% of Sensitive Strain
1. Amikacin	85%
2. Imipenem	70%
3. Piperacillin	51%
4. Ceftazidime	47%
5. Levofloxacin	43%
6. Piperacillin + Tazobactam	39%
7. Tabromycin	32%
8. Ciprofloxacin	27%

Table 3: Antibiotic sensitivity pattern of *Staphylococcus aureus*

Antimicrobial Agent	% of Sensitivity
1. Amikacin	90%
2. Gentamicin	30%
3. Ampicillin	75%
4. Ciprofloxacin	65%
5. Cefalexin	54%
6. Cefotaxime	47%
7. Cefoxitin	30%
8. Vancomycin	29%

Table 4: Antibiotic sensitivity of *proteus sp*

Antimicrobial Agent	% of Sensitivity
1. Amkacine	93%
2. Ciprofloxacin	86%
3. Imipenem	69%
4. Pipracillin	54%
5. Ceftriaxone	43%
6 . Levofloxacin	38%
7. Pipracillin + Tazobactam	32%

Table 5:Antibiotic sensitivity of *E.coli*

Antimicrobial Agent	% of Sensitivity
1. Amikacine	92%
2. Ciprofloxacin	63%
3. Imipenem	93%
4. Pipracillin	58%
5. Ceftriaxone	32%
6. Levofloxacin	53%
7. Pipracillin +Tazobactam	65%

Table 6: Antibiotic sensitivity of klebsiella

Antimicrobial Agent	% of Sensitivity
1. Amikacine	73%
2. Ciprofloxacin	52%
3. Imipenem	91%
4. Pipracillin	48%
5. Ceftriaxone	10%
6. Levofloxacin	40%
7. Pipracillin+Tazobactam	63%

Discussion

CSOM is a major health burden in developing countries. Malnutrition, overcrowding, loss substandard hygiene, frequent upper respiratory tract infections are the risk factors for developing CSOM⁶ due to lack of awareness and inaccessibility to health care. URTI, LRTI, Poor hygiene, introduction of foreign body in Ear, smoking and misuse of antibiotics were found to be the major risk factors for Otitis Media according to a study³ same was reported by Kumar et al⁴ in a study from India patients in our environment tend to live with the disease and tolerate its discomfort with result consequences⁷. CSOM is an important cause of preventable hearing loss. According to the WHO survey, the global burden of illness from CSOM involves (65–330 million) individuals with draining ears, 60% of whom (39–200 million) suffer from significant hearing impairment¹. In our study *Pseudomonas aeruginosa* (32.95%) was the most common isolate followed by *Staphylococcus aureus* (30.86%), *Proteus sp* (15.9%), *E coli* (7.95%), and *Klebsiella sp* (2.27%) the same some authors reported *pseudomonas aeruginosa* is commonest bacteria isolated from CSOM this parallel to other authors^{5,8,9}. Slight predominance of females (52.90%) over males (47.10%) was seen in our study but that finding might be incidental due to random selection of cases. This was parallel with the findings of few other authors⁹ and contrast to^{10,11}. Old age were found to be most affected group predominantly of age group (60-70) year followed by (50-58) year. This finding was contrast to the finding reported by few other research^{9,10}. In our study al-amekacine most common antibiotic affected on microorganism this finding parallel to other author in Australian.

Conclusion

In conclusion, knowledge of the responsible local pathogens in CSOM is essential for the proper

management of the disease to prevent the complications associated with its persistent and emergence of resistant bacterial strain in csom.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

1. Disease, deafness, deaths and DALYs Chronic Supportive Otitis Media—Burden of Illness and Management Options; pp. 9–23. (Accessed August 29, 2012, at <http://www.who>).
2. Peter S Morris and Amanda J Leach 8 min read Aust Prescr 2009;32:155-91 Dec 2009 DOI: 10.18773/austprescr.2009.077
3. Ghonaim, M., EL-Edel, R., Bassiony, L., ALZahrani, S. Otitis Media in Children: Risk Factors & Causative Organisms. *Ibnosina Journal of Medicine and Biomedical Sciences, North America*, 3, sep. 2011. <http://journals.sfu.ca/ijmbs/index.php/ijmbs/article/view/199/377>.
4. Kumar S, Sharma R, Saxena A, Pandey A, Gautam P, Taneja V. Bacterial flora of infected unsafe CSOM. *Indian J Otol* 2012;18:208-11
5. Prakash M, Lakhshmi K, Anuradha S, Swathi G. Bacteriological Profile And Their Antibiotic Susceptibility Pattern Of Cases Of Chronic supportive Otitis Media. *Asian J Pharm Clin Res*, Vol 6, Suppl 3, 2013, 210-2127. Taylor PS, Faeth I, Marks MK, Del MC, Skull SA, Pezzullo ML, et al. Cost of treating Otitis media in Australia. *Expert Rev Pharmacoecon Outcomes Res* 2009; 9: 133-141.
6. Simoes EA, Kioo F, Carosone-Link P, SN, Ayugi J, Macharia IM. Otitis media and its sequelae in Kenyan school children. *Journal of the Pediatric Infectious Diseases Society*. 2016; 5:375-384
7. Osazuwa F, Osazuwa E, Osime C, Igharo EA, Imade PE, Lofor P, Etiologic agents of otitis media in Benin city, Nigeria. *N Am J Med Sci*. 2011; 3:95-8.
8. Srivastava A, Singh RK, Varshney S, Gupta P, Bist SS, Bhagat S, Microbiological evaluation of an active tubotympanic type of chronic suppurative otitis media, *Nepalese J ENT Head Neck Surg*. 2010;1:14–6. Nikakhlagh S, Khosravi

9. Mansoor T, Musani MA, Khalid G, Kamal M. *Pseudomonas aeruginosa* in chronic suppurative otitis media: Sensitivity spectrum against various antibiotics in Karachi. *J Ayub Med Coll Abbott abad.*2009;21:120–3. [PubMed]
10. Prakash R, Juyal D, Negi V, et al. Microbiology of Chronic Suppurative Otitis Media in a Tertiary Care Setup of Utt arakhand State, India. *North American Journal of Medical Sciences.* 2013;5(4):282-287. doi:10.4103/1947-2714.110436
11. Kumar R, P Srivastava, M Sharma, S Rishi, P S Nirwan, K Hemwani and SS Dahiya. Isolation And Antimicrobial Sensitivity Profile Of Bacterial Agents In Chronic Suppurative Otitis Media Patients At NIMS Hospital, Jaipur. *IJPBS.* Vol 3 Issue 4 |OCT-DEC|2013

To Assess Awareness and Perspectives of Female Foeticide among School Children

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Abstract

Background: One of the most heinous ways of discrimination against women in a society is through female foeticide. The present study was conducted to assess knowledge and awareness regarding female foeticide among school children.

Materials and Method: The present study was conducted on 580 school children of both genders. A self questionnaire was administered and all participants were asked to reply to assess knowledge and perceptions regarding female foeticide.

Results: Out of 580 subjects, male were 320 and female were 260. 68% had correct knowledge regarding sex ratio, 65% had correct knowledge regarding district sex position, 67% had correct knowledge regarding state sex position and 74% had correct knowledge regarding foeticide definition. The difference was significant ($P < 0.05$). 76% replied correct that pre natal gender detection is crime, 72% replied that female foeticide should stop, 65% replied that female foeticide practice will harm society and 86% replied that pre natal gender detection is severely punishable act. The difference was significant ($P < 0.05$).

Conclusion: Authors found students had sufficient knowledge and awareness about female foeticide.

Keywords: *Abortion, foeticide, Awareness, perspectives, sex selection.*

Introduction

Female foeticide is perhaps one of the worst forms of violence against women where a woman is denied her most basic and fundamental right i.e. “the right to life”.¹ Sex selective abortions cases have become a significant social phenomenon in several parts of India.² It transcends all castes, class and communities and even the North South dichotomy. The girl children become target of attack even before they are born. The girls have not vanished overnight.³

A deleterious fall-out of the subjugated position of women is their vulnerability to violence like domestic violence, rape, sexual abuse, dowry harassment, trafficking etc, with little or no mechanisms for combating the same, either by way of effective laws and implementation or civil society action.⁴ One of the most heinous ways of discrimination against women in a society is through female foeticide. To discriminate against women when she enters what is often referred to as a man’s world is one thing, to not even let her be born to face that world, is quite another.

About 5.7 lakh females go missing every year due to practice of female foeticide.⁵ Many laws have been implemented to bring a hold on female foeticide. Some of them are MTP Act 1991, PNDT 1994 (Regulation and prevention of Misuse) Act, PCPNDT (Prohibition of sex selection) Act 2003. Despite such efforts, numerous

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clinical ultrasounds and abortions still continue to happen. In a diverse country like ours about 19.6% of the population is adolescents. The now adolescents are going to be responsible adults of tomorrow. Hence it is necessary that every adolescent must be equipped with ample amount of knowledge which can help them to bring a change in society.⁶ The present study was conducted to assess knowledge and awareness regarding female foeticide among school children.

Materials and Method

The present study comprised of 580 school children of both genders. All were informed regarding the study and written consent was obtained. Ethical Clearance was obtained prior to the study.

Data such as name, age, gender etc. was obtained. A self questionnaire was administered and all participants were asked to reply to assess knowledge and awareness regarding female foeticide. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of subjects

Total-580		
Gender	Male	Female
Number	320	260

Table I shows that out of 580 subjects, male were 320 and female were 260.

Table II: Assessment of knowledge regarding female foeticide

Knowledge	Correct	Incorrect	P value
Sex Ratio	68%	32%	0.02
District Position	65%	35%	0.03
State Position	67%	33%	0.04
Foeticide Definition	74%	26%	0.01

Table II shows that 68% had correct knowledge regarding sex ratio, 65% had correct knowledge regarding district sex position, 67% had correct

knowledge regarding state sex position and 74% had correct knowledge regarding foeticide definition. The difference was significant ($P < 0.05$).

Table III: Awareness regarding female foeticide

Awareness	Yes	No	P value
Pre natal gender detection is crime	76%	24%	0.02
Female foeticide should stop	72%	28%	0.03
Female foeticide practice will harm society	65%	35%	0.05
Pre natal gender detection is severely punishable act	86%	14%	0.01

Table III shows that 76% replied correct that pre natal gender detection is crime, 72% replied that female foeticide should stop, 65% replied that female foeticide practice will harm society and 86% replied that pre natal gender detection is severely punishable act. The difference was significant ($P < 0.05$).

Discussion

The social, cultural and religious fiber of India is pre-dominantly patriarchal contributing extensively to

the secondary status to women.⁷ The patrilineal social structure based on the foundation that the family life runs through a male, makes men a precious “commodity” that needs to be protected and given a special status.⁸ Another important pillar of the patriarchal structure is marriage wherein women are given a subordinate status, having no say in the running of their lives or any control over their bodies or bodily integrity.⁹ The dowry or groom price is so staggeringly high irrespective of the class structure that generations may have to toil to

repay the debts incurred during marriage. All of this has contributed to a secondary status for women in society, to such an extent that even the birth of a girl child in a family is sought to be avoided.¹⁰ The present study was conducted to assess knowledge and awareness regarding female foeticide among school children.

In this study, out of 580 subjects, male were 320 and female were 260. We found that 68% had correct knowledge regarding sex ratio, 65% had correct knowledge regarding district sex position, 67% had correct knowledge regarding state sex position and 74% had correct knowledge regarding foeticide definition.

Koradia et al¹¹ conducted a cross-sectional study among 200 school students with a pre-tested, semi structured questionnaire in order to assess the awareness & perception regarding female foeticide among adolescents. Majority (52.5%) of the study subjects were males. Majority (70%) of the subjects could define foeticide. Boys have better knowledge than girls regarding current sex ratio (21%), state position (20%) and district position (33.3%). The most common reasons for not preferring girl child were not carrying family name and burden to the family. Major source of information was social media.

We found that 76% replied correct that pre natal gender detection is crime, 72% replied that female foeticide should stop, 65% replied that female foeticide practice will harm society and 86% replied that pre natal gender detection is severely punishable act. Kansal et al¹² investigation was taken up to study the impact of educational programme on level of awareness regarding female foeticide and infanticide of adolescent boys and girls studying in 11th std. A sample of 120 adolescents (60 boys+60 girls) belonging to middle and high SES were taken. The finding of the study revealed no gender and SES difference was observed differences in the existing level of awareness regarding female foeticide and infanticide. A significant impact of educational programme was found in the level of awareness regarding female foeticide and infanticide among adolescent boys and girls belonging to high and middle SES as a highly significant difference was observed in the pre-test and post-test scores of adolescents.

Conclusion

Authors found students had sufficient knowledge and awareness about female foeticide.

Conflicts of Interest: The author declare that there is no conflict of interest regarding the publication of this paper.

Source of Funding: Self

Ethical Clearance: Ethical Clearance has been taken from Institutional Ethical Committee

References

1. Murarkar SK, Ghate MM, Joshi AM, Panchnadikar TM, Vaidya VM, Bogam RR. A study of knowledge and attitude of adolescent girls in rural area regarding prenatal sex determination and female foeticide. *Indian J Matern Child Health.* 2013;15(4):1-7.
2. Manhas S, Banoo J. A study of beliefs and perceptions related to female foeticide among muslim community in Jammu, Jammu and Kashmir, India. *Stud Home Com Sci.* 2013;7(2):125-30.
3. Singh R, Verma R, Dixit P, Saini M, Singh A, Chawla S, et al. Awareness about female foeticide among adolescents in rural areas of Haryana: a school based cross-sectional study. *Int J Basic App Med Sci.* 2015;5(2):71-7.
4. Shalini S, Kariwal P, Kapilarami MC. A community based study on awareness and perception on gender discrimination and sex preference among married women in a rural population of district bareilly, Uttar Pradesh. *Natl J Community Med.* 2011;2(2):273-6.
5. Kishore Yadav J, Ganapa P, Fernandes JP, Sreeharshika D, Ramesh S. Awareness and perception regarding female foeticide among adolescents in rural community of Nalgonda district, Telangana. *Int J Community Med Public Health* 2018;5:3106-10.
6. Ramesh A, Bhagwan D, Holla R, Unnikrishnan B, Thapar R, Mithra P, et al. Knowledge and Perception towards Female Foeticide among Adolescents of Coastal South India. *Ntl J Comm Med.* 2016;7(9):736-40.
7. Chaudhary A, Satija M, Sharma S, Singh G.P.I, Soni R.K., Sachar R.K. Awareness and Perceptions of school children in urban Ludhiana. *Natl J Community Med.* 2010;35(2):302-4.
8. Avachat S, Raut P, Zambare M, Gund D, Pundkar R. Perspectives of medical interns regarding female

- feticide and declining sex ratio in India. *North Am J Med Sci.* 2013;5(8):469-72.
9. Devi SK. A study to assess the level of perception and awareness regarding female foeticide among the college students with a view to develop an awareness programme in a selected college of BBSR, Odisha. *Int J Adv Nur Management.* 2015;3(4):309-14.
 10. Choudhary M. Perception regarding female feticide among females attending outpatient departments of selected hospital of Ludhiana city. *Nitte Univ J Health Sci.* 2014;4(4):42-5.
 11. Koradia K, Sharma M, Narang D, Yadav V. Female foeticide and infanticide: an educational Programme for adolescents of Jaipur city. *Int J Soc Sci Interdiscipl Res.* 2013;2(5):55-68.
 12. Kansal R, Maroof KA, Bansal R, Parashar P. A hospital-based study on knowledge, attitude and practice of pregnant women on gender preference, prenatal sex determination and female feticide. *Indian J Public Health.* 2010;54(4):209-12.

Knowledge and Protective Health Behaviors Concerning Risk Factors for Coronary Heart Disease among Baghdad University Students

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Abstract

Background: Coronary heart disease, a gradual buildup of fatty deposits in the coronary arteries, occurs as a result of several risk factors with 75% attributable to lifestyle choices.

Objectives: To evaluate knowledge and behaviour of Baghdad University students concerning coronary heart disease and to identify the relationship between demographic characteristic data with student's knowledge and health behavior.

Methodology: A cross-sectional design study utilizing a stratified random sampling method. Students of all colleges of Baghdad University (BU) in Baghdad City were included. The respondents were randomly selected from each college. The sample size was 200. Knowledge, health behaviour questionnaire was developed and distributed to the respondents involved. The data collected was analyzed using SPSS version 20.0.

Results: The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class. The majority of students (76.5%) were single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

Conclusions: findings of study shows that, undergraduate students have poor knowledge regarding risk factors for coronary heart diseases, as well as results demonstrate overall students have good behaviour toward preventive measurement about risk factors of CHD.

Keywords: Knowledge, Health behavior, Students, Risk Factors, Coronary Heart Disease.

Introduction

Coronary heart disease (CHD) is a major public

health problem worldwide. The coronary atherosclerosis is the major cause of coronary artery disease. However non atherosclerotic types of coronary heart disease are also reported. The clinical presentation of coronary artery disease includes angina pectoris, myocardial infarction, and chronic coronary heart disease⁽¹⁾. According to the World Health Organization (WHO), there were 7.4 million deaths due to ischemic heart disease in 2012, with high-income countries and upper-middle-income countries accounting for 158 and 107 deaths per million, respectively^(2,3). Multiple risk factors are involved in

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the development and progression of CAD. In general, risk factors of CVD and CAD can be divided into two groups. The first group is non-adjusted risk factors such as age, sex, race, and family history. The second group is adjustable risk factors such as hypertension, diabetes mellitus (DM), dyslipidaemia, overweight, and smoking^(4,5).

Methodology and Materials

A cross-sectional descriptive and analytical study to assess the knowledge and health behaviour regarding coronary heart disease among students of Baghdad University. This study was conducted at Bagdad University between December 15th 2016 up to the end of 10th march 2018. A tool of knowledge, health behaviour questionnaire was developed and distributed to the participants in this study. The questionnaire was validated by conducting the pre-testing among 20 students in a pilot study. The content validity of the questionnaire was verified by expert of faculty of nursing. The questionnaires were distributed to the

selected undergraduate students of all the four colleges in Baghdad University. The stratified random sampling method was utilized in selecting the participants. The inclusion criteria for the participants were age of 18 years old and above of both genders, male and female, which include Year 1 to Year 4 from each faculty. The sample size calculated was 200, inclusive of the 10% non-response rate. Proportional allocation from all grade levels (1 to 5 in all colleges).

Results

The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class. High percentage of the students was single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

Table (1): The Mean of Score of Students Knowledge Concerning Risk Factors for Coronary Heart Disease.

No	Items	True		False		MS	SD	A.D
		No	(%)	No	(%)			
1	Smoking	198	99.0	2	1.0	.99	.100	Pass
2	Alcohol	113	56.5	87	43.5	.56	.497	Good
3	High blood pressure is a risk factor	146	73.0	54	27.0	.73	.445	Good
4	High cholesterol	133	66.5	67	33.5	.66	.473	Good
5	Individuals who suffer DM are at more risk for CHD	114	57.0	86	43.0	.57	.496	Good
6	Being overweight increases a person's risk for CHD	91	45.5	109	54.5	.46	.499	Poor
7	BMI of more than 30 is considered as obese	107	53.5	93	46.5	.54	.500	Good
8	Diabetes is a risk factor for developing CHD	87	43.5	113	56.5	.44	.497	Poor
9	High blood sugar puts a strain on the heart disease	86	43.0	114	57.0	.43	.496	Poor
10	People with diabetes have high cholesterol	74	37.0	126	63.0	.37	.484	Poor
11	People with DM tend to have low HDL (good) cholesterol	87	43.5	113	56.5	.44	.497	Poor
12	Unhealthy diets	100	50.0	100	50.0	.50	.501	Good
13	High level of density lipoprotein	93	46.5	107	53.5	.46	.500	Poor
14	Physical inactivity	48	24.0	152	76.0	.24	.428	Poor
15	Stress	71	35.5	129	64.5	.36	.480	Poor
16	Men and women experience many of same symptoms of a heart attack	80	40.0	120	60.0	.40	.491	Poor
17	Walking is type of exercise to be a preventive of CHD	86	43.0	114	57.0	.43	.496	Poor
18	Daily exercise can prevent CHD	108	54.0	92	46.0	.54	.500	Good
19	Eating fruits or vegetable	104	52.0	96	48.0	.52	.501	Good

No	Items	True		False		MS	SD	A.D
		No	(%)	No	(%)			
20	Avoid drinking alcohol	137	68.5	63	31.5	.68	.466	Good
21	Tobacco cessation	103	51.5	97	48.5	.52	.501	Good
22	Prayer	91	45.5	109	54.5	.46	.499	Poor
23	Prime wherefores of heart attacks is stress s	99	49.5	101	50.5	.50	.501	Good
24	Most cholesterol in eggs found in yellow part	53	26.5	147	73.5	.26	.442	Poor
25	Polyunsaturated fats are healthier for the heart than the saturated fats	59	29.5	141	70.5	.30	.457	Poor
26	Eating a lot of red meat increases heart disease risk	62	31.0	138	69.0	.31	.464	Poor
27	Taking an aspirin each day decreases the risk of getting heart disease	52	26.0	148	74.0	.26	.440	Poor
28	Dietary fiber lowers blood cholesterol	62	31.0	138	69.0	.31	.464	Poor
29	Most cholesterol in eggs found in yellow part	15	7.5	185	92.5	.08	.264	Poor
30	HDL refers to „good“ cholesterol, and LDL refers to „bad“ cholesterol	36	18.0	164	82.0	.18	.385	Poor
	Total	2695		3305		0.45		

(A.D.): Assessment Degree, M.s=mean of score [(0 - .49) = fail (F); (0.5 -1) = Pass(P)]

Table (2): The Mean of Score of Health Behaviour Prevention Concerning Risk Factors for Coronary Heart Disease.

No	Items	Strong agree		Agree		Disagree		MS	A.D
		No	(%)	No	(%)	No	(%)		
1.	Doing exercise to maintain a healthy lifestyle	139	69.5	59	29.5	2	1.0	2.68	G
2.	Smoking is bad for health.	127	63.5	65	32.5	8	4.0	2.60	G
3	Maintain my weight according to my body mass index	136	68.0	60	30.0	4	2.0	2.66	G
4	Take less oily food	128	64.0	65	32.5	7	3.5	2.60	G
5	Taking a healthy diet	97	48.5	91	45.5	12	6.0	2.42	G
6	Exercising for 30 minutes most days	110	55.0	72	36.0	18	9.0	2.46	G
7	Control on blood pressure	110	55.0	72	36.0	18	9.0	2.49	G
8	Avoid eating fast food	93	46.5	97	48.5	10	5.0	2.42	G
9	Avoid stress	35	17.5	107	53.5	58	29.0	1.88	A
10	Avoid drinking carbonated drinks	53	26.5	98	49.0	49	24.5	2.02	A
11	Take fruit or vegetable in diet	88	44.0	93	46.5	19	9.5	2.34	G
12	Heart disease is severe	66	33.0	88	44.0	46	23.0	2.10	A
13	Choose a diet low in fat	106	53.0	65	32.5	29	14.5	2.38	G
14	Limits use of sugars	86	43.0	94	47.0	20	10.0	2.33	A
15	Get enough sleep	128	64.0	67	33.5	5	2.5	2.62	G
16	Take relaxation each day	120	60.0	67	33.5	13	6.5	2.54	G
17	Specific method to control stress.	123	61.5	59	29.5	18	9.0	2.52	G
18	Perform physical activity	133	66.5	62	31.0	5	2.5	2.64	G
19	prevent heart attacks my exercising	122	61.0	63	31.5	15	7.5	2.54	G
20	Exercise decreases stress.	113	56.5	72	36.0	15	7.5	2.49	G
	Total	2113		1516		371		2.44	G

(A.D.): Assessment Degree, M.s=mean of score [(1 - 1.66) = poor (p); (1.67 - 2.33)= Acceptance(F); [(2.34 - 3) = Good (G)]

Table (3): Association Between Students Knowledge & Demographic Characteristic

Demographic Variables		Sum of Squares	df*	Mean Square	F	Sig.
Age Groups	Between Groups	.152	1	.152	.179	.673
	Within Groups	168.003	198	.849		
	Total	168.155	199			
Gender	Between Groups	.074	1	.074	.295	.588
	Within Groups	49.606	198	.251		
	Total	49.680	199			
Academic Year	Between Groups	1.704	1	1.704	1.183	.278
	Within Groups	285.171	198	1.440		
	Total	286.875	199			
Marital Status	Between Groups	.000	1	.000	.000	.993
	Within Groups	35.955	198	.182		
	Total	35.955	199			
	Within Groups					
Total						

Sum of squares, Degree of freedom, Mean squares, Significant *: $P \leq 0.05$

Table (4): Association Between Health Behaviour Prevention Score & Demographic Characteristic).

Demographic Variables		Sum of Squares	df*	Mean Square	F	Sig.
Age groups	Between Groups	1.546	2	.773	.914	.403
	Within Groups	166.609	197	.846		
	Total	168.155	199			
Gender	Between Groups	.445	2	.222	.890	.412
	Within Groups	49.235	197	.250		
	Total	49.680	199			
Academic year	Between Groups	3.852	2	1.926	1.341	.264
	Within Groups	283.023	197	1.437		
	Total	286.875	199			
Marital status	Between Groups	.047	2	.023	.128	.880
	Within Groups	35.908	197	.182		
	Total	35.955	199			

Sum of squares, Degree of freedom, Mean squares, Significant *: $P \leq 0.05$

Discussion

Throughout the course of the data analysis of the current study indicated that students' knowledge concerning risk factors for coronary heart diseases. Thirteen questions to evaluate general knowledge related to risk factors of CHD. Only (45%) of the study sample answered correctly and (55%) responded incorrect "do not know". Knowledge questions were split to dietary pattern, medical and risk factors. Knowledge related to risk factors for CHD was answer correctly (Know) by (99%) majority of participation answer smoking main causes for CHD, most of them stated 56.5% alcohol

main risk factors for CHD, most of them reported (73%) hypertension risk factors for CHD, (66.5%) answer hypercholesterolemia one of causes CHD, and most of them told (57%) diabetes mellitus all of them answer these main risk factors for cardio vascular disease, most of students(45.5%) told being overweight increase person risk for CHD,(43%) of them stated that high blood sugar puts strain on the heart disease, only (37%) of students answer correctly that individual with DM have high cholesterol.

The finding of the study agree with result obtained from other study who reported respondents' knowledge

regarding the CHD risk factors who reported twenty five percent students graded smoking as the top most risk factor for CAD followed by hypertension high cholesterol, age, Family history, and high cholesterol diet. Correct identification of risk factors in the form of positive responses was highest for cholesterol levels (91%)⁽⁶⁾.

Students' knowledge regarding risk factors for CHD. The most of the participants answered the danger factors questions items know like ambulation is type of exercise to be a preventive of CHD (43%), taken up fruits or vegetable is able to prevent from CHD (52%), avoid drinking alcohol reduced the risk of getting heart disease (68.5%), tobacco cessation prevent the risk of getting heart disease (51.5%) and body mass index of more than (30) is considered as obese (53.5). From all the risk factor questions, knowledge concerning physical inactivity (24%), stress (35.5%), both gender experience same symptoms of heart attacks world (40).

This findings is same line with result obtain from other study the researcher reported that the majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity blood pressure control and smoking cessation .However, fewer participants demonstrated correct knowledge of other CHD risk factors, including diabetes, stress .Fewer subjects were aware of (HDL) and (LDL) as risk factors ^(7,8).

Health behaviour prevention about risk factors coronary heart disease. Twenty questions exploring students health behaviour concerning of CHD.

This result of study are good agreements with other studies done by other researchers whose reported that the item with the highest proportion of positive health behavior was "smoking is bad for health" (93.7%,) (149), "exercise to maintain a healthy lifestyle" (87.4%,) (139), I maintain my weight according to my body mass index (BMI(74.8%,)(119),take less oily food for healthy lifestyle (74.8),(119),I believe walking a lot can give benefits to my health (72.3), (115) and I should take fruit or vegetable in my diet for maintaining my health (77.4),(123) ^(9,10) .

Association between student's knowledge score and the demographic characteristics (age, gender, academic year and marital status. The association between sociodemographic and students' knowledge score was explored. There are no significant relationship between gender

and students knowledge (Chi-square = .526a), age (Chi-square = 2.118a) academic year (Chi-square = 3.507a) and marital status (Chi-square = .900a).

This result agrees with that of the other researcher who reported,The responses provided by the third year student nurses straight from school education and those mature students were found to be non-significant in relation to the two age categories ($p>0.05$). The HB however, was shown to differ significantly between males and females ($p=0.04$), demonstrates the mean scores attained for both CHD knowledge and health behavior byboth gender^(11,12).

The association between sociodemographic and Students attitudes Score was explored. There are no significant relationship between (age, gender, academic, marital status) and students' behaviour scores.

This finding Agree with results obtained from the study done by other researcher who reported. The present study identifies that there was no significant relationship between total CHD knowledge and HB of the third year student nurses ⁽¹³⁾.

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Conflict of Interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

Conclusions

This study demonstrate that, despite poor students knowledge regarding risk factors for CHD, as well as study indicated overall students have fair health behavior toward preventive measurement about risk factors of CHD. We recommend to health education programs about risk factors of coronary heart disease; seek to improve understand the trouble of heart disease and work cooperatively to reduce them. Should be transmitted through the mediums of radio and television, posters, pamphlets, social media like Facebook and Twitter to be beneficial to accessing to younger people.

References

1. Nusrata Z, and Rabia FA, Survey of Female

- Undergraduate Medical students of an Arab Community, Regarding Coronary Heart Diseases and Its OF Association to Eating and Physical inactivity. *ISRA Medical Journal* 2015;7(2):110-108.
2. World Health Organization. Cardiovascular diseases (CVDs). From: www.who.int/mediacentre/fact sheets/fs317/en/ Accessed: Nov 2015.
 3. World Health Organization. The top 10 causes of death: The 10 leading causes of death by country income group (2012). From: www.who.int/mediacentre/factsheets/fs310/en/index1.html Accessed: Nov 2015.
 4. Abdollahi AA., Hosseini SA, Salehi A, Vaghari GH and Behnam Pour N, The risk factors of coronary disorders in the elderly. *J Res Dev Nurs Midwifery* 2013; 11(2): 18-25.
 5. Canto JG, Kiefe CI, Rogers WJ, Peterson, ED, Frederick PD, French WJ, et al.; Number of coronary heart disease risk factors and mortality in patients with first myocardial infarction. *JAMA* 2011; 306(19): 2120-7.
 6. Aysha A, Aamir H, Fateh ATS, Knowledge of Coronary Artery Disease risk factors and Coronary Intervention among University Students, *J Pak Med Assoc.* 2008; 58(10): 556-553.
 7. Ali A A, Ayman T, Chandrani, I., Joy K. K., Joshua M., Shreedevi, B.; Knowledge of Coronary Heart Disease Risk Factors among a Community Sample in Oman. *Clinical and Basic Research*, 2016;16(2):196-190.
 8. Abdelmoneim A, hala N, Public knowledge of cardiovascular disease and its risk factors in Kuwait: a cross-sectional survey. *BMC Public Health*,2014(14):11-1.
 9. Yuba RA, study of assessing knowledge and health beliefs about cardiovascular disease among selected undergraduate university students using Health Belief Mode, A Dissertation, Health Education In the Graduate School Southern Illinois University, Carbondale October 2012:174-1.
 10. Mardhiah M1, Nor AA,, Nor IAR, Mainul, H.; Knowledge, Attitude and Practice of Malaysian Public University Students on Risk Factors for Cardiovascular Diseases, *Journal of Applied Pharmaceutical Science* 2016: 6 (2): 63-56.
 11. Rosemary M, Coronary Heart Disease Knowledge and Health Behaviour in Student Nurses. A Dissertation, Master's degree in Cardiovascular Rehabilitation by the University of Chester,2010;152-1.
 12. Winham DM, Jones KM, Knowledge of young African American adults about heart disease: a cross-sectional survey. *BMC Public Health*, 2011(11): 248.
 13. MacInnes JD, The illness perceptions of women following acute myocardial infarction: implications for behaviour change and attendance at Cardiac Rehabilitation. *Women & Health* 2005;42(4): 105-121.

A Descriptive Correlational Survey to Assess the Knowledge Related to Prevention of Nosocomial Infections and Selected Practices among Staff Nurses in a Selected Hospital of New Delhi

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Abstract

A Descriptive Correlational Survey to assess the knowledge related to prevention of Nosocomial Infections and selected practices among staff nurses in selected nursing care units of a selected Hospital of New Delhi. The objectives of the study were to assess knowledge and selected practices of staff nurses regarding prevention of nosocomial infections, to seek relationship between knowledge and hand washing practice, to seek relationship between knowledge and IV injection practice and to seek association between knowledge, hand washing practice and IV injection practice with their demographic variables. 60 staff nurses were selected by using convenient sampling. A knowledge questionnaire and two observational checklists were developed to determine the knowledge and selected practices related to hand washing and IV injection procedure. Knowledge questionnaire consisted of 30 items and two observational checklists for hand washing procedure consisted of 12 items and IV injection procedure consisted of 21 items. After obtaining permission from Administrative and Ethical committee, the data collection was done in the month of Dec.-Jan. The findings of the study revealed that mean percentage of knowledge seen (62.73%), mean percentage of hand washing practice seen (61.42%) and mean percentage of IV injection practice seen (53.19%). Karl Pearson correlation was used to check the relationship between knowledge and selected practices showed there was no significance between knowledge and practice scores. Statistical significance were only found between knowledge scores with variable like no. of times attended in service education but there was no significance found with other variables. Also, there was statistical significance found between hand washing practice and IV injection practice with variable like current area of posting but there was no association found with other variables. Based on the findings, recommendations proposed for future research.

Keywords: Knowledge, selected practices and staff nurses.

Introduction

The word “health” refers to a state of complete emotional and physical well-being. It refers not only to the absence of disease but the ability to recover from illness. Health services can be described as permanent

country wide system of established institutions, objective of which is to cope with the various health needs and demands of the population, and thereby provide health care to individuals and the community, including a broad spectrum of preventive, promotive, curative and rehabilitative activities, and utilizing, to a large extent. Patients in health care settings, especially Hospitals and long term care facilities, are at a higher risk for infection than those patients seen at home¹.

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Health care-associated infection (HAI), also referred to as “Nosocomial” or “Hospital” infection, is an infection occurring in a patient while receiving care

in a Hospital or other health care facility which was not present or incubating at the time of admission². It results due to the exposure of microorganism in the Hospital settings. These infections typically occur within 72 hours of hospitalization by the micro-organisms by the patients or originates from the animate or inanimate environment of the Hospital itself³.

Several factors that may cause HCAI are prolonged and inappropriate use of invasive devices and antibiotics, High-risk and sophisticated procedures, insufficient application of standard and isolation precautions, inadequate environmental hygienic conditions of Hospitals, inappropriate bio-medical waste management about HCAI, overcrowding, poor knowledge and lack of application of basic infection control measures, lack of knowledge regarding injection and blood transfusion procedures, absence of local and National guidelines and policies regarding HCAI and malpracticing aseptic procedures⁴.

Health care workers play an important role in preventing health care associated infections, as patient advocates, Health care worker has many tools to create a safe environment for patients. Standard universal precaution is one of the aspect of safe environment which is being provided for patients⁵.

Hospitals in India have a high burden of infections in their intensive care units (ICU) and general wards, many of which are resistant to antibiotic treatment⁶.

According to **WHO (2016)**, Patient Safety is actively working towards establishing effective ways of improving global health care and save lives lost to health care associated infections.

“Clean Care is Safer Care” programme initiated by WHO aiming reducing health care-associated infections globally and has placed improving hand hygiene practices at the core of achieving this⁴.

Nurses in all roles and settings can demonstrate leadership in infection prevention and control by using their knowledge, skill and judgement to initiate appropriate and immediate infection control procedures. There is a need to practice diligently so that patients will be safe⁷.

According to some studies, there is lack of hand hygiene practices in the Hospitals and also there is presence of knowledge regarding hand hygiene or

universal precautions but there is reluctance to adhere with it or sometimes they don't feel the need to maintain standard precautions of many reasons as they should engage in interventions on proper sanitation and hygiene procedures such as hand washing, disposing of medical waste products like used syringes, and cleaning up of patients environment to prevent deadly bacteria from harboring the patient's environment and cause infection⁸.

Problem Statement: A descriptive correlational survey to assess the knowledge related to prevention of Nosocomial Infections and selected practices among staff nurses in selected nursing care units of a selected Hospital of New Delhi.

Objectives:

- To assess knowledge of staff nurses working in selected nursing care units regarding prevention of nosocomial infections.
- To assess selected practices of staff nurses working in selected nursing care units regarding prevention of nosocomial infections.
- To seek relationship between knowledge and hand washing practice of staff nurses working in selected nursing care units regarding prevention of nosocomial infections.
- To seek relationship between knowledge and IV injection practice of staff nurses working in selected nursing care units regarding prevention of Nosocomial Infections.
- To seek association between knowledge with the demographic variables of staff nurses.
- To seek association between hand washing practice with the demographic variables of staff nurses.
- To seek association between IV injection practice with the demographic variables of staff nurses.

Operational Definition:

- **Knowledge:** It is the information regarding Nosocomial Infection and its preventable measures.
- **Selected Practices:** Actions of staff nurses while performing procedures i.e. hand washing procedure and IV injection procedure.
- **Nursing Care Units:** In this study, it refers to Medical, Surgical and Obstetrical and Gynaecological patient's care units.

Conceptual Framework: Conceptual framework of the present study is based on General System Theory by Ludwig Von Bertalanffy.

The conceptual framework consists of three phases: input, process and output.

Input: Refers to the target group i.e. staff nurses working in nursing care units of selected Hospital, Delhi and their existing demographic variables like age in years, educational qualification, professional experience, current area of posting, attended in service education or not, no. of times in service education attended.

Process: In this present study, process refers to the selection of the study subjects, development of tool, validation of tool, try out, pilot study, assessment of knowledge by using knowledge questionnaire, assessment of practice by using observational checklist, assessment of relationship between knowledge and practice and assessment of association between knowledge and practice with their socio demographic data.

Output: Refers to the evaluation of study in terms of level of knowledge and practice regarding prevention of Nosocomial Infection.

Feedback: In this study, feedback is the assessment of knowledge and practice of staff nurses which is not included in the study.

Methodology

Research Approach: The research approach utilized in the present study was Quantitative approach.

Research Design: The research design adopted for the present study was Descriptive Correlational Survey design.

Setting of the Study: The setting for the study was Holy Family Hospital in New Delhi.

Population: The population was the staff nurses working in selected Hospital of New Delhi.

Sample: Sample in this study were the staff nurses working in Medical, Surgical and Obstetrical and Gynecological units in selected Hospital.

Sampling Technique: Sampling technique used was non probability convenient sampling.

Sample Size: Size of the sample were 60 staff nurses.

Inclusion Criteria:

- Staff nurses working in Medical, Surgical and Obstetrical and Gynaecological units.
- Available during the time of data collection.
- Willing to participate in the study.

Exclusion Criteria:

- Staff nurses working in other units.

Findings:

1. The findings regarding sample characteristics related that
 - Majority 53 out of 60 (88.3%) of subjects were in the age group of 21-30years and 6 (10%) were in the age group of 31-40 years,
 - Majority (56.7%) had General Nursing and Midwifery education, 38.3% staff nurses had B.Sc Nursing education and 5% staff nurses had Post Basic B.Sc nursing education.
 - Majority (70%) were having 1-3 years of professional experience, 21.7% were having 4-6 years, 6.7% were having 7-9 years and 1.7% were having >10 years of experience.
 - Majority (40%) of staff nurses were posted in Medical ward, 28.3% were posted in Surgical ward and 31.7% were posted in Obstetrical and Gynaecological wards.
 - Majority (86.7%) attended Inservice education on the topic Nosocomial Infections.
 - Majority (38.3.3%) of staff nurses had attended Inservice Education for more than thrice, 35% attended once, 23.3% attended twice and 3.3% had attended thrice.
2. **Findings related to knowledge and selected practices scores of the staff nurses working in various nursing care units regarding the prevention of Nosocomial Infections.**
 - Majority of (48.3%) staff nurses were having moderate level of knowledge, 36.67% staff nurses were having good knowledge score and 15% staff nurses were having poor knowledge score.
 - Majority of (95%) staff nurses were having average

hand washing practice score, 3.33% were having good hand washing practice and 1.67% were having poor hand washing practice score.

- Majority of (63.33%) staff nurses were having average IV injection practice score, 36.67% were having poor IV injection practice score and none of them having good IV injection practice score.

3. Findings related to correlation between knowledge and selected practices scores obtained by staff nurses regarding prevention of Nosocomial Infection.

- There was no significance between knowledge, hand washing practice and IV injection practice as evident from the 'r' values of 0.09 and -0.19 respectively less than the table value 0.25.
4. Findings related to association between knowledge scores and selected practices scores with their demographic variables.
- There was significant association between the knowledge and demographic variables i.e. no. of times attended in service education but there was no significant association between the knowledge and demographic variables i.e. Age, Educational qualification, professional experience, current area of posting, attended in service education on this topic.
 - There was significant association between hand washing practice and demographic variable i.e. current area of posting but there was no significant association between hand washing practice and demographic variables i.e. Age in years, educational qualification, professional experience, attended in service education on this topic and no. of times attended in service education on this topic.
 - There was significant association between IV injection practice and demographic variables i.e. current area of posting but there was no significant association between IV injection practice and demographic variables i.e. Age in years, Educational qualification, Professional experience, attended in service education on this topic and no. of times attended in service education on this topic.

Discussion

The present study findings showed that the staff nurses having average knowledge level and average practice scores. These findings were consistent with

the findings of the study conducted by Fashafsheh I, Ayed A, Eqtaif F, Harazneh L⁹, which revealed that majority of the respondents have fair knowledge level and good practice level regarding infection control. The present study findings were consistent with the study conducted by Kalantarzadeh M, Mohammadnejad E, Ehsani SR, Tamizi Z¹⁰, to assess the knowledge and practice of nurses about control and prevention of Nosocomial Infections. The study findings showed that the participants had intermediate and high level of knowledge about infection control and had intermediate level of performance. The present study findings revealed that there was no significance between knowledge and selected practices scores. These findings were consistent with the study conducted by Ghadamgahi F, Zighaimat F, Ebadi A, Houshmand A¹¹, that there was not significant relationship between knowledge and self-efficacy. Also, present study revealed that there is significant association between knowledge and demographic variable i.e. no. of times attended in service education and no association with other demographic variables, There is significant association between hand washing and IV injection practice with demographic variable i.e. current area of posting. Similar findings were shown in study conducted by Biberaj P, Gega M, Bimi Indrit¹², that there was no significant association between course of study and knowledge of students among health care students. Similar study was conducted by Chauhan Krishna, Kumari Kiran¹³, that showed there was not any significant association of level of knowledge with selected demographic variable at 0.05 level of significance.

Conclusion

The gaps in knowledge and practices regarding prevention of nosocomial infection indicated there is a need to establish a related health care policy. Also study showed that there was no significance between knowledge and practice indicated that there is a need to emphasize staff nurses more about prevention of nosocomial infection and motivate them continuously to practice efficiently, as practicing infection control measures remains a major responsibility of the staff nurses working in a Hospital.

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Ethical Clearance: Ethical Clearance was taken from Ethical Committee of Holy Family Hospital of New Delhi.

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References

1. Basavanhappa B.T. Text book of community health nursing. 2nd ed. New Delhi: Jaypee publication; 2008. p. 18-19.
2. Potter, Perry, Styockert and Hall. Basic nursing. 7th ed. New Delhi: Elsevier publication; 2011. p. 648-649
3. Zaryekar R. The trained nurses association of India. Volume 1, Florence Nightingale Lane; Secretary General publication; 2013.
4. Health care without avoidable infections the critical role of infection prevention and control (online). 2016 [cited 2017 Nov 6]; [16 screens]. Available from URL: [file:///D:/documents/research/review%20of%20literature/WHO-HIS-SDS-2016.10-eng\(1\).pdf](file:///D:/documents/research/review%20of%20literature/WHO-HIS-SDS-2016.10-eng(1).pdf)
5. Jangwal L, Jangwal KR. Knowledge of infection control measures among nursing students. *Nightingale Nursing Times* 2016 [cited 2017 Nov 6]; XII(5):32,64.
6. Laxminarayan R. Hospital-acquired infections high in India: Study. *India Medical Times* 2011 Sep 22;3 (col.5).
7. Swaminathan S Hospital infection control guidelines [Online]. [2010];[103]. Available from: URL:<http://www.cdc.gov/ncidod/dhqp/guidelines.html>.
8. Olin J Nursing plays a major role in infection control. [Online]. [2012?] [cited 2012 Mar 5]; Available from: URL:<http://www.rncentral.com/blog/2012/nursing-plays-a-major-role-in-infection-control/>
9. Fashafsheh I, Ayed A, Eqtaif F, Harazneh L. Knowledge and Practice of Nursing Staff towards Infection Control Measures in the Palestinian Hospitals. *JEP* [serial online] 2015[cited 2017 Nov 12]; 6(4):82-88. Available from: URL: https://www.researchgate.net/publication/280805818_Knowledge_and_Practice_of_Nursing_Staff_towards_Infection_Control_Measures_in_the_Palestinian_Hospitals
10. Kalantarzadeh M, Mohammadnejad E, Ehsani SR, Tamizi Z. Knowledge and Practice of Nurses About the Control and Prevention of Nosocomial Infections in Emergency Departments. *Arch Clin Infect Dis* [serial online] 2014 [cited 2017 Nov 3]; 9(4):2-3. Available from: URL:<https://bmcr.esnotes.biomedcentral.com/articles/10.1186/s13104-019-4533-4>
11. Ghadamgahi F, Zighaimat F, Ebadi A, Houshmand A. Knowledge, attitude and self-efficacy of nursing staffs in hospital infections control. *IJMR* [serial online] 2011 [cited 2017 Nov 4]; 13(3):[6 screens]. Available from: URL:<http://www.jehp.net/text.asp?2016/5/1/23/184549>
12. Biberaj P, Gega M, Bimi I. Knowledge and Source of Information among Health Care Students on Nosocomial Infections. *IJHSSE* [serial online] 2014 [cited 2017 Nov 3]; 1(7):48-49. Available from: URL:<http://dx.doi.org/10.18203/2320-6012.ijrms20184037>
13. Chauhan K, Kumari K. A study to assess the effectiveness of Planned Teaching Program (PTP) on knowledge regarding prevention of Nosocomial Infection among the Staff Nurses working in selected areas of Indira Gandhi Medical College and Hospital, Shimla- Himachal Pradesh. *IOSR-JNHS* [serial online] 2016 [cited 2017 Nov 6]; 5(1):7-8.

The Effect of Scenario-based and Participatory Method of Cardiopulmonary Resuscitation (CPR) Training on the Knowledge of Basic and Advanced Life Support (BLS and ACLS) in Emergency Medical Technicians

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Abstract

Background: Despite running various training courses on cardiopulmonary resuscitation, emergency medical technicians are still facing problems with insufficient knowledge to play a professional role in management of CPR. Meanwhile, factors such as inefficiency of training method can have a detrimental effect on their learning, and eventually their knowledge and skills in CPR.

Objective: The present study aimed to determine and compare the effect of scenario-based and participatory method of cardiopulmonary resuscitation training on the knowledge of basic and advanced life support in emergency medical technicians.

Methodology and Participants: A total of 90 emergency medical technicians participated in the present quasi-experimental study (in three intervention groups of scenario-based, participatory and control). Block randomization was utilized to allocate the participants to three intervention groups. A researcher-made test including two sections of knowledge of basic and advanced life support (each one comprised 19 questions) was used to collect data. All statistical analyzes were conducted using SPSS software version 16.0 (SPSS Inc., Chicago, Ill., USA). The measure of central tendency and the Index of dispersion (mean and standard deviation) were used to analyze the quantitative data and Kruskal-Wallis H test was used to compare mean scores. A P value of less than 0.05 was considered statistically significant.

Results: The difference in knowledge mean scores of basic and advanced life support before the intervention was not statistically significant between the three groups ($P > 0.05$). However, the difference was significant between the three groups after the intervention ($P < 0.05$).

Conclusion: Based on the results of our study, scenario-based training method has a significant effect on improving the basic and advanced knowledge of CPR in emergency medical technicians compared to participatory method.

Keywords: *Cardiopulmonary resuscitation, Emergency medical technicians, Participatory method, Scenario-based training.*

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Introduction

Cardiac arrest is undoubtedly one of the cases that require immediate action to preserve life and prevent irreversible damage to the body's vital systems¹. Based on the studies in Iran, a mortality rate after CPR exceeds

90%². CPR can play an important role in preventing death by as much as 25%. CPR quality is an important determinant of cardiac arrest outcome and resuscitation success and survival rate^{3, 4}.

The most important determinant of the chance of survival of sudden cardiopulmonary arrest is the presence of specialists in the early moments of an accident^{5,6}. Therefore, emergency medical technicians have a crucial role to play in strengthening the survival chain and reducing mortality and improving recovery in these patients⁷. It is imperative for emergency medical technicians to have sufficient knowledge and skills in cardiopulmonary resuscitation in order to preserve patients' lives^{8,9}. The results of previous studies indicate that despite running various training courses on CPR, emergency medical technicians are still facing problems with insufficient knowledge to play a professional role in management of CPR^{10, 11}. Meanwhile, factors such as inefficiency of training method can have a detrimental effect on learning in these staff, and eventually their level of knowledge and skills in CPR¹². Therefore, it is necessary to carefully and accurately select the applicable training strategies so that their learning causes more effective performance in real cases through increasing their knowledge¹³. Despite many advances in training method, traditional method such as lecture and booklet are still dominant in all disciplines⁵. In this regard, using active teaching method such as participatory and scenario-based method have been known as effective ways to promote health staff learning⁷. Participatory learning is kind of social learning in which participants interact with each other and learning happens^{14, 15}. On the other hand, scenario-based training is a new approach that relies on the active participation of the learners, and attempts to help people through discussion, problem solving as well as employing their abilities and creativity as they would be able to develop their skills^{16, 17}. Regarding the importance of the role and performance of emergency medical technicians in exposure to patients with cardiopulmonary arrest as well as the limited number of studies on the effect of scenario-based and participatory training method and comparing them with the control group, the present study aimed to determine and compare the effect of scenario-based and participatory method of cardiopulmonary resuscitation training on the knowledge of basic and advanced life support in emergency medical technicians.

Methodology

Design: This is a quasi-experimental study with a nonequivalent pretest-posttest design. The minimum sample size for each group was calculated to be²⁵ using the corresponding formula ($X_1 = 12.38$, $X_2 = 10.92$, $S_1 = 1.85$, $S_2 = 1.79$) and the results of Babanazari et al. study 18 with a confidence interval of 0.95 ($Z_1 - \alpha/2 = 0.96$) and a test power of 0.80 ($Z_1 - \beta = 0.85$). Considering the sample attrition of 20% for each group, final sample size was considered 30 for each group so that a total of 90 emergency medical technicians were enrolled in the study. Block randomization was utilized to evenly allocate participants to three groups and avoid imbalance at any point of the randomization process. First, 6 blocks were created based on SSPPLL combination and then 90 codes were extracted and listed from. A code was assigned for each combination. Given the sample size of 90 and block size of 6, it required 15 blocks that were randomly selected from 90 codes and allocation was conducted based on the participants list extracted. Exclusion criteria consisted of unwillingness to continue participation in the study and the change in workplace.

A researcher-made test including two sections of knowledge of basic and advanced life support (each one comprised 19 questions) was used to collect data. Content validity was used to determine the tool validity so that the tool was given to five experts in the field of CPR. Subsequently, necessary corrections were made after receiving their feedbacks. Moreover, the internal correlation coefficient of 0.83 ($r = 0.83$) confirmed the reliability of the data collection tool. In the participatory intervention method, the participants were divided into heterogeneous groups of 6 to 10 individuals. The training material was presented at the same session to the groups. In each group, the training content was divided into smaller sections and each member studied a section. Information on the subject was collected by each learner to review and study. The researcher also answered the participants' questions during this process, and directed them to the correct answers. At the final stage, a representative was selected by the researcher from each group to present the lessons learned and the findings as a group task to the class. At the end of the session, the researcher summarized the materials and provided further explanation. In the scenario-based intervention group, the technicians were also divided into groups of 6 to 10 and each group was given a

sheet to work out a specific scenario (CPR) using their experiences and the information received from the training session. Eventually, through summing up the most appropriate scientific and practical action and implementing them as teamwork, they wrote down their answers and a representative presented solutions and the most principled action with regard to the scenario to the audience in order to discuss it. The training sessions in each group were four two-hour sessions for one month. The control group did not receive any intervention. Two month after completion of the training sessions, follow-up was conducted through taking a post-test from the intervention groups. The educational content was selected and presented to the groups based on the standard headings and the main educational textbooks.

Statistical Analysis: All statistical analyzes were conducted using SPSS software version 16.0 (SPSS Inc., Chicago, Ill., USA). The measure of central tendency and the Index of dispersion (mean and standard deviation) were used to analyze the quantitative data and Kruskal-Wallis *H* test was used to compare mean scores. A *P* value of less than 0.05 was considered statistically significant.

Ethical Considerations: Prior to the beginning of the study, ethical approval was obtained from the vice-

chancellor of research and ethics committee of Urmia University of Medical Sciences with ethics number of IR.UMSU.REC.1397.399. Subsequently, the researcher first referred to the Urmia EMS center and received permission from the authorities to conduct the study and begun to collect data as mentioned before. The written informed consent was obtained from all participants and full explanation of study objective and design was provided. Moreover, all participants were assured that their personal information would be regarded as strictly confidential and only the statistical results would be published.

Results

The mean ages of the participants in the participatory, scenario-based and control groups were 29.50±5.94, 29.80±5.80 and 28.23±4.76, respectively. Based on the results, there was no statistically significant difference between the three groups in the mean scores of the knowledge of basic and advanced life support before the intervention. However, the mean score increased significantly in the scenario-based intervention group compared to the other two groups after the intervention (Tables 2 and 1).

Table 1: Mean and standard deviation of the knowledge of basic and advanced cardiac life support (BLS and ACLS) in the three groups.

Knowledge		Group	Participatory	Scenario-based	Control
			Mean ± SD	Mean ± SD	Mean ± SD
Knowledge of BLS	Before		10±1.46	9.60±2.12	9.73±1.98
	After		9.90±2.45	14.73±1.11	8.56±1.69
Knowledge of ACLS	Before		7±1.66	7.13±2.04	6.96±1.73
	After		7.50±1.30	12.50±0.90	6.36±2.07

Table 2: Comparison of the mean and standard deviation of the knowledge of BLS and ACLS in the three groups.

Knowledge		Group	Participatory	Scenario	Control	Kruskal-Wallis H test
			Mean rank	Mean rank	Mean rank	
Knowledge of BLS	Before		46.98	44.5	45.02	P=0.922
	After		36.43	74.62	25.45	P=0.001
Knowledge of ACLS	Before		45.18	47.05	44.27	P=0.913
	After		36.12	75.43	24.95	P=0.001

Discussion

Cardiac arrest is undoubtedly one of the cases which requires immediate action to preserve life and prevent irreversible damage to the body's vital systems. The results of our study showed that there was no significant difference in mean score of the knowledge of BLS and ACLS between the three groups before the intervention, although the difference was statistically significant after the intervention. Generally, the mean scores of the knowledge of BLS and ACLS in the scenario-based intervention group were significantly more than in participatory and control groups. The results of Govender et al. (2015) study on comparison of two training programmes (traditional and tailored) on paramedic-delivered CPR performance, showed that paramedics who received CPR training with the tailored programme had significant higher mean scores than those who received the traditional programme. The results of this study showed that in an out-of-hospital cardiac arrest scenario, the CPR performance of paramedics who received the tailored programme was significantly greater¹². In another study by Salehi et al. (2016) on the effect of cardiopulmonary resuscitation education through compound method on knowledge and performance of entourages of patients with cardiovascular diseases, a researcher-made questionnaire was used as a data collection tool and completed once in the first 72 hours of admission to the hospital and once again 2 weeks after the intervention. The education was provided in 3 sessions of 60 minutes on 3 consecutive days through lecture, practice on medical moulage, and group discussion. The results of their study indicated that compound education could be effective on awareness and performance of entourages of patients with cardiovascular diseases¹⁹. In a study by Liaw et al. (2010), the results demonstrated that the mean scores of crisis management performance for students who were received scenario-based training were significantly higher than the others²⁰. Anderson et al. (2010) showed that participants who received CPR training monthly delivered a greater performance in terms of cardiac massage compared to other groups²¹. Regarding the reason for this, it can be assumed that in actual fact, scenario building, as it is close to reality, causes a learner to adapt him/herself to the conditions that are likely to occur. Therefore, it can lead to better performance.

Conclusion

Based on the results of our study, scenario-based training method has a significant impact on the knowledge of basic and advanced cardiac life support in emergency medical technicians. It is strongly recommended that this method of training should be studied in further cohort studies and in case of achieving same results, fundamental training method should be used in the country's EMS (Emergency Medical Services) system and related courses.

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Conflict of Interest: The authors declared no competing interests.

Ethical Clearance: the ethical approval was obtained from the vice-chancellor of research and ethics committee of Urmia University of Medical Sciences with ethics number of

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References

1. Mongardon N, Dumas F, Ricome S, Grimaldi D, Hissem T, Pène F, et al. Postcardiac arrest syndrome: from immediate resuscitation to long-term outcome. *Ann Intensive Care*. 2011;1(1):45-.
2. Andersen LW, Holmberg MJ, Berg KM, Donnino MW, Granfeldt A. In-Hospital Cardiac Arrest: A Review. *JAMA*. 2019;321(12):1200-10.
3. Talikowska M, Tohira H, Bailey P, Finn J. Cardiopulmonary resuscitation quality: widespread variation in data intervals used for analysis. *Resuscitation*. 2016;102:25-8.
4. Remino C, Baronio M, Pellegrini N, Aggogeri F, Adamini R. Automatic and manual devices for cardiopulmonary resuscitation: a review. *Advances in Mechanical Engineering*. 2018;10(1):1687814017748749.
5. Roh YS, Lee WS, Chung HS, Park YM. The effects of simulation-based resuscitation training

- on nurses' self-efficacy and satisfaction. *Nurse Education Today*. 2013;33(2):123-8.
6. Min S. A Study on College Students' Knowledge and Educational Experience about Basic Life Support. *Indian Journal of Science and Technology*. 2015;8:44.
 7. Veronese J-P, Wallis L, Allgaier R, Botha R. Cardiopulmonary resuscitation by Emergency Medical Services in South Africa: Barriers to achieving high quality performance. *Afr J Emerg Med*. 2018;8(1):6-11.
 8. Chang Y-T, Tsai K-C, Williams B. What are the educational and curriculum needs for emergency medical technicians in Taiwan? A scoping review. *Advances in medical education and practice*. 2017;8:649.
 9. Rabari AS, Shamseddini MT, Anari SMS, Heidari FG. Assessing Educational Needs of Emergency Medical Technicians. *Iranian Journal of Emergency Medicine*. 2017;4(3):111-7.
 10. Ezati P, Vaziri M, Adli F. Educational Needs Assessment in the Medical Emergency Technicians of Tehran Emergency Center. *Safety Promotion and Injury Prevention*. 2017;5(2):109-19.
 11. Hayashi M, Shimizu W, Albert CM. The spectrum of epidemiology underlying sudden cardiac death. *Circulation research*. 2015;116(12):1887-906.
 12. Govender K, Sliwa K, Wallis L, Pillay Y. Comparison of two training programmes on paramedic-delivered CPR performance. *Emerg Med J*. 2016; 33(5):351-6.
 13. Rajeswaran L, Cox M, Moeng S, Tsima BM. Assessment of nurses' cardiopulmonary resuscitation knowledge and skills within three district hospitals in Botswana. *Afr J Prim Health Care Fam Med*. 2018;10(1):e1-e6.
 14. Kowch EG. A new paradigm for teaching, leading and learning in participatory learning environments. *Actions of their own to learn: Brill Sense*; 2018. p. 225-51.
 15. Kiessling A. Participatory learning: a Swedish perspective. *Heart*. 2004;90(1):113-6.
 16. Rahmani A, Moradi Y, Mohammadi A. Effectiveness of scenario-based education on the performance of the nurses in the critical cardiac care unit for patients with acute coronary syndrome. *International Journal of Medical Research & Health Sciences*. 2016;5(8):218-24.
 17. Namadi F, Hemmati-Maslakpak M, Moradi Y, Ghasemzadeh N. The effects of nursing ethics education through case-based learning on moral reasoning among nursing students. *Nursing and Midwifery Studies*. 2019;8(2):85-90.
 18. Babanazari Z, Mansouri P, Amini M, Zare N, Raiesi H. Comparison of the effects of cardiopulmonary resuscitation training through modified team based learning and traditional method on knowledge and skills of nursing students in the College of Nursing and Midwifery, Shiraz, 2012. *Journal of Nursing Education*. 2017;6(3):8-16.
 19. Salehi S, Zonoori S, Tabarsi B, Ghanbarian H, Nasiri M. The effect of Cardiopulmonary Resuscitation Education Through Compound Method on Knowledge and Performance of Entourages of Patients With Cardiovascular Diseases. *J Nurs Educ*. 2016;5(3):10-6.
 20. Liaw SY, Chen F, Klainin P, Brammer J, O'Brien A, Samarasekera DD. Developing clinical competency in crisis event management: An integrated simulation problem-based learning activity. *Advances in Health Sciences Education*. 2010;15(3):403-13.
 21. Anderson R, Sebaldt A, Lin Y, Cheng A. Optimal training frequency for acquisition and retention of high-quality CPR skills: A randomized trial. *Resuscitation*. 2019;135:153-61.

Correlation between IL-10 Expression with Histopathology Type on Nasopharyngeal Carcinoma Patients

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Abstract

Background: Nasopharyngeal carcinoma (NPC) is a malignancy derived from lymphoepithelial tissue and nasopharyngeal epithelial cells. The response therapy of NPC evaluated from histopathological type, but in some patients with the same type was illustrated a different response of therapy. IL-10 expression expects to predict a better response therapy of NPC. IL-10 expression by immunohistochemical examination associated with the differentiation of tumors.

Method: The study was analytic observational with the cross-sectional approach. Samples were collected by consecutive sampling and formalin-fixed, paraffin-embedded biopsy specimens were obtained.

Result: The result of IL-10 expression in Nasopharyngeal carcinoma (NPC) patients with histopathological World health organization (WHO) type I was obtained; From all the samples, there were 36.36% of strong positive expression and 63.64% of frail positive expression. There were increases in the number of cells that give a strong expression on WHO type III. Statistical analysis using Fisher's exact test was obtained $p = 0.040$ with a contingency coefficient of 0.384.

Conclusion: There was a moderate correlation between IL-10 expression and histopathological type in NPC patients.

Keyword: *Nasopharyngeal Carcinoma, Expression IL-10, Histopathological Type.*

Introduction

Nasopharyngeal carcinoma (NPC) is a malignancy derived from lymphoepithelial and nasopharyngeal epithelial tissue. The response to NPC therapy has been assessed by histopathology, but in reality, NPC patients with the same histopathologic type might showing a different therapeutic response.¹ This proves that histopathologic types not accurate enough to predict the treatment response of NPC. IL-10 could be associated

with NPC histopathology type and serve as a marker for predicting therapeutic response.

The expression IL-10 levels are increased significantly in the World health organization (WHO) Type III compared to WHO type I². The statement was supported by other research at Dr. Moewardi Surakarta which showed that IL-10 expression increased in WHO type III³. Examination of IL-10 expression and histopathologic type is expected to provide the best prediction of therapeutic response in NPC patients. Until now, the relationship between IL-10 expression and histopathology type in NPC patients that came to treat in Outpatient Oncology Unit (URJ) of Otolaryngology Dr. Soetomo Teaching Hospital Surabaya is not known yet.

Histopathologies NPC WHO type II and III are known to have a better therapeutic response, but not all of it provide the complete therapeutic response.⁴

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According to Bergonie and Tribondeau's laws, the sensitivity of cells to radiation is inversely proportional to the degree of differentiation that the worse the cell differentiation rate the better the therapeutic response⁵. WHO Type II nasopharyngeal carcinoma has a degree of moderate-differentiation, and WHO type III has no differentiation.⁶ Another research obtained the same therapeutic response results in the three types of histopathology NPC especially in stage III and IV.

IL-10 is produced by Epstein-Barr Virus-encoded RNAs (EBER) in-situ at the nucleus of NPC cells² EBER-containing tissues was exhibited radio sensitive properties and thus have a better prognosis for radiotherapy⁷. Several studies have reported the role of IL-10 in the development of NPC^{7,8} The data above that showed IL-10 levels were found in stem-cell squamous cell carcinoma (SCC)⁹. Another research found a significant correlation between Epstein-Barr Virus (EBV) Load and IL-10, that used to assess the response of NPC therapy. Besides, showed that IL-10 expression might be a factor for assessing the therapeutic response and prognosis of NPC sufferers and associated with SCC oral cell transformation seen from its histopathologic type⁷ The role of IL-10 in the development of NPC cells in several ways is to increase cell differentiation, suppress local immune responses, stimulate proliferation, induce angiogenesis, and inhibit apoptosis¹⁰

The Epstein Barr virus codes for EBV-encoded RNAs (EBER) is responsible for the production of IL-10 or BCRF1 in the nucleus of NPC cells. The IL-10 protein has a homologous amino acid with IL-10 produced by the body and acts as an autocrine growth factor for NPC cells. IL-10 stimulates the activation of Signal transducer and activator of transcription 3 (STAT3) which affected cell differentiation and cause invasive growth of the nasopharyngeal epithelial cell layer, that it eventually becomes a carcinoma cell^{10,11} Therefore, we aimed to know the correlation between IL-10 expression and histopathological type in NPC patients. Aim this research to know the correlation between IL-10 expression and histopathological type in NPC patients.

Method

The research was conducted in Outpatient Oncology Unit (URJ) of Otolaryngology and Installation of Anatomical pathology (AP) Dr. Soetomo Teaching Hospital Surabaya also at PA Installation of Dr. Sardjito Yogyakarta. The research design was used analytic

observational research with the cross-sectional approach. The sample used in the study was NPC patients with biopsy results; WHO type I, II and III in the outpatient of oncology unit Dr. Soetomo Teaching Hospital, Surabaya from October to December 2016 and has never received radio chemotherapy and agree to be included as a sample of research (informed consent).

The paraffin block from the biopsy result was cut and immunohisto chemistry on rabbit polyclonal antibody and Anti-IL-10 ab34843 (Abcam®, Cambridge - UK). The intracellular expression of IL-10 in the NPC network was identified by the presence of a diffuse, brownish granule image in the cytoplasm of cancer cells against a background of lymphocytes. Assessment of IL-10 expression was performed based on the Allred scale. The intracellular IL-10 expression was observed in 5 fields of view with a 400x enlarged binocular microscope. The data obtained using Fisher's Exact and Contingency Coefficient with $\alpha = 0,05$.

Results

Table 1: The demographic Characteristics of NPC patients (n = 33)

Characteristics	Amount	Percentage (%)
Age (y/o)		
20 – 29	3	9.10
30 – 39	2	6.06
40 – 49	11	33.33
50 – 59	12	36.36
60 – 69	5	15.15
Sex		
Male	24	72.73
Female	9	27.27
Ethics		
Javanese	25	75.76
Madura	7	21.21
Minahasa	1	3.03
Jobs		
Farmer	10	30.30
Driver	4	12.13
Factory Employees	2	6.06
Civil Servant	1	3.03
Merchant	7	21.21
Mechanic	2	6.06
Construction Worker	2	6.06
Teacher	2	6.06
Unemployed Housewife	2	6.06
Police	1	3.03

The distribution data of NPC WHO patients type 1, 2 and 3 based on age, sex, ethnicity, and occupation are shown in Table 1 with the total samples obtained were 33 patients. The age distribution of the most NPC sufferers was 50 to 59 years old (36.36%), whereas the age distribution of NPC sufferers was lowest in the

age group 30 to 39 years (6.06%). The youngest age of NPC was 20 years old while the oldest was 67 years old. Patients with NPC was male (72.73%) more than female (27.27%). The highest number of NPC sufferers in Javanese (75.76%) and most of them were farmers (30.30%).

Table 2: The results of the IL-10 expression examination on NPC histopathology type based on WHO

IL-10 Expression	The types of histopatologiNPC				p	C
	I	II	III	Total		
Weak	2(9.5%)	12 (57.1%)	7(33.3%)	21(63.64%)	0.040	0.384
Strong	1 (8.3%)	2(16.7%)	9(75.0%)	12(36.36%)		
Total	3(9.1%)	14 (42.4%)	16(48.5%)	33(100%)		

The result analysis of the correlation between IL-10 expression with histopathology type of NPC patient based on WHO is shown in Table 2. The most common type of NPC histopathology was WHO type III; 16 patients and 9 have strong of IL-10 expressing. At least known of NPC histopathology type was WHO type I; 3 patients, where 2 of them have frail of IL-10 expressing. Strong intracellular IL-10 expression was 36.36% of all patients, whereas intracellular IL-10 expression was frail at 63.64% of all patients.

Discussion

Based on the result, the age distribution of NPC sufferers were mostly in the age group 50-59 years old, followed by 40-49 years old, and 60-69 years old. NPC cells might originate from normal cells undergoing malignant transformation due to spontaneous mutations or carcinogen induction. Transformation of normal cells into cancer required a long induction of time for 15 to 30 years. Nasopharyngeal carcinoma was rare in children about 1-5% of all cancers¹² NPC predisposing factors in productive age were the result of exposure to carcinogenic substances or pollution, latent EBV infection and decreased immune factors. It has led to a high incidence of NPC at the age of 40-60 years old¹³

Previous studies, from 40 patients NPC in Dr. Soetomo Teaching Hospital Surabaya reported that the highest incidence of NPC in the age group 50-59 years (35.71%), followed by age group 40-49 years (33.33%), and age group 60-69 years (14.29%). Research in Semarang, from 128 NPC sufferers, the age group was

40-49 years old (32.80%) followed by age group 50-59 years old (31.30%) and age group 30-39 years (10.90%). Other studies also showed similar results, the ratio of male and female NPC patients was 2.5: 1, and in other centers is 2: 1¹⁴. The high incidence of NPC in males versus females was due to differences in living habits and occupations that tend to be more frequent in contact with carcinogenic causes. Living habits such as smoking, exposure to steam, dust fumes and chemical gases in the workplace increase the risk of NPC 2-6 times¹⁵.

The distribution of NPC patients based on ethnicity in the study was Javanese (75.76%), followed by Madurese (21.21%) and Minahasa (3.03%). Many NPC sufferers were from Javanese because the research was conducted in Surabaya which majority of the population was Javanese. Previous research on genetics has found that the human leukocyte antigen (HLA) gene allele has the potential to cause susceptibility to NPC. The incidence of NPC in Indonesia was intermediate levels caused by a combination of environmental factors and EBV infection. Previous research showed almost the same result that most ethnic from 42 patients of NPC in Dr. Soetomo Teaching Hospital Surabaya was a Javanese ethnic group of 66.67%, followed by Madurese, Flores, and Balinese.

The most types of job in patients with NPC in Dr. Soetomo Teaching Hospital Surabaya was a farmer (30.30%), and trader (21.21%). It was because farmers were exposed to pesticides chronically, and exposure to workers in the form of dust or particles of medium size (5-10 μm) where the particles were easily absorbed

by the nasopharyngeal mucosa. Cigarette smoke and exposure to formaldehyde and wood dust were also a risk factor for NPC. There were several major chemicals were known to cause NPC based on occupational exposure, including bleach, acid and base agents, sulfuric acid, inks, formaldehyde, and pesticides. The result was similar to the previous research, it was reported the most job was farmers 16 patients (38.09%) and self-employed 6 patients (14.29%)¹⁷ Several epidemiological studies have shown increased risk factors for NPC in workers exposed to wood dust in certain periods and doses.

The most common type of histopathology in the study was WHO type III, followed by type II, and type I. Previous studies reported the most common type of NPC histopathology found in Indonesia was WHO type III⁸ Other studies that showed similar results of NPC WHO type III was ranked first and followed WHO type II and type I². WHO type III of nasopharyngeal carcinoma was common because the main cause of NPC in endemic areas was caused by exposure to EBV infection.

Based on the analysis of the results of the study showed a significant correlation ($p = 0.04$) between the expression of IL-10 with histopathology type NPC WHO type I, II, and III with contingency coefficient ($C = 0.384$), which means there was a moderate positive correlation between the two variables. The results were supported by the existing theory that IL-10 plays a role in increasing the differentiation of NPC cells WHO types I, II, and III through STAT3 activation. Increased activation of STAT3 in epithelial cells infected with EBV involves Janus kinase-1 (JAK1), Activating protein-1 (AP1), Jun N kinase (JNK), and Tyrosine kinase-2 (TYK2). The IL-10 bond with receptors was related to the activation of Jak tyrosine kinases and stimulates downstream signaling. Activation of JAK1, TYK2, and STAT3 was involved in signaling cascades. STAT3 activation plays a role in tumor formation and progression by triggering the invasive growth of independent nasopharyngeal epithelial cell layer into carcinoma cells⁸

Histologic studies showed a different type of histopathology NPC was a homogeneous variation in the neoplasm group. Histogenetically, all NPC types were derived from squamous cells and to distinguish between NPC WHO type II and type III were used electron microscopy and immunohistochemical examination²⁰ Tumor differentiation has been known to occur in sarcomas²¹ The phenomenon was also recognizable in NPC and was common in recurrent

lesions, tumors undergoing metastasis to lymph nodes and exhibiting different types of histopathology than at the start of the diagnosis. The results of the study were similar to demonstrated that expression and IL-10 levels significantly increased in NPC WHO type III compared to WHO type II also reported that activation of LMP-1 in NPC helped stimulate the production of IL-10 with the help of CD4.

The results of the study were also according to research in Dr. Moewardi General Hospital Surakarta which showed that IL-10 expression increased in NPC of WHO type III. Stromal inflammatory and cytokines systems play a role in stimulating growth and expression of latent and lytic EBV genes in NPC epithelial cells. A cytokine that removed from inflammatory cells will cause the activation of NF- κ B and STAT3 signal systems in epithelial cells infected with EBV. Chronic inflammation of epithelial cells infected with EBV plays a role in the pathogenesis of NPC WHO type III¹⁹ The study on 325 samples of oral SCC patients with immunohistochemical staining was found an increase in IL-10 expression that correlates with aggressive clinical symptoms and it could be a predictor of therapeutic responses. It was performed an immunohistochemical staining on oral SCC to prove an association of IL-10 expression with progressive oral of SCC cell transformation, which was examined from histopathologic types. Similarly with another result that found IL-10 expression was significantly associated with treatment response and poor prognosis in gastric cancer.

Recently, a therapeutic response based on histopathologic type. however, in reality, NPC patients with the same histopathologic type might exhibit different therapeutic responses that requiring additional examination to predict a more accurate treatment response. The study has demonstrated the association of IL-10 expression with histopathologic type (NPC WHO types I, II, and III) which indispensable to predict a more accurate treatment response in NPC patients.

Conclusion

There was a moderate correlation between IL-10 expression with histopathologic type in NPC patients.

Conflict of Interest: There is no conflict of interest.

Source of Funding: This study is self-funded.

Ethical Clearance: The research was conducted after it was approved by the Research Ethics Committee

of Dr. Soetomo Teaching Hospital Surabaya (181/Panke.KKE/III/2017).

References

1. Fibrian KC. Hubungan Antara Klasifikasi Histopatologis dengan Respon Kemoradiasi Berdasarkan Gambaran CT Scan pada Penderita Karsinoma Nasofaring. Faculty of Medicine; 2010.
2. Budiani DR, Hutahaean S, Haryana SM, Soesatyo MH, Sosroseno W. Interleukin-10 levels in Epstein-Barr virus-associated nasopharyngeal carcinoma. *J Microbiol Immunol Infect* Wei mian yu gan ran za zhi. 2002;35(4):265–8.
3. Mulyati DE. Perbedaan Ekspresi Interleukin-10 (Il-10) Pada Karsinoma Nasofaring Who Tipe 3 Stadium Iii Dan Stadium Iv. Universitas Sebelas Maret; 2015.
4. Wang M, Zou H, Zhang W, Hou K. Emotional Intelligence and Subjective Well-Being in Chinese University Students: The Role of Humor Styles. *J Happiness Stud* [Internet]. 2019;20(4):1163–78. Available from: <https://doi.org/10.1007/s10902-018-9982-2>
5. Anugrahini HN, Nuswantoro D, Sriyono. Progressive muscle relaxation and symptoms of women with breast cancer undergoing adjuvan chemotherapy. *Indian J Forensic Med Toxicol* [Internet]. 2019;13(4):1605–10. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85075939962 & doi=10.5958%2F0973-9130.2019.00535.8 & partnerID=40 & md5=fbc5483d37571dde0c9bcf3160d046e8>
6. Rasad S, Kartoleksono S, Ekayuda I. Radiologi diagnostik. Edisi. 2005;2:85–6.
7. Ren JS, Freedman ND, Kamangar F, Dawsey SM, Hollenbeck AR, Schatzkin A, et al. Antioxidant and in vivo anti-hyperglycemic activity of *Muntingia calabura* leaves extracts. *Appetite*. 2014; 4(3):654-61.
8. Mocellin S, Marincola FM, Young HA. Interleukin-10 and the immune response against cancer: a counterpoint. *J Leukoc Biol*. 2005;78(5):1043–51.
9. Lavaee F, Ghapanchi J, Anjomruz A, Malekzadeh M. The evaluation of the serum level of IL-10 in OLP patients. *Comp Clin Path*. 2018;27(1):131–4.
10. Poh YW, Gan SY, Tan EL. Effects of IL-6, IL-10 and TGF- β on the expression of survivin and apoptosis in nasopharyngeal carcinoma TW01 cells. *Exp Oncol*. 2012;
11. Iwakiri D. Epstein-Barr virus-encoded RNAs: key molecules in viral pathogenesis. *Cancers (Basel)*. 2014;6(3):1615–30.
12. Ferawati L, Hasih Sri Lamdari, Dimas Teguh Saputra JS. Bercerita, Berpuisi, dan bernyanyi dalam Pembelajaran Bahasa Indonesia di Sekolah Dasar untuk Meningkatkan Kognitif Anak. Pendidik Guru Sekol Dasar FKIP UNS. 2012;
13. Lu JJ, Cooper JS, Lee AWM. Nasopharyngeal cancer: multidisciplinary management. Springer Science & Business Media; 2010.
14. Thompson LDR. Update on nasopharyngeal carcinoma. *Head Neck Pathol*. 2007;1(1):81–6.
15. George B, Minello C, Allano G, Maindet C, Burnod A, Lemaire A. Opioids in cancer-related pain: current situation and outlook. *Support Care Cancer*. 2019;27(8):3105–18.
16. Widjaja AE, Chen JV, Sukoco BM, Ha QA. Understanding users' willingness to put their personal information on the personal cloud-based storage applications: An empirical study. *Comput Human Behav*. 2019;91:167–85.
17. Amini MH, Azar FM, Wilson BR, Smith RA, Mauck BM, Throckmorton TW. Comparison of outcomes and costs of tension-band and locking-plate osteosynthesis in transverse olecranon fractures: a matched-cohort study. *Am J Orthop (Belle Mead NJ)*. 2015;44(7):E211-5.
18. Terzic TT, Boricic MI, Pendjer IP, Zecevic DTR, Tomanovic NR, Brasanac DC, et al. Prognostic significance of clinical parameters and Epstein-Barr virus infection in non-endemic undifferentiated carcinoma of nasopharyngeal type: a Serbian report. *Med Oncol*. 2011;28(4):1325–30.
19. Fujieda S, Lee K, Sunaga H, Tsuzuki H, Ikawa H, Fan G, et al. Staining of interleukin-10 predicts clinical outcome in patients with nasopharyngeal carcinoma. *Cancer Interdiscip Int J Am Cancer Soc*. 1999;85(7):1439–45.
20. Tan E, Selvaratnam G, Kananathan R, Sam C. Quantification of Epstein-Barr virus DNA load, interleukin-6, interleukin-10, transforming growth factor- β 1 and stem cell factor in plasma of patients with nasopharyngeal carcinoma. *BMC Cancer*. 2006;6(1):227.

Survival Patterns of Hormone Refractory Prostate Cancer in Sulaymaniyah, Iraqi Kurdistan

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Abstract

As the most common solid tumor diagnosed among men, prostate cancer is responsible for the death of a remarkable number of men worldwide every year. The present study was carried out in order to figure out the survival patterns and the effective variables in patients with hormone refractory prostate cancer. Using a retrospective cohort design with a nested case-control study approach, the present study was carried out on 150 patients with prostate cancer at Hiwa Cancer Hospital located in Sulaimania, the Iraqi Kurdistan in 2014. The patients were assigned into a case group (who developed resistance to androgen deprivation therapy) and a control group (who did not develop resistance to androgen deprivation therapy within the first three years of prostate cancer treatment). The required data were collected through a researcher-designed questionnaire and using the patients' hospital records. Most of the patients aged between 65 to 80 years. According to the results, the highest survival probability belonged to the age group 60-80, while the lowest was related to those aged less than 60 years, and there was no significant relationship between age groups and overall survival ($p>0.05$). Prostate cancer is more likely to develop in males aged 65 to 80 year. They patients' overall survival is not correlated with their age, while there is a correlation between the stage of their tumors and their overall survival. The patients' their progression-free survival was found to be significantly affected by their age and histopathology, while the stage of their tumors was not in a significant correlation with their progression-free survival.

Keywords: Prostate cancer, survival patterns, adenocarcinoma.

Introduction

Although prostate cancer (PC) has been referred to as the most common solid tumor among men in developed countries and less common in underdeveloped countries, its etiology is still not well-known¹. PC has

been introduced as the fifth leading cause of mortality in males worldwide². The most significant risk factor for PC is being an elderly male, such that it is the most commonly detected cancer among elderly men¹. In addition to age and male gender, other effective factors in incidence of prostate cancer have been introduced as family history, race, diet, obesity, smoking, and alcohol³.

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Statistics has shown that 20 to 30% of the diagnosed patients have diagnosed or metastatic disease, out of whom 25% die within 2 years⁴. As shown by the statistics published by GLOBOCAN 2018, the age-standardized incidence and mortality rate of PC in Iraq

have been reported to be respectively 6.6 and 2.0 per 100,000⁵. Moreover, the incidence rate of PC among the population living in Sulaimani, the Kurdistan Region of Iraq was 36, 67, and 41 cases respectively in 2008, 2012, and 2013⁶.

PC incidence and survival rates vary widely in different regions of the world; however, little variation has been reported in mortality rate⁷. It has been reported that the risk of death is more common in men with a Gleason grade of 8-10 tumor, advanced clinical stage, or prostate-specific antigen (PSA) of greater than 20 nanograms per milliliter (ng/mL). In addition poor survival rates have been reported in patients with castration-resistant prostate cancer (CRPC) which is an advanced form of PC⁸.

The 5-year survival rate is defined as the percentage of patients who live a minimum of 5 years after their cancer is diagnosed. Research has indicated improvement in the 5-year survival rate for patients with prostate cancer⁹ which has largely been attributed to the fact that there has been an increase in utilizing the PSA test for PC diagnosis. Survival rate can be influenced by many factors including the patient's age, overall health status, the treatment received, and how well the cancer responds to the treatment. According to the reports by the American Cancer Society, over the last 25 years, there has been an increase from 68% to 100% in the 5-year relative survival rate for all stages of prostate cancer¹⁰. It has also been reported that 5-year relative survival rate is slightly lower in men under the age of 50 years¹¹.

Given what was mentioned above and the fact that no study has focused on survival patterns of and effective factors in patients with prostate cancer in the Kurdistan Region of Iraq, the present study was carried out in order to figure out the parameters involved with survival patterns and rates of PC patients.

Method

Study Design and Patients: This study was carried out using a retrospective cohort design with a nested case-control study approach on a number of patients suffering from prostate cancer at Hiwa Cancer Hospital located in Sulaimania, the Kurdistan Region of Iraq in 2014. The participating patients were chosen from among the total number of the patients (n=257) who were diagnosed to have prostate cancer through laboratory investigations (biopsy and elevated PSA) at Hiwa

Cancer Hospital from July 1, 2009 to July 1, 2014. Of those 257 patients, 150 cases were selected as the study sample in the present study (75 with castration resistant prostate cancer, 75 with non-castration resistant prostate cancer). Using Statsdirect statistical software and based on the assumption of an event rate of 0.2 in the control group, the sample size was determined to be 150¹⁷. After the patients were chosen, they were divided into two groups, such that those with resistance to androgen deprivation therapy were considered as the case group and those without resistance to androgen deprivation therapy within the first three years of prostate cancer treatment were regarded as the control group.

Data Collection: A researcher-administered questionnaire was utilized to collect the required data through structured interviews with the patients either on phone or face-to-face at their homes. The questionnaire aimed to collect data on the patients' socio-demographics, medical history of chronic diseases, PC-related risk factors, and anthropometric measurements. Moreover, the patients' hospital records were reviewed under the supervision of the managing physicians in order to collect required clinical data. It should be noteworthy that no examination was carried out in the present study to obtain required data.

Statistical Analysis: After the collected data were revised and coded, they were analyzed through SPSS (version 20). In so doing, descriptive statistics was utilized, and the results were expressed as means (\pm standard deviation). In addition, Pearson's Chi-square test, Mann Whitney test, independent samples t-test, and one-sample Kolmogorov-Smirnov test were run to check if the difference between the groups was significant or not. The level of statistical significance was set at $p < 0.05$ for all statistical tests. Survival analysis was conducted using Cox proportional hazards model. A Kaplan-Meier curve was constructed.

Ethical Considerations: The ethical considerations were taken into account by receiving approval for the study protocol from the research ethics committee of the High Institute of Public Health (HIPH) - Alexandria University, Egypt. Furthermore, necessary approval was retrieved from the Ministry of Health, the Kurdistan Region of Iraq and Directorate of Health Sulaimaniyah. Finally, informed consent was obtained from the participants, and necessary measures were taken in order to keep their information strictly confidential.

Results

Based on the findings, the proportion of castration resistance was 63.03%. Distribution of PC cases and the controls according to age and family history has been shown in table 1.

Table 1. Distribution of PC cases and the controls according to age and family history

Sociodemographic characteristics	Group				X ² (P-value)	OR (95% CI)
	Controls		Cases			
	No	%	No	%		
Age in years					0.43 (0.511)	
▪ 50-	11	14.7	8	10.7		1
▪ 65-80	44	58.7	45	60.0		1.4 (0.51-3.4)
▪ 80+	20	26.7	22	29.3		1.5 (0.51-4.5)
Family history					0.23 (0.631)	
▪ No	64	85.3	66	88.0		1
▪ Yes	11	14.7	9	12.0		0.79 (0.31-2.1)

Regarding the clinical characteristics, the results revealed that in terms of their disease stage, 40%, 28%, 17.3%, and 14.7% of the cases were respectively in stages II, IV, III, and I, while 45.3%, 24.7%, 16%, and

4% of the controls were respectively in stages II, I, III, and IV, and the two groups were significantly different in this regard (p=0.001) (See Table 2).

Table 2. Comparison between the CRPC and non-CRPC patients regarding their clinical characteristics

Clinical characteristics	Group				X ² (P-value)	OR (95% CI)
	Controls		Cases			
	No	%	No	%		
Histopathology					0.043*!	
▪ Adenocarcinoma	71	94.7	75	100.0		9.5 (1.2-179.1)*
▪ Sarcoma	4	5.3	0	0.0		1
Stage					17.9 (0.001)*#	
▪ Stage I	26	34.7	11	14.7		1
▪ Stage II	34	45.3	30	40.0		2.1 (0.88-4.9)
▪ Stage III	12	16.0	13	17.3		2.6 (1.0-7.3)*
▪ Stage IV	3	4.0	21	28.0		16.5 (4.1-67.1)*

The mean overall survival time among the PC patients according to their age has been shown in table 3.

Table 3. The mean overall survival time among the PC patients according to their age

Age	Mean		P-value
	Estimate	Std. Error	
<60	4.18	0.297	0.982
60-80	4.47	0.107	
80+	4.36	0.168	
Overall	4.46	0.091	

Regarding the patients' OS according to the stage of their tumor, as expected, the Kaplan-Meier curves indicated that the highest probability of survival belonged to tumors of stage I, followed by those patients with tumors of stages II and II, and the lowest OS belonged to patients with tumors of stage IV (See Figure 1). with a statistically significant difference between the groups(p<0.001).

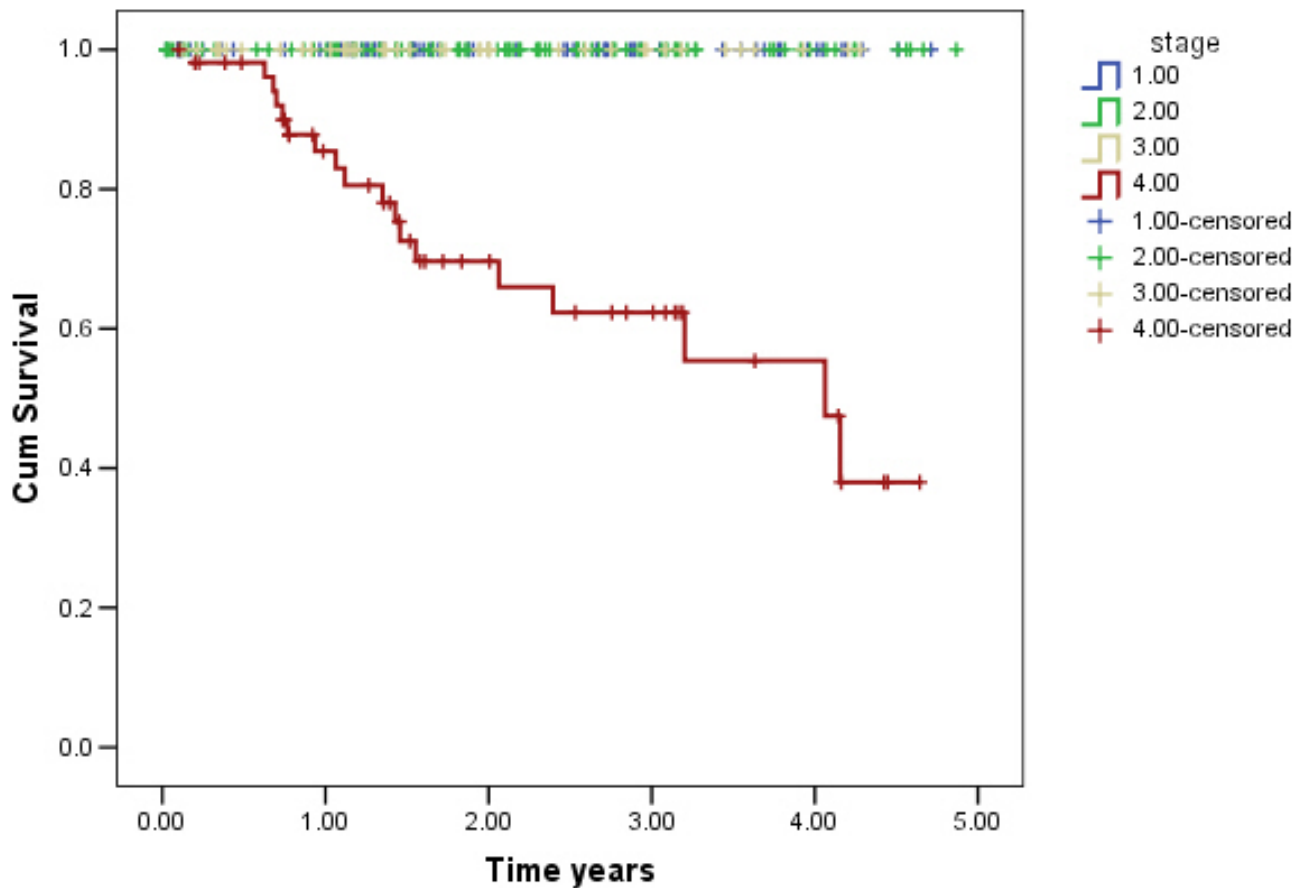


Fig. 1. Kaplan-Meier survival curve of patients with prostate cancer according to stage of tumor

Regarding the patients’ progression-free survival (PFS), the results showed that the mean and median PFS were respectively 2.469 (± 0.116) and 2.712 (± 0.155) years (See Table 4).

Table 4. The mean and median progression-free survival in the PC patients

Mean				Median			
Estimate	Std. Error	95% CI		Estimate	Std. Error	95% CI	
		Lower Bound	Upper Bound			Lower Bound	Upper Bound
2.469	.116	2.241	2.696	2.712	.155	2.408	3.017

The results also showed that there was a significant difference between different age groups in terms of their progression-free survival ($p=0.025$), such that patients aged 60-80 years had the longest PFS and those over 80 years the shortest PFS. Also, regarding the patients’

histopathology, the results revealed a significant difference between patients with adenocarcinoma and sarcoma in terms of their PFS ($p=0.006$), such that patients with adenocarcinoma had a remarkably longer PFS. (See Table 5).

Table 5. Comparison between different age groups, stages, and histopathology regarding their PFS

	Mean				p-value
	Estimate	Std. Error	95% CI		
Age					
<60	2.333	.400	1.550	3.117	0.025
60-80	2.603	.145	2.318	2.888	
80+	2.220	.212	1.806	2.635	
Overall	2.469	.116	2.241	2.696	
Stage					
I	2.136	.180	1.784	2.489	0.124
II	2.643	.199	2.254	3.033	
III	2.220	.231	1.767	2.673	
IV	2.814	.276	2.273	3.355	
Overall	2.469	.116	2.241	2.696	
Histopathology					
Adenocarcinoma	2.540	.122	2.301	2.778	0.006
Sarcoma	1.536	.317	.915	2.157	
Overall	2.469	.116	2.241	2.696	

Discussion

Based on the finding of this study due to the specific conditions in this region as a result of environmental and epidemiological changes, changes in lifestyle, and the effect of chemical hazards because of wars, there has been an increase in the incidence rate of prostate cancer over the past decades¹².

The results of the present study revealed that most of the patients (60% of the cases and 58.7% of the controls) were 65-80 years old. This finding is in good agreement with the report by Williams and Powell (2009) who referred to old age as the most significant risk factor for prostate cancer. Although research has regarded family history as a well-established risk factor for prostate cancer¹³, the results showed that most of the patients (88% of the cases and 85.3% of the controls) did not have a positive family history of prostate cancer.

As revealed by the results of the present study, all of the patients in the case group (100%) and most of those in the control group (94%) had adenocarcinoma, while sarcoma was diagnosed in none of the cases and in a very few control (5.3%). This finding is in line with the results of the studies carried out in Iran¹⁴. Moreover, most of the patients in the current study were diagnosed to be at stages I and II. Research has indicated that there is a significant direct correlation between stage of disease and PC survival rate, such that patients who are at stages I and II have a higher survival rate¹⁵.

In the present study, it was seen that the mean overall survival (OS) time for the patients was 4.46 years, with the longest OS (4.47 years) belonging to the age group 60-80 years. This finding is partly in agreement with previous studies which reported that survival maximizes in men who are 60-69 years old at the time of diagnosis^{16,17}.

The results of the present study showed no significant relationship between the patients' age and their survival rate ($p > 0.05$). However, it was observed that older patients with prostate cancer had higher survival durations. This finding is supported by the results of the study carried out by Yang et al. (2013) who reported that older patients with single-bone metastasis had a higher survival rate¹⁸. It was also seen that there was a significant difference between prostate cancer patients with tumors of different stages in terms of their overall survival time ($p > 0.001$), such that patients with tumors stages I had the longest survival duration, followed by those with stages II and II. This finding is well supported by previously conducted studies^{16,17}.

In this study, there was a significant difference between different age groups in terms of their PFS at a p-value of 0.025, such that the longest PFS belonged to the age group 60-80 years, followed by <60 years, and over 80 years. Similar results were reported in a study conducted in the US to analyze survival in 275,280 histologically confirmed adult cases of PC¹⁹.

In the present study, no significant relationship was observed between the stage of tumor and PFS. Also, low probability of progression-free survival was seen in patients with stage I of tumor, which can be related to the late diagnosis of prostate cancer. PFS can be influenced by several factors such as screening program which is absent in Kurdistan, lack of specialized units for detection of PC, and lack of an efficient reporting system. The lowest PFS was observed in the patients are stage IV, which is in line with the results of the study carried out in the USA¹⁹.

Results revealed a significant relationship between the patients' histopathology results and their PFS, such that patients with adenocarcinoma had remarkably higher progression-free survival of 2.54 compared to those with sarcoma who had a PFS time of 1.536 years ($p=0.006$). This finding can be due to the small number of patients with sarcoma, which is in line with Alizadeh's study¹⁴.

Conclusion

Prostate cancer is more likely to develop in males aged 65 to 80 year. Patients' overall survival is not correlated with their age, while there is a correlation between the stage of their tumors and their overall survival. The patients' their progression-free survival was found to be significantly affected by their age and histopathology, while the stage of their tumors was not in a significant correlation with their progression-free survival.

Conflict of Interest: Not

Ethical Clearance: The study was approved by the ethical committee of the High Institute of Public Health (HIPH) - Alexandria University, Egypt and Ministry of Health, the Kurdistan Region of Iraq .

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References

- Hsing AW, Chokkalingam AP. Prostate cancer epidemiology. *Front Biosci.* 2006;11(5):1388-413.
- Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA: a cancer journal for clinicians.* 2011;61(2):69-90.
- Moradi Y, Rahmani A-R, Gholipour KH, Mirzaie R, Samadi N, A Sharaa S. Nurses' pharmacology knowledge of food-drug interactions in Ayatollah Taleghani Hospital of Orumieh, Iran. *Journal of Chemical and Pharmaceutical Sciences.* 2016;9(3):1083-7.
- Chen HS, Portier K, Ghosh K, Naishadham D, Kim HJ, Zhu L, et al. Predicting US-and state-level cancer counts for the current calendar year: Part I: evaluation of temporal projection method for mortality. *Cancer.* 2012;118(4):1091-9.
- World Health Organization. The Global Cancer Observatory: Iraq. Globocan 2018. Retrieved on June 20, 2019 from: <https://gco.iarc.fr/today/data/factsheets/populations/368-iraq-fact-sheets.pdf>
- Ministry of Health, Kurdistan region/Iraq, Directorate of health/Sulaimaniyah. Hiwa hospital-cancer registries unite. Iraq: Ministry of Health, Kurdistan region/Iraq; 2014.
- Quinn M, Babb P. Patterns and trends in prostate cancer incidence, survival, prevalence and mortality. Part I: international comparisons. *BJU international.* 2002;90(2):162-73.
- Kirby M, Hirst C, Crawford E. Characterising the castration-resistant prostate cancer population: a systematic review. *International journal of clinical practice.* 2011;65(11):1180-92.
- Batty GD, Kivimäki M, Clarke R, Smith GD, Shipley MJ. Modifiable risk factors for prostate cancer mortality in London: forty years of follow-up in the Whitehall study. *Cancer Causes & Control.* 2011;22(2):311-8.
- Baade PD, Youlden DR, Krnjacki LJ. International epidemiology of prostate cancer: geographical distribution and secular trends. *Molecular nutrition & food research.* 2009;53(2):171-84.
- Rowan S, Rachet B, Alexe D, Cooper N, Coleman M. Survival from prostate cancer in England and Wales up to 2001. *British journal of cancer.* 2008;99(S1):S75.
- Othman RT, Abdulljabar R, Saeed A, Sadiq S, Kittani HM, Mohammed SA, et al. Cancer Incidence Rates in the Kurdistan Region/Iraq from. *Asian Pacific Journal of Cancer Prevention.* 2011;12:1261-4.
- Williams H, Powell IJ. Epidemiology, pathology, and genetics of prostate cancer among African Americans compared with other ethnicities. *Cancer Epidemiology: Springer;* 2009. p. 439-53.
- Alizadeh M, Alizadeh S. Survey of clinical and pathological characteristics and outcomes of patients with prostate cancer. *Global journal of*

- health science. 2014;6(7):49.
15. Chattopadhyay S, Zheng G, Hemminki O, Försti A, Sundquist K, Hemminki K. Prostate cancer survivors: Risk and mortality in second primary cancers. *Cancer medicine*. 2018;7(11):5752-9.
 16. Westlake S, Cooper N. Cancer incidence and mortality: trends in the United Kingdom and constituent countries, 1993 to 2004. *Health Stat Q*. 2008;38:33-46.
 17. Moore AL, Dimitropoulou P, Lane A, Powell PH, Greenberg DC, Brown CH, et al. Population-based prostate-specific antigen testing in the UK leads to a stage migration of prostate cancer. *BJU international*. 2009;104(11):1592-8.
 18. Yang C, Qi G-S, Rong R-M, He J. Clinical features and treatment strategies for older prostate cancer patients with bone metastasis. *Asian journal of andrology*. 2013;15(6):759.
 19. Ries LG, Young J, Keel G, Eisner M, Lin Y, Horner M. SEER survival monograph: cancer survival among adults: US SEER program, 1988-2001, patient and tumor characteristics. National Cancer Institute, SEER Program, NIH Pub. 2007(07-6215):193-202.

Evaluation of the Effect of Caring Program Based on Roy Adaptation Model in Physiology and Self-Concept Dimensions on Fatigue of Elderly Cancer Patients Undergoing Chemotherapy

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Abstract

Introduction: Fatigue is one of the complications of chemotherapy. Due to physiological conditions of elderly people, it is followed by several complications. Nursing intervention based on Roy adaptation model is required to reduce these complications.

Objective: Evaluation of the effect of caring program based on Roy adaptation model in physiology and self-concept dimensions on fatigue of elderly cancer patients undergoing chemotherapy

Method: This was a clinical trial study conducted in two groups (65 subjects in each group) undergoing chemotherapy in oncology ward of hospitals affiliated to Shahid Beheshti University of Tehran in 2018. Sampling was performed in 2 stages. First, eligible people were selected by convenient sampling method. Then, they were randomly assigned to intervention and control groups. The research tools included standard multidimensional fatigue inventory and “Roy” adaptation form. In the intervention group, 4 sessions of training were provided to elderly people in accordance with nursing diagnosis. Then, fatigue was followed-up in the two groups and the data were analyzed using SPSS, version 20.

Finding: In this study, no significant difference was observed in the number of chemotherapy courses in the groups before intervention according to chi-square test ($P = 0.667$). Mean score of fatigue according to the paired T-Test was 60.63 ± 5.92 and 58.84 ± 6.28 , respectively, in intervention and control groups before the intervention and it was 50.43 ± 7.42 and 58.46 ± 5.68 , respectively, in intervention and control groups after the intervention (p -value < 0.001).

Conclusion: The caring program based on “Roy” adaptation model was effective in reducing the fatigue of elderly cancer people undergoing chemotherapy.

Keywords: Roy adaptation model, Fatigue, Chemotherapy.

Introduction

Aging is a natural and irreversible process. Nowadays, the number of ageing population in the world will estimate 22% by the year 2050. The reasons for this increase, can be increase in fertility and decrease in mortality ⁽¹⁾. The structural changes in the body of elderly people causes chronic diseases in this group

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of community chronic diseases of the aging include cardiovascular, musculoskeletal diseases, neurological disorders, respiratory problems, cancer, eye disorders, and skin illnesses⁽²⁾. Its even affects on bodys physical and activity and sometimes fatigue⁽³⁾.

Cancer treatment includes surgery, chemotherapy, radio therapy and hormone therapy, or a combination of these method ⁽⁴⁾. The prevalence of cancer-induced fatigue is between 60 to 90% ⁽⁵⁾ fatigue caused following anemia, loss of appetite and weight loss due to this type of treatment⁽⁶⁾.

Nurse for nursing care can use from different model. One of this nursing model is “Roy” adaptation model. For this model, there are three stimulation that include focal, contextual, and residual⁽⁷⁾. The goal of “Roy” adaptation model is intervention in physiological, self-concept, roleplaying and independence dimensions ⁽⁸⁾. In the field of nursing care, different studies have been conducted based on Roy model and its effect on the different dimensions of adaptation has been investigated. In a study conducted on MS patients, it was found that the implementation of the care program based on the Roy adaptation model is effective on effects and severity of fatigue in the MS patient ⁽⁹⁾. In another study, it was found that the implementation of this intervention is effective in reducing fatigue in patients undergoing hemodialysis ⁽¹⁰⁾. The studies conducted in this regard has indicated that implementation of caring program based on “Roy” adaptation model is effective in reducing this complication and this model has not been used so far to control the fatigue of the elderly people undergoing chemotherapy. Hence, the present study was conducted to evaluate the effect of the caring program based on the Roy adaptation model on elderly patients with cancer undergoing chemotherapy in physiological and self-perception dimensions.

Method

This study conducted based on pretest-posttest design in intervention and control groups since June to March 2018. The research population included all elderly patients with cancer undergoing chemotherapy and referred to Oncology Wards in hospitals affiliated to Shahid Beheshti University of Medical Sciences (Emam Hossein, Shohaday-e Tajrish and Ayatollah Taleghani Hospitals). In this study, considering the power of 90% and the first type error of 0/05 in each group, sample size was obtained 60 people, and considering 10% of

the probability of drop out in subjects, 65 people were selected as samples in each group.

$$n = \frac{(\sigma_1^2 + \sigma_2^2) \times \left(z_{1-\frac{\alpha}{2}} + z_{1-\beta} \right)^2}{(\mu_1 - \mu_2)^2} = 65.5,$$

The patients in each of two were not in contact with each group and they did not know in what groups they were. The samples were selected based on inclusion criteria. The inclusion criteria included having an age of 60 years and older, having speaking ability, the possibility of making phone calls and meeting with elderly people, and treatment of them by chemotherapy method.

Exclusion criteria also included: change the treatment from chemotherapy to surgery or radiotherapy, change in the consciousness level during chemotherapy and patient’s withdrawal from cooperation according to his or her self-expression.

The data collection tool included one questionnaire and one patient evaluation form based on “Roy” adaptation model and an informed consent form. The used questionnaire included a Multidimensional Fatigue Inventory (MFI-20). This questionnaire includes 20 items scored on a 5-point Likert scale ranging from 1 (yes, it is quite correct) to 5 (no, it is quite false). The total score of fatigue was between 20 and 100, so that the higher score was the sign of more fatigue.

Based on the Roy form, the subjects were also examined in 2 dimensions (physiologic and self-conception). Based on this form, maladaptation and different types of stimuli were identified.

Sampling was performed in two stages. Initial sampling was performed using convenient sampling method and 130 participants were selected. After introducing the researcher to the staffs of the ward, the patients and their caregivers and having explained the working process, the informed consent form was completed by the elderly people. Then, pre-test was performed to identify the patients who had fatigue based on the MFI in the intervention and control groups. Then, the elderly people whose score was 20 or more than 20 in MFI, were considered as elderly people with fatigue. Then, they were randomly (through flip a coin) divided into two groups (each included 65 subjects) of intervention and control.

In the intervention group, the researcher used the “Roy” adaptation model in the physiology and self-concept dimensions. Based on this form, maladaptive behaviors were examined in these dimensions. Patients’ responses in physiological dimension of the 9 subcategories were as follows: resting and doing activity, nutrition, excretion, oxygen supply, fluids and electrolytes, endocrine glands function, skin consistency, sensation, and neurologic. In the self-concept dimension, the self-objective and the self- subjective were examined. In the self-objective section, questions were asked about the appearance of the dress, changes in the appearance of the patient, client feelings, changes in the appearance, and weight of the patient were asked. In the self-subjective section, questions were asked on on-verbal communication, hairstyles, and nails, attending religious ceremonies and beliefs in general. The questions were open-ended. The data were collected using interviews and observations.

The focal, underlying, and residual stimuli of this maladaptation were identified. Then, nursing diagnosis was written based on maladaptation for the elderly with cancer and the necessary trainings were given for elderly

people during 4 sessions. The training was provided through face to face method, preparation of educational pamphlets, and providing CD for solving the problems caused by chemotherapy and cancer.

Follow-up in both groups was performed by telephone in the first, second, third and fourth weeks after 4 sessions of training. One month after the completion of intervention, post-test was re-taken from patients in control and intervention groups and the data were collected.

Data were analyzed by quantitative data analysis method and using descriptive statistics such as mean, standard deviation, and frequency and inferential statistics of chi-square, paired t-test, Mann-Whitney test, Wilcoxon test, analysis of variance and Kruskal-Wallis test in SPSS software.

Finding: The results showed that there was no significant difference between the intervention and control groups regarding marital status, gender, education level, insurance status, duration of disease, and job (Table 1).

Table 1. Individual characteristics and disease status of the elderly cancer (T: Independent t-test, X²: Chi-square test).

		N (%) Intervention Group	N (%) Control Group	
Marital Status	Married	61(93/8)	61(93/8)	p=0/0264 X ² =2/667
	Spouse deceased and single	4(6/2)	4(6/2)	
Gender	Male	32 (49/2)	33(50/8)	p=0/725
	Female	33 (50/8)	32 (49/2)	
Age (Year)	60-70	44(76/6)	50(76/9)	p=0/315 X ² =2/309 t=0/796
	71-80	17(26/2)	10(15/4)	
	Over 80	4(6/2)	5(7/7)	
Job	Unemployed	13(20)	4(6/2)	P=0/151 X ² =8/105
	Self-employed	11(16/9)	12(18/5)	
	Housewife	40(26)	29(44/6)	
	Employee/worker	1(1/5)	4(6/2)	
	Retired	14(21/5)	16(24/6)	
Level of education	Illiterate	25(38/5)	20(30/8)	P=0/174 X ² =6/356
	Elementary	28(43/1)	21(32/3)	
	Guidance	7(10/8)	13(20)	
	High school	3(4/6)	9(13/8)	
	Academic	2(3/1)	2(3/1)	
number of chemotherapy	once	3(4/6)	4(6/2)	p=0/667 X ² =0/811 T=0/636
	2-4 times	29(44/6)	33(50/8)	
	Over 5 times	33(50/8)	28(43)	

		N (%) Intervention Group	N (%) Control Group	
Duration of disease (month)	Under 1 month	14(21/5)	14(21/5)	P=0/093 X ² =4/744 t=3/37
	1-6 month	47(72/3)	39(60)	
	Over 6 months	4(6/2)	12(18/5)	

Based on the study objectives, the fatigue level of patients undergoing chemotherapy was evaluated using MFI. Based on the results, the pre-intervention fatigue was 60.63 ± 5.92 in the intervention group and 58.84 ± 6.28 in the control group, which were not statistically significant (P-value= 0.53). After implementing the

intervention, fatigue was 50.43 ± 7.42 in the intervention group and 58.46 ± 5.68 in the control group. Given the normality of the data distribution and the independent t-test, the mean fatigue of two groups was significantly different after intervention (p-value ≥ 0.001) (Table 2).

Table 2. Comparison of mean fatigue before and after the intervention

Variable	Group	Intervention	Control	Statistic	P
		Mean ± SD	Mean ± SD		
Level of fatigue based on questionnaire MFI	Before Intervention	5/92 ± 60/63	6/28 ± 58/84	0/79	0/53
	After Intervention	7/42 ± 50/43	5/68 ± 58/46	6/92	0/001
	Statistic	. 10/96	1/33		
	P	0/0010 ≥	0/187		

Based on the “Roy” adaptation form, maladaptation issues such as eating disorders, nausea, vomiting, constipation, weight loss, sleep disturbances, anorexia, pain, dysfunction in social interactions, reduced religious beliefs.

Stimuli such as drug complications, financial problems, anxiety on preparation drug, physical weakness and the fear of falling in bathroom, impatience, unwillingness to attend religious ceremonies due to depression and lack of performing religious practices in the hospital were obtained.

Conclusion

This study was conducted to investigate the effect of caring program based on Roy adaptation model in physiologic and self-concept dimensions on fatigue in elderly patients with cancer undergoing chemotherapy in oncology wards of Imam Hossein, Shohaday-e Tajrish and Ayatollah Taleghani hospitals. According to the results of the present study, the mean fatigue in the elderly patients with cancer undergoing chemotherapy in the intervention group decreased after the intervention

compared to before the intervention, but such significant difference was not seen in the control group. Hence, it can be stated that implementation of care program based on “Roy” adaptation model was effective in reducing fatigue in elderly cancer patients undergoing chemotherapy.

This study show that in older patients, due to the physiological status and underlying comorbidity disease, the rate of maladaptation and fatigue is higher.

Maleki et al. (2016) reported that “ Roy” adaptation model had positive and useful effects in reducing the level of patients’ fatigue with Multiple Sclerosis ⁽¹¹⁾.

Rosinczuk et al. (2015), applying “Roy” adaptation model improved the physiological status of patients with chronic diseases such as MS ⁽¹²⁾. studies and present study have shown that the use of adaptation model is effective on the physiological dimension of patients with chronic MS and Thalassemia major. s.

Ursava et al (2014) reported that applying the “Roy” adaptation model in cancer patients is useful and can help

these patients in different dimensions, including self-concept, role-playing, physiological and independence and dependence. ⁽¹³⁾. In the present study, show that reduce in physiological and self-concept dimensions and indicate that training on fatigue is affect.

One aspect of the “Roy” adaptation model is self-concept. Mohammadpour et al (2015) came to this conclusion that the this model is a low-cost and effective intervention that made adaptation in the self-concept dimension in primiparous women⁽¹⁴⁾.

Hasani et al (2012) found that the this had no effect on self-concept and dependency⁽¹⁵⁾. Azarmi and Farsi (2015) stated that training based on “Roy” model improved the level of physiological adaptation and role-playing in the veterans with limb amputation ⁽¹⁶⁾.

Akyil et al. (2013) showed that the “Roy” adaptation model did not affect the physiological dimensions of patients with chronic obstructive pulmonary disease ⁽¹⁷⁾. Some limitations of this study included individual differences, financial problems, cultural factors, physical and mental problems caused by aging, elderly people impatience in the implementation of the trainings provided for them.

The findings of the results show the effective this model in reducing the fatigue in elderly cancer patients undergoing chemotherapy. It means that this care program as a nursing intervention and a non-pharmacological approach can reduce the fatigue caused by chemotherapy in elderly cancer patients. In addition, using nursing interventions, nurses can help these patients. Implementing a care program based on the Roy Adaptation Model helps nurses easily implement it and empower patients and their families to control this complication. The care program based on “Roy” adaptation model as a non-invasive intervention that its implementation is easy and cost-effective to be used in order to reduce the chemotherapy-induced fatigue in elderly people suffering from cancer.

Conflicts of Interest: The authors of this research announced no conflict of interest for this study.

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Ethical Clearance: This study was derived from a master thesis in elderly nursing. It was approved by Shahid Beheshti University of Medical Sciences,

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Reference

1. Paltasingh T, Tyagi R. Demographic transition and population ageing: Building an inclusive culture. *Social Change*. 2012;42(3):391-409.
2. Habibi A, Nemadi-Vosoughi M, Habibi S, Mohammadi M. Quality of life and prevalence of chronic illnesses among elderly people: A cross-sectional survey. *Journal of Health*. 2012;3(1):58-66.
3. Paice JA, Ferrell B. The management of cancer pain. *CA: a cancer journal for clinicians*. 2011;61(3):157-82.
4. Mustian KM, Sprod LK, Janelins M, Peppone LJ, Mohile S. Exercise recommendations for cancer-related fatigue, cognitive impairment, sleep problems, depression, pain, anxiety, and physical dysfunction: a review. *Oncology & hematology review*. 2012;8(2):81.
5. Berger AM, Mitchell SA, Jacobsen PB, Pirl WF. Screening, evaluation, and management of cancer-related fatigue: Ready for implementation to practice? *CA: a cancer journal for clinicians*. 2015;65(3):190-211.
6. Siegel K, Lekas H-M, Maheshwari D. Causal attributions for fatigue by older adults with advanced cancer. *Journal of pain and symptom management*. 2012;44(1):52-63.
7. Roy C, Whetsell MV, Frederickson K. The Roy Adaptation Model and research: global perspective. *Nursing science quarterly*. 2009;22(3):209-11.
8. Allgood MR. *Nursing Theorists and Their Work-E-Book*: Elsevier Health Sciences; 2017.
9. Hemmati Maslak Pak M, Maleki F. Te e□ect

- of Performance care Plan Based on the Roy Adaptation Model on fatigue in Multiple sclerosis Patients. *scientific Journal of Hamadan nursing & Midwifery faculty* Volume 24, no 3, Autumn 2016. 2016;24(3):185-93.
10. Fazel Asgarpoor A, Amini Z, Zeraati A, Esmaeli H. The effect of a care plan based on the Roy Adaptation Model on level of Fatigue in hemodialysis patients. *Evidence Based Care*. 2011;1(1):77-90.
 11. Maleki F, Khalkhali H, HemmatiMaslak Pak M. Study The Effect Of Performance Roy Adaptation Model On Intensity And Effects Of Fatigue In Multiple Sclerosis Patients. *The J Urmia Nurs Midwifery Fac*. 2016;14(6):571-9.
 12. Joanna R, Rosińczuk J, Aleksandra K, Magdalena G, Izabella U. Application of Callista Roy Adaptation Model in the Care of Patients with Multiple Sclerosis–Case Report. *The journal of neurological and neurological nursing*. 2015;4(3):121-9.
 13. Alimohammadi N, Maleki B, Shahriari M, Chitsaz A. Effect of a care plan based on Roy adaptation model biological dimension on stroke patients' physiologic adaptation level. *Iranian journal of nursing and midwifery research*. 2015;20(2):275.
 14. MOHAMMAD PA, NAJAFI S, TAVAKKOLI ZJ, MOHAMMAD ZF. THE EFFECT OF INTERVENTION BASED ON “ROY” ADAPTATION MODEL ON PERSONAL SELF-CONCEPT IN PRIMI-GRAVIDA WOMEN. 2016.
 15. Hassani P, Otaghi M. Roy adaptation model in hemodialysis patients: a mixed method research. *The Journal of Urmia Nursing and Midwifery Faculty*. 2012;10(4):610-20. (Persian)
 16. Azarmi S, Farsi Z. Roy's Adaptation Model-Guided education and promoting the adaptation of veterans with lower extremities amputation. *Iranian Red Crescent Medical Journal*. 2015;17(10). (Persian)
 17. Akyil RÇ, Ergüney S. R oy's adaptation model-guided education for adaptation to chronic obstructive pulmonary disease. *Journal of Advanced Nursing*. 2013;69(5):1063-75.

Evaluation of Infection Control Measures of Iraqi Dentists in Dental Practices

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Abstract

Objectives: The objective of this study was to investigate the knowledge, attitudes, and behavior of Iraqi dentists in Al-Najaf City regarding infection control measures.

Materials and Method: A questionnaire was designed to obtain information about procedures used for the prevention of cross infection in dental practices. The study population included all dentists in Al-Najaf City, Iraq, in September 2019 (n=500) to whom the questionnaires were distributed. The questionnaire was designed to collect data on sociodemographic characteristics, knowledge and practice of infection control procedures, cleaning, disinfection, sterilization, hand hygiene, use of personal protective equipment, immunization, prevention and handling of occupational hazards, and antisepsis.

Results: From the 500 dentists to whom the questionnaires were submitted, 372 participated in the study (overall response rate 74.4%). Half of the dentists (50%) expressed concern about risks of infection transmitted in dental practices. The rate of vaccination against hepatitis B was good among dentists (76%). Iraqi practitioners widely apply certain basic infection control measures, such as hand washing (85%) and wearing gloves (90%) and face masks (84%), but poorly address other important issues, such as examining medical history records (65%), wearing protective eye wear (41%) and disposable gowns for surgery (30%), and using rubber dam (18%), preoperative mouth rinses (25%) and puncture-resistant containers (34%).

Conclusions: The knowledge, attitude, and behavior of Iraqi dentists about infection control measures are relatively weak. Improved compliance with recommended infection control measures is required for all dentists. Continuing education programs and short courses/workshops about cross infection and infection control measures are important to improve the knowledge, awareness, attitude, and behavior of Iraqi dentists.

Keywords: *Infection control measures, knowledge, attitude, Iraqi dentists.*

Introduction

Infection control is an important concern in all healthcare services worldwide. In dentistry, healthcare workers and patients are vulnerable to different types

of pathogens, such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), mycobacterium tuberculosis, staphylococci, streptococci, herpes viruses, and varicella-zoster virus, during dental procedures through direct contact with blood, oral fluids, saliva, and airborne droplets containing infectious agents or indirect contact with contaminated instruments, equipment, and environmental surfaces (1,2). Health organizations, such as the Center for Disease Control, Occupational Safety and Health Administration, American Dental Association, National Sanitary Department, and National Institute of Health and Clinical Excellence have established precautionary guidelines to

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provide a safe environment and prevent transmission of infections among dental healthcare workers and patients. These guidelines should be followed and applied in all dental activities for all patients regardless of their infection conditions^(3,4,5,6). Several factors, such as knowledge, educational background^(7,8), lack of motive, costs⁽⁹⁾, professional and sociodemographic variables^(10,11), and availability and access to required materials and equipment^(12,13) affect compliance with effective infection control measures by dental healthcare workers. Despite many studies about infection control procedures in several countries, no such research on dental infection control measures has been conducted in Iraq. Consequently, the goal of this study was to evaluate infection control measures of Iraqi dentists in dental practices.

Materials and Method

The study was conducted as a descriptive survey of infection control measures in the dental practices of Iraqi dentists in Al-Najaf City. A self-administered questionnaire was designed to assess the knowledge, attitude, and practices of infection control measures by dentists. The questionnaire was pretested, revised, and retested before use. The study population included all dentists in Al-Najaf City, Iraq, in September 2019 (n=500) to whom the questionnaires were distributed. Three researchers gathered questionnaire data by face-to-face interviews. No tracking system was used to determine who responded to ensure anonymity. The questionnaire used in this study was adapted from similar previous studies^(20,21). Institutional ethical committee approval was obtained before administration of the questionnaire. The questionnaire consisted of 26 questions involving the following: **Part 1** included general information about gender (female/male) and type of practice (general practitioner/specialist). **Part 2** sought infection control knowledge and awareness (sources of infection control knowledge, infectious diseases, transmission of infection, records of patient medical history, and dentist HBV vaccination). **Part 3** recorded hand hygiene practices and use of personal protective equipment (washing hands, using gloves, protective eyewear, mask, head cover, and disposable gowns) and control of aerosol (use of rubber dam, high-volume evacuator, and preoperative mouth rinses). **Part 4** noted practices on cleaning, disinfection, and sterilization of dental instruments and recorded incidences of injuries due to use of sharp objects and use of puncture-resistant containers for disposal of

sharp instruments. Questionnaire data were collected and analyzed using SPSS software version 25/2017. Descriptive statistics included frequency distributions and percentages. Inferential statistics, including Chi-square test, was used to assess statistical significance according to gender and type of practice.

Results

Out of the 500 dentists to whom the questionnaires were distributed, 372 participated in the study, with an overall response rate of 74.4%: 247 (66%) of the respondents were women, and 125 (34%) were men. One hundred sixty (43%) of the respondents were specialists, and 212 (57%) were general practitioners. The sociodemographic characteristics of the participants are shown in (table 1).

Table 1: Sociodemographic characteristics of dentists

Characteristic		N	%
Gender	Female	247	66
	Male	125	34
Type of practice	Specialist	160	43
	General Practitioner	212	57

Table 2: Knowledge, attitude, and behavior of dentists relative to infectious diseases.

Q	N	%
Source of knowledge about infection control		
Dental school courses	190	51
Scientific meetings	89	24
Postgraduate courses	71	19
Dental journals	15	4
Other	7	2
Infectious diseases considered important by the Participants		
HIV(AIDS)	165	44
HBV, HCV	151	41
Mycobacterium tuberculosis	36	10
Neisseria gonorrhoeae	12	3
Treponema pallidum	8	2
Knowledge about transmission of infectious diseases		
Infection can be transmitted in dental practice	186	50
Infection can be transmitted through splatter/splash	110	30
Infection can be transmitted through percutaneous route	76	20

Q	N	%
Asking about medical history		
Yes	242	65
No	130	35
Asking about dentist's vaccination against Hepatitis B		
Yes	281	76
No	91	24

(Table 2) illustrates the knowledge, attitude, and behavior of the participating dentists concerning infectious diseases. The main source of knowledge related to infection control was dental school courses (51%) and scientific meetings (24%). About 44% and 41% of the participants considered HIV and HBV, HCV as the most serious potential threats in dental practices. Half of the participants expressed concern about risks of infection transmitted in dental practices. The mode of transmission through splatter was recognized by

30% of the participants, whereas the percutaneous route was acknowledged by only 20%. About 65% of the participants reported reviewing the medical history of their patients prior to initiating treatment. The rate of vaccination against HBV was good among dentists (76%).

(Figure 1) summarizes the compliance of the surveyed dentists with hand hygiene practices, use of personal protective equipment and aerosol control. Hand washing (85%) and wearing gloves (90%) and face masks (84%) were more widely implemented by most participants, whereas protective eyewear (41%), head covering (22%), and disposable gowns for surgery (30%) were less widely applied. Low rates of using rubber dam (18%) and preoperative mouth rinse (25%) were observed, whereas (73%) of the dentists used high-volume evacuators.

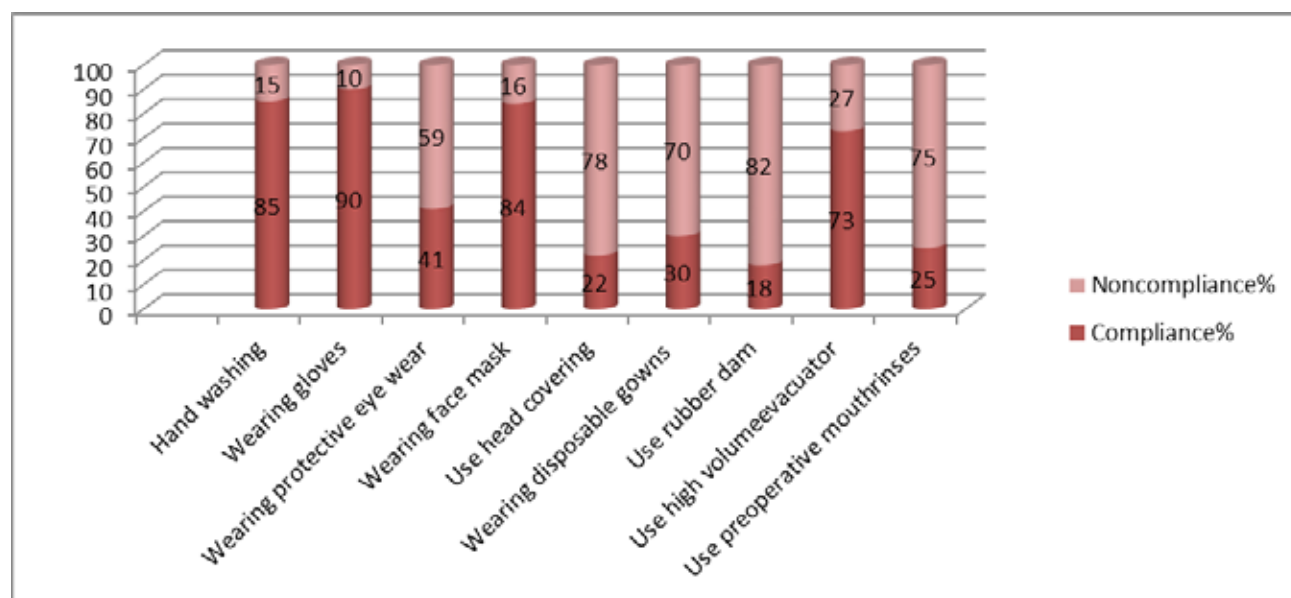


Figure 1: Graph summarizing hand hygiene practices, use of personal protective equipment, and aerosol control.

Table 3 shows the cleaning, disinfection, sterilization practices, the incidence of accidents in using sharp instruments during the previous year, and use of puncture-resistant container for disposal of sharp instruments among dentists. Most dentists (83%) depended on manual washing to clean used instruments. Instruments were immersed in decontaminant solutions mainly before washing (67%). Autoclaving was the preferred means of sterilization (64%), but some dentists still used dry heat sterilizers (36%). Participants used heat sterilization

for burs (49%) and for endodontic files (62%). Nearly half (49%) of the surveyed dentists applied barriers for dental unit surfaces, whereas (41%) used wrapping bags for instrument sterilization. Routine wiping of working surfaces with surface disinfectant was reported by (75%) of the participants. Accidents involving the use of sharp instruments were experienced by more than half of the participants (59%). Special puncture-resistant containers for disposal of sharp instruments were used by (34%) of the surveyed dentists. Potential correlations between

sociodemographic characteristics (gender and type of practice) and HB vaccination, hand hygiene, and use of personal protective equipment were evaluated using Chi-square test (Table 4). Female dentists reported a higher rate of wearing protective eyewear ($p = 0.000$) and face mask ($p = 0.012$) than their male counterparts, whereas general practitioners reported a higher rate of HB vaccination ($p = 0.023$) than specialists.

Table 3: Cleaning, disinfection, sterilization practices, accident of sharp instruments during last year, and use a puncture resistant container.

Q	N	%
Method of cleaning used instruments		
Manual washing	308	83
Ultrasonic cleaner	49	13
Washer disinfectant	15	4

Q	N	%
Timing of immersion of the used instruments in decontaminant solution		
Before washing	249	67
After washing	123	33
Kind of sterilizer used		
Autoclave	238	64
Dry heat	134	36
Use of heat sterilization for burs	182	49
Use of heat sterilization for endodontic files	231	62
Use of wrapping bags for instruments sterilization	152	41
Use of surface barriers for dental unit surfaces	184	49
Use of any surface disinfectant for routine wiping	279	75
Any accident of sharp instruments during last year	219	59
Use a puncture resistant container for sharp instruments	127	34

Table 4: Correlations between sociodemographic characteristics (gender and type of practice) with HB vaccination, hand hygiene and use of personal protective equipment.

Q	Females		Males		Comparison		Specialist		General Practitioner		Comparison	
	N	%	N	%	X ²	p-value	N	%	N	%	X ²	p-value
Dentist's HB vaccination	185	66	96	34	0.162	0.687	130	46	151	54	4.958	0.023
Hand washing	216	68	100	32	3.602	0.058	140	44	176	56	1.432	0.231
Wearing gloves	225	67	110	33	0.887	0.346	144	43	191	57	0.001	0.974
Wearing protective eye wear	120	79	31	21	19.468	0.000	70	46	81	54	1.162	0.281
Wearing face mask	215	69	96	31	6.354	0.012	136	44	175	56	0.400	0.527
Wearing disposable gowns	75	68	36	32	0.097	0.755	52	47	58	53	1.157	0.282

Discussion

Dentistry is a profession that involves constant risk of exposure to various environmental and human infectious agents that can be transmitted through blood, oral and oropharyngeal secretions, air, and water⁽¹⁴⁾. Contamination can affect dentists, patients, and even members of their family. Occupational hazards involving blood and other organic fluids account for the most frequent exposure, resulting in a high risk of contracting diseases, such as HIV, HBV, HCV, mycobacterium tuberculosis, staphylococci, streptococci, herpes viruses, and other viruses and bacteria^(15,16). Given these facts, we highlighted several actions that must be applied to reduce the risks in dental practices: (I) cleaning, disinfection, and sterilization; (II) hand hygiene practices and use of

personal protective equipment; (III) immunization; (IV) prevention and handling of occupational hazards; and (V) antisepsis^(17,18).

In this study, Iraqi practitioners widely applied certain basic infection control measures, such as hand washing (85%), wearing gloves (90%) and face masks (84%), and using high-volume suction (73%) but poorly addressed other important issues, such as reviewing medical history records (65%); wearing protective eyewear (41%), head covering (22%), and disposable gowns for surgery (30%); sterilization of burs (49%) and endodontic files (62%); and using wrapping bags for instruments (41%), surface barriers for dental unit surfaces (49%), rubber dam (18%), preoperative mouth rinses (25%), and puncture-resistant containers (34%).

Similar findings are reported by previous studies. For example, Al Rabeah and Mohamed⁽¹⁹⁾ showed that all dentists in Riyadh use gloves, 90% wear masks, 49.8% use high-volume suction, and 56.20% utilize puncture-resistant containers. Yuzbasioglu et al.⁽²⁰⁾ stated that 5.20% of Turkish dentists prefer rubber dam, 13.90% apply pre-procedural mouth rinses, 41.60% use high-volume suction, and 37.80% utilize puncture-resistant containers. Dagher et al.⁽²¹⁾ reported that dentists in Lebanon wear gloves (92.4%), masks (89.1%), and eyewear (45.7%) and use rubber dam (20.8%), preoperative mouth rinses (51.0%), and high-volume evacuators (71.4%). In this study, 44% of the surveyed dentists considered HIV as the most worrisome infectious disease; by comparison, 41% considered HBV as the most serious infectious disease. However, the risk of acquiring HBV is reportedly considerably greater than that of HIV among non-immune dental anesthesiologists⁽²²⁾ and the mortality risk of HBV infection is greater than that of HIV⁽²³⁾. Although the microorganisms listed in Table 2 are important in dental practice, the dentists that participated in this survey had inadequate knowledge of the risks they pose. Half of the surveyed dentists were aware of infectious risks associated with dental procedures and had good rate of HBV vaccination (76%) comparable with those observed in developed countries⁽²¹⁾. The wide application of manual washing to clean used instruments (83%) is likely associated with incidences of accidental percutaneous injuries (59%) among the surveyed dentists. However, adherence to several specific infection control practices, such as use of protective eye wear and wearing face mask, is remarkably different between genders, with women showing better compliance than their male counterparts. This finding coincides with the results of previously published surveys⁽¹¹⁾. With regard to HB vaccination, general practitioners showed better compliance than specialists because HB vaccine in Iraq is usually available in governmental dental health centers where general practitioners work. Thus, obtaining vaccines is easier for general practitioners than for dental specialists.

Conclusion

The knowledge, attitude, and behavior of Iraqi dentists about infection control measures are relatively weak. This situation indicates that cross infection control topics do not elicit interest among dentists, or a deficiency exists in continuing dental education on how to avoid cross infection in dental practices. Further studies should be designed to identify the reasons.

Improved compliance with recommended infection control measures is required for all dentists. Continuing education programs and short courses/workshops about cross infection and infection control procedures are important to improve the knowledge, awareness, attitude, and behavior of Iraqi dentists.

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References

1. Kohn W G, Collins A S, Cleveland J L, Harte J A, Eklund K J and Malvitz D M. "CDC centers for disease control and prevention guidelines for infection control in dental health care settings," *MMWR Recommendations and Reports*, 2003.vol. 52(RR-17), pp. 1–61,.
2. Laheij A M G A, Kistler J O, Belibasakis G N, " Alimaa H V, and De Soet J J, "Healthcare-associated viral and bacterial infections in dentistry," *Journal of Oral Microbiology*,. 2012. vol. 4, Article ID 17659.
3. OSHA Occupational Safety and Health Administration, "OSHA instruction bloodborne pathogens exposure control plan and guidance on post-exposure evaluations for federal osha personnel," Directive no. CPL 02-02-077, 2010.
4. American Dental Association, ADA Guidelines for Infection Control, ADA Science Institute, 2016.
5. National Institute for Health and Care Excellence (NICE), Evidence-Based Information for Health, Public Health and Social Care Professionals, NICE Organization, 2016.
6. Australian guidelines for the prevention and control of infection in healthcare. NHMRC guidelines. CD33, 2010.
7. Tada A, Watanabe M, and Senpuku H, "Factors influencing compliance with infection control practice in Japanese dentists," *The International Journal of Occupational and Environmental Medicine*. 2014. vol. 5, pp. 24–31,.
8. Ebrahimi M, Ajami B M, and Rezaeian A . "Longer years of practice and higher education levels promote infection control in Iranian dental practitioners," *Iranian Red Crescent Medical Journal*, 2012. vol. 14, pp. 422–429.

9. AlShatrat S M, Shuman D, Darby M L and Jeng H A. "Jordanian dentists' knowledge and implementation of ecofriendly dental office strategies," *International Dental Journal*, 2013.vol. 63, no. 3, pp. 161–168.
10. Cheng H C, Su C Y, Huang C F and Chuang C Y. "Changes in compliance with recommended infection control practices and affecting factors among dentists in Taiwan," *Journal of Dental Education*. 2012., vol.76, pp.1684–1690,
11. Breda-Albuquerque F, deFarias A B, doPrado M G and Orestes Cardoso S. "Influence of clinicians' socio-demographic, professional and educational variables on their compliance with preventive measures against hepatitis B and C," *Oral Health and Preventive Dentistry*. 2008. vol.6, pp.349–354,
12. Puttaiah R, Miller K, Bedietal R. "Comparison of knowledge, attitudes and practice of dental safety from eight countries at the turn of the Century," *Journal of Contemporary Dental Practice*. 2011. vol. 12, no. 1, pp.1–7,
13. Oosthuysen J, Potgieter E and A. Fossey, "Compliance with infection prevention and control in oral health-care facilities: a global perspective," *International Dental Journal*. 2014. vol. 64,no.6, pp. 297–311.
14. Zenkner C L. Infecção cruzada em odontologia: Riscos e diretrizes. *Revista de Endodontia Pesquisa e Ensino On Line*. Jan-Jun .2006. 2(3)
15. Cavalcante NJF, Monteiro ALC, Barbieri DD. *Biossegurança. Atualidades em DST/AIDS*. 2ª ed. São Paulo: Programa Estadual de DST/AIDS da Secretaria do Estado da Saúde de São Paulo; 2003. 80 pp.
16. Brasil. Ministério da Saúde. Secretaria de Políticas de Saúde. Coordenação Nacional de DST e AIDS. *Controle de infecções e a prática odontológica em tempos de AIDS: manual de condutas – Brasília: Ministério da Saúde; 2000. 118 pp.*
17. Guimarães JJ. *Biossegurança e controle de infecção cruzada em consultórios odontológicos*. 1ª ed. São Paulo: Santos; 2001. 536 pp.
18. Lockhart PB, Loven B, Brennan MT, Fox PC. The evidence base for the efficacy of antibiotic prophylaxis in dental practice. *J Am Dent Assoc*. Apr 2007; 138(4):458-74.
19. Al-Rabeah A, Mohamed AG. Infection control in the private dental sector in Riyadh. *Ann Saudi Med*. 2002;22(1-2):13-7.
20. Yuzbasioglu E, Sarac D, Canbaz S, Sarac S, Cengiz S, "A survey of cross-infection control procedures: knowledge and attitudes of Turkish dentists," *Journal of applied oral science*. 2009; 17(6):565-569.
21. Dagher J, Sfeir Ch, Abdallah A, Majzoub Z, "Infection Control Measures in Private Dental Clinics in Lebanon," *International Journal of Dentistry*. 2017; Article ID 5057248,1-11.
22. Suljak J P, Leake JL and Haas DA. "The occupational risk to dental anesthesiologists of acquiring 3 bloodborne pathogens.," *Anesthesia Progress*. 1999; vol. 46,no.2,pp.63–70,
23. Capilouto E I, Weinstein M C, Hemenway D, and Cotton D. "What is the dentist's occupational risk of becoming infected with hepatitis Bor the human immunodeficiency virus?" *American Journal of Public Health*, 1992; vol.82,no.4,pp.587–589,

Evaluation of Reproductive Hormones in Patients with β -Thalassemia Major in Misan Province, Iraq

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Abstract

Assessment of serum ferritin, FSH, LH, estradiol, testosterone levels in β -thalassemia major patients. A total 50 (30 male and 20 female) children with β -thalassemia major patients with ages range 11- 16 years and 50 age and sex matched healthy adolescents as control group were included in this study. The study subjects divided into 2 more subgroups: 11-13 years, and 14-16 years to measure mean serum ferritin, FSH, LH, testosterone, estradiol hormones. There was significant increase ($P < 0.05$) in serum ferritin level in male and female patients as compared to control groups. Male patients have significant decreased ($P < 0.05$) serum levels of FSH, LH, testosterone and estradiol, while female patients have non-significant ($P > 0.05$) high serum FSH and testosterone levels, but LH, estradiol levels were non-significant ($P > 0.05$) low as compared to control. In age subgroup 11–13 years, male patients have significant ($P < 0.05$) decreased reproductive hormones levels as compared to control, however in 14 – 16 years subgroups serum FSH, LH and estradiol levels in male patients were significantly decreased as compared to control ($P < 0.05$), whereas, hormones levels in female patients didn't show significant differences in comparison to female control in both age subgroups ($P > 0.05$). Serum ferritin had an inverse correlation with serum FSH, LH, testosterone, estradiol hormones levels. Patients with β -thalassemia major have iron overload with inverse correlation between gonadal hormones and serum ferritin.

Keywords: *β -thalassemia major, serum ferritin, reproductive hormones.*

Introduction

Beta-thalassemia is a hereditary blood disorder characterized by reduced (β^+) or absent (β^-) synthesis of the beta globin chains of the hemoglobin, resulting in reduced hemoglobin in red blood cells, decreased red cells production and anemia^[1].

Before the introduction of regular blood transfusion and before the availability of iron chelation therapies β -thalassemia major patients died within the first few

years^[2,3]. This bad prognosis changed since the survival rates, and life expectancy started to improve progressively and patients may survive until 4th-5th decades due to the implementation of continuous and significant advent of diagnostic and therapeutic method, consisting mainly of an intensive transfusion program combined with chelation regimes and imaging method^[4,5,6,7].

The most serious disadvantage of life-saving transfusions is the inexorable accumulation of iron within tissues and high incidence of endocrine abnormalities in children, adolescents and young adults^[4,5].

Hypothalamic-pituitary-gonadal (HPG) dysfunctions are the most frequently registered endocrine complication in β -thalassemia major despite regular transfusions and optimal chelation therapy ranges between 30 and 80% of patients^[5,8].

The current study was designed for assessment of

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serum ferritin and reproductive hormones (FSH, LH, estradiol, testosterone) in β -thalassemia major patient.

Materials and Method

Over a six-month period, from 1st of December 2018 to the 31st of May 2019, a total 50 (30 male and 20 female) children with β -thalassemia major patients with ages range between 11 to 16 years attended Misan Thalassemia Center, and an equal number of age and sex matched healthy adolescents as control group were included in this case control study. The cases and control were further divided into 2 more subgroups based on age from 11-13 years, and 14-16 years to measure the serum ferritin, FSH, LH, testosterone, and estradiol. The assay principle combines an enzyme immunoassay sandwich

method with a final fluorescent detection Enzyme Linked Fluorescent Assay (ELFA) was used [9, 10, 11].

Statistical analyses were reports as mean estimation \pm standard error, t test, and correlation using Statistical Package for Social Science (SPSS) version 23 for windows.

Results

The present study revealed a highly significant increase ($P < 0.05$) in serum ferritin level (4094.78 ± 492.55 ng/ml) in male and female (3603.20 ± 564.88 ng/ml) patients in comparison to male and female in control groups (94.96 ± 8.17 ng/ml, 74.82 ± 6.44 ng/ml respectively), (table 1).

Table (1): Comparison of serum ferritin in control and β -thalassemia patients regarding gender

Variable	Gender	Control Group	Patients Group	P Value	T test
Ferritin (ng/ml)	Male	94.96 \pm 8.17	4094.78 \pm 492.55	0.000	8.119
	Female	74.82 \pm 6.44	3603.20 \pm 564.88	0.000	6.246

Value represented mean \pm SE.

According to the age subgroups in control and patients groups, male patients in both age subgroups have a highly significant increase ($P < 0.05$) in serum ferritin level (11–13 years = 3716.03 ± 535.76 ng/ml, and 14-16 years = 4473.50 ± 835.21 ng/ml) in comparison to male control groups (86.86 ± 10.51 ng/ml, and 103.07 ± 12.53

ng/ml respectively), and so female patients in both age subgroups have a high statistically significant increase ($P < 0.05$) in serum ferritin (11-13 years = 3894.90 ± 894.56 ng/ml, and 14-16 years = 3311.40 ± 726.72 ng/ml) as compared to controls, (table, 2).

Table (2): Serum ferritin value according to gender and age groups in control and β -thalassemia patients

Variables	Gender	Age	Control Group	Patients Group	P Value	T test
Ferritin (ng/ml)	Male	11-13	86.86 \pm 10.51	3716.03 \pm 535.76	0.000	6.773
		14-16	103.07 \pm 12.53	4473.50 \pm 835.21	0.000	5.232
	Female	11-13	79.77 \pm 8.45	3894.90 \pm 894.56	0.000	4.265
		14-16	69.88 \pm 9.91	3311.40 \pm 726.72	0.000	4.460

Value represented mean \pm SE.

The results of our study revealed male patients have highly significant ($P < 0.05$) decreased levels of serum FSH (1.52 ± 0.26 mIU/ml), LH (0.92 ± 0.16 mIU/ml), testosterone (1.31 ± 0.20 ng/ml) and estradiol (23.67 ± 3.54 pg/ml) levels in comparison to male patients in control group. However, in female serum FSH

(3.38 ± 0.60 mIU/ml), and testosterone (1.08 ± 0.20 ng/ml) in patients was not significantly high as compared with control group ($P > 0.05$), while serum LH (2.54 ± 0.78 mIU/ml), and estradiol (48.13 ± 6.57 pg/ml) levels were not significantly low in patients in comparison to control ($P > 0.05$), (table, 3).

Table (3): Comparison the values of reproductive hormones in control and β -thalassemia patients regarding gender

Hormone	Gender	Control Group	Patients Group	P Value	T test
FSH (mIU/ml)	Male	2.67±0.17	1.52±0.26	0.000	3.688
	Female	2.72±0.21	3.38±0.60	0.316	1.015
LH(mIU/ml)	Male	2.64±0.20	0.92±0.16	0.000	6.560
	Female	2.73±0.18	2.54±0.78	0.806	0.248
Testosterone(ng/ml)	Male	5.64±1.62	1.31±0.20	0.01	20649
	Female	0.80±0.10	1.08±0.20	0.225	1.233
Estradiol (pg/ml)	Male	54.79±5.18	23.67±3.54	0.000	4.957
	Female	72.92±17.83	48.13±6.57	0.200	1.305

Value represented mean \pm SE.

Regarding age subgroups; (table 4) showed that there were significant ($P < 0.05$) decreased levels of serum FSH (1.47±0.39mIU/ml), LH (0.88±0.25 mIU/ml), testosterone (1.40±0.37 ng/ml), and estradiol (23.89±5.13 pg/ml) in male patients compared with control in 11 – 13 years subgroups, and so in female of same age subgroup serum FSH (2.71±0.84 mIU/ml), LH (1.24±0.42 mIU/ml), and estradiol (59.45±9.42 pg/ml) levels were decrease in patients as compared with control, but FSH and estradiol levels had no significant ($P>0.05$) difference, while testosterone level in female patients group (1.52±0.31 ng/ml) was higher than in control (0.92±0.12 ng/ml) without significant difference ($P>0.05$).

In 14 – 16 years subgroups our results showed that serum FSH, LH and estradiol levels in male patients were significantly ($P<0.05$) decreased (1.57±0.35 mIU/ml, 0.96±0.20 mIU/ml, and 23.44±5.06 pg/ml respectively), as so testosterone level (1.21±0.17 ng/ml) was lower but without significant difference ($P >0.05$) as compared with male controls (2.66±0.26 mIU/ml, 2.63±0.32 mIU/ml, 58.85±8.40 pg/ml and 7.30±3.21 ng/ml respectively). While in female of same age subgroup serum FSH (4.06±0.88 mIU/ml), and LH (3.83±1.41mIU/ml) levels have non-significant differences in comparison to control ($P>0.05$), but testosterone (0.65±0.18 ng/ml) and estradiol (36.81±8.06 pg/ml) levels were measured not significantly differed in female patients compared to same gender of control group ($P>0.05$), (table, 4).

Table (4): Evaluation of reproductive hormones values according to gender and age groups in control and β -thalassemia patients

Hormone	Gender	Age	Control Group	Patients Group	P Value	T test
FSH(mIU/ml)	Male	11-13	2.67±0.24	1.47±0.39	0.014	2.630
		14-16	2.66±0.26	1.57±0.35	0.019	2.496
	Female	11-13	3.06±0.35	2.71±0.84	0.706	0.002
		14-16	2.39±0.20	4.06±0.88	0.081	1.849
LH (mIU/ml)	Male	11-13	2.65±0.27	0.88±0.25	0.000	4.721
		14-16	2.63±0.32	0.96±0.20	0.000	4.401
	Female	11-13	2.64±0.18	1.24±0.42	0.007	3.022
		14-16	2.82±0.32	3.83±1.41	0.499	0.690
Testosterone (ng/ml)	Male	11-13	3.98±0.45	1.40±0.37	0.000	4.391
		14-16	7.30±3.21	1.21±0.17	0.069	1.891
	Female	11-13	0.92±0.12	1.52±0.31	0.093	1.776
		14-16	0.68±0.16	0.65±0.18	0.895	0.133

Hormone	Gender	Age	Control Group	Patients Group	P Value	T test
Estradiol (pg/ml)	Male	11-13	50.73±6.19	23.89±5.13	0.002	3.337
		14-16	58.85±8.40	23.44±5.06	0.001	3.609
	Female	11-13	93.93±34.21	59.45±9.42	0.344	0.972
		14-16	51.91±8.58	6.81±8.06	0.216	1.282

Value represented mean±SE

Serum ferritin as a dependent variable had an inverse correlation with serum FSH, LH, testosterone, and estradiol levels, (table, 5).

Table (5): Correlation between serum ferritin levels versus reproductive hormones levels in β-thalassemia major Patients

Variables	Ferritin	Testosterone	Estradiol	FSH	LH
Testosterone	-.123	1			
Estradiol	-.023	.000	1		
FSH	-.135	-.043	.044	1	
LH	-.124	-.033	-.011	.676*	1

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

Although blood transfusions are crucial in the survival of β- thalassemia major, but the most serious disadvantage of life-saving transfusions is the inexorable accumulation of iron within tissues, and excess iron is extremely toxic to all cells of the body and can cause serious and irreversible end-organ damages as these β-thalassemia major children grow into adolescence and adulthood if untreated^[12,13].

In Iraq thalassemia is a serious and real public health problem due to the unavailability of equipment and drugs during different periods of unrest and war and calls for an effective management plan, including public health education programsto facilitate early diagnosis and treatment^[14,15,16].

Our study results showed that our patients have a high significant increase in serum ferritin levels among male and female patients compared with same genders in control group. This high serum ferritin level most likely due to frequent blood transfusions and hemolysis of red blood cells. Leechoenkiat *et al*^[12] and Gardenghi *et al* ^[14] mentioned iron overload in β-thalassemia major patients as predicted by high serum ferritin level due to frequent blood transfusions, hemolysis of red blood cells, and increased gastrointestinal iron absorption due to paradoxical hepcidin suppression from dyserythropoiesis.

In agreement to our findings Yamanet *al*^[7] and Abdulzahra *et al*^[18] found a significant increase in serum ferritin in thalassemia major patients in comparison with control children. As well as, Majeed^[15] found a highly statistical significant increase in serum ferritin in male and female β-thalassemia major patients in comparison with control group.

Endocrine glands have extreme sensitivity to iron toxicity, because they have high levels of transferrin receptors that promote iron accumulation and hence increase vulnerability of these glands to iron toxicity. Iron stored in endocrine glands binds to intracellular transferrin and as the storage capacity of transferrin gets exceeded, pathological quantities of metabolically active iron catalyses formation of free radicals^[6,19,20]. Joshi and Phatarpekar^[21] mentioned most of the endocrine abnormalities in developed countries were after ten years of age, but in developing countries it is possible to have a high prevalence of endocrine complications at an early age due to suboptimal of transfusions and chelation therapy.

Analysis of our study documented abnormalities in gonadal hormones. Compared to healthy male control group, male patients group have significantly lower mean serum levels of FSH, LH, testosterone and estradiol. While female patients as compared to female control have statistically non-significant higher levels of

FSH and testosterone, but LH and estradiol levels were decreased without significant effect.

Regarding age subgroups, female patients have non-significant increased level of FSH, LH in 14 – 16 years, and so increased level of testosterone in 11 -13 years subgroup as compared to controls, while male patient have significant decreased levels of FSH, LH, testosterone and estradiol in both age subgroups, but testosterone level in age 14 – 16 years had non-significant effect as compared to respective gender in same age subgroups, (table 4).

In comparison to current results, Sutayet *al*^[22] in their study found the difference was not significant in the FSH levels in the age group of 8-12 years, and the FSH values of cases >12 years were significantly lower than those of controls, but LH values were significantly lower in patients as compared to control in both age groups, and estrogen values were significantly lower in thalassemia patients as compared to control in both age groups. As well as, they found FSH, LH and estrogen levels were significantly lower in the girls with thalassemia as compared to control in age group of 12-16 years. While, Vahidi *et al*^[23] found that mean levels of FSH and LH were significantly lower in cases than in controls for boys and girls, and mean testosterone levels were significantly depressed in male thalassemia major patients compared to controls, moreover a lower level of estradiol in female patients compared to female controls.

However, Majeed^[15] reported that the mean of FSH levels in healthy male in control group were higher than patients group, but FSH levels of male and female patients were significant lower than the corresponding values in the healthy and the level of LH in male patients and control groups were comparable. While the values of estradiol, and testosterone in patients group were significant lower than in the control group.

Moreover, Yenzeel and Salih^[16] reported a significant decrease in the levels of FSH, LH, and estradiol hormones when compared to control in their study of female β -thalassemia major patients.

Our study results indicated that serum ferritin had an inverse correlation with FSH, LH, estradiol, and testosterone hormones levels. These findings highlight the importance of iron overload in the development of endocrinopathy in the β -thalassemia major patients, due to iron deposition in secretory cell of endocrine glands leading to impairment of gonadal hormones.

In agreement to our finding, Hagag *et al*^[24] observed significant negative correlations between FSH, LH, and estrogen levels with serum ferritin level, while Abdulzahra *et al*^[18] observed significant correlation between serum ferritin with LH and FSH levels, but no significant correlation between serum ferritin with testosterone level.

Conclusion

There was a highly significant increase in serum ferritin level β - thalassemia major patients in comparison to control groups. Male patients have highly significant decreased levels of serum FSH, LH, testosterone, and estradiol. While female patients have non-significant high serum FSH and testosterone levels, but LH and estradiol levels were non-significant low in comparison to control.

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References

1. Cao A and Galanello R. Beta-thalassemia. *Genet Med.* 2010; 12(2):61-76.
2. Modell B, Khan M, and Darlison M. Survival in beta-thalassaemia major in the UK: data from the UK Thalassaemia Register. *Lancet.* 2000; 355(9220):2051-2.
3. Lubis DA and Yunir EM. Endocrinopathies in thalassemia major patient. (IOP) Conference Series: Earth Environ. Science. 2018; 125:1-5.
4. Hamidi Z. Endocrine Disorders in Thalassemia Major Patients: A Review. *Kuwait Med. J.* 2016; 48(1): 4-11.

5. De Sanctis V. Endocrine complications. *Thalassemia Reports*. 2018;8(7479): 33-36.
6. Singh P and Seth A. Growth and endocrine issues in children with thalassemia. *Pediatric Hemat. Oncol. J*. 2017;2: 98-106.
7. Yaman A, Isik P, Yarali N, Karademir S, Cetinkaya S, Bay A, et al. Common Complications in Beta-Thalassemia Patients. *Intern. J. Hemat. Oncol*. 2013;3(23):193-99.
8. Parijat De, Mistry R, Wright C, Pancham S, Burbridge W, Gangopadhyay K, et al. A Review of Endocrine Disorders in Thalassemia. *Open J. End. Metab. Dise*. 2014;4:25-34.
9. Challand GS, Mickaeloudis A, Watfa RR, Coles S J, and Macklin JL. Distribution of haemoglobin in patients presenting to their general practitioner, and its correlation with serum ferritin. *Ann Clin Biochem*. 1990; 27:15-20
10. Gray CH, and James VHT. *Hormones in Blood*. London; Academic press Inc; 1983.
11. Vesper HW, Botelho JC, and Wang Y. Challenges and improvements in testosterone and estradiol testing. *Asian J Androl*. 2014;16(2):178–184.
12. Leecharoenkiat K, Lithanatudom P, Sornjai W, and Smith DR. Iron dysregulation in beta-thalassemia. *Asian Pac J Trop Med*. 2016; 9(11):1035-1043
13. Khan H, Kamran M, Ubaidullah, Masood T, Ahmed J, Shah S, et al. Hypogonadism In Multiply Transfused β - Thalassemia Syndrome Patients. *ABMS*. 2017;1(2): 55-60.
14. Hassan MK, Taha JY, Al-Naama LM, Widad NM, and Jasim SN. Frequency of haemoglobinopathies and glucose-6-phosphate dehydrogenase deficiency in Basra. *East Mediterr Health J*. 2003; 9(1-2):45-54.
15. Majeed MS. Evaluation of some Biochemical and Endocrine Profiles in transfusion dependent Iraqi major β -thalassemia patients. *Iraqi J.Sci*. 2017; 58(2A):639-645.
16. Yenzeel JH and Salih LA. Effect of Beta-Thalassemia Major on Reproductive Hormones Levels and Ovarian Status in Sample of Iraqi Female. *I.J.S.N*. 2017; 8(3) 2017:500-504
17. Gardenghi, S., Grady, R. and Rivella, S. Anemia, Ineffective Erythropoiesis, and Hcpcidin: Interacting Factors in Abnormal Iron Metabolism Leading to Iron Overload in β -Thalassemia. *Hematol Oncol Clin North Am*. 2010. 24(6):1089-107.
18. Abdulzahra MS, Al-Hakeim HK, and Ridha MM. Study of the effect of iron overload on the function of endocrine glands in male thalassemia patients. *Asian J Transfus Sci*. 2011;5:127-31.
19. Merchant RH, Shirodkar A, and Ahmed J. Evaluation of growth, puberty and endocrine dysfunctions in relation to iron overload in multi transfused Indian thalassemia patients. *Indian J Pediatr*. 2011;78(6):679-83.
20. Shalitin S, Carmi D, Weintrob N, Phillip M, Miskin H, Kornreich L, et al. Serum ferritin level as a predictor of impaired growth and puberty in thalassemia major patients. *Eur J Haematol*. 2005;74(2):93-100.
21. Joshi R and Phatarpekar A. Endocrine abnormalities in children with Beta thalassaemia major. *Sri Lanka J. Child Health*, 2013;42: 81-86.
22. Sutay NR, Karlekar MJ, and Amit J. Growth And Puberty In Girls With B-Thalassemia Major And It's Correlation With Chelation Therapy And Serum Ferritin Levels. *Ann. Intern. Med. Dental Rese*. 2017;3(3):16-21.
23. Vahidi AA, Torabinejad MH, Ahmadi A, Farahmandinia Z, Moghaddam GK, and Meghdadi B. Across-Sectional Controlled Study of Gonadal Function and Pubertal Developmental in Thalassemia Major. *M.J.I.R.I*.2003;17(1):5-10.
24. Hagag AA, Badraia IM, Elfarargy MS, and Abo El-Enein AM. Gonadal Hormones in Adolescent Females with β -Thalassemia in Relation to Iron Load. *Endocr. Metab. Immune. Disord. Drug Targets*. 2016; 16(2):148-153.

Half Beam Technique in Patient with Left Breast Cancer and Evaluate its Dosimetry Parameters from Dose-volume Histograms

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Abstract

Using of 3DCRT for the treatment of left breast cancer by a single isocenter with half beam in the junction of tangential and supraclavicular fields is an important method. The purpose was to evaluate the outcome of Radiation Treatment Plans (RTP) that includes planning target volume (PTV) dose, conformity index (CI), homogeneity index (HI), organs at risk (OAR), and compared with tolerance doses of left-sided whole breast irradiation by half beam technique. Thirteen patients with left breast cancer who had received radiotherapy by using 6, 10, and 18 MV photons. The clinical target volume [CTV] was contoured as a target volume, and left lung, right lung, heart, and spinal cord tissues as OAR planning technique was analyzed at Zhianawa cancer center (ZCC), Sulaimany-KR-Iraq. There was No risk for 12 patients CI (<1), accept patient No. (6) CI>1. the PTV was under coverage (4060±32.116 cGy), was close to 4005 Gy volume. The left lung, and right lung mean dose was (33.923, 1018.231cGy < tolerance mean Dose (4000 cGy), and for Lt lung Dose V20 < 30 cGy. Heart Dose V35 (2.354) <20Gy, and Heart mean Dose (cGy)Dose was (358.308 cGy) < tolerance mean Dose (2600 cGy). Cord Max dose was (682.692cGy) < 2000. the Dose mean value of esophagus was (29,077)cGy was <3400 (Esophagus Tolerance mean dose (cGy). The application of left breast cancer provides significant advantages especially in PTV and OAR dosages.

Keywords: Radiotherapy, breast cancer, tolerance doses.

Introduction

Three Dimensional Conformal Radiotherapy (3DCRT) technique is an external beam radiotherapy that can deliver more precise doses. (3D-CRT) consists of 3D images That are produced by (CT scan). The 3DCRT is able to shape the Radiotherapy Beam to closely match the tumor shape and size. Radiation is delivered by using

irregular beams with homogeny intensity according to the target shape, which conforms with the irradiated volume of the target shape¹.

The supra-clavicular, internal mammary fields and tangents are set as half beams (use of asymmetric jaws) so that there is no divergence at the junction. Planning was set as supraclavicular area half beam. Table and collimator angles were not added to provide field overlap. The gantry angle was provided to extract the esophagus out of the field. In patients with location in the left breast². The purpose of this study was to verify and evaluate between the outcome of Radiation Treatment Plans (RTP) of left-sided whole breast irradiation by half beam technique, to organs at risk (OAR) that included left lung, right lung, heart, and spinal cord by different numbers of beam in left sided breast. These were then compared with tolerance doses.

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Material and Method

Patients: Thirteen patients with left-sided, breast carcinoma who had received radiotherapy were selected for this study. The dose prescriptions for the patients were different according to each patient's cancer stage.

Optima CT Scanner: Breast cancer treatment often uses Optima CT 580 RT (general electric Healthcare -USA) 80cm big bore CT-Scanner. This device is often employed in radiotherapy, with a flat RT couch^{3,4}.

Xio Treatment Planning System: Xio is a radiotherapy planning software system designed by CMS-Elekta for contouring, 3DCRT planning. All (pencil beam, convolution, and super position) algorithms can be used with Xio (Elekta Product. version 5.00.01)⁵.

The Xio which used is predicated on a network of three main high performance computers (Quad-core Intel xeon 2.93GHz processor, 24GB DDR3 RAM, 4TB Storage) that is connected with the center's main network.

Elekta Synergy Linac: Elekta Synergy Linac (2013, UK) utilises three photon energies (6, 10 and 18MV) and 8 electron energies (4, 6, 8, 10, 12, 15, 18 and 22MeV). Each leaf is 1cm width and can access a maximum field size of 40x40 cm at SSD 100cm⁵.

Method

Patient Selection: Radiotherapy using 3DCRT was used on thirteen patients with early-stage left-sided breast cancer. This study was performed on a linear accelerator machine type Elekta Synergy, 2013. The Elekta Synergy linac consists of 3 photon energies (6, 10, and 18MV).

Simulation: All patients underwent Computed Tomography (CT) simulation. The patients' left and right arms were positioned above their heads. Tattoos and markers were used during the pretreatment procedure. Scanning was performed in 2.5-mm slices from the clavicle to the mid-abdomen during free-breathing⁶.

The Clinical Target Volume (CTV) for the tumor was contoured. Additionally, the Planning Target Volume (PTV) was constructed by adding 5-mm margins and editing 5-mm of the build-up region from the breast skin surface.

Plan Evaluation: In current radiation therapy, physical dose indices, such as isodose distribution charts

and mean doses, (DVHs), are invariably employed for treatment plan evaluation.

DVH created for the planning method as well as several quantitative evaluation tools were reviewed for plan evaluation. These included target volume coverage, (HI), (CI), and OAR dose, maximum dose, mean dose by half beam technique and then compared with tolerance doses.

Conformity Index (CI): Conformity index (CI) is defined as the ratio between the volumes covered by a specific dose to the PTV volume. For this study, volumes that covered 95% of the approved doses were employed to estimate the CI values (Eq.: 1). Therefore, $CI < 1$ signifies that the PTV is under coverage. In contrast, $CI > 1$ denotes that normal body tissue is receiving an elevated dose. Where $CI = 1$ the prescribed dose is consistent with to PTV outline⁶.

$$CI = (\text{volume covered by 95\% of prescribed dose}) / (\text{volume of PTV}) \quad \dots 1$$

Homogeneity Index (HI): Homogeneity Index (HI) is an empirical tool used to examine the consistency of a distribution dose in a target volume. The maximum dose (D2%) can be delivered to 2% of the PTV. Dp is the agreed dose for PTV, and D98% is the minimum dose calculated for the 98% of the PTV.

These parameters were used to calculate the HI using the Eq 2.

$$HI = (D_{(2\%)} - D_{(98\%)}) / (D_p) \quad \dots 2$$

Lower HI denotes a beneficial uniform dose distribution that can be achieved in the target^[7].

Results

From table (1 and 2); CI value indicates the degree of conformity of the plan. Therefore, above results indicates that ($CI = 0.89 \pm 0.209$) $CI < 1$ signifies that the PTV was under coverage. If $CI > 1$ denotes that the normal body tissue were receiving a substantial dose. Finally, $CI = 1$ indicates that the prescribed dose conformed to the shape of the PTV⁸.

Lower HI means a better and more uniform dose distribution that can be achieved in the target^[8].

Data obtained from Table (1, and 2) indicated that the conformity index (CI) of 3D-CRT for patient No. (6) was > 1 . This indicated that the normal tissue received a

high dose. However, for the other 12 patients where CI < 1 this signified that the PTV was under coverage. All 3D plans significantly improved CI for 12 patients except patient No (6).

In general, 3D technique was more beneficial and with greater uniform dose distribution.

Table 1. The values of conformity index (CI) and homogeneity index (HI).

No. of the Patient	Half Beam Size		
	PTV Mean Dose (cGy) 4060±32.116	HI	CI
1	4104	0.20749	0.905485
2	4073	0.166821	0.949103
3	4097	0.208388	0.936251
4	4058	0.179553	0.515840
5	4021	0.179903	0.919338
6	4068	0.218250	1.339031
7	4057	0.187193	0.945477
8	4039	0.167095	0.949424
9	4095	0.374485	0.976303
10	3987	0.453851	0.913427
11	4067	0.196954	0.516054
12	4049	0.200499	0.754823
13	4072	0.175484	0.950828
Mean±SD	4060±32.116	0.224±6.087	0.89±0.209

Table 2. Dose homogeneity (HI) value, and Conformity Index (CI) value.

		No	%
CI for PTV 3D	No risk (<1)	12	92.3
	High risk (>1)	1	7.7
	Perfect (=1)	-	-

Table 3. Mean dose value delivered to the Right-Lung (Rt-lung).

No. of the Patient	Rt-Lung Mean Dose (cGy)		
	Half beam mean dose	V20<30	Tolerance mean Dose cGy <4000
1	23	0	<4000
2	25	0	<4000
3	22	0	<4000
4	41	0	<4000
5	27	0	<4000
6	123	0	<4000
7	31	0	<4000
8	37	0	<4000
9	18	0	<4000
10	21	0	<4000
11	16	0	<4000
12	31	0	<4000
13	26	0	<4000
Mean±SD	33.923± 27.696	0±0	

Data from tables 3; The received mean dose volume of the Right lung (Rt-lung) was $(33.923 \pm 27.696 \text{ cGy})$, and Rt Lung Tolerance mean dose (cGy) was $<4000 \text{ cGy}$. Also $V_{20} < 30 \text{ Gy}$, this was since the Rt lung was distant from the target.

Table 4. Mean dose value delivered to the Left-Lung (Lt-lung).

No. of the Patient	Lt lung mean Dose (cGy)		
	Half beam mean dose	$V_{20} < 30$	Tolerance mean Dose < 4000
1	893	17.32	< 4000
2	1115	21.53	< 4000
3	1152	26.82	< 4000
4	853	20.17	< 4000
5	1191	28.31	< 4000
6	1064	23.92	< 4000
7	1392	19.68	< 4000
8	642	9.81	< 4000
9	484	9.91	< 4000
10	1104	25.75	< 4000
11	755	16.64	< 4000
12	1392	30.35	< 4000
13	1200	27.43	< 4000
Mean \pm SD	1018.231 \pm 276.621	21.357 \pm 6.639	

In the present study from table 4; the low dose volume ($< 30 \text{ Gy}$) for the left lung was $(21.357 \pm 6.639 \text{ cGy})$ and the low dose volume $V_{20} < 30 \text{ Gy}$. The Left Lung (Lt-lung) Mean Dose (cGy) (1018.231 ± 276.621) .

Table 5. Mean dose value delivered to heart of 13 patients in half beam techniques

No. of the Patient	Heart mean Dose (cGy)		
	Half beam mean Dose cGy	$V_{35} < 20 \text{ Gy}$	Mean Dose < 2600
1	259	0.16	< 2600
2	518	2.35	< 2600
3	370	2.94	< 2600
4	199	0.02	< 2600
5	759	10.11	< 2600
6	393	2.78	< 2600
7	462	3.14	< 2600
8	213	0.09	< 2600
9	362	2.34	< 2600
10	191	0.32	< 2600
11	191	0.37	< 2600
12	462	3.77	< 2600
13	279	2.21	< 2600
Mean \pm SD	358.308 \pm 165.213	2.354 \pm 6.639	

The quantitative data obtained from Table 5 showed that the mean dose to the heart was (358.308±165.213), which was <2600 cGy.

The result indicated that the heart was exposed to doses (2.354±6.639) <20 Gy. The low dose volume

for(V35)was <20Gy. However, we found that there was no absolute safe dose. Our finding concurs with (Taylor et al, 2009)⁸, who found that adjuvant RT to left sided breast cancers had a small but significant increase in the risk of both cerebrovascular and cardiac deaths.

Table 6. Max dose value delivered to spinal cord and Mean dose value delivered to esophagus

No. of the Patient	Cord Max. Dose (cGy)	Cord Tolerance	Esophagus
	Half Beam Max Dose	Max. Dose (cGy< 2000	Mean Dose Value (cGy)
1	788	<2000	25
2	283	<2000	27
3	1244	<2000	38
4	1456	<2000	36
5	819	<2000	52
6	538	<2000	20
7	594	<2000	39
8	149	<2000	13
9	22	<2000	18
10	922	<2000	34
11	30	<2000	20
12	1112	<2000	39
13	918	<2000	17
Mean±SD	682.692±463.284		29,077±11.5

Table 6. indicates that Cord max dose was (682.692±463.284cGy)< 2000 cGy. And Spinal cord max dose was <45Gy (4500 cGy), which coincides with (Majumder et al, 2014) ⁹. From data in table 6, the Dmean value of esophagus was (29,077±11.5)cGy <3400 (Esophagus Tolerance mean dose (cGy)).

Discussion

Breast radiotherapy is a prevalent type of radiotherapy procedure. Breast cancer poses a serious health threat to much of the human population. Breast cancer alone is the most widespread form of female carcinoma. By this commonly the use of 3D planning offers better dose homogenization with considerable decrease in skin toxicity while minimizing the radiation dose received by normal organs. In this study, PTV max and PTV mean values obtained by single isocenter with half beam use were proximal to the planned values while overdose was minimal. PTV was in half beam technique (4060±32.116 cGy).

The aim of 3DCRT that employs single isocenter with half beam is to produce an equal dose distribution

during treatment. Concomitantly, the technique attempts to minimize radiation exposure in the esophagus, ipsilateral lung, spinal cord and heart. Quantitative data were considered from the DVHs and were based on three significant factors: PTV dose, conformity index (CI), and homogeneity index (HI). The D2% represented the maximum dose delivered to 2% of the PTV for all 13 patients, and D98% was the minimum dose calculated for 98% of the PTV. The prescribed dose received by 95% of the PTV assisted in the evaluation of the dosimetry plans. A minimal amount of HI indicated that a lesser dose exceeded the prescription dose. in this study, a minimum HI had better dose uniformity than other patients

Dose conformity was measured by CI. CI value indicates the degree of conformity of the plan.

The CI measures the degree of conformity, which is calculated as follows⁷:

- CI value indicates the conformity degree of the plan. If CI < 1, the PTV is under coverage.

- If $CI > 1$, the normal tissues receive a high dose.
- Lastly, if $CI = 1$, in this case, the prescribed dose conforms to the PTV shape.

$CI = (\text{volume covered by 95\% of the prescribed dose})/(\text{volume of PTV})$ (10).

Data obtained from table 1; indicated that the PTV was under coverage because $CI < 1$ for 13 patients except patient number(6).

Lungs are one of the first organs to receive radiation beam and to be protected during breast radiation^[10]. However, half beam technique is statistically significant on right lung (Rt-lung) via reduction of V5 in <5 Gy. In this study, there while was a decrease in V20, V30, and D- mean values they did not reach statistical significance.

In half beam techniques satisfied the objective for V5Gy, V20Gy and V30Gy for Left lung (Lt-lung). The lowest V20Gy were found with half beam (21.357 ± 6.639).

In general, Our results showed that both V5 Gy, V20Gy, V30Gy, D- mean values, and Dmax were significantly higher in Left lung (Lt-lung) than Right lung(Rt-lung) in both techniques, due to the location of Left lung which was proximal to the target area.

In relation to the heart, the objective V35 <20 GY or (2000 cGy) was achieved in half beam technique. Clinical effects of radiation induced heart disease have been observed with therapeutic doses of >35 Gy to partial volumes of the heart.

Risks to the left breast tend to be increased during radiotherapy. Factors such as age gender, lifestyle, obesity and hypertension, among others significantly increase Even when these aforementioned factors are taken into consideration, radiation dose to the heart is still considered as being the most important factor¹¹. Table 6 Showed that max dose for the spinal cord in half beam was (682.692 ± 463.284 cGy). In half beam technique the spinal cord max dose <45 Gy. This finding corresponds with (Majumer et al, 2014)⁹.

Conclusions and Suggestions

A plan should ideally produce a steep curve showing that the dose within the PTV is constant; albeit, the dose between 95% - 107% of PTV varies according to the International Commission on Radiation Units and measurements ICRU50.

Any radiation dose may increase the risk of a second malignancy. In principle, the irradiated volume should be as minimal as possible. The 3DCRT with half beam technique achieved a significant reduction in the volume of heart and ipsilateral lung exposed to high-dose (≤ 40.05 Gy). In general, these techniques may benefit patients with heart disease, and wherever cardiac regions are exposed to doses <20 Gy, irrespective of the selected plan. Heart and lung are the primary organs of concern. In this study when using half beam, the relative volume of ipsilateral lung or heart receiving high-dose (40.05Gy) was significantly reduced. The relative volume of bilateral lungs and heart receive even a lower dose (5 Gy) was increased.

In a radiotherapy center like (ZCC), where a limited number of RT machines and requirements are available for hundreds of patients in the waiting list, it is necessary to take into consideration the required delivery time, as well as improvement in the target coverage and OARs sparing, when selecting an available treatment method. The dose was prescribed for all PTVs according to the type, size, and location of the tumor for each patient.

Recommendations:

1. We recommended using other 3DCRT with half beam technique in Zhianawa Center that they reduce the risk of induce second cancers.
2. Based on the results, one isocentric in half beam with wedge technique provides significant advantages in

Conflict of Interest: Not

Ethical Clearance: The study was approved by the Ethics Committee of the College of Medicine, Hawler Medical University, Kurdistan Region, Iraq.

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References

1. Veronesi U, Cascinelli N, Mariani L, Greco M, Saccozzi R, Luini A, Aguilar M, Marubini E. Twenty-year follow-up of a randomized study comparing breast-conserving surgery with radical mastectomy for early breast cancer. *New England Journal of Medicine*. 2002 Oct 17;347(16):1227-32.
2. Kagkiouzis J, Platoni K, Kantzou I, Dilvoi M, Patatoukas G, Kypraiou E, Efstathopoulos E, Sarris G, Trogkanis N, Kouloulis V. Review of the three-field techniques in breast cancer radiotherapy. *J*

- BUON. 2017 May 1;22:599-605.
3. Gagliardi G, Constine LS, Moiseenko V, Correa C, Pierce LJ, Allen AM, Marks LB. Radiation dose-volume effects in the heart. *International Journal of Radiation Oncology* Biology* Physics*. 2010 Mar 1;76(3):S77-85.
 4. Inc. XiO® is a registered trademark of IMPAC Medical System. Revision LUGXIO0470 in 2015.
 5. Elekta Product. XiO Treatment Planning System TPS (version 5.00.01, Elekta AB, Stockholm, Sweden).
 6. Knöös T, Kristensen I, Nilsson P. Volumetric and dosimetric evaluation of radiation treatment plans: radiation conformity index. *International Journal of Radiation Oncology* Biology* Physics*. 1998 Dec 1;42(5):1169-76.
 7. Yoon KS, Duncan T, Lee SW, Scarloss B, Shapley KL. Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement. *Issues & Answers. REL 2007-No. 033. Regional Educational Laboratory Southwest (NJ1)*. 2007 Oct.
 8. Taylor CW, McGale P, Povall JM, Thomas E, Kumar S, Dodwell D, Darby SC. Estimating cardiac exposure from breast cancer radiotherapy in clinical practice. *International Journal of Radiation Oncology* Biology* Physics*. 2009 Mar 15;73(4):1061-8.
 9. Majumder D, Patra NB, Chatterjee D, Mallick SK, Kabasi AK, Majumder A. Prescribed dose versus calculated dose of spinal cord in standard head and neck irradiation assessed by 3-D plan. *South Asian journal of cancer*. 2014 Jan;3(1):22.
 10. Petrova D, Smickovska S, Lazarevska E. Conformity index and homogeneity index of the postoperative whole breast radiotherapy. *Open access Macedonian journal of medical sciences*. 2017 Oct 15;5(6):736.
 11. Gagliardi G, Constine LS, Moiseenko V, Correa C, Pierce LJ, Allen AM, Marks LB. Radiation dose-volume effects in the heart. *International Journal of Radiation Oncology* Biology* Physics*. 2010 Mar 1;76(3):S77-85.

Risk Factors and Coronary Artery Diseases in Young Adults Above and Below 40 Years: An Observational Study

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Abstract

Background: Coronary artery disease and its complications are increased in young adults in developing countries. In this study we aimed to identify the risk factors and coronary angiographic profile of young adults with coronary artery disease.

Objectives: To find out the risk factors for coronary heart disease in young adults in below and above 40 years and compare the pattern of the disease .

Method: This is an observational descriptive study was conducted in Angiography Laboratory, in Krishna institute of Medical Sciences deemed to be University and Krishna Hospital, Karad. (Maharashtra) from April 2018 to July 2019. A total of about 324 patients from Angiography Laboratory of Krishna Hospital, Cardiology department were included in this study. During the procedure of coronary angiogram type of dye (OMNIPCK-50ml) that is visible by an x-ray machine (GE.INNOVA), is injected into peripheral vessels. Time taken for this procedure is 30-60 minutes. 33 patients (25[75.7%] male & 8[24.2%] female) were in ≤ 40 years & 291 patients (185[63.57%] male & 106[36.42%] female) were above 40 years of age studied. Demographic data of patients and Angiographic reports were recorded.

Result: Coronary artery disease (CAD) was present in 10 patients of aged below 40 years and in 194(66.66%) patients of age more than 40 years which comes around 66.66%. Frequency of normal, Single Vessel disease, Double Vessel Disease & Triple Vessel Disease in above 40 yr age group was 23(69.70%), 7(21.21%), 2(6.06%), and 1 (3.03%) respectively.

Frequency of normal, SVD, DVD & TVD in >40 years was 97 (33.33%), 63(21.65%), 58 (19.93%), and 73 (25.08%) respectively. Overall 98 (27.77%) patients were Diabetes, Hypertension was present in 160 (49.38%), 114(35.18%) was Smoker, Obesity were 99(30.55%) and Family history was present in 114 (35.18%) patient, 58.76% was Tobacco user patients in >40 years. Frequency of Diabetes, Hypertension, Smoker, Obesity, Family history, Tobacco users in ≤ 40 years was 12.12%, 36.36%, 5.9%, 72.72%, 39.39%, 48.48% respectively.

Keywords: Coronary artery disease, Risk factors, Hypertension, Diabetes.

Introduction

The global burden of diseased study estimated that there are 31 million people with coronary artery disease in India. Approximately 1.7 million people die of cardiovascular diseases in India.¹ The risk of CAD in Indians is 3-4 times higher than white Americans, 6 times higher than Chinese & 20 times higher than Japanese.²

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The burden of Coronary artery disease has been on the rise in India. It is on a higher side in the urban population mainly because of their changing life style. There are many risk factors like Diabetes, hypertension, smoking, Alcohol, obesity, family history at younger age. Thus there is a need to diagnose early and thus correct the conventional risk factors. The studies revealed that 28.6% of adult aged 15 and above in India currently use tobacco. Among adult 24.9% are daily tobacco users and 3.7% are occasional users.³ Many younger's migrate from rural to urban for jobs. It is associated with stress of seeking, stress of adjusting new job, stress of new friend circles. They undergoing to facing many problem like the higher consumption of calories, intake of saturated fats, salts, alcohol and mainly the products of tobacco. Products of tobacco like the smoking, tobacco chewing, mishary using increases the risk of CAD. These are the risk factors to indicate the Hypertension, Diabetes, and Obesity. Use of multiple tobacco products as cigarettes, mishary is common among young age. The nicotine and carbon monoxide from smoking may make your blood sticky and arteries become narrow. Narrow arteries reduce the flow of blood to your heart, muscle.

Smoking increases the risk of CAD by 3-5 times. In India smoking is increasing in the younger generation. Studies have shown that 40-50% of males in obesity is the next risk the increase body fat is the increases the risk.² In an analysis of worldwide data for the global burden of hypertension, 20.6% of Indian men and 20.9% of Indian women were suffering from hypertension in 2005. The rates for hypertension in percentage are projected to go up to 22.9 & 23.6 for Indian men & women respectively by 2025.⁴

Diabetes mellitus is one of the world's major diseases and also increases the risk of cardiovascular diseases. It currently affects an estimated 143 million people worldwide & the number is growing rapidly. In India, about 5% population suffers from diabetes.⁵

The incidence of CAD in young Indians is about 12%-16%.⁶ So this study was done to identify and compare the differences of risk factors of CAD in ≤ 40 year and >40 year patients.

Material and Method

This is an observational descriptive study and was conducted in Cardiology Laboratory in Krishna Institute of Medical Sciences deemed to be University and Krishna Hospital, Karad (Maharashtra). The study period

was from April 2018 to July 2019. A total of about 324 patients from undergoing angiography from Cardiology department, were included in the study. Demographic and anthropometric data of study cases will be obtained from IPD records as well as by interviewing the patient. Angiographic variables and coronary parameters will be measured with help/guidance/assistant of cardiologists.

Demographic Data Collected of Patient: The data noted from patients are Age, Gender, Religion, Occupation, Body weight, Height, Body surface area, Diabetes, Hypertension, Chest pain, Smoking, Family history, Exercise, Tobacco chewing, Diet, Alcohol consumption.

Exclusion Criteria: Patients with previous history of coronary artery intervention (balloon or stenting) patients with previous history of coronary artery bypass graft surgery.

Methodology of Coronary angiography- During the procedure of coronary angiogram type of dye (OMNIPCK-50ml) that is visible by an x-ray machine (GE.INNOVA), is injected into peripheral vessels. Time taken for this procedure is 30-60 minutes and cineangiogram were taken in different views.

The procedure of research was explained to the patients and written consent form was taken from each participants present to enrolment in the study. Then Demographic information recorded on a Questionnaire. Coronary angiography was performed by Cardiologists. All patients were evaluated for coronary risk factor like Diabetes, hypertension, smoking, alcohol, obesity, family history.

The Normal, Single vessel Disease (SVD), Double vessel disease (SVD), Triple vessel disease (TVD) was noted and confirmed by report given by cardiologist . The data were entered in SPSS Version. Pattern of coronary involvement and risk factors were noted.

Results

Table 1: Age wise distribution of patients:

Gender	≤ 40 years No (%)	>41 years No (%)	Total No (%)
Male	25(75.7)	185(63.57)	210(64.81)
Female	8(24.2)	106(36.42)	114(35.18)
Total	33(10.18)	291(89.81)	324(100)

The total number of patients included in this study

was 324. The patients were divided into two groups. The group I were the patients who were ≤40 year of age. The patients in group II were above 40 years of age. Out of 324, 33(10.18%) were ≤40 were in group I and 291(89.81%) were in group II. The youngest patient was 22 years of age & eldest was 87 years of age. The mean

age in ≤40 years (Group I) was 33.96 year & >40 years (Group II) was 61.17 year.

In group I (≤40years) there were 25(75.7%) male & 8(24.2%) were female, in group II (>40 years) there were 185(63.57%) males & 106(36.42%) were females. (Table I).

Table 2: Age & sex wise distribution of Risk Factors

Risk Factors	≤40 yrs. (n= 33)		>41 yrs. (n= 291)	
	Male no. (%) 25(75.7)	Female no. (%) 8(24.2)	Male no. (%) 185(63.57)	Female no. (%) 106(36.42)
Diabetes	2(8)	2(25)	56(30.27)	38(35.85)
Hypertension	10(40)	2(25)	88(47.57)	62(54.38)
Smoking	2(8)	0	20(10.81)	0
Family history	11(44)	2(25)	60(32.43)	41(38.68)
Tobacco user	14(56)	2(25)	110(59.46)	61(57.55)
BMI				
18.5-24.9	6(24)	73(40.10)	3(37.5)	54(53.46)
25-29.9	9(36)	78(42.86)	4(50)	32(31.68)
30 & Above	10(40)	31(17.03)	1(12.5)	15(14.85)

Regarding coronary risk factors, Presence of diabetes was higher in the patients >40yrs. Patients was 94(32.30%) than that in ≤ 40 years patients ie. 4(12. 12%).Hypertension was significantly less in ≤ 40 years 12(36.36%)than that in the > 40 years group 150(51.55%).

2 patients (6.06%) of in ≤40-year group were smoker as compare to 20(6.87%) in 40> years group. Higher incidence of obesity was observed in 72.72% in ≤40-year group than in >40year group 99(30.55%)

Presence of family history of coronary heart disease was observed in ≤40 year group 14(42.42%) than that in > 40 years ie. 101 (34.71%). 16 patients (48.48%) of ≤ 40 years were tobacco user as compare to 171(58.76%) in >40-year group. The most prevalent cardiovascular risk factors was tobacco users (48.48%) in ≤ 40 years & 171(58.76%) in >40-year group & increased body mass index>25 Kg/m², followed by a family history of CAD & Hypertension,The proportion of patients with obesity with family history of coronary heart disease was high in ≤ 40-year group (72.72% & 39.39%) respectively. (Table 2).

Table 3: Showing Comparison of Risk Factors with other author

Risk Factors	≤40yrs.	>41yrs.	≤40yrs.	>41yrs.	≤40yrs.	>41yrs
	Tahir Saghir ⁷ et al No. (%)		Md.Abu Siddique ⁸ et al No. (%)		Present study No. (%)	
No. of patient	102(34)	197(66)	50(50)	50(50)	33(10.18)	291(89.81)
Mean age	-	-	33.0 yrs.	52.0 yrs.	33.96 yrs.	60.88 yrs.
Diabetes	14(14)	71(36)	2.0(4.0)	17.0(34.0)	4(12.12)	94(31.65)
Hypertension	35(34)	83(42)	19.0(38.0)	36.0(72.0)	12(36.36)	150(51.54)
Smoking	71(70)	148(75)	35.0(70.0)	23.0(46.0)	2(6.06)	20(6.87)
Family history	3(30)	52(26)	18(36.0)	8(16.0)	13(39.39)	101(34.70)
BMI						
18.5-24.9	31(31)	60(31)	--	--	9(27.27)	127(43.64)
25-25.9	55(53)	10(51)	--	--	13(39.39)	110((37.80)
30 & Above	16(16)	36(18)	--	--	11(33.33)	46(15.81)

Table 4: Showing Coronary Artery Disease and Age.

Coronary Artery Disease	≤40-year (n= 33) No. (%)	>40 year(n=291) No. (%)
Normal	23(69.70)	97(33.33)
SVD	7(21.21)	63(21.65)
DVD	2(6.06)	58(19.93)
TVD	1(3.03)	73(25.08)

SVD-single vessel disease DVD-double vessel disease TVD-triple vessel disease

Table 4 shows distribution of coronary artery disease according to age.

Coronary artery disease (CAD) was present in 10(30.3%) ≤40 years and in 194(66.66%) patients >40 years. Frequencies of normal, SVD, DVD, & TVD in ≤40 was 23(69.70%), 7(21.21%), 2(6.06), 1(3.03%) respectively. while frequencies of normal, SVD, DVD, TVD in >40 was 97(33.33%), 63(21.65%), 58(19.93%), 73(25.08%) respectively.

Discussion

In the present scenario death due to cardiovascular diseases has been increased from 1.3 million in 1990 to 2.8 million in 2016 & more than half the deaths caused by heart disease in 2016 were in persons less than 70 years of age, according to the study 'The changing Pattern of cardiovascular diseases & their risk factors in the states of India' the Global burden of Disease study, 15% of deaths in India were due to heart disease in 1990, now up to 28%.⁹

In this study we included 324 patients. Out of total 324 patients 33 are less than 40 years (10.18%) & 299 are above 40 years (89.81%). Hazrat Ullah Khan et al¹⁰ was done the study in 2014, in which frequencies of age ≤40 year & >40 year were 48(12%) & 352(88%). Mean age of the patient was 55.27 which is similar as determined by Hazrat¹⁰ and was 52.78. Table -3 shows comparison of risk factors in different studies.

In this study Frequencies of diabetes, Hypertension, Smoking, Obesity, Family history & Tobacco user were 98(27.27%), 160(49.38%), 114(35.18%), 99(30.55%), 114(35.18%), 58.76% in >40 year. & ≤40 years was 12.12%, 36.36%, 5.9%, 72.72%, 39.39%, 48.48%, which is nearly same as by Tahir Saghir.

Significant CAD was present in 10(30.3%) patient of ≤40 yrs. Patients & in 194(66.66%) patient of >40 year. Total 63.63% of CAD was present which is nearly

same as by Aknd which 74.4%.¹⁰ In our study the Family history for CAD is present was present in 39.39% in ≤40 yrs. Patients & 35.18% was in >40 yrs. But Tahir Saghir et al study shows 3(30%) in ≤40 yrs. Patients & 52(26%) in >40 yrs. patients. The data for western world showing family history present in 45-65% of ≤40 yrs. & 20-40% in >40 yrs.

This study showed frequencies of normal, SVD, DVD, & TVD in ≤40 was 23(69.70%), 7(21.21%), 2(6.06), 1(3.03%) respectively. while frequencies of normal, SVD, DVD, TVD in >40 was 97(33.33%), 63(21.65%), 58(19.93%), 73(25.08%) respectively. Shah S Set al¹¹ studied that ≤40 years patients have frequencies of SVD, DVD, & TVD shows 44.4%, 24.4% & 15.6% & in >40 years group has 25.4%, 30.5% & 39.4% respectively. Siddique Met al⁸ studied that ≤40 years group has frequencies of SVD, DVD, & TVD as 42%, 22%, & 18% & in >40 yrs. were 24%, 24% & 46% resp.

Conclusion

In conclusion the young patient (≤40 yrs.) have different risk factor in comparison with elder group (>40 yrs.) Tobacco user including smoking is a common risk factor in the patients. Risk factors in CAD patient is threat for ≤40 yrs. group. We will advise to these people to live in healthy life style and precautions about tobacco products should be taken. This study will definitely benefit to younger group. The rate of CAD risk factors in ≤40 yrs. is high. Most important risk factor is Tobacco users & Obesity.

So there should be needed more visible and aggressive anti-tobacco camps including increased public awareness of tobacco harms and active arrangement of workshops. It should be helpful to younger age group.

Limitation: Some other risk factors may also be contributing to the coronary artery diseases.

Ethical Considerations: The present study was approved by the Institution Ethical Committee KIMS “Deemed To Be University”, Karad.

Conflicts of Interest: None.

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References

1. <https://www.csikerala.org/ACS%20Registry%20-%20Project%20Report.pdf> Kerala Acute Coronary Syndrome Registry Project Report
2. HS Rissam, S Kishore, N Trehan, Coronary Artery Disease in Young Indians-The Missing Link. *Journl Indian Academy of Clinical Medicine*, 2001; Vol.2(3) : 128-132.
3. https://www.who.int/tobacco/surveillance/en_tfi_india_gats_fact_sheet.pdf, GATS
4. Raghupathy Anchala, Nanda K, Kannuri, & DorairajPrabhakaran-Hypertension in India: a systematic review & metanalysis & control of hypertension. *Journal of Hypertension*, 2014; 32 (6): 1170-7.
5. <https://bit.ly/32Uath4>. (Om) life style. India is the diabetes capital of the world-Times of India
6. G Suresh, K Subramanym, SrinivasaKudva, Ram Prakasha Saya. Coronary artery disease in young adults: Angiographic study-A single center experience. *Heart India* 2016;4:132-5.
7. Tahir Saghir, NadeemQamar, JavaidSial;Coronary Angiographic Characteristics of coronary Artery Disease in Young Adults Under Age Forty Years Compare to Those Over Age Forty. *Pakistan Heart Journal*, 2008;Vol. 41 (3): 49 – 56 .
8. Md.AbuSiddique, Milan Prakash Shrestha, Mohammad Salman, KMHSSirajuHaque, Md. KhurshedAhmed, Md.Ashraf Uddin Sultan, Md. HarisulHoque, SM. Mustafa Zamau.Age- Related Differences of Risk Profile and Angiographic Finding in Patients with Coronary Heart Disease. *BSMMU J*, 2010; Vol.3 (1) :13-17.
9. <https://bit.ly/31TTnTZ> .ToufiqRshid15% of deaths in India were due to heart diseases in 1990; now up to 28%.
10. Hazrat Ullah Khan, Mati U Khan, Md Munir Noor, Umer Hayat, Muhammad Adeel Alam. Coronaryartery Disease Pattern: A Comparison among Different Age Groups. *J Ayub Med Coll Abbottabad* 2014;26(4) : 466-9.
11. Shah SS, Noor L, Shah SH, Shahsawar, Awan ZA, et al. Myocardial Infarction in Young verus older Adults: Clinical characterstics and Angiographic features. *J Ayub Med Coll Abbottabad*,2010; 22 (2):187-90.

Evaluation of Quality of Nursing Documentation in Surgical Wards at Baghdad Teaching Hospitals

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Abstract

Background: Nursing documentation has been one of the most important functions of nurses.

Objectives: To evaluate quality of nursing documents for nursing care at surgical ward and to find out the relationship between demographic characteristic with nursing documents.

Methodology: A descriptive design study was conducted in the period of 1st January 2017 to 15th August 2017. Utilizing a stratified random sampling method (60) nurses working in surgical ward at Baghdad teaching hospitals.

Results: The majority of the study participants were female who accounted for (58.3%) of the total participants while male constituted (41.7%) making a female male ratio of 1.5:1. Most of the study participants (46.7%) were between ages 18 and 27 years old. (71.7) of the nurses were married and the remainder was single. (45%) of the participants had institute graduate. Majority of them (31.7%) were employee (1-5) years in surgical wards, and finally most of nurses(66.7%) have training session in the nursing documentation.

Conclusions: The study showed that nurses have poor nursing documentation in surgical ward and there is no significant association between the nursing documentation with some demographic characters of selected nurses but significant association between the nursing documentation with training course.

Keywords: *Evaluation, Quality of Nursing Documentation, Nursing care, Surgical Wards.*

Introduction

Nursing documentation is considered as an important indicator to develop nursing care. According to patient safety law, nurses have to document nursing interventions.^[1] Nursing documented has jointly practical and legal embodiment in client care thus kind documentation and true notify are fundamental to improve efficiency in client care in any case of the way

used to document, the client's health-care register is a solemn, legal records is client's patronage specifics^[2,3]. Nurse's ability to script in a pure brief, fair and legally precise way can safely decrease the danger of misunderstanding and passive patient result concerning to bad communication^[4,5]. Nurses have accepted that registration isn't dismissing from nursing care and it is not permissive. It is an integral section of on file nurses' practices, and an important instrument that RNs use to secure high-finesness client care. Literature debate exceedingly the barriers encountered by nurses in recorded involving time limited, mismatches among staffing resources and work overload, shortage of pure guidelines for fill up documentation, repeated at documentation, and the routine systems and institutional policies usually related with protection precise documentation^[6]. The major responsibility of nursing

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documentation are patients' information transport to other health team members, promote professional autonomy [7].

Methodology and Materials

A descriptive design study carried out to evaluate quality of nursing documentation in surgical wards at Baghdad teaching hospitals. The study was carried out during the period extended from 1st January 2017 to 15th August 2017. The study population included all nursing staff in four selected hospitals. Inclusion criteria for nurses were having at least 12 month clinical experience and having any educational level degree in nursing. The sample size estimated 70 nurses with pilot study. Then, these nurses selected to participate with stratified random sampling, according to the number of nursing staff employed in each hospital. Then, for evaluate of each nurse's documents, in four parts of nursing documents, was selected randomly and analyzed. The demographic data of self fill reporting. For evaluate of nursing documents for nursing care four observational checklists were used. These checklists were evaluate four parts

of nursing documents including recording vital sign assessment (4 items), recording wound care(dressing) (11 items), recording medication treatment (4 items) and recording intake and output (I & O) of fluids (10 items). The validity of checklists was determined by content validity and after receiving commends from 10 nursing member checklists were revised. The content validity of the instrument was established through a panel of (15) experts. . Test- Coefficients for (29) items of nursing documentation for nursing care were($r= 0.83^{**}$) . Data were collected between 8.30 am to 12.30 pm. The data is analyzed by using SPSS version 20.0.

Results

This table revealed that(58.3%) of the study samples were females, and most of them were age group (18-27) years old, a high percentage of them were institute graduate (45%), most of them(71.7%) were married, (31.7%) were for (1-5) years were employment in nursing, Majority of them (31.7%) were employee (1-5) years in surgical wards, and finally most of nurses(66.7%) have training session in the nursing documentation

Table (1): The Mean of Score of Nurses Documentation for Nursing Care at Surgical Wards

No.	Items	Always		Some time		Never		MS	Ass
		F	%	F	%	F	%		
	Vital signs								
1	Body temperature	49	81.7	4	6.7	7	11.7	2.70	Good
2	Pulse rate	28	46.7	10	16.7	22	36.7	2.10	Fair
3	Respiration rate	34	56.7	9	15.0	17	28.3	2.28	Fair
4	Blood pressure	31	51.7	9	15.0	20	33.3	2.18	Fair
	Total							2.315	Fair
	Wound care (Dressing)								
5	Location of wound	14	23.3	8	13.3	38	63.3	1.60	Poor
6	Size of wound	4	6.7	8	13.3	48	80.0	1.27	Poor
7	Wound discharge	2	3.3	1	1.7	57	95.0	1.07	Poor
8	Amount of discharge	2	3.3	4	6.7	54	90.0	1.07	Poor
9	Color of discharge	2	3.3	3	5.0	55	91.7	1.07	Poor
10	Odor of discharge	2	3.3	7	11.7	51	85.0	1.07	Poor
11	Pain	1	1.7	3	5.0	56	93.3	1.05	Poor
12	Signs of infection	3	5.0	1	1.7	56	93.3	1.12	Poor
13	Signs of wound healing	2	3.3	1	1.7	57	95.0	1.08	Poor
	Dressing changes							1.15	Poor
14	Morning	20	33.3	15	25.0	25	41.7	1.92	Fair
15	Evening	21	35.0	16	26.7	23	38.3	1.97	Fair
	Total							1.28	Poor
	Drugs administration								
16	Drug name	57	95.0	2	3.3	1	1.7	2.93	Good

No.	Items	Always		Some time		Never		MS	Ass
		F	%	F	%	F	%		
17	Route of administration	52	86.7	6	10.0	2	3.3	2.83	Good
18	Dose	44	73.3	11	18.3	5	8.3	2.65	Good
19	Time of administration	54	90.0	2	3.3	4	6.7	2.87	Good
	Total							2.82	Good
	Fluid intake & output								
	Fluid intake								
20	Oral route	12	20.0	8	13.3	40	66.7	1.53	Poor
21	IV infusion	5	8.3	9	15.0	46	76.7	1.32	Poor
22	Nasogastric tube	1	1.7	5	8.3	54	90.0	1.12	Poor
23	Gastrostomy route	1	1.7	5	8.3	54	90.0	1.12	Poor
	Fluid output								
24	Urination	8	13.3	7	11.7	45	75.0	1.38	Poor
25	Defection	8	13.3	7	11.7	45	75.0	1.38	Poor
26	Vomiting	8	13.3	7	11.7	45	75.0	1.38	Poor
27	Chest tube	2	3.3	4	6.7	54	90.0	1.17	Poor
28	Drain	5	8.3	1	1.7	54	90.0	1.18	Poor
29	Nasogastric tube	3	5.0	1	1.7	56	93.3	1.12	Poor
	Total							1.28	Poor

(A.D.): Assessment Degree, M.s=mean of score [(1 – 1.67) = poor (p); (1.67 – 2.34)= Fair(F); [(2.34 – 3) = Good (G)]

This finding of this table indicated that the mean of score was poor document non items (5, 6, 7, 8, 9, 10, 11, 12, 13, 20, 21, 22, 23, 24, 25, 26, 27, 28 & 29), items (2, 3, 4, 14 and 15) was fair documentation, and good documentation on the remaining items.

Table (2): The Association between Nurses Documentation for Nursing Care Score and the Demographic Characteristics.

Demographic Variables		Sum of Squares	df*	Mean Square	F	Sig.
Age groups	Between Groups	.057	2	.029	.027	.974
	Within Groups	60.526	57	1.062		
	Total	60.583	59			
Gender	Between Groups	.022	2	.011	.043	.958
	Within Groups	14.561	57	.255		
	Total	14.583	59			
Level of education	Between Groups	2.268	2	1.134	2.395	.100
	Within Groups	26.982	57	.473		
	Total	29.250	59			
Years of employed in hospital	Between Groups	4.136	2	2.068	.617	.543
	Within Groups	191.114	57	3.353		
	Total	195.250	59			
Years of employed in surgical ward	Between Groups	3.512	2	1.756	.681	.510
	Within Groups	147.088	57	2.580		
	Total	150.600	59			
Training course	Between Groups	2.070	2	1.035	5.238	.008
	Within Groups	11.263	57	.198		
	Total	13.333	59			

This table indicates that there is no significant association between nurse's documentation for nursing care score and the demographic characteristics (age, gender, level of education, years of experience in surgical ward and years of employed in hospital).

Discussion

Throughout the course of the data analysis of the current study, the findings show the majority of the study were female who accounted for (60%) of the total participants while male constituted (40%). Most of the study participants (46%) were ages group (18-27) years old, the level of education represented that most of them (38%) were from institute graduate, most of them (74%) were married, (38%) for (1-5) years were employment in nursing, most of nurses (70%) have training special session in the nursing documentation. Majority of them (34%) were employee (1-5) years in surgical ward, and finally

These findings are in line with study done by other researcher who reported that study the average age of nurses was 32.40+ 5.58 years and they have a 6.40+ 3.58 years clinical experience. of all, 147(86.8%) nurses were female and 168 (98.8%) of them has a BS degree in nursing. 83 (48.8%) nurses working in medical wards and 87(51.2%) were working in surgical wards [8].

These findings agreed with findings obtained from other study, who stated that the majority of participation nurses were female 142 (87.6%), most of them 104(61.2%) were married their mean of age group was 31.38 years, majority of them (51.2%) were working in surgical wards and almost of them (98.8%) had bachelor of science degree in nursing [9].

Twenty nine questions to assess nurses documentation for nursing care in surgical ward, in order to response to first question of the study table five. This table shows the nursing documentation in four selected parts of nursing documents including recording vital sign, recording wound care, recording medication treatment, and recording intake and output of fluids, the total mean of score was poor nursing documentation. Further investigation of results of study revealed the most of items that weren't recorded by nurses in recording wound care dressing, location of wound (68%), size of wound (82%), wound discharge (96%), all items related to Amount of discharge, colour of discharge, odor of discharge (96%), signs of wound healing (94%) all items that mention up that weren't recorded by nurses, total

mean of score related to wound care was poor.

In recording intake and output of fluids most items that weren't recorded were including, where not recording fluid take through mouth (64%), intravenous fluid (72%), nasogastric tube and gastrostomy route (88%) all items are absent (88%) all items are absent (88%) all items are absent in nursing documentation. Also recording were absent in fluid output including urination, defecation, vomiting (74%), chest tube, drain (88%) and nasogastric tube (92%) of all items related fluid intake and output not recorded by nursing, the total of mean of score related to fluid intake and output was poor.

In recording vital sign assessment part most items are recorded the mean of score of vital sign was fair. In recording medication treatment most items are recorded by nurses, the total of mean of score related drugs treatment was good.

This finding was in good agreement with that obtained from other researcher reported that the quality of nurses' documents was moderate. Further investigation showed that most items that weren't recorded by nurses in recording nursing report part were including "recording the time of reports" (100%), "recording the response of patients to interventions" (97.9%) and "recording the time of nursing cares" (96.5%). In recording medication treatment part most items that weren't recorded were including "respect suitable method for correct errors" (40.6%) and other items were completely respected by nurses. In recording intake and output of fluids most items that weren't recorded were including recording accurate time of checking I & O of fluids" (100%) and "recording the differences between the intake and output of fluids" (78.3%). In recording vital sign assessment part most items that weren't recorded were including "recording the location of controlling vital signs", "recording the unit of temperature", "the limb used for controlling the blood pressure" (100%) and "the unit of blood pressure" (97.1%) [8].

Another study agree with the finding of the study who stated the nursing records showed In the vital sign section, data showed that all of them had moderate level and their mean score were 10.69 ± 0.52 . In I & O fluid section data showed that 18.6% of flow sheets had moderate quality but most of them 81.4% had suitable quality and their mean score were 13.24 ± 1.07 . In chronology sections, all of flow sheets had suitable

quality. In drug intervention part, mean score was 11.78 \pm 1.42 and most (85.9%) of them had good quality^[9].

These findings agreed with study done by other researcher who reported that the quality of nursing care records was poor and inadequate to reflect individualized nursing care. Their results suggested that more emphasis is needed in nursing practice, and nursing education on the quality of record keeping in order increasing its evidential value^[12].

These finding is the same line with study done Rangraz Jedi et al by In one study, assessed the quality of 540 nursing documents and reported that only 11% of these documents didn't Contain necessary information [13]. Hanifi, (2002) assessed the quality of 30 medical records and reported that only 16.1% of nursing documents had a good quality and 35.8% of them didn't contain necessary information [14]. Findings of most other studies have also showed that nursing documents have inadequate information about nursing care process and are consistent with the findings of our study [15,16].

In order to respond to second question of the study the association between the nursing documentation for nursing care with some demographic characters of selected nurses. There are no significant relationship between nursing documentation and demographic characteristics of nursing, but significant relationship between nursing documentation and training course.

This finding was in good agreement with that obtained from other study who reported that correlation between age and clinical experience of nurses with quality of their documents chi-square test was used. Results showed that there was no meaningful statistical correlation between qualities of nurses' documents with their age ($\chi^2 = 1.34$, $df = 2$, $p = 0.51$)^[8].

Conclusions

The study concluded that; nurses that working in surgical ward in all selected teaching hospitals had poor documentation in most aspect of nursing daily documentation for nursing care. We recommend conducting teaching programs or sessions must emphasize on all aspects of nursing documentation, for improving quality of nursing documentation and also the study recommends to nursing documentation must be covered widely and in-depth in nursing curriculum of nursing schools.

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Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

References

1. Agneta, Ö, Advanced Home Care Nurses Everyday Practice. PhD thesis, Karolin ska Institute, Stockholm, Sweden 2015:80-1.
2. Blair, and Smith B, Nursing documentation: Frameworks and barriers. *Contemporary Nurse. A Journal for The Australian Nursing Profession* 2012; 41(2): 168-160.
3. Collins S, Cato K., Albers D, Scott K., Stetson P, Vawdrey D, et al, Relationship Between Nursing Documentation and Patients' Mortality. *American Journal of Critical Care* 2013; 22(4); 313-306.
4. Yeung M, Lapinsky S, Granton J, Doran D, Cafazz J, Examining Nursing Vital Signs Documentation Workflow Barriers and Opportunities in General Internal Medicine Units. *Journal of Clinical Nursing* 2012; 21(7/8): 982-980.
5. Wang N, Hailey D, Yu P, Quality of Nursing Documentation and Approaches to its Evaluation: a Mixed-method Systematic Review. *Journal of Advanced Nursing* 2011; 67(9); 1858-1875.
6. Asamani J, Amenorpe F, Babanawo F, Ansah A, Nursing Documentation of Inpatient Care in Eastern Ghana. *British Journal of Nursing* 2014; 23(1): 54-56.
7. Cheevakasemsook A, Chapman Y, Francis K, Davies C, The Study of Nursing Documentation Complexities. *International Journal of Nursing Practice* 2014; 12(6):74 -68.
8. Ali R M., Madineh J, Farahnaz A Z, Azad R, Vahid Z Z, Quality of Nursing Documents in Medical-Surgical Wards of Teaching Hospitals related to Tabriz University of Medical Sciences. *IJNMR* 2009; 14(2): 45-50.
9. Madineh J, Vahid Z, Azad R, Alireza M, Fahime M., Knowledge and Practice of Tabriz Teaching Hospitals Nurses Regarding Nursing Documentation. *Thrita J Med Sci*, 2013; 2(1): 134-138.

10. Inan N, and Dinc I, Evaluation of Nursing Documentation on Patient Hygiene Care. *International Journal of Nursing Practice* 2013;19(1):394-401.
11. Rangraz J F, Farzandi P M, Musavi S, Assessing Recorded Information in Patients' Medical Records in Emergency Departments of Kashan Hospitals. *Feiz Research-Scientific Journal* 2004;8(31):61-73.
12. Hanifi N, Mohammadi I, Assessing the Reasons for Uncorrected Documentation in Nursing. *Hayat*2004;10(2) : 39-49.
13. Lee TT. Nursing Diagnoses Factors Affecting their use in Charting Standardized Care Plans. *J ClinNurs* 2005;14(5):7-640.
14. Thoroddsen A, Thorsteinsson HS, Nursing Diagnosis Taxonomy Across the Atlantic Ocean Congruence Between Nurses' Charting and the NANDA Taxonomy. *J AdvNurs* 2002;37(4):81-372.

Expropriation in Relation to Drug Patenting Concerning Pharmaceutical Companies

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Abstract

With the development of trade companies started transacting business across its borders attaining the character of Transnational Corporation's/Multinational Corporation's which in some cases taken over by the sovereign country what has been called as expropriation. The expropriation at initial stage proceeded towards immovable and movable properties attracting the attention of international community to ponder over the issue with the result permitting the expropriation but after satisfying limitations like public purpose, good faith, non-discriminatory followed by compensation. With the developments in law and technology, the intellectual property as a patent has also come within the ambit of expropriation. In developing phase of jurisprudence, the expropriation was said to be either direct or in direct and/or creeping. The Australian case of concessional rights in favour of US company regarding coral reef and its cancelation had been subject of debate inter alia as an expropriation. In the world of technology and drug pharmacy, the manufacturing units of drugs in most of the cases registered their patents with local law protection under the coverage of WIPO. An emerging concern has been Eli Lilly case of Canada where the patent of the two drugs namely olanzapine and atomoxetine was invalidated in Canada resulting in the litigation. The Company lost both at original stage as well as before the appellate court in Canada. But before the NAFTA Tribunal the orders of national courts were reversed in the favour of ELI Lilly. The case has thrown new dimensions towards expropriation, besides, the status of NAFTA tribunal overruling national courts. In the context the research article is of essence and is based on doctrinal methodology.

Keywords: *Expropriation, Drug Patent, Intellectual property, Transnational Corporation, NAFTA Tribunal.*

Introduction

The topic under deliberations has assumed relevance especially since the period patents have been considered as intangible property. In modern era, individual health has assumed attention from state in adopting welfare activities. The Governments have shown concern towards drug/medicine and their manufacture with availability to common masses. The corporate entities in the field

of Drug manufacturing have shown their presence not only nationally but also globally. The companies assumed transnational character by establishing industries in countries other than the country of their origin. This gave rise to Transnational corporations and/or Multinational Corporations. This on one side has satisfied the concept of Foreign Direct Investment in a host country with an object of business and profitability as far as the corporation is concerned while development as an intent for Host country. Like Industrial companies other than Pharmaceuticals, one witnesses Expropriation by the Host country but there also have been issues where Expropriation has entered into Pharmaceutical arena especially in Eli Lilly and company¹, a multinational pharmaceutical corporation whose two patents were invalidated by the Canadian government thereby claiming that such an invalidation of the patents amounts to an unlawful expropriation of corporation's property

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thereby claiming damages in excess of half a million dollars. The award/adjudication raised questions as to whether patent in the form of Intellectual property can be expropriated, secondly if so, whether invalidating a patent in particular geography amounts to expropriation. Besides, under the circumstances, what are the limitations in International scenario for expropriation of drug patents. Before entering into analysis and finding out the answers it is prudent to understand the expropriation in the international scenario.

Material and Method

The research is doctrinal in nature whereby both Primary and secondary sources data has been evaluated and analysed for this research in arriving at definite conclusions. The data comprises of different patterns including commentaries/digests, articles/writings in journals, case laws from different tribunals so on and so forth.

Expropriation/Property Meaning & Ambit: As per the Chambers Dictionary² Expropriate means: “. . . to dispossess (of property), esp. for use by the state . . .” Expropriation as per literal dictionary meaning is stated as:

*“A taking, as of privately owned property, by government under eminent domain”.*³

The use of ‘eminent’ as mentioned in the referred dictionary opens the debate as to what it means. Basically, the eminent domain being the right of a government to expropriate private property for public use, with payment of compensation. Accordingly, the expropriation means taking over property by the government for public use subject to payment of compensation.

On the other, the property has different dimensions. In its traditional way it is categorised into immovable and movable. In its evolutionary phase emerged third category of property in the form of right like in case of intellectual property. The intellectual property are in fact intellectual rights in isolation or in unison. This intellectual property rights also called intangible rights have legal recognition and by now have assumed appreciable area in law including in the field of science and technology with much presence in relation to drugs and pharmaceuticals. So intellectual property right with respect to drug patent has protection. This protection to the patent regimen got its strength since globalisation and as a regulatory mechanism WIPO as an arm of WTO

is bestowed with responsibility to take care of the global regimen. On the other, in relation to Expropriation the intangible rights are also considered to be property. This kind of property in the nature of patents fall within the definition of property including in its ambit and scope. The learned author of Malcolm N. Shaw of International Law⁴ while referring to this sort of property has quoted Higgins⁵ by saying:

“...property would clearly include physical objects and certain abstract entities, for example, shares in companies, debts and intellectual property.”

The Harvard draft convention⁶ has also included the intangible rights within the ambit of property for the purpose of expropriation. From the factual point of view patents does not seem to be capable of expropriated but declaring them invalid caused a loss to the corporation ‘Eli Lilly’ in its Canadian market.

While the property includes both immovable and movable. In addition, the intangible property and/or intellectual property is also a property which can be the subject matter of expropriation and/or for computation of compensation. When taken into consideration in its broader perspective the concessional right under contractual obligations have been considered to be property rights in a case decided by the Australian high Court with respect to contractual right and termination of contract by the government on the ground of Environmental Protection pertaining to coral reef⁷.

The fact remains that the property under expropriation involves different dimension of the property vis-à-vis to its right, enjoyment etc. The determination as to property is crucial and involves complicated questions of law and fact under some circumstances. Same is the situation with respect to manufacturing of drugs and their patenting. Under normal circumstances most of the countries have Intellectual Property Laws including those concerning Patents especially pertaining to Drugs, cosmetics etc. In India in addition to Patent Laws⁸ there are also laws regarding Drug and Cosmetics⁹. The industry with respect to referred commodity assumes importance in Health perspective with a regulator thereto. The Drug Patenting in India squarely falls within the ambit of Patent Laws read with International Conventions and WIPO guidelines. In case of Transnational Corporations/Multinational Corporations dealing with Pharmaceuticals, in short, Drug manufacturing for Medical and health purposes they assume importance in

multidimensional ways by generating employment in the Host country coupled with payment of Taxes, helping in balance of payments, besides other beneficial aspects of meeting the health hazard challenges by providing the Drugs/Medicine with recommended specifications in compliance to national Health regulations and WHO guidelines¹⁰. It is a fact that expropriation is permissible but there do arise difficult questions when merely a drug having Patent is banned in a particular territory of the Globe like Canada as happened in the referred case. To understand the genesis and intricacies it is prudent to enter into permissible limits of Expropriation.

Permissible Limits of Expropriation: Once arriving at a conclusion as to what is meant by Expropriation and also what constitutes property, the permissible limits of Expropriation are based on Hull Formula¹¹ read with World Bank Guidelines¹². The international Law guidelines and also what is said in Hull Formula five parameters are to be followed namely (i) Expropriation ought to be in accordance with Law (ii) It ought to be for public purpose (iii) To be made in good faith and (iv) Shall be non-discriminatory and (v) To be followed by compensation¹³.

Intangible Property and its Expropriation: With respect to Transnational Corporations/Multinational Corporations dealing in Pharmaceuticals, the Expropriation is not on any different footing than expropriation generally expressed. It is only the issue of the Patent which is debatable. Thus, in a case where pharmaceutical company has not been Expropriated or there was no possibility for expropriating such pharmaceutical company because of its manufacturing unit being in any different country and in the process only banning its patent. There have been cases where Expropriation has been extended to concessional agreements as referred and also in some cases Expropriation has been used for preventing Environmental violations¹⁴ but the case of Eli Lilly claims against the Canada with respect to two drugs namely compound olanzapine (Zyprexa Patent) and atomoxetine (Strattera Patent) is unique in nature. The case has thrown neo-dimensions in relation to expropriation of property and competence of national forums to adjudicate and overriding power of NAFTA tribunal. This being the case having importance and essence.

Case Study and Evaluation: Eli Lilly is a company incorporated in US in 1943 carrying its

activities of pharma by manufacturing drugs of different diversifications including that olanzapine and atomoxetine. The company has its market in number of countries including that of Canada. The Canadian government within whose territory the referred drugs were marketed invalidated therein patent. The invalidation of patent tends to cause losses to the company in case of shrinking market and imitation of the drug in other name to facilitate the companies of the Canadian origin for carrying on similar manufacturing process. After finding indifferent attitude of the state, the company approached the court in Canada having jurisdiction against the invalidation against the patent. But the company could not succeed at the original court and in process approached the appellate court where also they could not succeed and order of invalidation of the patent affecting the Canadian market for the company remain in force. Being aggrieved by the orders from national courts, the company Eli Lilly agitated the matter before NAFTA tribunal under NAFTA Agreement. The tribunal in its order annulled the decisions/order of the national courts of Canada. The case has thrown the issues of superiority of the tribunal over the decisions of the national court on one side and on the other extension of expropriation to the areas of manufacturing/marketing of the drugs duly patented. This case is a pointer towards jurisprudential expansion by entering into areas of marketing rights and the rights of patentee.

Expanding Horizon of Expropriation: The realistic school of Jurisprudence bases the foundation of Law on the assumption 'certainty of Law is a judicial myth'¹⁵. When applied to the developments in arena of Expropriation, there seems to be some truth in the assumption. After the advent of concept of sovereignty and emergence of Transnational Corporations/Multinational Corporations the Law towards expropriation came into being in 'Conflict jurisprudence' for search towards proper law which may be applicable to the situation. As the concept of sovereignty concretised, the comity of Nations did not like to disturb the sovereign authority in the result the expropriation of Transnational Corporations/Multinational Corporations have been recognised but with limitations. The limitations on the expropriation was immediate jurisprudential development in relation to expropriation. As already said that the expropriation initially was limited to immovable property, thereafter to movable property, subsequently the intangible property was also brought within the ambit of expropriation as dealt earlier. In its emerging trends in SD Myers¹⁶ and

Saipem¹⁷ the cases related to Canada and Bangladesh have thrown new dimensions with respect to the sanctity of the national courts. In the case of Eli Lilly the further expansion of the scope of expropriation becomes apparent when in fact the Judgement of the National courts including that of Supreme Court of Canada invalidated the patent of Eli Lilly with respect to the two drugs but still the corporation aggrieved by the adjudication of Canadian National courts agitated the matters before NAFTA tribunal and succeeded in getting the award to the tune of US\$5,198,323.29. Besides annulling the order of the National courts, all these adjudications at global/regional tribunals are bent upon to affect the orders of the national courts maybe in dilution to the sovereign principals or by adhering to global regulatory mechanism. The emerging jurisprudence with respect to drug patenting is presenting new dimensions specially towards marketing, sale and patenting.

Comparative Study and Adjudicatory Approach:

For the purpose of comparative study which is limited to expropriation with respect to tangible property on one side and intangible property merely by invalidating the patent is taken into consideration. As already said in its expanded horizons patents have been considered as property but one sees that though they can't be physically taken away, but their invalidation allows other manufacturers to produce such medicines and market them in a definite territory. In the case, once patent is invalidated in a host country the manufacturers of that country have a free hand to copy and market the patent though considered under laws unethical. The different cases are there with respect to taking over the tangible property and/or the management of said property but in case of patents nothing is taken away but only the right of the patent holder is invalidated posing a complicated question of law and fact in the realm of International investment laws especially within the scope of Drug patenting.

Conclusion and Suggestions

In view of the deliberations based on doctrinal methodology and evaluation of data on the factual matrix by adopting an analysis congenial to the subject, it is revealed that expropriation in the context of International Law has assumed certainty as far as its form is concerned. It is with respect to the content and/or the subject matter of the expropriation which has assumed elasticity and stretched from time to time for different dimensions. The expropriation is a concept started from

right of a sovereign state to which International obligation are being imposed giving rise to legal framework that though the expropriation is permissible in International Law but it has its own limitations in the nature of the fact that it ought to be in accordance with law, for public purpose, in good faith, non-discriminatory and followed by compensation. The deliberations in the Article are also dealt with indirect expropriation besides others where International Law has given coverage, but the case of Eli Lilly have thrown complicated question of law and fact for jurist to ponder over. The issue of the substance remains whether the case falls under expropriation where the companies immovables and movables have not been taken over but only their patent with respect to two drugs has been invalidated making the market indifferent to the product of the Eli Lilly in absence of Patent protection. On the other the referred case has raised an issue that where the judgements of the national tribunals have become absolute but still have given chance to NAFTA tribunal to overrule the decisions of the National courts of Canada only because of the treaty agreement. The patent invalidation has arisen with much consequences on sovereign laws by expanding the International Jurisprudence on the subject of expropriation. The ratio of the case is much open for the future to unfold on the subject.

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Source of Funding: No funding for this research and same is from own resources.

Ethical Clearance: The research does not involve any in-vivo study. Therefore, the approval of Institutional Ethics Committee is not required.

References

1. Eli Lilly and Company v. The Government of Canada, ICSID Case No. UNCT/14/2.
2. The Chambers Dictionary, Allied Chambers (India) New Delhi, Edition 2000, Reprint 2006, 571
3. The term eminent domain was incorporated in US constitution by 5th amendment
4. Malcolm N. Shaw, International Law published by Cambridge University Press, 6th edition 2008
5. Rosalyn C. Higgins, Baroness Higgins, was the President of the International Court of Justice since 2006. She was the first female judge elected to the ICJ.

6. Harvard Draft convention, 1961 on International Responsibility of States for injuries to aliens
7. Dillingham- Moore v. Murphyores (1979) 136 CLR 1 (Great Barrier Reef case)
8. The Patent Act, 1970 read with The Patent (amendment) Act, 2005
9. The Drugs and Cosmetics Act, 1940
10. WHO Drug Information, 2000 and later guidelines
11. Hull Formula laid the standard of compensation based on triple criteria of 'Prompt', 'adequate' and 'effective' given by Cordell Hull who was longest-serving U.S. Secretary of State
12. World Bank Guidelines section IV (1) regarding treatment of Foreign Direct Investment referred in 31 ILM, 1992
13. The referred fundamentals for expropriation have find place in various international awards especially from ICSID
14. Metalclad Corporation v. The United Mexican States, ICSID Case No. ARB(AF)/97/1
15. Jerome Frank, an American legal philosopher and legal realism movement author. He was Chairman of the Securities and Exchange Commission, and a United States Circuit Judge of the United States Court of Appeals for the Second Circuit.
16. SD Myers Inc v The Government of Canada, Partial Award (13 November 2000, NAFTA/UNCITRAL) at para 263
17. Saipem SPA v. The people's Republic of Bangladesh, Award (30 June 2009) ARB -05-07 (ICSID)

The Effectiveness of Communication Skills Training on Self-Efficacy and Emotional-Social Adjustment in Women with MS

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Abstract

Objective: The present study aimed to evaluate the effectiveness of communication skills training on the self-efficacy and emotional-social adjustment in the women with MS in Ahvaz.

Methodology: This is an experimental study conducted with pretest-posttest design and a control group. The statistical population included the women with MS who referred to the MS Association of Ahvaz. 30 patients with a low score on self-efficacy scale were selected and they were randomly assigned into experimental/ case and control groups. The Multiple Sclerosis Self-efficacy Scale and Bell Emotional Adjustment Inventory were used to collect the data. MANCOVA was used in order to analyze the data.

Results: The results revealed that communication skills training can enhance the self-efficacy of the MS patients and improve their adjustment level (0.001).

Conclusion: Training of communication skills can enhance the self-efficacy by improving the patients' social communication and the level of their communication with the daily external environment.

Keywords: *Communication Skills Training, Self-efficacy, Adjustment, MS Patients.*

Introduction

Multiple Sclerosis (MS) can be considered as one of the most prevalent demyelinating central nervous system diseases that can be chronic and progressive^{1,2}. In this disease, the nerve sheath is gradually degraded, so that the nerve waves are not transmitted to the brain well and the symptoms of the disease emerge. In Iran, 70000 MS patients are treated by MS associations. MS disease, causes several pressures on different aspects of the patients' lives³. Psychological stress is involved in the formation and development of MS, and one of the most

stressful aspects of the disease is its unpredictability. When the patient is adjusting to the feeling of disability caused by previous attacks, the patient faces another attack with more restrictions^{4,5}. The experience of many MS patients suggests a strong association between psychological stress and the disease relapse⁵. Severe physical disability and cognitive impairment in these patients predict job loss, reduced life standards and social contact, resulting in higher psychological stress in their families and relatives⁶. They often complain of fatigue following the onset of the disease, so spend several hours and days at home⁶.

Reduced self-efficacy is one of the most common problems in MS patients. Self-efficacy is a kind of ability of feeling competent in controlling and coping with different environmental situations. Compared to the patients with diabetes, migraine and gastrointestinal diseases, the rate of depression and fatigue caused by

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low self-efficacy is higher in MS patients^{7,8}. Motl et al.⁷ suggest that self-efficacy as a mediator variable affects the quality of life of MS patients and their level of physical activity. Hence, with self-efficacy decrease, the probability of physical, cognitive and social function will increase in MS patients. Patients with MS have a negative attitude towards life and ignore their abilities in life⁹. Based on the Bandura's theory of self-efficacy, patients with major sources of self-efficacy, including successful and surrogate experiences, verbal persuasions, and physiological states undergo major changes in a way that this process has the greatest impact on the emotional and physiological states. These patients' personal perception of their physiological states causes them to underestimate their ability in accomplishing the tasks. High self-efficacy can predict and improve the mental health of the MS patients^{10, 11}. The results of the research carried out by Molt et al.¹² suggest that there is a relationship between self-efficacy and an improvement in their walking function in patients. Emotional and social adjustment problems are another consequence of this disease¹³. Ghaffari et al.¹⁴ report that praying, seeking of information, social support, and hope play a key role in the adjustment of these patients. Soundy et al.¹⁵ report that three basic needs are addressed in the model of emotion, hope and adjustment in the MS patients, including independence and right to choose, coping with conditions, and control perception. Bringfelt et al.¹⁶ report that these patients avoid social situations due to communication problems. Few studies have been conducted on the effect of communication skills training on improving social communication in the MS patients. Training the communication skills to a group of MS patients, counseling and expression of the emotions in group interactions affected the fatigue, anxiety, and depression in the MS patients. Hemmatpour et al.¹⁷ reported that life skills training can enhance the self-control and self-management in these patients¹⁸.

Method and Materials

This experimental study was conducted as a pretest-posttest design with a control group. All women referred to the Ahvaz MS Counseling Center from March to July 2017 were asked to complete the *Washington* self-efficacy scale for MS patients. Then, out of the 58 subjects who met the inclusion criteria (definitive diagnosis of the MS disease by a neurologist, score 0-5 on the disability status scale, the first type of the disease, that is, relapsing-remitting, and willingness to participate in all training sessions), 30 patients assigned into 2

groups. In order to observe the ethical considerations, the subjects were ensured that their answers would remain completely confidential. After coordinating with Ahvaz MS Association, the experimental group completed 8 sessions of communication skills training for one month and Each session lasted 120 minutes.

Two questionnaires were used to collect the data in this study, including Washington Multiple Sclerosis Self-efficacy Scale and Bell's Adjustment Inventory. The Persian version of the Washington Multiple Sclerosis Self-efficacy Scale is a 17-item self-report scale designed and validated by Emtelman et al.¹⁹ to assess the efficacy level of MS patients. It is scored on a 5-point Likert scale (1 to 5). The higher score in this scale means higher self-efficacy. This scale was re-translated by the researchers of this paper into Persian. The reliability of this scale was reported 0.90 by using Cronbach's alpha and its validity coefficient through correlating it with Efficiency Scale for Chronic Disease was reported 0.80. The Bell's Adjustment Inventory is a self-report scale consists of 160 questions with five subscales of home adjustment, health adjustment, social adjustment, emotional adjustment, and job adjustment. Each of its questions is answered by choosing one of the three options of Yes, No, and I don't know. Cronbach's alpha reliability coefficients of this questionnaire for the subscales of home, health, social, emotional and adjustment and for the whole test were reported 0.91, 0.81, 0.88, 0.91, 0.85, and 0.94, respectively. In Iran, The validity coefficient of this questionnaire was also reported 0.78 by correlating it with Eysenck personality test.

Research Procedure: After obtaining the permission of Ahvaz MS Association, the subjects of the case group referred to Rehabilitation Conference Hall and attended the sessions. The package of training communication skills was prepared and implemented by extracting it from the UNICEF Adult Life Skills Communication Skills Book²⁰.

Communication skills sessions:

1. Introducing group members to each other, stating the rules, goals, and necessities of learning communication skills
2. Introducing the types of verbal and nonverbal communication and the way of expressing them in different social situations
3. Explaining the barriers to communication,

and introducing the techniques of starting and maintaining an effective communication with others.

4. The importance of self-knowledge, introducing the self-disclosure and self-expression skills
5. Introducing the listening skills and reflection of meanings and feelings and familiarity with communication patterns
6. Examining different types of self-expression and its benefits and functions, decisiveness in behavior with flexibility, developing a power of saying no, ability of demanding and assertiveness training
7. Introducing the environmental factors in the communication, the importance of eye contact,

transmission of the message through face movements and emotion expression

8. The way of expressing the emotions in everyday situations
9. Playing different roles in possible situations by the patients
10. Assessing the level of patients' progress and providing appropriate solutions

Data Analysis: In this study, the data were analyzed using statistical method of mean, standard deviation and multivariate analysis of covariance. The data were analyzed using SPSS software version 19 and at the $p \leq 0.01$ significance level.

Results

Table 1: The mean and standard deviation of the variables of self-efficacy, emotional adjustment, and social adjustment in the case and control groups separately in pretest and posttest stages

Variables	Statistical Indices	Case Group		Control Group	
		Mean	SD	Mean	SD
Self-Efficacy	Pretest	43	2.11	46.43	24.10
	Posttest	50	04.12	06.43	61.10
Emotional Adjustment	Pretest	20	67.6	53.19	34.4
	Posttest	4.16	89.7	13.19	77.3
Social Adjustment	Pretest	6.12	66.3	66.12	85.5
	Posttest	2.10	29.4	2.13	87.5

As shown in Table 1, the mean (SD) score of the self-efficacy was 43 (11.2) in the case group and 43.46 (10.24) in the control group in the pretest stage and it was 50 (12.4) in the case group and 43.06 (10.61) in the control group in the posttest stage. The mean (SD) score of the emotional adjustment was 20 (6.67) in the case group and 19.53 (4.34) in the control group in the pretest stage and it was 16.4 (7.89) in the case group and 19.13 (3.77) in the control group in the posttest stage. The mean (SD) score of the social adjustment was 12.6 (3.66) in the case group and 12.66 (5.85) in the control group in the pretest stage and it was 10.2 (4.29) in the case group and 12.2 (5.87) in the control group in the posttest stage

Kolmogorov-Smirnov test results were used to determine the normality of the research variables. Its results are as follows: self-efficacy ($F = 0.43, P = 0.51$), emotional adjustment ($F = 3.05, P = 0.09$), and social adjustment ($F = 4.02, P = 0.06$). The F ratios of the Levene's homogeneity variance test were not significant for self-efficacy and socio-emotional adjustment variables; so, the homogeneity of the variances is confirmed. In this study, the posttests of self-efficacy, emotional adjustment, and social adjustment were considered as dependent variables and their pretests were considered as covariates.

Table 2: The results of MANCOVA on the mean scores of posttest of variables

Test	Value	F	df hypothesis	df error	Significance Level	Effect Size	Statistical Power
Pillai's Trace	606.0	79.11	3	23	001.0 \geq p	606.0	998.0
Wilks' Lambda	394.0	79.11	3	23	001.0 \geq p	606.0	998.0
Hotelling's Trace	53.1	79.11	3	23	001.0 \geq p	606.0	998.0
Roy's Largest Root	53.1	79.11	3	23	001.0 \geq p	606.0	998.0

Table 2 illustrates that there is a significant difference between the case and control groups in terms of dependent variables at the level of ≥ 0.001 . Accordingly, it can be stated that there is a significant difference between the two groups in at least one of the dependent variables (self-efficacy, emotional adjustment and social adjustment). Three covariance analyses were

performed in the MANCOVA to find this difference. Based on the calculated effect size, about 61% of the total variance of the case and control groups is explained by the independent variable effect. The statistical power of the test is also 0.99, which means that the test rejects the null hypothesis with 99% power.

Table 3: The results of the analysis of covariance in the MANCOVA on the posttest of variables

Dependent Variable	Sum of Squares	df	Mean of Squares	F	Significance Level	Effect Size	Statistical power
Self-Efficacy	95.397	1	95.397	78.18	001.0	43.0	99.0
Emotional Adjustment	89.75	1	89.75	02.9	001.0	27.0	82.0
Social Adjustment	63.65	1	63.65	11.18	001.0	42.0	98.0

As shown in Table 3, the F-value is 18.78 for the self-efficacy variable, 9.02 for the emotional adjustment variable, and 18.11 for the social adjustment variable, all of which were significant at the level of $P = 0.001$. It is also seen that the highest effect size relates to the self-efficacy variable (0.43), indicating that 43% of the total variance of the case and control groups in the self-efficacy variable is explained by the independent variable effect (training of communication skills) and the least effect size relates to emotional adjustment (0.27), indicating that 37% of the total variance of the case and control groups in the emotional adjustment variable is explained by the independent variable effect (training of communication skills).

Discussion

The present study aimed to evaluate the effectiveness of training of the communication skills on self-efficacy and social-emotional adjustment in the women with MS in southwestern of Iran. The results revealed that training of the communication skills enhanced the self-efficacy and emotional adjustment, and social adjustment in the women with MS, compared

to the control group. The results of this study are in line with those research conducted by Krokavcova et al.²¹, Pagnin et al.¹⁸, Hemmatpoor et al.¹⁷, Motl et al.⁷. Psychological conditions of patients along with fatigue and hopelessness resulted in a reduction in their social communication and quality of life. Based on the results of the few research^{2,16}, changes in the social identity of these patients cause social constraints, and training of the communication skills is effective in their presence in public settings. According to the Adjustment and Hope Model of Soundy et al.¹⁵, there are various ways to meet the need for self-management in the MS patients such as training of life and communication skills, so that they can meet their psychological and emotional needs and enhance their self-efficacy.

Conclusion

Regular trainings of communication skills can provide effective communication with others and explain the disease conditions and the physical restrictions. The way of talking and starting and terminating the conversations with others without the shame of the disease and concern of self-disclosure is one of the

benefits of this training. In light of the trainings and performing the everyday exercises, these patients are encouraged to communicate properly with others without a concern about their physical problems. So, recommended that the communication skills packages be included in the plans of improving the patients' adjustment at the rehabilitation centers.

Ethical Consideration: Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or submission, redundancy, etc.) have been observed by the authors.

Conflicts of Interest: The authors declare no conflicts of interest.

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References

1. Cosio D, Jin L, Siddique J, & Mohr D. The effect of telephone administered cognitive behavioral therapy on quality of life among patients with Multiple Sclerosis. *J Behav Med* 2011;41: 227-234.
2. Lincoln N, Yuill F, & Holmes J. Evaluation of an adjustment group for people with multiple sclerosis and low mood. *Multiple Sclerosis* 2011; 17(10): 1250-1257.
3. Moher DC. Stress and multiple sclerosis. *Journal of Neurology* 254 suppl2: 1165-8
4. Patten BP, Marrie RA & Carta MG. Depression in multiple sclerosis. *Int Rev Psychiatry* 2017; 29: 1-10.
5. Hakim EA, Bakhiet M, Bryant TN, McLellan DL. The Social impact of multiple sclerosis- A study of 305 patients and their relatives. *Disability and rehabilitation* 2000 22(6) 288-93.
6. Schmitt, MM, Goverover Y, & Deluca J. Self-efficacy as self-reported physical, cognitive and social functioning in multiple sclerosis. *Rehabilitation Psychology* 2014; 59(1): 27-34.
7. Motl RW, McAuley E, Snook EM, & Gliottoni RC. Physical activity and quality of life in multiple sclerosis. *Psychological Health Medicine* 2014; 14(1): 111-124.
8. Bandura A. Toward a psychology of human agency. *Perspectives on Psychological Science* 2006; 1: 164-180
9. Shaker Dolagh A, Amin pur M. Optimism-Pessimism and self-efficacy in patients with multiple sclerosis. *Health and care* 2014; 17(1):47-56 (In Persian).
10. Rigby S, Domenech C, Thornton E, Tedman S, & Young C. Development and validation of a self-efficacy measure for people with multiple sclerosis. *Multiple Sclerosis Journal* 2013; 9(1): 73-81.
11. Riazi A, Thompson A, & Hobart J. Self-efficacy predicts self-reported health status in multiple sclerosis. *Multiple Sclerosis Journal* 2004; 10(1): 61-66.
12. Molt RW, Balto JM, Ensari I, Hubbard EA. Self efficacy and walking performance in persons with multiple sclerosis. *J Neurol Phys Ther* 2017, 41(2), 114-118.
13. Barker AB, Lincoln NB, Hunt N, Nair R. Social Identity in people with multiple sclerosis. *Int J MS Care* 2018, 20 (2), 85-91
14. Ghafari S, Fallahi-Khoshknab M, Noruzi Tabrizi K, Mohamadi E. Patient experience of adapting to multiple sclerosis: A qualitative study. *Contemporary Nurse: A Journal for the Australian Nursing Profession* 2015 50(1), 36-49.
15. Soundy A, Roskell C, Elder TM, Collet J, Dawes H. The psychological processes of adaptation and hope in patients with multiple sclerosis: A Thematic synthesis. *Open Journal of Therapy and Rehabilitation* 2016, 4(10), 10.4236
16. Bringfelt PA, Hartelius L, Runmarker B. Communication problems in multiple sclerosis: 9-year follow-up. *Int J MS Care* 2006, 8, 130-140.
17. Hemmatpoor B, Gholami A, Parnian S, Seyeddoshohadaee M. The Effect of Life Skills Training on the Self-Management of Patients with Multiple Sclerosis. *Journal of Medicine and Life* 2018, 11(4), 387-393
18. Pagnin F, Bosma CM, Philips D, Langer E. Symptom changes in multiple sclerosis following psychological interventions: a systematic review 2014, *BMC Neurology*, 14, 222.
19. Amtmann D, Bamer AM, Cook KF, Askew RL, Noonan VK, & Brockway JA. University

- of Washington self-efficacy scale: A new self-efficacy scale for people with disabilities. *Archives of Physical Medicine and Rehabilitation* 2012; 93(10): 1757-65.
20. Naseri H. Life Skills. Publication of Deputy of Cultural Affairs and Prevention of Welfare Organization of Iran. 2010 (In Persian)
21. Krokavcova M, Dijk JP, Nagyova I, Rosenberger J, Gavelova M, & Middel B. Social support as a predictor of perceived health status in patients with multiple sclerosis. *Patient Education and Counseling Journal* 2008; 73(1): 159-165.
22. Dennison L, Moss-Morris R, & Chalder T. A review of psychological correlates of adjustment in patients with multiple sclerosis. *Clinical Psychology Review* 2009; 29(2): 141-153.

Comparison of Biomechanical Stability between Tensionband Wiringfixation and Post-Osteotomyolecranonchevronhook Plate

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Abstract

Background: The distal humerus fracture is a challenging type of fracture for Orthopedic & Traumatologic surgeons due to the complexity of articular anatomy, limited area of fixation, osteoporotic bone, and intraarticular comminution. The most popular field surgery technique is olecranon osteotomy and olecranon osteotomy Fixation, usually using Tension Band Wiring. However, a high level of complications raises the discourse to look for better implant alternatives.

Objective: To compare the biomechanical stability between Tension Band Wiring and the post osteotomy Chevron olecranon Hook Plate

Method: We divided the sample into two groups, each with 7 ulna bones. Chevron osteotomy was conducted on Olecranon, and then reduced, and fixed. Tension Band Wiring was installed using 2 Kirschner wire 1.6 which was paralleled and loop wire 1.0 which formed the number 8. Hook plate using 3.5, 7 hole GSM® plate. The screw lag was mounted on the proximal hole. The biomechanical test using the Shimadzu AG-10TE autograft engine, performed by 200 N recurring tugs. The shift between the two osteotomical fragments was measured using a digital thrust range after a 10x, 20x, 50x, and 100x tension.

Result: The 10x tensile test showed an insignificant difference ($p = 0.091$). When the recurring tensile test was continued, the results show significant differences after 20x ($p = 0,007$), 50x ($p = 0.004$), 100x ($p = 0.001$). The results showed that the olecranon osteotomy fragment shift after fixation with Hook Plate was less than that of the Wiring Tension Band.

Conclusion: Biochemically Hook Plate is better than post-osteotomy Chevron olecranon Tension Band Wiring.

Keywords: *Fraktur distal humerus, osteotomi Chevron olecranon, Tension Band Wiring, Hook Plate, stabilitas biomekanik.*

Introduction

A distal humerus fracture is one of the most challenging fractures for Orthopedic & Traumatologic

surgeons due to the complexity of articular anatomy, limited area of fixation, osteoporosis, and intraarticular cominary trends^{1,2}. The distal humerus fracture occurs in 2% of all adult fractures, with a ratio of 5.7 cases per 100,000 adult population⁵. The incidence of this fracture tends to increase with increasing life expectancy and the incidence of osteoporosis in geriatric patients⁶. This fracture requires anatomical reduction and stable fixation to facilitate early mobilization⁷. Preservation of extensor mechanisms and minimizing soft tissue damage will improve clinical outcomes². The most commonly

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used operating field opening is posteriorly by osteotomy of olecranon^{6,7}. Tension band wiring, screw, or plating may be used for Post-osteotomy Olecranon fixation¹⁰. However, the ideal fixation of olecranon osteotomy remains unanswered.

Tension band wiring is the most commonly used olecranon fixation technique (2,9,10). This wiring olecranon tension band technique was first introduced by Weber and Vasey¹³. The principle of tension bands on transverse olecranon fracture is based on the understanding that the distraction force in the outer cortex will be converted into compression forces on the side of the joint surface when elbow flexion. Fracture compression is not associated with active flexion, but appears when the active extension is between 30-120°¹⁴. The installation procedure of Tension Band Wiring requires only simple instruments, and is financially cheaper¹⁵. However, Tension band wiring has several complications, namely implants that protrude into soft tissue causing irritation (3-80%), Kirschner wire uprooted, fractured shift fragments, malposition, elbow joint stiffness, heterotopic ossification, non union, or injury to important structures in the vicinity, the ulnar artery, the ulnar nerve, and the anterior interosseous nerve¹⁶. Transverse olecranon osteotomy fixed with Tension Band Wiring, non-union risk is 30% and loss of reduction is 60%¹⁷.

The risk of higher complications post olecranon fixation makes the selection of Tension Band Wiring implants to be reviewed. The alternative to olecranon fixation is to use plating. Plating olecranon has a lower loss of reduction risk compared with Tension Band Wiring in retrospective clinical and radiological trials¹³. 17 patients were treated using olecranon osteotomy and fixation using plate, all union, with 1 screw complication of the proximal radioulnar joint, and only 1 patient requested a plate release¹⁹.

By far, the Tension Band Wiring has been the choice of olecranon osteotomy fixation, but with the risk of more frequent complications arising, it has arisen to compare the biomechanical strength of the locally made olecranon hook plate with Tension Band Wiring olecranon. The biomechanical strength of the two implants is measured by comparing the displacement of fracture fragments when given the pull force of the triceps muscle. In this study, osteotomy of Chevron olecranon was made in the cervical ulna bone. This study is expected to provide answers on implants that are

superior in biomechanical strength and whether locally made olecranon hook plates can be an alternative to post osteotomy olecranon fixation.

Method

The subjects in this study were ulna cadaveric bones that met the criteria. Subject inclusion criteria included male cadaveric ulna bones between the ages of 20-60 years and the ulna cadaver bone that died within less than 3 years ago. Subject exclusion criteria including damaged ulna cadaver bone and maladronic cadaver ulna bone. The samples were collected by 14 ulna bones, which were then divided randomly into 2 groups, namely the Tension Band Wiring group and the Hook Plate olecranon group (each group of 7 ulna bones).

This is an analytic-prospective study conducted by comparing the displacement of fracture fragments post-fixation and repetitive load on cadaveric bone. The samples were divided into two groups, i.e. the group treated with displacement measured by comparing the distance between the two points before and after being given repeated loading. The initial distance between the two points was 10 mm. The load was given at 200 N, repeated periodically by 10x, 20x, 50x, and 100x. Measurement displacement (shift) was done by measuring the distance between two points, each located in the proximal and distal fracture fragments.

The study procedure included olecranon osteotomy performed by making a V pattern with the distal end (apex distal), then proceed by cutting olecranon using oscillating saw. The bone was placed on the bone holder, then the olecranon fracture was reduced using pointed reduction forceps. Kirschner wire 1.6 was drilled on a proximal fragment, penetrating the fracture line leading to the anterior cortex. One other Kirschner wire 1.6 was drilled in the direction of the first. After penetrating the anterior cortex, both wires were pulled back for ±1 cm. The hole for the wire loop on the diaphysis was made using 2.0, 4 cm of drill bit from the fracture line and 0.5 cm from the posterior edge of the ulna. Holes were made through two cortices.

The wire loop was twisted at 1/3 of length, then inserted into the hole in the diaphysis. Loop wire 1.0 was formed to resemble the number 8 by passing both ends of Kirschner wire. Both ends of the wire were united and twisted. Both twists were played simultaneously and headed in the same direction, leading Tension Band Wire tension to be balanced. Torsion was performed

until compression occurs from the fracture line. The two ends of the Kirschner wire were cut and bent, then imprinted into the bone. The ulna bone was placed on the bone holder. Fractures were reduced using pointed reduction forceps. After the compression of the fracture, both other holes were drilled using a 2.5 drill, measured with depth gauge, and taped. The two 3.5 cortical screws were placed corresponding to the depth of the hole.

Biomechanical test was conducted by measuring friction fragment shift when tensile test was carried out using autograft machine. Bone that has been fixed using Tension Band Wiring olecranon or Hook Plate olecranon placed on autograft machine. The triceps tension on the olecranon was replaced with a 1.0 wire loop inserted on the olecranon, and attached to the top side autograft puller. The direction of the wire loop was perpendicular to the long axis of the ulna to condition the pull of the triceps muscle when the elbow is in a 90° flexion position. Proximal ulna difection was perforated and fastened with a 1.0 wire loop on the underside of the lower side autograft machine to resist the pulling force. In both fragments each fracture was marked a point then installed Kirschner wire 1.0 perpendicularly as a marker. Prior to the tensile strength testing, the distance between the two point markers was measured first using the digital throw term. Automatic drag force was given for 200 N, and was repeated continuously. At 10x, 20x, 50x, and 100x repetitions, the engine tension was suspended and measured at both markers. The collected data were analyzed statistically using SPSS program version 23.0 (SPSS, Inc., Chicago, IL)^{17,18,19}.

Result

Table 1. Implant Biomechanical Parametric Test Results of Wiring (TBW) and Olecranon Hook Plate.

Tensile Test of 200 N	Implant Type	Mean±SD	p
10x	TBW	0.67±0.80	0.091
	Hook plate	0.07±0.06	
20x	TBW	1.22±0.74	0.007
	Hook plate	0.11±0.06	
50x	TBW	1.39±0.70	0.004
	Hook plate	0.19±0.08	
100x	TBW	1.74±0.66	0.001
	Hook plate	0.30±0.11	

The biomechanical test results showed a shift in the Tension Band Wiring greater than the Hook Plate

olecranon (table 1). The initial hypothesis is that the olecranon Hook Plate biomechanical strength is better than the olecranon tension band. To test the normality of the sample using the Kolmogorov-Smirnov test, from the Tension Band Wiring and Hook Plate olecranon groups, $p = 0.2$ ($p > 0.05$). This shows that the data represents the population and can be continued for parametric tests. In statistical calculations, it was found that the 200 N tensile test was 10x, no significant difference was found ($p = 0.068$). When the tensile test was continued to 20x, there were significant differences ($p = 0.002$), as well as the 50x tensile test ($p = 0.001$) and 100x ($p = 0,000$). These results indicate that biomechanically, Hook Plate olecranon is better than Tension Band Wiring olecranon (table 1).

Discussion

By far, Tension Band Wiring was more often used in post osteotomy olecranon fixation^{2,9,10}. This technique is easy to work with and requires only simple and inexpensive equipment¹⁵. The risk of complications is one of the disadvantages of this implant. Complications that may occur are malposition, implant migration, broken implants, implants irritating surrounding tissue, or about important structures such as the ulnar artery and the anterior inteosseal nerve^{14,15,17}

Olecranon plating is one of the alternatives to post osteotomy olecranon fixation. Although economically more expensive, plating has a lower risk of complications, i.e. the screw penetrates the proximal radioulne joints^{13,11,16}. The protrusion of the plate and the screw against the soft tissue is relatively dependent on the design and thickness of the implant. The plating time compared to the wiring tension band depends on the operator, the operating technique, and the complexity of the fracture.

This study compares the biomechanical stability between Tension Band Wiring with Hook Plate (local custom design) for ulna cadaveric bone fixation after osteotomy of Chevron olecranon. The initial hypothesis of this research was that the olecranon Hook Plate is more stable biomechanically when compared with Tension Band Wiring. The sample was the ulna cadaveric bone, with the required sample size of each 7 for each group (total 14 bone samples), calculated using the Federer formula. The entire samples were randomized and osteotomy of Chevron on olecranon using oscillating saw. Then, the fracture was reduced and fixed using Tension Band Wiring or Hook Plate.

Construction Tension Band Wiring uses Kirschner wire 1.6 and loop wire 1.0. Hook Plate olecranon 3.5 7 holes (non locking) using local design GSM® implant. The entire sample was tensile test with Shimadzu AG-10TE Autograft engine. The tensile test was carried out with a load of 200 N. The load size was 200 N because the reaction force at the elbow joint at extension is 107 N. The tensile test was carried out repeatedly up to 100x. The measured variable was a shift between the two fragments of bone fracture. Bone shift is measured by comparing the distance between the two points on each bone fragment, marked with Kirschner wire 1.0, before being given a pull, after the pull of 10x, 20x, 50x, and 100x. The distance between the two points was measured using a digital thrust range, and calculated the difference between before tensile test and after tensile test 200 N 10x, 20x, 50x, and 100x. The mean displacement result then was analyzed the significance of the shift difference using paired t test for each treatment (after pull of 10x, 20x, 50x, and 100x) using SPSS 23.

The paired t test results showed that after the tension of 10x there was a difference between Tension Band Wiring to Hook Plate, but this difference was not significant. However, the 20x, 50x, and 100x tension show significant differences. These results indicate that, according to the original hypothesis of the study, the olecranon hook plates are biomechanically more stable than the Tension Band Wiring Olecranon.

This study shows that olecranon hook plates (non locking, local design) can be an alternative to replacing Tension Band Wiring, which is often used for post-fracture olecranon fixation or osteotomy. This study was performed on the cervical ulna bone without any soft tissue around it. Thus, the effect of implants on soft tissue can not be assessed.

Conclusion

This study shows that biomechanically, Olecranon Hook Plate (non locking, local design) is more stable than Tension Band Wiring. Plate olecranon is one of the alternatives to olecranon osteotomy fixation, with the risk of complications being the screw through the proximal radioulnar joints.

Conflict of Interest: There is no conflict of interest.

Source of Funding: This study is self-funded.

Ethical Clearance: This study was approved by

Ethical Commission (691/Panke, KKF/XII/2016) at the Dr. Soetomo General Hospital, Surabaya, Indonesia.

Reference

1. Wolfe SW, Pederson WC, Hotchkiss RN, Kozin SH, Cohen MS. Green's operative hand surgery: the pediatric hand E-book. Elsevier Health Sciences; 2010.
2. Limthongthang R, Jupiter JB. Distal humerus fractures. *Oper Tech Orthop.* 2013;23(4):178–87.
3. Nugraha HK, Adiantono A. Epidemiology Of Fractures And Dislocations In Children Mode of Injury Road traffic accidents Falls below 1 meter Falls above 1 meter Blunt trauma. 2017;1–5.
4. Binti Ida Umayu. The Characteristic Of Patients With Femoral Fracture In Department Of Orthopaedic And Traumatology RSUD Dr. Soetomo Surabaya 2013 – 2016. Univ Nusant PGRI Kediri [Internet]. 2017;01(1):1–7. Available from: <http://www.albayan.ae>
5. Robinson CM, Hill RMF, Jacobs N, Dall G. Adult distal humeral metaphyseal fractures: epidemiology and results of treatment. *J Orthop Trauma.* 2003;17(1):38–47.
6. Palvanen M, Kannus P, Niemi S, Parkkari J. Secular trends in distal humeral fractures of elderly women: nationwide statistics in Finland between 1970 and 2007. *Bone.* 2010;46(5):1355–8.
7. Jupiter JB, Neff U, Holzach P, Allgower M. Intercondylar fractures of the humerus. An operative approach. *J Bone Jt Surg Am.* 1985;67(2):226–39.
8. Wilkinson JM, Stanley D. Posterior surgical approaches to the elbow: a comparative anatomic study. *J shoulder Elb Surg.* 2001;10(4):380–2.
9. Pollock JW, Athwal GS, Steinmann SP. Surgical exposures for distal humerus fractures: a review. *Clin Anat.* 2008;21(8):757–68.
10. Wong AS, Baratz ME. Elbow fractures: distal humerus. *J Hand Surg Am.* 2009;34(1):176–90.
11. Karlsson MK, Hasserijs R, Karlsson C, Besjakov J, Josefsson P-O. Fractures of the olecranon: a 15- to 25-year followup of 73 patients. *Clin Orthop Relat Res.* 2002;403:205–12.
12. Ring D, Gulotta L, Chin K, Jupiter JB. Olecranon osteotomy for exposure of fractures and nonunions of the distal humerus. *J Orthop Trauma.* 2004;18(7):446–9.

13. Hume MC, Wiss DA. Olecranon fractures. A clinical and radiographic comparison of tension band wiring and plate fixation. *Clin Orthop Relat Res.* 1992;(285):229–35.
14. Brink PRG, Windolf M, De Boer P, Brianza S, Braunstein V, Schwieger K. Tension band wiring of the olecranon: is it really a dynamic principle of osteosynthesis? *Injury.* 2013;44(4):518–22.
15. Amini MH, Azar FM, Wilson BR, Smith RA, Mauck BM, Throckmorton TW. Comparison of outcomes and costs of tension-band and locking-plate osteosynthesis in transverse olecranon fractures: a matched-cohort study. *Am J Orthop (Belle Mead NJ).* 2015;44(7):E211-5.
16. Villanueva P, Osorio F, Commessatti M, Sanchez-Sotelo J. Tension-band wiring for olecranon fractures: analysis of risk factors for failure. *J shoulder Elb Surg.* 2006;15(3):351–6.
17. Gainor BJ, Moussa F, Schott T. Healing rate of transverse osteotomies of the olecranon used in reconstruction of distal humerus fractures. *J South Orthop Assoc.* 1995;4(4):263–8.
18. Hewins EA, Gofton WT, Dubberly J, MacDermid JC, Faber KJ, King GJW. Plate fixation of olecranon osteotomies. *J Orthop Trauma.* 2007;21(1):58–62.
19. Bayusentono S, Choi Y, Chung CY, Kwon S. Recurrence of Hip Instability After Reconstructive. 2014;1527–34.
20. Ku Abd Rahim KN, Kamaruzaman HF, Dahlui M, Wan Puteh SE. From Evidence to Policy: Economic Evaluations of Healthcare in Malaysia - A Systematic Review. *Value Heal Reg Issues [Internet].* 2020;21:91–9. Available from: <https://doi.org/10.1016/j.vhri.2019.09.002>
21. Utomo DN, Mahyudin F, Wijaya AM, Widhiyanto L. Proximal fibula osteotomy as an alternative to TKA and HTO in late-stage varus type of knee osteoarthritis. *J Orthop [Internet].* 2018;15(3):858–61. Available from: <https://doi.org/10.1016/j.jor.2018.08.014>
22. Monitoring AC. Cyclostationarity : Theory and Method – IV Contributions to the 10th Workshop. 2017.
23. Chung MK, Zulkarnain A, Lee JB, Cho BC, Chung CY, Lee KM, et al. Functional status and amount of hip displacement independently affect acetabular dysplasia in cerebral palsy. *Dev Med Child Neurol.* 2017;59(7):743–9.
24. Kim JY, Lee YH, Gong HS, Lee SL, Lee SK, Baek GH. Use of Kirschner wires with eyelets for tension band wiring of olecranon fractures. *J Hand Surg Am.* 2013;38(9):1762–7.

Study on Various Evidences of Physiotherapy Interventions for Decision Making towards Management of Stroke

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Abstract

Stroke rehabilitation focuses on reducing impairments and functional disability. Regaining functional independence in stroke patients in order to participate in usual self-care and daily activities as independently as possible in the final aim. For this New treatment approaches to enhance recovery are been tried out globally. Implementing this requires timely understanding of disease in order to decide right approach. Clinical decision making for correct assessment strategies will largely influence appropriate treatment strategies. It is therefore necessary to find out evidences for understanding traditional strategies and learn newer skills for treatment.

Keywords: *Stroke, clinical decision making, evidence based practice, assessment, and management.*

Introduction

Stroke is one of the leading cause of death and impairments worldwide. The effect on patients, their families and economy are increasing day by day due to the long-term physical and cognitive consequences of stroke. By 2030, stroke prevalence is expected to increase by 25% in the USA¹. Importance is been given on acute care management for stroke due to the nature of disease. Significant research is going on management as per the stage and duration of disease. Although recovery varies among stroke patients, studies have suggested that functional recovery is predictable in the first days after stroke². Advances based on animal models have sharpened our understanding of the genetic, molecular, physiologic, cellular, and behavioral adaptations that drive and may limit the recovery of function³. Various therapies are based on changing the mechanisms

of learning and memory, enhancing neurogenesis, improving axonal regeneration, facilitating neurotransmitters and growth factors which can facilitate the recovery process in subjects with stroke. Following stroke, the motor recovery is often inadequate. The site of lesion, stage of recovery, assessment strategies and treatment strategies often plays an important role in functional outcome. Long term survival can be predicted by functional outcome at 6 months⁴. Many approaches are based on the principle of neural plasticity.

Effects of stroke: Effect of stroke is decided by site and initial stroke lesion⁵. Altered Consciousness/attention/alertness, Reduced energy/motivation, Dysphagia, Dysphonia/dysarthria/dysphasia Reduced muscle power/tone, Altered sensation/proprioception, Reduced co-ordination, Change in temperament/personality, Executive dysfunction/cognitive decline, Perceptual change, Loss of visual acuity/field deficit, Reduced joint stability/mobility, Balance impairment, Altered gait pattern are common impairments following stroke. Motor impairment is the most commonly recognized one⁵. The focus of management is to achieve voluntary motor control in order to reduce disability and promote functional independence. Multiple studies have assessed novel therapeutic interventions that may improve both motor and non motor symptoms. It is

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becoming extremely important to assess the effect, the impact despite limitations in clinical practice. In 2001, the World Health Organization developed and endorsed the International Classification of Functioning, Disability and Health (ICF)⁶.

Clinical decision making: Clinical decision making is a contextual, continuous, and evolving process, where data are gathered, interpreted, and evaluated in order to select an evidence-based choice of action.

In the context of the complex and nature of clinical practice, therapists gathered data that they considered meaningful during patient examination. The findings provide insight into factors influencing assessment decisions and suggest mechanisms to foster translation of research into clinical practice⁷. Physiotherapists used a variety of clinical reasoning strategies and considered many factors to influence their decision-making in the planning and delivery of physiotherapy post-stroke. These included the therapist's clinical experience, patient's presentation and response to therapy, prioritization, organizational constraints and compliance with organizational practice⁸.

Education in principles of EBP, EBP self-efficacy, a positive attitude towards research, and involvement in research at work may promote research use in neurological physical therapy practice⁹.

Stroke rehabilitation: Stroke rehabilitation is an ongoing process. Goal of stroke rehabilitation is to help you relearn skills that are lost when a stroke affected part of brain. Stroke rehabilitation can help regain independence and improve your quality of life. Multidisciplinary team approach is effective in delivering the necessary care. Accurate prognosis of recovery after stroke can help to decide on the type, duration and specific goals of rehabilitation for individual patients.

Urinary incontinence, sex, pre stroke disability and dysarthria affected the level of outcome after stroke; age, dysphasia, and limb deficit also affected the rate of recovery¹⁰.

Rehabilitation therapies: Various therapies have been evolved for stroke care. They are largely influenced by underlying principles. Nervous system is adaptive and has the capacity to reorganize itself. The underlying neurons take over the function in the process of recovery. Establishment of inter neuronal circuits is largely affected by pattern of rehabilitation, amount

of repetitions and transference of training in variety of situations. Regular practice with attention, motivation is effective in enhancing motor control.

Animal studies are identifying genetic and biochemical pathways involved in the establishment of new anatomic connections and functional network reorganization (e.g., axonal sprouting, dendrite proliferation, neurogenesis).¹¹ In same manner a human brain undergoes continuous anatomical, physiological changes following stroke.

Recently published draft guideline on 'Therehabilitation and support of stroke patients', developed by the UK National Clinical Guideline Centre and commissioned by the National Institute for Health and Clinical Excellence (NICE), contains a comprehensive list of recommendations on interventions used in stroke rehabilitation¹².

Interventions for stroke: Pharmacology in stroke: Pharmacologic therapy for stroke may be divided into stroke-specific treatment and stroke prevention¹³. Pharmacologic treatment of a stroke depends upon whether the stroke is ischemic or hemorrhagic. Pharmacotherapeutic options for primary ischemic stroke are tissue plasminogen activator (tPA) and—under defined conditions—antiplatelet agents. Pharmacotherapeutic treatment for hemorrhagic stroke is aimed at controlling the patient's blood pressure and intracranial pressure. Amphetamine showed promise in highly selected patients for motor gains¹⁴. Aspirin is the only oral antiplatelet agent that has been evaluated for the treatment of acute ischemic stroke. Aspirin therapy (325 mg) should begin within 24 to 48 hours of an ischemic stroke, but not within 24 hours of completion of alteplase therapy¹⁵. Management of the patient's blood pressure also reduces the patient's risk of another stroke¹⁶.

Peculiar therapies for stroke:

Stem cell therapy: Stem cells can be defined as clonogenic cells that have the capacity to self-renew and differentiate into multiple cell lineages. After a stroke, millions of brain neurons die within minutes. Research has found that stem cells target the area with chemicals that save and rejuvenate that tissue. Optimal time for introducing stem cells seems to be between 36 and 72 hours after the stroke. Cell therapy is emerging as a promising new modality for enhancing neurologic recovery in ischemic stroke¹⁷. Many studies advocate

stem cell transplantation within the first 3 days after ischemia for better functional recovery¹⁸. Cell therapy promotes re-vascularization and reduces cerebral inflammation after stroke and phase II clinical trials of intravenous transplantation of autologous bone-marrow stem cells have reported safety and tolerability in stroke patients¹⁹.

Transcranial direct current stimulation (tDCS):

Transcranial direct current stimulation (tDCS) is a form of neuromodulation that uses constant, low direct current delivered via electrodes on the head. It can be contrasted with cranial electrotherapy stimulation, which generally uses alternating current the same way. Transcranial direct current stimulation has enormous clinical potential for use in stroke recovery because of its ease of use, noninvasiveness, safety (does not provoke seizures), and sham mode (important for controlled clinical trials) and because of the possibility to combine it with other stimulation or stroke recovery-enhancing method (eg, simultaneous occupational and physical therapy).

Robotic therapy: Many studies have worked on introducing robotic devices in the management of stroke. Robotic technology has developed remarkably in recent years, with faster and more powerful computers and new computational approaches as well as greater sophistication of electro-mechanical components²⁰. Robotic assisted therapy has been found to be effective tool in rehabilitating upper limb motor function. Robot-assisted therapy for stroke rehabilitation is in a dynamic phase of development and has achieved remarkable advances. A small study of 18 patients with chronic hemiparesis reported that using a robotic device coupled with virtual reality over 4-weeks improved walking ability in the laboratory and the community better than robot training alone²¹.

Interventions for Impairments:

Cognitive Impairments: New dementia is seen in 10% of patients after a first stroke and in more than one third of patients after recurrent stroke²². Cognitive rehabilitation is systematic, functionally oriented service of therapeutic activities that is, based on assessment and understanding of the patients brain behavioral deficits. Specific interventions may have various approaches, which include :i) Reinforcing, strengthening or reestablishing previously learned patterns of behavior. ii) Establishing new patterns of cognitive activity through compensatory cognitive mechanisms or

impaired neurological systems. iii) Establishing new patterns of activity through external compensatory mechanisms such as personal orthoses or environmental structuring and support. vi) Enabling persons to adapt to their cognitive disability, even though it may not be possible to directly modify or compensate for cognitive impairments, in order to improve their overall level of functioning and quality of life²³.

Speech impairments: Constraint-induced aphasia therapy (CIAT) was first proposed by Pulvermüller et al. as a therapeutic approach that included the principles of massed practice (3 to 4 hours per day for 10 consecutive days), shaping (the difficulty of the required verbal actions is gradually increased according to the patients' needs) and constraint of compensatory (nonverbal) communication strategies²⁴. Studies of both tDCS and rTMS have resulted in language improvements, including receptive and expressive modalities, and may offer future supplementary approaches to conventional therapy^{25, 26}.

Locked in syndrome: Brain-computer interface (BCI) is a hardware and software communications system that permits cerebral activity alone to control computers or external devices. The devices are most needed for people with locked-in syndrome from brainstem stroke who are without voluntary control of their limbs. Alterations in the amplitude of the mu rhythm by thoughts about an action, are recorded with electroencephalography electrodes and interpreted by a computer algorithm, allowing patients to select letters or words on a computer screen for communication or to search the Web²⁷.

Interventions for Mobility:

Functional Electrical Stimulation: Can be used to generate muscle contraction in otherwise paralyzed limbs to produce functions such as grasping, walking, bladder voiding and standing. FES is a technique that takes advantage of peripheral nerves and muscles left unaffected by damage to the central nervous system.

Aerobic exercise training by treadmill, over ground walking, or recumbent cycling, can produce a conditioning effect and increase walking speed and endurance²⁸. It has been found to be effective in chronic stroke patients who have recovered with significant motor control²⁹.

Balance training: Task specific training has been

shown to improve walking performances in post stroke individuals³⁰. Over-ground gait training is an integral component of standard physical therapies to improve dynamic balance and ensure safe ambulation in the home. Functional reeducation from supine lying to standing has been found to be effective in achieving central control in turn improves static and dynamic balance.

Strength and fitness: Standard rehabilitative therapies include selective muscle strengthening by isometric and isokinetic exercises to improve the power and endurance of affected and unaffected muscle groups. Sets of moderate resistance exercise with weights or elastic bands are feasible for most patients.

Locomotor training: Body weight-supported treadmill training (BWSTT) enables supervised, repetitive, task-related practice of walking. Patients with limited motor control wear a chest harness connected to an overhead lift to reduce the need to fully load a paretic leg. The treadmill induces rhythmic stepping, although the paretic leg and trunk often require physical assistance by therapists.

Recent advances to enhance plasticity: Sensory stimulation: Sensory stimulation can be given in a number of ways, from passive movement to cutaneous stimulation with transcutaneous electrical nerve stimulation, and even acupuncture. NMES may also work in part by enhancing sensory feedback. Mirror therapy has been found to improve functional recovery.

Transcranial magnetic stimulation: It is still in its theoretical form. Slow rates of repetitive TMS depress cortical excitability and high rates increase excitability. Trials have been undertaken in depression, Parkinson's disease, and dystonia.

Conclusion

Many of the stroke survivors are left with chronic disabilities. Rehabilitation is very important during the initial phase. Early intervention will allow lot of scope in improving functional mobility and independence. Impairment following stroke has been extensively researched and newer approaches have come up. Correct timing of assessment and management is the key of successful outcome. Future of stroke rehabilitation is promising as well as challenging. There has been exceptional revolution in stroke care from rehabilitation point of view.

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Ethical Clearance: From institutional ethical committee from KIMSUDU, Karad.

References

1. Heidenreich PA, Trogon JG, Khavjou OA, Butler J, Dracup K, Ezekowitz MD, et al. Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association. *Circulation* 2011; 123:933–44.
2. Kwakkel G, Kollen B, Linderman E. Understanding the pattern of functional recovery after stroke: facts and theories. *Restor Neurol Neurosci* 2004; 22:281–99.
3. Murphy TH, Corbett D. Plasticity during stroke recovery: from synapse to behaviour. *Nat Rev Neurosci*. 2009 Dec; 10(12):861–872. [PubMed: 19888284]
4. Slot KB, Berge E, Dorman P, Lewis S, Dennis M, Sandcock P. Oxfordshire Community Stroke Project the International Stroke Trial (UK); Lothian Stroke Register. Impact of functional status at six months on long term survival in patients with ischaemic stroke: prospective cohort studies. *BMJ* 2008; 336:376–9.
5. Lawrence E, Coshall C, Dundas R, Stewart J, Rudd AG, Howard R, et al. Estimates of the prevalence of acute stroke impairments and disability in a multiethnic population. *Stroke* 2001; 32:1279–84.
6. World Health Organization. International Classification of Functioning, Disability and Health (ICF). www.who.int/classification/icf/en (19 April 2012, date last accessed).
7. Patricia Q McGinnis, Laurita M Hack, Kim Nixon-Cave, Susan L Michlovitz, Factors That Influence the Clinical Decision Making of Physical Therapists in Choosing a Balance Assessment Approach, *Physical Therapy*, Volume 89, Issue 3, 1 March 2009, Pages 233–247, <https://doi.org/10.2522/ptj.20080131>.
8. Mark P. McGlinchey & Sally Davenport (2015) Exploring the decision-making process in the delivery of physiotherapy in a stroke unit,

- Disability and Rehabilitation, 37:14, 1277-1284, DOI: 10.3109/09638288.2014.962106
9. Salbach, N.M., Guilcher, S.J., Jaglal, S.B. et al. Determinants of research use in clinical decision making among physical therapists providing services post-stroke: a cross-sectional study. *Implementation Sci* 5, 77 (2010) doi:10.1186/1748-5908-5-77
 10. Tilling K, Sterne JA, Rudd AG, Glass TA, Wityk RJ, Wolfe CD. A new method for predicting recovery after stroke. *Stroke*. 2001 Dec 1;32(12):2867-73.
 11. Krakauer JW, Carmichael ST, Corbett D, Wittenberg GF. Getting neurorehabilitation right: what can be learned from animal models? *Neurorehabil Neural Repair*. 2012 Oct; 26(8):923–931. [PubMed: 22466792]
 12. National Institute for Health and Clinical Excellence. Stroke Rehabilitation: Clinical Guideline Draft. <http://www.nice.org.uk/nicemedia/live/11950/56129/56129.pdf> (20 April 2012, date last accessed).
 13. Piechowski-Józwiak B, Bogousslavsky J. Pharmacotherapy of stroke. *Eur Neurol Dis*. 2006;1:52-62
 14. Schuster C, Maunz G, Lutz K, Kischka U, et al. Dexamphetamine improves upper extremity outcome during rehabilitation after stroke: a pilot randomized controlled trial. *Neurorehabil Neural Repair*. 2011 Oct; 25(8):749–755. [PubMed: 21712481]
 15. Adams HP Jr, del Zoppo G, Alberts MJ. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: the American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. *Stroke*. 2007;38:1655-1711.
 16. Marsh JD, Keyrouz SG. Stroke prevention and treatment. *J Am Coll Cardiol*. 2010;56:683-691.
 17. Savitz SI, Chopp M, Deans R, Carmichael ST, Phinney D, Wechsler L. Stem Cell Therapy as an Emerging Paradigm for Stroke (STEPS) II. *Stroke* 2011;42:825–829.
 18. M. Vendrame, J. Cassady, J. Newcomb, et al. *Stroke*. 2004. 35. 2390–95p.
 19. Schabitz WR, Laage R, Vogt G, Koch W, Kollmar R, Schwab S, et al. AXIS: a trial of intravenous granulocyte colony-stimulating factor in acute ischaemic stroke. *Stroke* 2010; 41:2545–51.
 20. Esquenazi A, Packel A. Robotic-assisted gait training and restoration. *Am J Phys Med Rehabil*. 2012;91:S217–S227. quiz S228-231. [PubMed] [Google Scholar]
 21. Mirelman A, Bonato P, Deutsch J. Effects of training with a robot-virtual reality system compared with a robot alone on the gait of individuals after stroke. *Stroke* 2009; 40:169–74.
 22. Pendlebury ST, Rothwell PM. Prevalence, incidence, and factors associated with pre-stroke and post-stroke dementia: a systematic review and meta-analysis. *Lancet Neurol* 2009; 8:1006–18.
 23. Keith DC, Cynthia D, Kathleen K et al : Evidence-Based Cognitive Rehabilitation: Recommendation for Clinical Practice. *Arch Phys Med Rehabil* 2000; 81 : 1596-1615.
 24. Pulvermüller F, Roth VM. Communicative aphasia treatment as a further development of PACE therapy. *Aphasiology*. 1991;5:39–50. [Google Scholar]
 25. Fridriksson J, Richardson JD, Baker JM, Rorden C. Transcranial direct current stimulation improves naming reaction time in fluent aphasia: a double-blind, sham-controlled study. *Stroke* 2011; 42:819–21.
 26. Barwood CH, Murdoch BE, Whelan BM, Lloyd D, Riek S, O’Sullivan JD, et al. Improved language performance subsequent to low-frequency TMS in patients with chronic non-fluent aphasia post-stroke. *Eur J Neurol* 2011;18:935–43.
 27. Mizuno K, Tsuji T, Takebayashi T, Fujiwara T, et al. Prism adaptation therapy enhances rehabilitation of stroke patients with unilateral spatial neglect: a randomized, controlled trial. *Neurorehabil Neural Repair*. 2011 Oct; 25(8):711–720. [PubMed: 21700922]
 28. Brazzelli M, Saunders DH, Greig CA, Mead GE.

Physical fitness training for stroke patients. *Cochrane Database Syst Rev.* 2011 Nov 9.(11):CD003316. [PubMed: 22071806]

29. Globas C, Becker C, Cerny J, Lam JM, et al. Chronic stroke survivors benefit from high-intensity aerobic treadmill exercise: a randomized control trial. *Neurorehabil Neural Repair.* 2012 Jan;26(1):85–95. [PubMed: 21885867]
30. Kanase SB, Varadharajulu G. Effect of Task Related Training versus Conventional Training on Walking Performances in Post Stroke Patients. *Age (years).* 2012;54:53-15.

Autism Spectrum Disorder: Review Article

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Abstract

Autism is a lifelong neuro developmental condition. It is characterised by differences in behavior, social interaction, communication, special interests and sensory processing. These differences can present people on the autism spectrum with challenges in how they interact with their environment.

Some people on the autism spectrum may behave in non-typical ways, often in response to the different ways in which they experience their environment. Such behaviors are generally a way to communicate their feelings or to adapt to a situation, or may result from their heightened sensitivity to a sound or something they have seen or felt.

The researchers suggest that genes and environment play important roles in the causing of ASD. A more recent study examined the cell structure, size, and shape of the brains of individuals with ASD, they demonstrated that different brain regions showed these differences more profoundly than others. The amygdala is therefore proposed to be one of several neural regions that are abnormal in autism, and may associated with other neurodisorders. There are several types of ASD according to the development of disease. While there is no single best treatment for ASD. There are association between the child's diet and severity or frequency of symptomatology; especially vitamin D, calcium, potassium, pantothenic and choline may persist in a significant percentage of patients. Types of playing are very successful and designing appropriate play opportunities for children with ASD need to be the primary concerns for educators, clinicians, and parents.

Keywords: Autism, disorder, spectrum, amygdala, brain.

Introduction

Autism Spectrum Disorder: Autism spectrum disorder (ASD) is a term for a group of developmental disorders described by:

- Lasting problems with social communication and social interaction in different settings
- Repetitive behaviors and/or not wanting any change in daily routines
- Symptoms that begin in early childhood, usually in the first 2 years of life

- Symptoms that cause the person to need help in his or her daily life.

The term "spectrum" refers to the wide range of symptoms, strengths, and levels of impairment that people with ASD can have.

Although ASD begins in early development, it can last throughout a person's lifetime⁽¹⁾.

ASD affects many people, and it has become more commonly diagnosed in recent years. More boys than girls receive an ASD diagnosis⁽²⁾.

Autism is a lifelong neurodevelopmental condition. It is characterized by differences in behavior, social interaction, communication, special interests and sensory processing. These differences can present people on the autism spectrum with challenges in how they interact with their environment.

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Some characteristics of autism are common to a greater or lesser extent among many people on the autism spectrum; other characteristics are typical but not necessarily experienced by all people on the autism spectrum..

While some people on the autism spectrum also have an intellectual impairment or disability, many others have average intelligence, while others have above-average intelligence⁽³⁾.

Reasons of ASD: Scientists don't know the exact causes of ASD, but research suggests that genes and environment play important roles.

- Researchers are starting to identify genes that may increase the risk for ASD.
- ASD occurs more often in people who have certain genetic conditions, such as Fragile X syndrome or tuberous sclerosis.
- Many researchers are focusing on how genes interact with each other and with environmental factors, such as family medical conditions, parental age and other demographic factors, and complications during birth or pregnancy.
- Currently, no scientific studies have linked ASD and vaccines⁽⁴⁾.

Brain Growth, Structure, and Connectivity in ASD: One of the earliest indications of aberrant brain growth during development in ASD came from measurements of head circumference among infants and young children with autism. Head circumference is posited as a reliable proxy for relative brain size during early postnatal ages⁽⁵⁾. These studies have provided important initial evidence for the presence of both over- and under-growth in ASD. Many studies have shown head circumference to be abnormally enlarged in children with ASD around the age of symptomatic diagnosis^(6,7).

A more recent study examined the cell structure, size, and shape of the brains of individuals with ASD. The researchers agreed with amygdala growth theory in principle, but added some details⁽⁸⁾. (Patients with autism or AS did not activate the amygdala when making mentalistic inferences from the eyes, whilst people without autism did show amygdala activity. The amygdala is therefore proposed to be one of several neural regions that are abnormal in autism)⁽⁹⁾. They demonstrated that different brain regions showed these

differences more profoundly than others. These brain regions include the cerebellum, which contributes to the execution of complex motor movements; the nucleus accumbens, which is associated with motivation and reward for behaviors including social interaction; and the amygdala. This might explain the specific behavioral features seen in ASD.

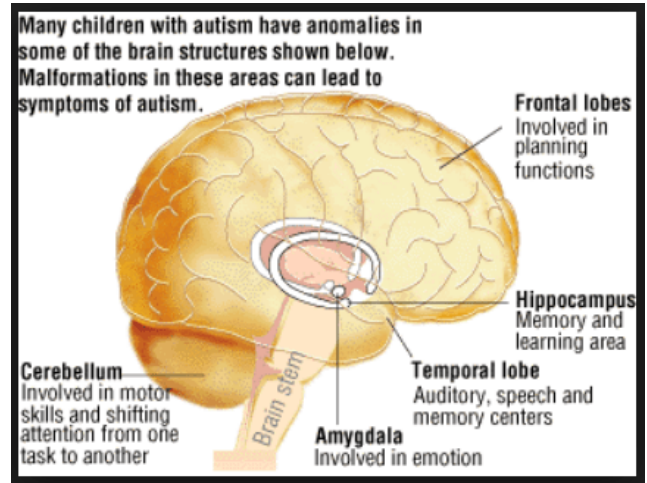


Fig. 1. The functions of different brain regions

These findings may not just be limited to autism-related pathology and autism symptoms. Early findings, which need to be replicated, reported an increase in the Alzheimer's disease-associated protein, Amyloid beta, in some individuals with autism⁽¹⁰⁾.

This is the protein that leads to the plaques and tangles associated with Alzheimer's symptoms. While the link between Alzheimer's disease and autism has not been determined, the presence of this protein in the brains of people with autism may signal early signs and symptoms⁽¹¹⁾.

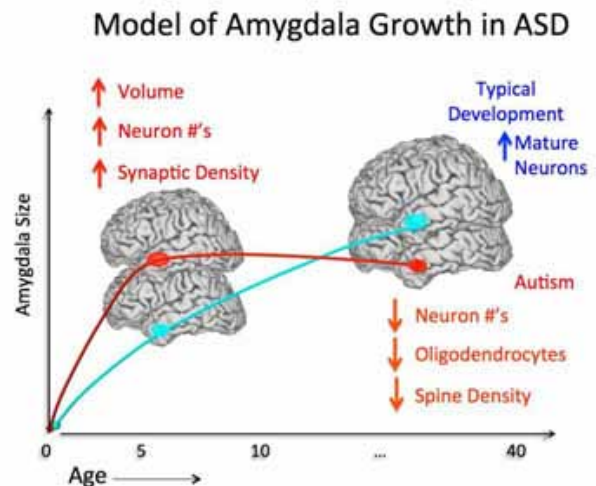


Fig. 2: Model of Amygdala Growth in ASD

Signs and Symptoms:

A child with ASD might:

- Avoid eye contact and want to be alone.
- Have trouble understanding other people's feelings or talking about his or her own feelings.
- Have delayed speech and language skills (for example, use words much later than siblings or peers or not use words to communicate).
- Repeat words or phrases over and over.
- Give unrelated answers to questions.
- Get upset by minor changes in routine (for example, getting a new toothbrush).
- Have obsessive interests (for example, having a very strong interest in trains that is difficult to interrupt).
- Flap his or her hands, rock his or her body, or spin in circles.
- Have unusual ways of playing with or using objects, such as spinning or lining them up repeatedly.
- Have unusual reactions to the way things sound, smell, taste, look, or feel⁽¹²⁾.

Symptoms of autism in children: No single indicator necessarily signals autism – usually, a child will present with several indicators from some of the following categories:

Behaviors:

- Has inexplicable tantrums
- Has unusual interests or attachments
- Has unusual motor movements such as flapping hands or spinning
- Has extreme difficulty coping with change.

Sensory

- Afraid of some everyday sounds
- Uses peripheral vision to look at objects
- Fascination with moving objects
- High tolerance of temperature and pain .

Communication:

- Not responding to his/her name by 12 months
- Not pointing or waving by 12 months

- Loss of words previously used
- Speech absent at 18 months
- No spontaneous phrases by 24 months
- Selective hearing – responding to certain sounds but ignoring the human voice
- Unusual language patterns (e.g. repetitive speech)⁽¹³⁾

Diagnosis: Autism is usually diagnosed in early childhood. Young children with ASD can usually be reliably diagnosed by age 2, but can be done at any age by developmental paediatricians, psychiatrists and psychologists who are qualified and experienced in assessing people on the autism spectrum. An assessment includes observations, standardised tests or questionnaires, and meeting with the individual, their family and service providers. Information is gathered about the individual's strengths and difficulties, particularly in the areas of social interaction and social communication, sensory processing, and restricted and repetitive interests, activities and behaviours. There is no single behaviour that indicates autism. Currently, there are no blood tests that can detect autism⁽¹⁴⁾.

The treatments for ASD: Treating ASD early and getting proper care can reduce a person's difficulties and increase his or her ability to maximize strengths and learn new skills. While there is no single best treatment for ASD, working closely with the doctor is an important part of finding the right treatment program⁽⁴⁾.

Types of Autism Spectrum Disorders

There are three types of autism spectrum disorders:

Autistic Disorder: This is sometimes called "classic" autism. It is what most people think of when hearing the word "autism". People with autistic disorder usually have significant language delays, social and communication challenges, and unusual behaviors and interests. Many people with autistic disorder also have intellectual disability.

Asperger Syndrome: People with Asperger syndrome usually have milder symptoms of autistic disorder. They might have social challenges and unusual behaviors and interests. However, they typically do not have problems with language or intellectual disability.

Pervasive Developmental Disorder – Not Otherwise Specified: This is sometimes called "atypical autism," or PDD-NOS. People who meet some of the

criteria for autistic disorder or Asperger syndrome, but not all, may be diagnosed with atypical autism. These people usually have fewer and milder symptoms than those with autistic disorder. The symptoms might cause only social and communication challenges⁽¹⁶⁾.

Nutrition and the development of ASD: A number of parents or professionals working with children having one of the autism spectrum disorders have noted an association between the child's diet and severity or frequency of symptomatology; with different mechanism proffered in the explanation of this association⁽²¹⁾. There have also been suggestions that food additives or food substances may play important roles in the etiology of ASDs; and recently, animal studies have demonstrated that propionic acid (PA), a dietary short chain fatty acid and common food additive induces neuroinflammatory responses and a number of behavioral changes in rats that are similar to that observed in ASD. The alteration in behavior, as well as neuropathological and biochemical effects of intraventricular administration of PA^(16,17) also increased support for the hypothesis that autism may be a systemic metabolic encephalopathy⁽¹⁸⁾. The children with ASD were found to consume significantly fewer foods on the average, compared to normally-developing children. They were also found to have taken lower amounts of protein, calcium, vitamin B12 and vitamin D⁽¹⁹⁾. Deficits in vitamin D, calcium, potassium, pantothenic and choline may persist in a significant percentage of patients, despite intake of nutritional supplements⁽²⁰⁾

Play in Children with ASD: Introducing play and designing appropriate play opportunities for children with ASD need to be the primary concerns for educators, clinicians, and parents. Playing with others requires multiple skills, especially social skills. Through social play, children with autism learn about social interaction. Therapeutic and educational play settings should be designed to provide long-term learning processes. Before they can correctly express emotions in daily life, children with ASD need to learn to understand emotions and recognize them and their meaning. For this reason, emotional recognition and theory of mind are frequently taught to these children before work can begin to improve play for the sake of play⁽²¹⁾. In play situations, the child will be confronted with many different emotions and varied ways to express them, requiring direct application in everyday life contexts. Role-playing then seems a more appropriate tool for matching learnt social interactions to real life⁽²²⁾, many children with ASD, 'banging a doll'

or 'pouring sand in different containers' are activities that require directed and skilled actions and could be considered a form of play, as well as an occupation for its own sake⁽²³⁾. We can also note that other types of play are very successful in leisure time, for instance, those related to new technologies. One of their advantages is their attractiveness^(24,25). In fact, touch screens or playful interfaces are all assets that stimulate children's motivation. Moreover, the programmed, predictable, and emotionally neutral environments of new technologies are particularly appreciated by children with ASD^(25,26).

Conclusions

Developmental monitoring is important for all young children from birth to age 5 years. Caregivers, such as parents, healthcare providers, and early educators, should be aware of developmental milestones—how children grow, move, communicate, interact, learn, and play. This information helps caregivers know what to expect, get ideas on how to promote positive development, and be aware of potential concerns about development as early as possible. Developmental monitoring is an ongoing process, and "Learn the Signs. Act Early."

Conflict of Interests: Nil.

Ethical Clearance: Taken from Autism Centre in Samawa city by approval ethical committee.

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Reference

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub; 2013 May 22.
2. Polyak A, Kubina RM, Girirajan S. Comorbidity of intellectual disability confounds ascertainment of autism: implications for genetic diagnosis. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*. 2015 Oct;168(7):600-8.
3. Spitzer RL, Williams JB. American Psychiatric Association (APA) Diagnostic and Statistical Manual of Mental Disorders. revised. DSM III R APA Washington DC: APA. 1987:47-217.
4. Fernandes FD, Molini-Avejonas DR, Amato CA. Language Therapy with Children with Autism Spectrum Disorders. *A Comprehensive Book on Autism Spectrum Disorders*. 2011 Sep 15:23.
5. Bartholomeusz HH, Courchesne E, Karns CM.

- Relationship between head circumference and brain volume in healthy normal toddlers, children, and adults. *Neuropediatrics*. 2002 Oct;33(05):239-41.
6. Courchesne E, Carper R, Akshoomoff N. Evidence of brain overgrowth in the first year of life in autism. *Jama*. 2003 Jul 16;290(3):337-44.
 7. Courchesne E, Pierce K, Schumann CM, Redcay E, Buckwalter JA, Kennedy DP, Morgan J. Mapping early brain development in autism. *Neuron*. 2007 Oct 25;56(2):399-413.
 8. Wegiel J, Flory M, Kuchna I, Nowicki K, Ma SY, Imaki H, Wegiel J, Cohen IL, London E, Brown WT, Wisniewski T. Brain-region-specific alterations of the trajectories of neuronal volume growth throughout the lifespan in autism. *Acta neuropathologica communications*. 2014 Dec; 2(1):28.
 9. Adolphs R, Spezio M. Role of the amygdala in processing visual social stimuli. *Progress in brain research*. 2006 Jan 1;156:363-78.
 10. Wegiel J, Frackowiak J, Mazur-Kolecka B, Schanen NC, Cook Jr EH, Sigman M, Brown WT, Kuchna I, Wegiel J, Nowicki K, Imaki H. Abnormal intracellular accumulation and extracellular A β deposition in idiopathic and Dup15q11. 2-q13 autism spectrum disorders. *PLoS One*. 2012 May 2;7(5):e35414.
 11. Starkstein S, Gellar S, Parlier M, Payne L, Piven J. High rates of parkinsonism in adults with autism. *Journal of neurodevelopmental disorders*. 2015 Dec;7(1):29.
 12. Sandin S, Hultman CM, Kolevzon A, Gross R, MacCabe JH, Reichenberg A. Advancing maternal age is associated with increasing risk for autism: a review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2012 May 1;51(5):477-86.
 13. Abbeduto L, Seltzer MM, Shattuck P, Krauss MW, Orsmond G, Murphy MM. Psychological well-being and coping in mothers of youths with autism, down syndrome, or fragile X syndrome. *American Journal on Mental Retardation*. 2004 May;109(3):237-54.
 14. Brugha TS, McManus S, Bankart J, Scott F, Purdon S, Smith J, Bebbington P, Jenkins R, Meltzer H. Epidemiology of autism spectrum disorders in adults in the community in England. *Archives of general psychiatry*. 2011 May 2;68(5):459-65.
 15. Blaylock RL. A possible central mechanism in autism spectrum disorders, part 3: the role of excitotoxin food additives and the synergistic effects of other environmental toxins. *Alternative Therapies in Health & Medicine*. 2009 Mar 1;15(2).
 16. MacFabe DF, Cain DP, Rodriguez-Capote K, Franklin AE, Hoffman JE, Boon F, Taylor AR, Kavaliers M, Ossenkopp KP. Neurobiological effects of intraventricular propionic acid in rats: possible role of short chain fatty acids on the pathogenesis and characteristics of autism spectrum disorders. *Behavioural brain research*. 2007 Jan 10;176(1):149-69.
 17. MacFabe DF, Cain NE, Boon F, Ossenkopp KP, Cain DP. Effects of the enteric bacterial metabolic product propionic acid on object-directed behavior, social behavior, cognition, and neuroinflammation in adolescent rats: relevance to autism spectrum disorder. *Behavioural brain research*. 2011 Feb 2;217(1):47-54.
 18. El-Ansary AK, Bacha AB, Kotb M. Etiology of autistic features: the persisting neurotoxic effects of propionic acid. *Journal of neuroinflammation*. 2012 Dec;9(1):74.
 19. Adams JB. Summary of dietary, nutritional, and medical treatments for autism—based on over 150 published research studies. ARI publication. 2013;40:1-53.
 20. Stewart PA, Hyman SL, Schmidt BL, Macklin EA, Reynolds A, Johnson CR, James SJ, Manning-Courtney P. Dietary supplementation in children with autism spectrum disorders: common, insufficient, and excessive. *Journal of the Academy of Nutrition and Dietetics*. 2015 Aug 1;115(8): 1237-48.
 21. Thommen, E., Suarez, M., Guidetti, M., Guidoux, A., Rogé, B., & Reilly, J. S. Comprendre les émotions chez les enfants atteints d'autisme: regards croisés selon les tâches. *Enfance*. 2010; 3, 319-337..
 22. Baghdadli A, Brisot-Dubois J. *Entraînement Aux Habiletés Sociales Appliqué à L'autisme*. Elsevier Health Sciences France; 2011.
 23. Spitzer SL. With and without words: Exploring occupation in relation to young children with autism. *Journal of Occupational Science*. 2003 Aug 1;10(2):67-79.
 24. Wainer AL, Ingersoll BR. The use of innovative

- computer technology for teaching social communication to individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders*. 2011 Jan 1;5(1):96-107.
25. Shane HC, Albert PD. Electronic screen media for persons with autism spectrum disorders: Results of a survey. *Journal of autism and developmental disorders*. 2008 Sep 1;38(8):1499-508.
 26. Ramdoss S, Machalicek W, Rispoli M, Mulloy A, Lang R, O'Reilly M. Computer-based interventions to improve social and emotional skills in individuals with autism spectrum disorders: A systematic review. *Developmental neurorehabilitation*. 2012 Apr 1;15(2):119-35.

One-Pot Synthesis of New Pyrazolo [3, 4, -d] Pyrimidine Derivatives and Study of their Antioxidant and Anticancer Activities

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Abstract

An effort was made to synthesize a new series of pyrazolo [3,4-d] pyrimidine derivatives (2-5). The synthesis of these compounds was achieved via reaction of 3-methyl-1,4-dihydropyrazol-5-one (1) with a substituted aromatic aldehyde and urea or thiourea in mild reaction conditions, giving satisfactory yields. FT-IR and ¹H-NMR spectroscopies were used to characterize the structure of the newly synthesized compounds (2-5), where the spectral data confirmed the formation of these compounds. The antioxidant activity of these compounds (2-5) was examined in this study the synthesized compounds showed a moderate-high antioxidant effect, which was examined by using 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assays. The cellular toxicity of the compounds (2-5) was studied on MCF-7 cell lines using MTT assay. Compound (5) showed the highest toxicity towards MCF-7 cell lines.

Keywords: Pyrazole, Pyrimidine, anticancer, antioxidant DPPH; MCF-7.

Introduction

Chemists and biologists in recent years were motivated to focus their attention to study these compounds. The pyrazole derivatives have a wide spectrum of biological activities such as anticancer¹, antimicrobial, antitubercular², antidepressant, analgesic, anti-inflammatory³, antidiabetic⁴, anticonvulsant, antiulcer⁵, and antipyretic⁶, activities. Further, the pyrazole ring is not only significant as a biologically active moiety, but it's also an important and synthetically versatile substrate which can be utilized as a starting material for the building of other fused heterocycles⁷.

On the other hand, Pyrimidines are very well known for their pharmacological properties, and it was demonstrated that pyrimidine derivatives constitute an interesting class of heterocycles in drug design⁸, where some of them act as anticancer⁹, bactericide, fungicide, vermicide, and antiviral agents¹⁰. Pyrazolo [3,4-d] pyrimidine is a fused heterocyclic scaffold which is analogous for purines and has gained an interest in the drug discovery¹¹.

Procedures:

Synthesis of 3-methyl-1, 4-dihydropyrazol-5-one (1): To a round bottom flask containing ethyl acetoacetate (1 mol), 3 drops of glacial acetic acid were added with stirring, then hydrazine hydrate (1.2 mol) was slowly added. The reaction mixture was stirred at room temperature for 10 min, and then solid was precipitated. The separated solid was filtered by gravity filtration, washed twice with water and air dried¹². Yield 81%. FT-IR (KBr, cm⁻¹, stretching), 3439 (N-H), 2959 (CH₃), 1686 (C=O), 1606 (C=N); ¹H-NMR (300MHz,

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DMSO- d_6): 10.59 (br, 1H, NH-Pyrazole), 2.11 ppm(s, 3H, CH₃), 5.27 ppm(s, 2H, CH₂- ring).

General procedure for the synthesis of pyrazolo[3, 4-d]pyrimidine derivatives(2-5): To three component mixture of compound (1)(0.01 mol), substituted aromatic aldehyde(0.01mol) and urea or thiourea(0.01 mol)that dissolved in acetonitrile(20 mL), 3-4 drops of concentrated HCl was added. The resulted clear solution was refluxedfor 4-6 h. The reaction mixture was then cooled to room temperature. The resulted precipitate was then obtained by filtration, washed several times with acetonitrile and air dried¹³.

Synthesis of 4-[4-(dimethylamino)phenyl]-3-methyl-1, 4, 5, 7-tetrahydro-6H-pyrazolo[3, 4-d]pyrimidin-6-one(2): Yield 74%. FT-IR (KBr, cm⁻¹, stretching), 3259(-NH), 3034(Ar-H), 2933(C-H, aliphatic), 1620(C=O), 1550(C=N), 1519(Ar, C=C); ¹H-NMR (300MHz, DMSO- d_6): δ 7.91 (s, 1H, NH-Pyrimidine), 7.45 (s, 1H, NH-Pyrimidine), 6.66-6.99 (dd, 4H, Ar-H), 7.21 (br, 1H, NH-Pyrazole), 4.77 (s, 1H, CH-Pyrimidine), 2.82 (s, 6H, CH₃-N), 2.20 (s, 3H, CH₃).

Synthesis of 4-[4-(dimethylamino)phenyl]-3-methyl-1, 4, 5, 7-tetrahydro-6H-pyrazolo[3, 4-d]pyrimidine-6-thione(3): Yield 77%. FT-IR (KBr, cm⁻¹, stretching), 3184(-NH), 3044(Ar-H), 2929(C-H, aliphatic), 1610(C=N), 1491(Ar, C=C), 1271(C=S); ¹H-NMR (300MHz, DMSO- d_6): δ 9.53 (br, 1H, NH-Pyrimidine), 8.13 (s, 1H, NH-Pyrimidine), 6.79-7.17 (dd, 4H, Ar-H), 7.56 (s, 1H, NH-Pyrazole), 5.07 (s, 1H, CH-Pyrimidine), 2.26 (s, 6H, CH₃-N), 2.07 (s, 3H, CH₃).

Synthesis of 4-(5-bromo-2-hydroxyphenyl)-3-methyl-1, 4, 5, 7-tetrahydro-6H-pyrazolo[3, 4-d]pyrimidine-6-thione(4): Yield 68%. FT-IR (KBr, cm⁻¹, stretching), 2400-3500(Ar-OH), 3167(-NH), 3049(Ar-H), 2953(C-H, aliphatic), 1599(C=N), 1516(Ar, C=C), 1143(C=S), 756(Ar-Br); ¹H-NMR (300MHz, DMSO- d_6): δ 8.12 (s, 1H, NH Pyrimidine), 7.90 (s, 1H, NH-Pyrimidine), 7.54 (s, 1H, NH-Pyrazole), 6.97-7.27 (m, 3H, Ar-H), 5.83 (s, 1H, Ar-OH), 5.52 (s, 1H, CH-Pyrimidine), 2.18 (s, 3H, CH₃).

4-(2-hydroxynaphthalen-1-yl)-3-methyl - 1, 4, 5, 7-tetrahydro-6H-pyrazolo [3, 4-d] pyrimidine-6-thione (5): Yield 71%. FT-IR (KBr, cm⁻¹, stretching), 2400-3500(Ar-OH), 3126(-NH), 3047(Ar-H), 2997(C-H, aliphatic), 1622(C=N), 1545(Ar, C=C), 1236(C=S); ¹H-NMR (300MHz, DMSO- d_6): 8.71 (s, 1H, NH-Pyrimidine), 7.2 (s, 1H, NH-Pyrimidine), 6.33 (s, 1H,

NH-Pyrazole), 7.35-7.77 (m, 6H, Ar-H), 6.00 (s, 1H, CH-Pyrimidine), 5.75 (s, 1H, Ar-OH), 2.16 (s, 3H, CH₃).

Antioxidant activity¹⁴:

DPPH radical scavenging activity: Methanolic solutions of 1, 000 ppm concentration of synthesized of pyrazolo [3, 4-*d*] pyrimidine derivatives (2-5) were prepared. Different amounts (5, 10, 15, 20 and 25 μ L) of the methanolic solution of pyrazolo [3, 4-*d*] pyrimidine derivatives (2-5)were transferred into separate test tubes having 5 mL of 0.004% methanolic solution of DPPH. All the test solution was prepared in triplicate. The mixtures were shaken vigorously and left in the dark for 2 hours, or until obtaining stable values.

Reducing Power Activity: Different amounts of methanolic solutions of pyrazolo [3, 4-*d*] pyrimidine derivatives (2-5) (0.1, 0.2, 0.3, 0.4 and 0.5) mg/mL was mixed with 2.5 mL of the phosphate buffer (200 mmol and pH 6.6) and 2.5 mL of 1% potassium ferricyanide. The mixtures were incubated at 50 °C. After the incubation, 2.5 mL of 10% trichloroacetic acid was added to the mixture. This was followed by centrifugation at 650 rpm for 10 minutes. The upper layer was separated. 5.0 mL of this was mixed with 5.0 mL of distilled water and 1.0 mL of 0.1% ferric chloride. The absorbance of the resulting solution was measured at 700 nm.

Determination of Cytotoxicity: Human Erythrocytes was treated with different amounts of pyrazolo [3, 4-*d*] pyrimidine derivatives (2-5)solutions of 0.1, 0.2, 0.3, 0.4 and 0.5 mg/mL. A serial dilution of the compounds (2-5)was made up in phosphate-buffered saline solution. A total volume of 0.8 mL for every dilution was prepared in an Eppendorf tube. A negative control tube (having saline only) and a positive control tube (having tap water) were also prepared for the analysis. Human erythrocytes were added to every tube, to make-up a final volume of 1.0 mL. The prepared solutions were incubated at 37°C for 30 minutes. The tubes were then examined for red blood cell decomposition.The experiment was repeated in duplicate.

Anticancer Activity:

Maintenance Of Cell Cultures¹⁵: These human cell line has been maintained in RPMI-1640, supplemented with 10% fetal bovine, 100units/mL penicillin, and 100 μ g/mL streptomycin. The cells were passed through the Trypsin-EDTA reseeded at 50% confluence two times

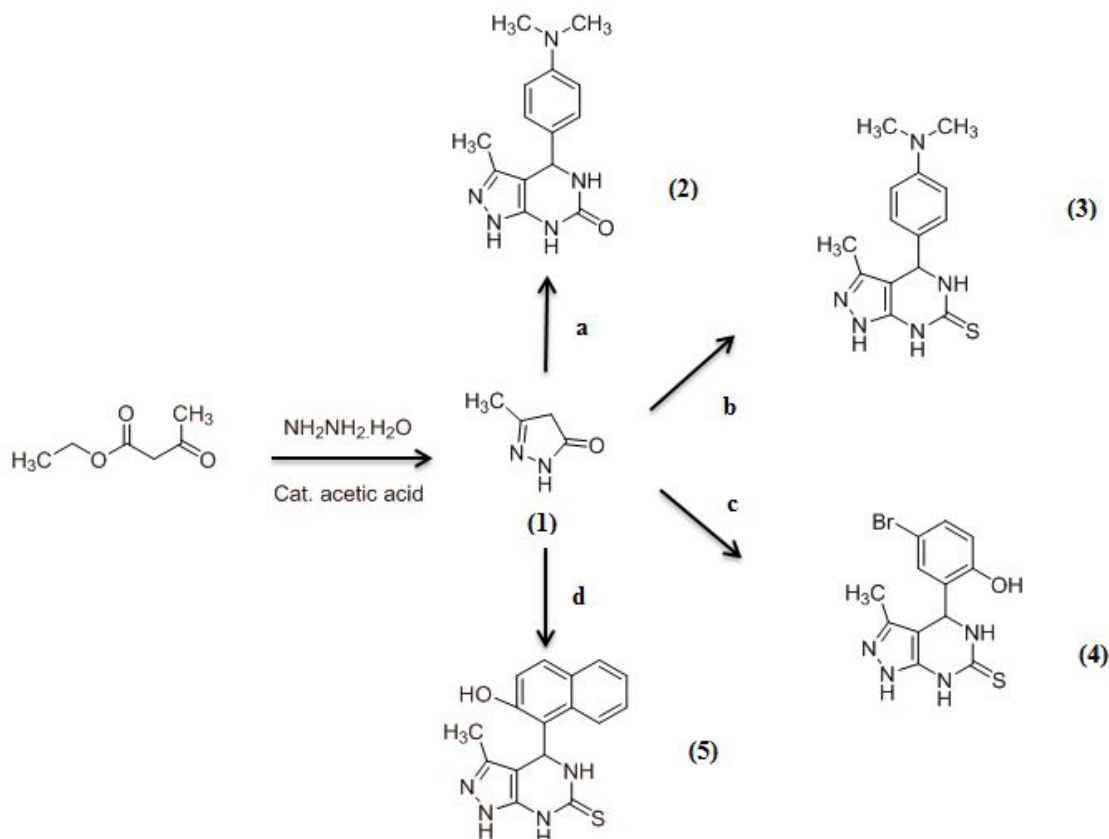
per-week and incubated at 37 °C.

Cytotoxicity Assays (MTT assay)¹⁶: MTT cell viability was carried out on 96-well plates. Cell lines were seeded at 1×10^4 cells/well. After 24h or a confluent monolayer was accomplished. Cells were treated with the test compounds (**2-5**). The cell viability was calculated after 72h of treatment. The medium was removed and 28 μ L of 2 mg/mL solution of MTT was added. This was followed by incubation of the cells for 1.5 h at 37 °C. After removing the MTT solution, the crystals that remained in the wells were solubilized by adding 130 μ L of DMSO followed by incubation at 37 °C for 15 minutes with shaking. The absorbance was measured and identified on a microplate reader at 492 nm (test wavelength). The assay was performed in triplicate.

Result and Discussion

The structures of the synthesized compounds were confirmed depending on the obtained spectral data of FT-IR, and ¹H-NMR spectroscopies. The FT-IR spectrum of compound (**1**), displays an absorption band at 3439 cm^{-1} , which is attributed to stretching vibration of NH group, a weak absorption band at 2959 cm^{-1} corresponding

to stretching vibration of CH_3 group, in addition to strong absorption bands at 1686 cm^{-1} and 1606 cm^{-1} corresponding to stretching vibration of $\text{C}=\text{O}$ and $\text{C}=\text{N}$, respectively. On the other hand, the FT-IR spectra of the title compounds (**2-5**) were showed absorption bands assigned to NH function ranged at 3259-31126 cm^{-1} , absorption bands of $\text{C}=\text{N}$ ranged at 1622-1550 cm^{-1} and absorption bands corresponding to $\text{C}=\text{S}$ group in the region 1271- 1143 cm^{-1} . In addition, compound (**4**) and compound (**5**) were shown a broad absorption band attributed to aromatic hydroxyl group ranged at 3500-2400 cm^{-1} . Moreover, the ¹H-NMR spectra of compound (**1**) revealed singlet signal assigned to the one proton NH of ring at 10.59 ppm, singlet signal assigned to the three protons of CH_3 at 2.11 ppm and singlet signal to the two protons CH_2 of ring at 5.27 ppm. The ¹H-NMR spectra of compounds (**2**) revealed singlet signals assigned to the two NH of pyrimidine ring at 7.91 and 7.45 ppm, singlet signals assigned to the NH of pyrazole ring at 7.21 ppm and singlet signals assigned to the three protons of CH_3 (olefinic) at 2.20 ppm. In addition, the ¹H-NMR spectra of compound (**2**) revealed singlet signals belong to six protons of CH_3 -N at 2.82 ppm and the aromatic region of double doublet signals at 6.66-6.99 ppm for four protons.



Scheme 1. (a) 4-(dimethylamino) benzaldehyde, urea, acetonitrile, Conc.HCl (b) 4-(dimethylamino) benzaldehyde, thiourea, acetonitrile, Conc.HCl (c) 5-bromo-2-hydroxybenzaldehyde, thiourea, acetonitrile, Conc. HCl (d) 2-hydroxynaphthalene-1-carbaldehyde, thiourea, acetonitrile, Conc. HCl.

Antioxidant activity:

DPPH radical scavenging activity¹⁷: Antioxidant activity of the prepared compounds was established by using DPPH assay. The antioxidant could reduce the alcoholic solution of DPPH to the non-radical form, i.e. DPPH-H in the reaction. In addition, the dark-color of the DPPH solution is transformed into a yellow colored solution in the presence of an antioxidant, resulting in a decrease in the absorbance.

The DPPH assay is often used to measure the free radical scavenging activities of antioxidants. Table 1 illustrates the scavenging capability of the test compounds. The variation in the absorbance was evaluated at 517 nm. The percentages inhibition of the samples ranges from 82% to 69%. Vitamin C exhibited inhibition of 94% at 25 μ L in 1000 ppm concentration. On the other hand, compound (5) showed the maximum inhibition at 82% compared with all the test compounds at 25 μ L in 1000 ppm. In addition, lower inhibition was recorded for all samples lower than 25 μ L in 1000 ppm. The least inhibition was recorded for compound(2) (69%) at 25 μ L in 1000 ppm. Overall, all the compounds tested exhibited various antioxidant activities when compared with vitamin C.

Table 1. The values of inhibition shown by the test compound

Comp.	Concentration of 1000 ppm														
	5 μ L			10 μ L			15 μ L			20 μ L			25 μ L		
	A _a	A _o	(I%)	A _a	A _o	(I%)	A _a	A _o	(I%)	A _a	A _o	(I%)	A _a	A _o	(I%)
2	0.45	0.752	40.15	0.39	0.752	48.13	0.31	0.752	58.77	0.26	0.752	65.42	0.23	0.752	69.41
3	0.401	0.752	46.67	0.347	0.752	53.85	0.306	0.752	59.30	0.255	0.752	66.09	0.218	0.752	71.01
4	0.362	0.752	51.86	0.311	0.752	58.64	0.249	0.752	66.88	0.218	0.752	71.01	0.188	0.752	75
5	0.31	0.752	58.77	0.24	0.752	68.08	0.184	0.752	75.53	0.152	0.752	79.78	0.134	0.752	82.18
Vit. C	0.15	0.752	78.98	0.122	0.752	83.77	0.098	0.752	86.96	0.066	0.752	91.22	0.041	0.752	94.54

Reducing power assay¹⁸: Table 2. illustrates the decreasing power of compounds (2-5) as a function of their concentration. For each assay, the yellow color of the test solution transformed into different shades of blue and green, according to the decreasing power of the compound. The presence of the antioxidants results in the decrease of the Fe³⁺/ferri-cyanide complex and transform into the ferrous forms. Thus, measuring the formations of Perl's Prussian blue at 700 nm can be

used to monitor the Fe²⁺ concentration. The decreasing power of every compound was found to increase with concentration. The decreasing power of compound (5) at 0.5 mg/mL was more than 0.64. At 0.1 mg/mL, the decreasing power of compound (5) was 0.28, and at 0.3 mg/mL was 0.45. As for compound 2, it had the least decreasing power of 0.21 at 0.1 mg/mL, 0.36 at 0.3 mg/mL and 0.47 at 0.5 mg/mL.

Table 2. The absorption values of the compounds (2-5) and vitamin C

Comp	Concentration (mg/ml)																			
	0.1				0.2				0.3				0.4				0.5			
	A ₁	A ₂	A ₃	A _a	A ₁	A ₂	A ₃	A _a	A ₁	A ₂	A ₃	A _a	A ₁	A ₂	A ₃	A _a	A ₁	A ₂	A ₃	A _a
2	0.2	0.21	0.22	0.21	0.29	0.29	0.3	0.29	0.35	0.36	0.36	0.36	0.41	0.42	0.4	0.41	0.48	0.48	0.47	0.48
3	0.22	0.23	0.24	0.23	0.29	0.28	0.28	0.28	0.35	0.35	0.35	0.35	0.43	0.43	0.44	0.43	0.48	0.48	0.49	0.49
4	0.25	0.25	0.26	0.25	0.31	0.31	0.31	0.31	0.38	0.39	0.39	0.39	0.46	0.46	0.46	0.46	0.52	0.52	0.53	0.52
5	0.28	0.28	0.29	0.28	0.39	0.4	0.39	0.39	0.46	0.45	0.44	0.45	0.52	0.51	0.52	0.52	0.65	0.64	0.64	0.64
Vit.C	0.32	0.32	0.32	0.32	0.45	0.44	0.45	0.45	0.57	0.57	0.57	0.57	0.69	0.68	0.7	0.69	0.84	0.83	0.84	0.84

Cytotoxicity Testing¹⁹: The results of cytotoxicity towards human red blood cells showed that the compounds (2-5) did not have any toxicity at the concentrations of 0.1, 0.2, 0.3, 0.4 and 0.5 mg/mL. Red blood cells have been used to detect the toxicity of prepared compounds because this method is inexpensive, easy to apply and the results can be obtained quickly. Red blood cell decomposition depends on the concentration of the material, incubation period and temperature.

Anticancer Profiles: The percentage cytotoxicity of the compounds (2-5) on MCF-7 at varying concentrations

of 6.25, 12.5, 25, 50 and 100 µg/mL (Table 3) were determined and are shown in Table 3. It can be seen that the compound (5) shows the highest inhibition rate of 84% at a concentration of 100 µg/mL as shown in table 3. Thus, MCF-7 cells showed low viability on treatment with (5) which indicated good anticancer activities of this compound. Compound (2) was least effective on the MCF-7 cells at only 60% at a concentration of 100 µg/mL which indicated the moderate anticancer potential of this compound.

Table 3. In hibitionrate of cell growth for compounds

Comp.	Concentration i µg/mL				
	6.25 i	12.5 i	25	50 i	100
2	21.55	25.34	44.87	52.38	60.12
3	25.66	34.89	54.87	60.57	73.94
4	29.23	38.85	56.78	62.19	77.36
5	32.06	41	69	77	84

Conclusion

Our findings indicate that all the newly synthesized pyrimidines had moderate-high antioxidant and anticancer activities. Finally, further biological investigations are needed to evaluate the potential pharmacological properties.

Conflict of Interests: Nil.

Ethical Clearance: Take from cancer Centre in Baghdad by approval ethical committee.

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References :

1. Ansari A, Ali A, Asif M. biologically active pyrazole derivatives. *New Journal of Chemistry*. 2017;41(1):16-41.
2. Gomha SM, Edrees MM, Faty RA, Muhammad ZA, Mabkhot YN. Microwave-assisted one pot three-component synthesis of some novel pyrazole scaffolds as potent anticancer agents. *Chemistry Central Journal*. 2017 Dec;11(1):37.
3. Aggarwal R, Bansal A, Rozas I, Kelly B, Kaushik P, Kaushik D. Synthesis, biological evaluation and molecular modeling study of 5-trifluoromethyl-Δ2-pyrazoline and isomeric 5/3-trifluoromethylpyrazole derivatives as anti-inflammatory agents. *European journal of medicinal chemistry*. 2013 Dec 1; 70:350-7.
4. Aggarwal R, Kumar S, Kaushik P, Kaushik D, Gupta GK. Synthesis and pharmacological evaluation of some novel 2-(5-hydroxy-5-trifluoromethyl-4, 5-dihydropyrazol-1-yl)-4-(coumarin-3-yl) thiazoles. *European journal of medicinal chemistry*. 2013 Apr 1;62:508-14.
5. Mukarram S, Bandgar BP, Shaikh RU, Ganapure SD, Chavan HV. Synthesis of novel α, α-difluoro-β-hydroxycarbonyl pyrazole derivatives as antioxidant, anti-inflammatory and anticancer agents. *Medicinal Chemistry Research*. 2017 Jan 1;26(1):262-73.
6. Aggarwal R, Kumar R, Kumar S, Garg G, Mahajan R, Sharma J. Synthesis and antibacterial activity of some 5-hydroxy-5-trifluoromethyl-4, 5-dihydropyrazol-1-thiocarboxamides, 3-trifluoromethylpyrazol-1-thiocarboxamides and 4-aryl-2-(5 (3)-trifluoromethyl-1-pyrazolyl) thiazoles. *Journal of Fluorine Chemistry*. 2011 Nov 1;132(11):965-72.

7. Aggarwal R, Bansal A, Rozas I, Diez-Cecilia E, Kaur A, Mahajan R, Sharma J. p-Toluenesulfonic acid-catalyzed solvent-free synthesis and biological evaluation of new 1-(4', 6'-dimethylpyrimidin-2'-yl)-5-amino-4H-3-arylpyrazole derivatives. *Medicinal Chemistry Research*. 2014 Mar 1;23(3):1454-64.
8. Daniel A, Daniel K. Synteza niektórych azotowych układów hetero cyklicznych oraz ich zastosowanie w komórkach elektroluminescencyjnych. *Chemik*. 2010;64(7-8):511-22.
9. Saad HA, Osman NA, Moustafa AH. Synthesis and analgesic activity of some new pyrazoles and triazoles bearing a 6, 8-dibromo-2-methylquinazoline moiety. *Molecules*. 2011;16(12):10187-201.
10. El-Sabbagh OI, Baraka MM, Ibrahim SM, Pannecouque C, Andrei G, Snoeck R, Balzarini J, Rashad AA. Synthesis and antiviral activity of new pyrazole and thiazole derivatives. *European journal of medicinal chemistry*. 2009 Sep 1;44(9):3746-53.
11. Ouyang G, Chen Z, Cai XJ, Song BA, Bhadury PS, Yang S, Jin LH, Xue W, Hu DY, Zeng S. Synthesis and antiviral activity of novel pyrazole derivatives containing oxime esters group. *Bioorganic & medicinal chemistry*. 2008 Nov 15;16(22):9699-707.
12. Aggarwal R, Kumar V, Gupta GK, Kumar V. Synthesis of some new 3, 5-diamino-4-(4'-fluorophenylazo)-1-aryl/heteroarylpyrazoles as antimicrobial agents. *Medicinal Chemistry Research*. 2013 Aug 1;22(8):3566-73.
13. Bekhit AA, Ashour HM, Ghany YS, Bekhit AE, Baraka A. Synthesis and biological evaluation of some thiazolyl and thiadiazolyl derivatives of 1H-pyrazole as anti-inflammatory antimicrobial agents. *European journal of medicinal chemistry*. 2008 Mar 1;43(3):456-63.
14. Nilesh M . Thumar, Ankur A . Kaneria, Milan Vadodaria, K. L. Synthesis, Characterization and Biological Evaluation of some Novel Synthesis, Characterization and Biological evaluation of some novel Pyrazolo [1,5-a] Pyrimidine derivatives. *Int. Lett. Chem. Phys. Astron*. 2016 Aug 15;65(6):11-26.
15. Yadava U, Shukla BK, Roychoudhury M, Kumar D. Pyrazolo [3, 4-d] pyrimidines as novel inhibitors of O-acetyl-l-serine sulfhydrylase of *Entamoeba histolytica*: An in silico study. *Journal of molecular modeling*. 2015 Apr 1;21(4):96.
16. Manikannan R, Venkatesan R, Muthusubramanian S, Yogeewari P, Sriram D. Pyrazole derivatives from azines of substituted phenacyl aryl/cyclohexyl sulfides and their antimycobacterial activity. *Bioorganic & medicinal chemistry letters*. 2010 Dec 1;20(23):6920-4.
17. Özdemir A, Altıntop M, Kaplancıklı Z, Can Ö, Demir Özkay Ü, Turan-Zitouni G. Synthesis and Evaluation of New 1, 5-Diaryl-3-[4-(methylsulfonyl) phenyl]-4, 5-dihydro-1H-pyrazole Derivatives as Potential Antidepressant Agents. *Molecules*. 2015 Feb;20(2):2668-84.
18. Zhang L, Balan G, Barreiro G, Boscoe BP, Chenard LK, Cianfrogna J, Claffey MM, Chen L, Coffman KJ, Drozda SE, Dunetz JR. Discovery and preclinical characterization of 1-methyl-3-(4-methylpyridin-3-yl)-6-(pyridin-2-ylmethoxy)-1H-pyrazolo-[3, 4-b] pyrazine (PF470): a highly potent, selective, and efficacious metabotropic glutamate receptor 5 (mGluR5) negative allosteric modulator. *Journal of medicinal chemistry*. 2014 Jan 22;57(3):861-77.
19. Damont A, Médran-Navarrete V, Cacheux F, Kuhnast B, Pottier G, Bernards N, Marguet F, Puech F, Boisgard R, Dollé F. Novel pyrazolo [1, 5-a] pyrimidines as translocator protein 18 kDa (TSPO) ligands: synthesis, in vitro biological evaluation, [18F]-labeling, and in vivo neuro inflammation PET images. *Journal of medicinal chemistry*. 2015 Sep 3;58(18):7449-64.

Evaluation of TNF α in Patients with Heart Failure According to BNP Concentration

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Abstract

Background: Heart failure (HF) is a condition in which the heart can no longer pump blood as efficiently as it used to. This leads to a complex of clinical symptoms like (dyspnea, orthopnea, lower limb swelling). BNP is a neurohormone released from myocardium and increased when failure of heart is occurred and used for diagnosing heart failure. TNF α is pro-inflammatory cytokine, its concentration increasing in patients with heart failure, this caused by inflammation which is present in heart with failure.

Objectives: This study was designed for Examining serum concentrations of TNF α in patients with HF, examining whether this cytokines was involved in the pathophysiology of the HF syndrome, and investigating the effectiveness of using BNP concentration as an indicator for heart failure.

Subjects and Method: The current study is a cross sectional study that was carried out in the center of Diyala province, Baquba Teaching Hospital, to determine the serum concentration of BNP and TNF- α in patients with heart failure. The samples were collected in 2 and a half months, from January the 15th to April the 1st 2019.

A total of 150 serum samples were collected . 100 patients with diagnosed heart failure, and the rest apparently healthy. The age range was 30-89 years, 50 of them were males, and 50 were females. BNP and TNF α concentrations were tested in the serum samples using the BNP and TNF α ELISA kit (from Sun Red company - China). Human privacy was respected by taking the parents' verbal consent. Statistical analysis of data was carried out using the Statistical Packages for Social Sciences (SPSS), Version 25. Statistical significance was considered whenever the P value was equal to or less than 0.05.

Results: The results showed that the BNP concentration range in HF group patients (50-1600) was wider than that in healthy control group (5-160) with a statistically significant difference between HF group and healthy control group (P = 0.0001). Also there is statistically significant association between TNF α concentration and HF (P = 0.005). Furthermore, there was no statistically significant effect of age and gender on TNF- α concentration in neither the diseased group nor the control group. Also there is statistically significant relationship between TNF α and family history (P = 0.026). There is direct relationship between TNF α and HF grade with a P value of 0.0001.

Conclusion: The concentration of TNF α is elevated with increasing the severity of heart failure accompanied by BNP concentration elevation, where The increase the HF grade, the elevation the concentration of TNF α .

Keyword: Heart Failure, BNE, TNE, TNF α , serum concentrations.

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Introduction

Heart failure (HF) is a condition in which the heart can no longer pump blood as efficiently as it used to. This causes blood and other fluids to retained in the body – particularly in the liver, lungs, hands, and feet, it is a

complex of clinical symptoms like (dyspnea, orthopnea, lower limb swelling) Accompanied by pulmonary congestion, elevated jugular venous pressure⁽¹⁾.

There are two main categories of HF are HFREF (HF accompanied by decreased ejection fraction) and HFPEF (HF accompanied by kept ejection fraction). The responses of body to these two types of left ventricular abnormalities can be extremely similar, while the clue base for therapy is frequently better confirmed for the former⁽²⁾.

According to numerous population studies the prevalence of heart failure has been indicated as 1-2% and increase up to 10% of people who are over the age of 65 years⁽³⁾. Other studies found that the risk age rate of developing heart failure in males is 33% while in females is 28%⁽⁴⁾.

During the response to atrial/ventricular dilation or volume overload, Atrial and brain natriuretic peptide (BNP) initiate to secreted from cardiomyocytes⁽⁵⁾, Pro-BNP is released as a response to volume expansion or stress. Then it is cleave to biologically effective BNP and inefficient N-terminal segment (NT-proBNP)^(5,6). BNP consider specific marker for heart failure and the circulating levels of NT-proBNP and BNP have been utilized in prediction assessment and diagnosis for heart failure⁽⁷⁾.

According to study of the European Society of Cardiology (ESC) in 2016 acute and chronic heart failure guidelines said that “circulating levels of NT-proBNP and BNP can be used as an initial diagnostic test for heart failure⁽⁸⁾”.

BNP is neuro-hormone released from the ventricular myocardium in response to ventricular wall stress, such as with increased preload or afterload and decreased systolic or diastolic ventricular function⁽⁹⁾, also myocardial ischemia can induce the synthesis/secretion of BNP and its related peptides by ventricular cardiomyocytes⁽¹⁰⁾.

TNF α has not completely understood physiological function in the heart. It participates in the cardiac dysfunction developments also it has been known for its cardio protective effects⁽¹¹⁾. This cytokine is active proteins, low molecular weight which act in an autocrine to modulate cell function. It is proinflammatory cytokines implicated in HF which is secreted from the mononuclear cells and myocardium⁽¹²⁾.

The heart does not produce TNF α under physiological conditions, the opposite of that, after an acute damage the TNF α concentration raises significantly. Other studies thought that TNF α production increased in the case of ischemia, myocyte stretch and pressure as well⁽¹³⁾. TNF α is assumed to play an essential role in the development of left ventricle dysfunction, increased myocyte apoptosis, remodeling, endothelial dysfunction, and cardiac cachexia as well. Two different types of TNF α cell membrane receptors⁽¹⁴⁾.

Subjects and Method

The current study is a cross sectional study that was carried out in the center of Diyala province, Baquba Teaching Hospital, to determine the serum concentration of BNP and TNF- α in patients with heart failure. The samples were collected in 2 and a half months, from 15/1/2019 to 1/4/2019.

The samples from the HF patients were collected from Baquba Teaching Hospital, in the coronary care unit (CCU) and internal medicine unit. Those patients were diagnosed by internal medicine specialist.

A total of 150 serum samples were collected. 100 patients with diagnosed heart failure, and the rest apparently healthy. For the clinically patients with heart failure, the mean age \pm SD was 63.7 \pm 13.5 years, the age range was 30-89 years, 50 of them were males, and 50 were females. The mean age \pm SD of apparently healthy subjects was 55.9 \pm 10.7 years, the age range was 37-74 years, 23 of them were males, and 27 were females. A questionnaire includes information about age, sex, risk factors, clinical problems, HF grade, history of cardiac medication, vital signs, electrocardiogram (ECG) findings, clinical problems, ejection fraction (obtained from echo cardiogram). Then 5 ml of blood was drawn and put in the gel tube, the latter has been put in the cool box (contain ice bag) until transport to laboratory of emergency unit and separated by centrifuge for 10 minutes at 6000 rpm. After separation of whole blood the serum sample was drawn by pipette and put in plane tube and stored in deep freezer (-20C $^{\circ}$) until the time of performing the tests. The BNP and TNF α concentrations were tested in the serum samples using the BNP and TNF α ELISA kit (from SunRed company-China). Human privacy was respected by taking the parents' verbal consent. Statistical analysis of data was carried out using the Statistical Packages for Social Sciences (SPSS), Version 25. Statistical significance

was considered whenever the P value was equal to or less than 0.05.

Results

As seen in table (1), the Pro BNP mean concentration \pm SD in HF group was (408.713 \pm 357.384), which was

higher than that in healthy control group (17.575 \pm 12.757). Similarly, the concentration range in HF group patients (50-1600) was wider than that in healthy control group (5-160). Nevertheless, the difference between the two groups was statistically significant (P = 0.0001).

Table (1): Association of Pro BNP concentration with heart failure.

Pro BNP (ng/L)		HF Group	Control Group
Mean \pm SD		408.713 \pm 357.384	17.575 \pm 12.757
Standard Error of Mean		35.738	4.836
Range		50-1600	5-160
Percentile	05th	50.000	5.000
	25th	109.064	5.616
	50th(Median)	336.058	6.918
	75th	476.193	9.589
	95th	1144.275	118.779
	99th	1548.092	160.000
P value		0.0001	

As shown in **table (2)**, the mean concentration \pm SD for the diseased group was significantly higher than that for the control group, resulting in a statistically significant association between the concentration and heart failure (P = 0.005).

Table (2): Association of TNF- α concentration with heart failure.

TNF- α (ng/l)		HF Group	Control Group
Mean \pm SD		233.924 \pm 227.220	124.128 \pm 210.450
Standard Error of Mean		22.722	29.762
Range		30-960	30-960
Percentile	05 th	39.324	32.838
	25 th	107.228	44.595
	50 th (Median)	180.687	58.176
	75 th	217.786	75.446
	95 th	936.858	703.950
	99 th	960.000	960.000
P value		0.005	

As shown in **table (3)**, there was no statistically significant effect of age on TNF- α concentration in neither the diseased group nor the control group (P = 0.518, and 0.463 respectively).

Table (3): Association of TNF- α concentration with age.

Age (Years)	TNF- α (ng/L)			
	HF group		Control group	
	No.	Mean \pm SD	No.	Mean \pm SD
< 40	4	105.288 \pm 61.186	3	48.514 \pm 6.086
40-49	10	277.684 \pm 289.703	11	51.574 \pm 17.244
50-59	22	258.601 \pm 308.577	20	132.934 \pm 224.959
60-69	24	184.664 \pm 169.650	7	119.358 \pm 140.753
\geq 70	40	251.831 \pm 196.984	9	222.148 \pm 339.760
P value	0.518		0.463	

Results in table (4) show that gender had no statistically significant effect in both the diseased and control groups on TNF- α concentration.

Table (4): Association of TNF- α concentration with gender.

Gender	TNF- α (ng/L)			
	HF Group		Control Group	
	No.	Mean \pm SD	No.	Mean \pm SD
Male	50	255.420 \pm 238.364	23	137.424 \pm 220.844
Female	50	212.428 \pm 215.757	27	112.801 \pm 204.720
P value	0.347		0.684	

The effect of various risk factors on the TNF- α concentration are summarized in **table (5)**. No statistically significant effect of any of the risk factors on the concentration was found in either groups except, family history show statistically significant effect on TNF- α concentration in the diseased group (P value =

0.026).however, the mean concentration \pm SD showed a direct relationship with HF grade reaching its highest value in patients with grade IV HF (781.835 \pm 189.761) with a P value of 0.0001, indicating a statistically significant association.

Table (5): Association of TNF- α concentration with risk factors and heart failure grade.

Risk factors		TNF- α (ng/L)			
		HF Group		Control Group	
		No.	Mean \pm SD	No.	Mean \pm SD
Hypertension	Yes	66	254.247 \pm 235.715	8	171.889 \pm 318.593
	No	34	194.473 \pm 207.409	42	115.030 \pm 187.275
	P Value	0.214		0.489	
Diabetes Mellitus	Yes	51	232.013 \pm 242.676	3	181.038 \pm 216.928
	No	49	235.912 \pm 212.441	47	120.495 \pm 211.913
	P Value	0.932		0.634	
Mixed Dyslipidemias	Yes	32	230.690 \pm 224.391	15	150.409 \pm 259.599
	No	68	235.445 \pm 230.181	35	112.864 \pm 188.796
	P Value	0.923		0.569	
Obesity	Yes	27	273.509 \pm 277.228	4	60.480 \pm 14.282
	No	73	219.282 \pm 205.989	46	129.662 \pm 218.681
	P Value	0.292		0.534	

Risk factors		TNF- α (ng/L)			
		HF Group		Control Group	
		No.	Mean \pm SD	No.	Mean \pm SD
Cigarette Smoking	Yes	22	165.518 \pm 84.808	8	238.353 \pm 341.173
	No	78	253.218 \pm 250.409	42	102.370 \pm 173.284
	P Value	0.110		0.094	
Family history	Yes	17	345.092 \pm 327.396	10	216.267 \pm 330.471
	No	83	211.154 \pm 195.783	40	101.093 \pm 166.499
	P value	0.026		0.123	
HF grade	Grade I	40		118.460 \pm 77.802	
	Grade II	39		254.257 \pm 214.606	
	Grade III	15		269.798 \pm 202.675	
	Grade IV	6		781.835 \pm 189.761	
	P value	0.0001			

Discussion

Because of the difficulty of diagnosing heart disease since its inception by physician office, there is no doubt that there is great importance to these cytokines and neuro-hormone for the purpose of diagnosing heart disease, especially BNP which is more specific for diagnosing heart failure which improve the way for the doctor to diagnose this syndrome since its beginning and to treat the patient.

In our current study we found that the BNP concentration was elevated in heart failure compared to healthy group, which indicate that there is statistically significant between BNP concentration and heart failure ($P = 0.0001$). The reason of elevation of this neuro-hormone is that it is co-released from cardiomyocytes⁽¹⁶⁾, and patient with heart failure had inflammation in their myocardium and this neuro-hormone produced as a result of this inflammation because it is produced from myocardium, however this neuro-hormone associated with the development of cardiac hypertrophy⁽¹⁷⁾. A previous study proved that BNP was significantly increased in complicated heart failure⁽¹⁸⁾.

Other previous iraqi study reported that BNP elevate according to ejection fraction which mean there is relationship between BNP concentration and ejection fraction with P value less than 0.001, in which BNP concentration elevated with reduced ejection fraction

⁽¹⁵⁾. In addition, there is another previous study showed that the concentration of BNP level increased with progress of heart failure grade⁽¹⁹⁾. Other studies also found similar results^(20, 21).

Our analysis findings found that concentrations of TNF- α in the serum of HF patients were significantly higher than in the control patients. TNF α serum level can be a useful as a non specific marker to predict the severity of heart failure in patients with HF with the help of BNP concentration, the P value for TNF α , was 0.005.

Early in 1990, some authors were reported the possibility role of proinflammatory cytokines in HF. where found that TNF levels were increased in patients with HF. thereafter, numerous studies with regard to the role of proinflammatory cytokines in HF were secreted⁽²²⁾.

Other study, have been checked the serum TNF- α and IL-6 levels in 84 HF patients and 34 controls. this study found that significantly elevated serum IL-6 and TNF- α levels were found in HF patients⁽²³⁾.

Ethical Clearance: Taken from Diyala University College of Medicine committee

Source of Funding: Self

Conflict of Interest: Nil.

References

1. Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JG, Coats AJ, et al., "ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)", *Eur Heart J*. 2016;37(27):2129–200. doi:10.1093/eurheartj/ehw128.
2. Yancy CW, Jessup M, Bozkurt B, et al. "guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines". *J Am Coll Cardiol* 2013;62:e147–239.
3. Mosterd A, Hoes AW. "Clinical epidemiology of heart failure". *Heart*. 2007;93(9):1137–46. doi:10.1136/hrt.2003.025270.
4. Bleumink GS, Knetsch AM, Sturkenboom MC, Straus SM, Hofman A, Deckers JW, et al. Quantifying the heart failure epidemic: prevalence, incidence rate, lifetime risk and prognosis of heart failure: the Rotterdam Study. *Eur Heart J*. 2004;25(18):1614–9. doi:10.1016/j.ehj.2004.06.038.
5. Daniels LB, Maisel AS. Natriuretic peptides. *J Am Coll Cardiol* 2007;50:2357–68.
6. Hall C. Essential biochemistry and physiology of (NT-pro)BNP. *Eur J Heart Fail* 2004;6:257–60.
7. Lainchbury JG, Troughton RW, Strangman KM, et al. N-terminal pro-B-type natriuretic peptide-guided treatment for chronic heart failure: results from the BATTLESCARRED (NT-proBNP-Assisted Treatment To Lessen Serial Cardiac Readmissions and Death) trial. *J Am Coll Cardiol* 2009;55:53–60.
8. Ponikowski P, Voors AA, Anker SD, et al. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. *Eur J Heart Fail* 2016;18:891–975.
9. Law YM, Hoyer AW, Reller MD, et al: Accuracy of plasma B-type natriuretic peptide to diagnose significant cardiovascular disease in children: The Better Not Pout Children! Study. *J Am Coll Cardiol* 2009; 54:1467–1475.
10. Januzzi JL, Troughton R: Are serial BNP measurements useful in heart failure management? Serial natriuretic peptide measurements are useful in heart failure management. *Circulation* 2013; 127:500–507; discussion 508.
11. Rathi SS, Dhalla NS. Mechanism of cardioprotective action of TNF- α in the isolated rat heart. *Exp Clin Cardiol* 6: 146-150, 2002.
12. Ahluwalia N, Blacher J, Szabo de Edelenyi F et al. Prognostic value of multiple emerging biomarkers in cardiovascular risk prediction in patients with stable cardiovascular disease. *Atherosclerosis* 2013; 228 : 478-84.
13. Feldman AM CA, Wagner D, Kadakomi T, Kubota T, Li YY, McTiernan C. The Role of Tumor Necrosis Factor in the Pathophysiology of Heart Failure. *J Am Coll Cardiol* 35: 537-544, 2000.
14. Defer N, Azroyan A, Pecker F, Pavoine C. TNFR1 and TNFR2 signaling interplay in cardiac myocytes. *J Biol Chem* 282: 35564-35573, 2007.
15. Adil Hassan Alhousseiny; Marwan Salih Mohamad Al-nimer; Ismail Ibrahim Latif and Ahood Khaleel Ibrahim (2013). Heart Failure: Discrepancy Between NYHA Functional Classification, Serum NT-pro Brain Natriuretic Peptide and Ejection Fraction. *Eur. J. Gen. Med.*, 10(1): 26-31.
16. Bialik GM, Abassi ZA, Hammel I, Winaver J, Lewinson D (2001) Evaluation of atrial natriuretic peptide and brain natriuretic peptide in atrial granules of rats with experimental congestive heart failure. *J Histochem Cytochem* 49:1293–1300.
17. Vellaichamy E, Das S, Subramanian U, Maeda N, Pandey KN (2014) Genetically altered mutant mouse models of guanylyl cyclase/natriuretic peptide receptor-A exhibit the cardiac expression of proinflammatory mediators in a gene-dose-dependent manner. *Endocrinology* 155:1045–1056
18. Hejmdal A, Boesgaard S, Lindholm MG, Goetze JP. B-type natriuretic peptide and its molecular precursor in myocardial infarction complicated by cardiogenic shock. *J Card Fail* 2007;13:184-8
19. Al Bannay RA, Husain AA. Role of tissue Doppler imaging in assessing left ventricular diastolic dysfunction severity. Does it hold the same ability? *Saudi Med J* 2012;33:34-8
20. Feng, S. D., Jiang, Y., Lin, Z. H., Lin, P. H., Lin, S. M., & Liu, Q. C. (2017). Diagnostic value of brain natriuretic peptide and β -endorphin plasma

- concentration changes in patients with acute left heart failure and atrial fibrillation. *Medicine*, 96(34),e7526.
21. Piek, A.; Du, W.; de Boer, R. A. and Sillije, H. H. W. (2018). Novel heart failure biomarkers: why do we fail to exploit their potential? *Critical Reviews In Clinical Laboratory Science*, 2018, DOI: 10.1080/10408363.2018.1460576.
 22. Hall C. Essential biochemistry and physiology of (NT-pro)BNP. *Eur J Heart Fail* 2004;6:257–60.
 23. Kinugawa T, Kato M, Ogino K, et al. Neurohormonal determinants of peak oxygen uptake in patients with chronic heart failure. *Jpn Heart J* 2003;44:725–34.

Serum Vitronectin and Related Molecules in Chronic Kidney Disease

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Abstract

One in eight people are reported to have chronic kidney disease (CKD). The renal function slowly deteriorates when nephrons become impaired by inflammatory and fibrotic processes. In this study, the relationships between vitronectin (VTN), plasminogen activator inhibitor-1 (PAI-1) and growth factor translation β 1 (TGF- β 1) are studied in CKD to assess the role as predict about progression stages of diseases. 105 patients with early stages (1 to 3) of CKD and 35-69 age matched healthy controls were included in the study. The VTN, PAI-1, TGF- β levels of all participants were examined by Enzyme linked immune sorbent assay, creatinine, and urea by enzymatic method. Early morning urine sample was collected to be used for determination albumin creatinine ratio in patient with early stages of CKD. The renal function tests were significantly elevated in CKD group compared with healthy controls. The serum concentration of VTN increase in early stages(1-2) of CKD and decrease significantly with progression of disease (stage 3). Serum PAI-1 antigen level increased significantly. With the development of CKD, the effective role of TGF- β became more severe, the correlation among VTN, TGF- β and PAI-1 was positive.

Conclusions: These results indicate that VTN is important indicator for predict of CKD progression and both VTN, PAI-1 are connected to TGF- β 's active form and can be used as a prediction for progression of CKD.

Keywords: CKD, Vitronectin, PAI-1, TGF- β .

Introduction

The role of VTN in the pathogenesis of chronic kidney injury is of particular interest due to its high binding affinity to the potent fibrosis-promoting molecule (PAI-1) ^[1]. VTN is known to be a cofactor in proteolytic inhibitory activities of PAI-1 ^[2]. Once PAI-1 is attached to VTN, it stabilizes its effective verification and raises its half-life nearly fourfold ^[3]. when serine proteases become active, the VTN/PAI-1 complex effectively inhibits plasmin production and proteolytic responses induced by plasmin. Nevertheless, during kidney damage, plasmin has pleiotropic and even opposite consequences. Recent surveys promote the belief that plasmin is beneficial in acute glomerular disease but in chronic tubulointerstitial disease it induces fibrosis ^[4]. PAI-1 elevated expression is observed in mesangial cells endothelial cells glomeruli podocyte cells, interstitial narrow arteries, proximal tubular epithelial cells, and

fibroblast cells. However, some primary renal fibrosis modulators induced PAI-1. The most prominent molecular characteristic of progression kidney diseases is over-expression of TGF- β , a 28-kDa dimeric protein composed of two 14-kDa subunits produced by different cell types, including T cells and monocytes ^[5]. TGF- β significantly increases the development of PAI-1 by cultivated glomeruli, mesangial cells and tubular cells and it is associated with increased expression of PAI-1 in disease ^[6]. All main components of the renin-angiotensin-aldosterone system; renin, ang II and aldosterone quickly and significantly enhance the production of PAI-1 via pathways that are independent of and dependent on TGF- β ^[7].

Material and Method

A total of 105 Patients most of them were early staged included in this study (54 female, 65 male), age

range ((35-69) years), they were seen from Nov. 2018 till April 2019 at Baghdad Teaching Hospital/Medical City, A group of 30 subjects matched for age and sex, served as healthy control were, 14 (60%) female and 16(40%) male age range (35-67) years. None of them was CKD, according to laboratory findings of renal function tests that were considered as control. Blood, and urine were collected at the same visit from each subject. Venous blood samples were aspirated following a 12-hour fasting into plain tubes and centrifuged to obtain serum for the measurement of serum VTN, PAI-1 and TGF- β levels in the fasting state, which were determined using ELISA. Blood urea and serum creatinine to assess renal function were estimation by Jaffe method. Early morning (1st am urination) sample was collected by patient for microalbuminuria test and be examined in early morning. Microalbumin in urine was estimated by particle enhanced turbid metric inhibition immunoassay (PETINIA).

Result and Discussion

Function examination of kidney includes numerous parameters that should be estimated to determine disorder in kidney biological function. These parameters represent each of serum S.Cr and urea, albumin creatinine ratio (ACR) in urine and glumular filtration rate (eGFR) were estimated on the basis of the Modification of Diet in Renal Disease (MDRD) formula which was measured for CKD and control groups also for subgroups of patients as recorded in Table 1. The mean \pm SD of S.Cr values of groups including each of patients group and control group are (1.803 \pm 0.967) and (0.792 \pm 0.279) respectively. Whereas mean \pm SD values of urea for the mentioned groups are including (10.544 \pm 6.926) and (3.948 \pm 1.084) respectively. The results showed a high significant increase ($p < 0.001$) in level of both S.Cr and urea in the CKD group comparison with control group.

Table 1: Mean \pm SD and range of renal function parameter for the studied groups

	CKD	Healthy Controls	P value
S.Cr (mg/dl)	1.803 \pm 0.967 (0.501-4.2)	0.792 \pm 0.279 (0.501-1.567)	0.0001*
Blood Urea (mg/dl)	10.544 \pm 6.926 (2.1-25.5)	3.948 \pm 1.084 (2.1-6.97)	0.0001*
GFR (ml/min/1.73m ²)	61.462 \pm 21.444 (30.22-110.1)	127.897 \pm 12.108 (110.1-150.56)	0.0001*
ACR	268.681 \pm 232.525 (9.23-599.0)	12.037 \pm 2.311 (7.28-16.05)	0.0001*

*Significant difference between two independent means using Student-t-test at 0.05 level.

In earlier research, an increased incidence of kidney failure was associated with high levels of S.Cr and renal impairment depending on stages of eGFR. Creatinine is easily processed at a constant rate by the glomerulus, but is excreted by the tubules (10-40%). Creatinine tubular secretion rises with CKD resulting in unpredictable GFR overestimation^[8]. Seki et al(2019) proposed that complete blood urea might have a predictive ability for development of kidney disease. These findings can indicate that in earlier stages of CKD, blood urea rates has a strong effect of on the development of renal disease^[9].

In table 1 the mean \pm SD values of eGFR for the mentioned groups were (61.462 \pm 21.444) and

(127.897 \pm 12.108) respectively. The results showed high significant decrees in CKD group ($p < 0.001$) compared to control groups. The mean \pm SD level of ACR showed that there are a high significant differences ($p < 0.001$) in the value of ACR among the studied groups that included CKD and control groups (268.681 \pm 232.525) and (12.037 \pm 2.311) respectively. The ACR between 30 mg/g is used as a kidneyharm indicator and is used to describe CKD with low eGFR. Albuminuria is an indicator of diabetic and nondiabetic kidney disease progression and development^[10]. Such results are compatible with latest studies, Eknoyan et al (2013) found that patients with regular or mild decline in GFR and Albuminuria may occur during the early stages; later it develops, lead to end stages of renal disease^[11].

Coresh et al (2014) reported that decline in eGFR in CKD and non-CKD patients must be tested for threat of accident and mortality because the eGFR gradient in CKD with eGFR < 60 ml/min/1,73 m² is more important and critical than eGFR > 60 ml/min/1,73 m². [12]. Emily et al (2014) showed in patients with CKD, increased

proteinuria (or albuminuria) is a major predictor of CKD progressions^[13].

Table (2) shows mean ± SD of fibrosis markers for CKD and control groups.

Table 2: Assessment mean ± SD of fibrosis markers for CKD and healthy groups

Fibrosis Markers	CKD	Healthy Controls	P value
VTN (ng/ml)	3.166±0.888 (1.21-5.42)	6.379±0.881 (5.32-9.01)	0.0001*
PAI-1 (ng/ml)	32.544±13.481 (10.353-58.02)	9.452±2.290 (4.661-14.426)	0.0001*
TGF-β1 (pg/ml)	22.702±10.163 (10.33-46.4)	1.713±1.303 (0.37-6.38)	0.0001*
-Data were presented as Mean±SD (Range)			
*Significant difference between two independent means using Student-t-test at 0.05 level.			

The results revealed a significant decrease level VTN in CKD patients as compared to control subjects (3.166±0.888), (6.379±0.881) respectively While serum VTN level ranged between (5.42-1.21) and (5.32-9.01) in CKD, and healthy control groups respectively, as shown in figure (1).

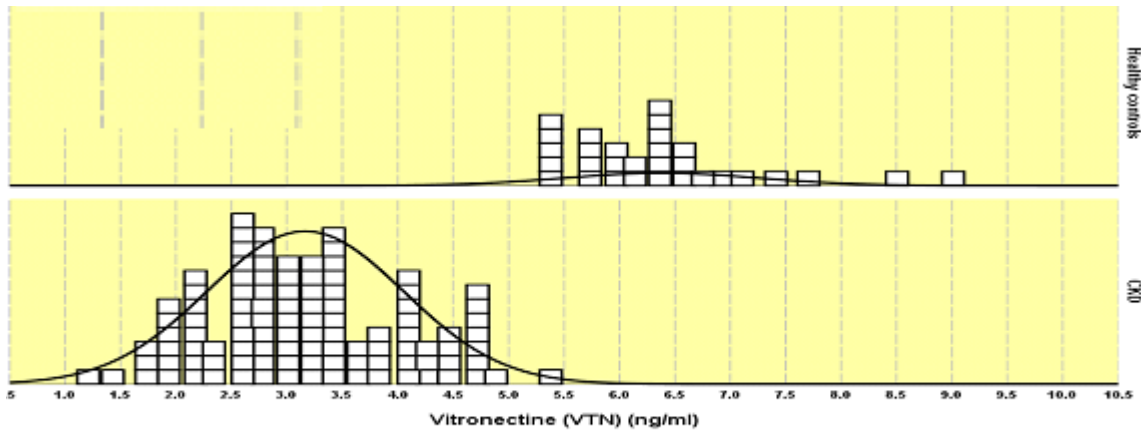


Figure 1: Distribution of VTN values in the CKD and control groups

The present result revealed the following: a) the serum concentration of VTN increase in early stages of CKD, and decrease with disease progression: b) increased serum VTN might be released from activated platelet c) progression renal injury may also contribute to the decreased serum VTN concretion because of VTN precipitated in kidney. VTN, one of the αvβ3 ligands of integrin, is a multifunctional glycoprotein found in the blood and ECM [14]. This protein, which is an adhesive glycoprotein in structure, is initially defined as serum spreading factor in blood. VTN plays an important role

in fibrinolysis, the immune defense, and hemostasis by providing cell adhesion and migration through interaction with collagen^[15]. In the present study, demonstrates for the first time that VTN is instrumental in CKD. The one reason of the decreased VTN levels may be that it functions as a cofactor for PAI-1 proteolytic inhibitory activities^[16].

The mean ± SD values of PAI-1 for the CKD and controls groups include (32.544±13.481), and (9.452±2.290) respectively while serum PAI-1 level

ranged between (10.353-58.020), and (4.661-14.426) in CKD and control cases respectively control as shown in the table and figure. Statistically higher significant differences were found between mean serum PAI-1 level of CKD and control groups.

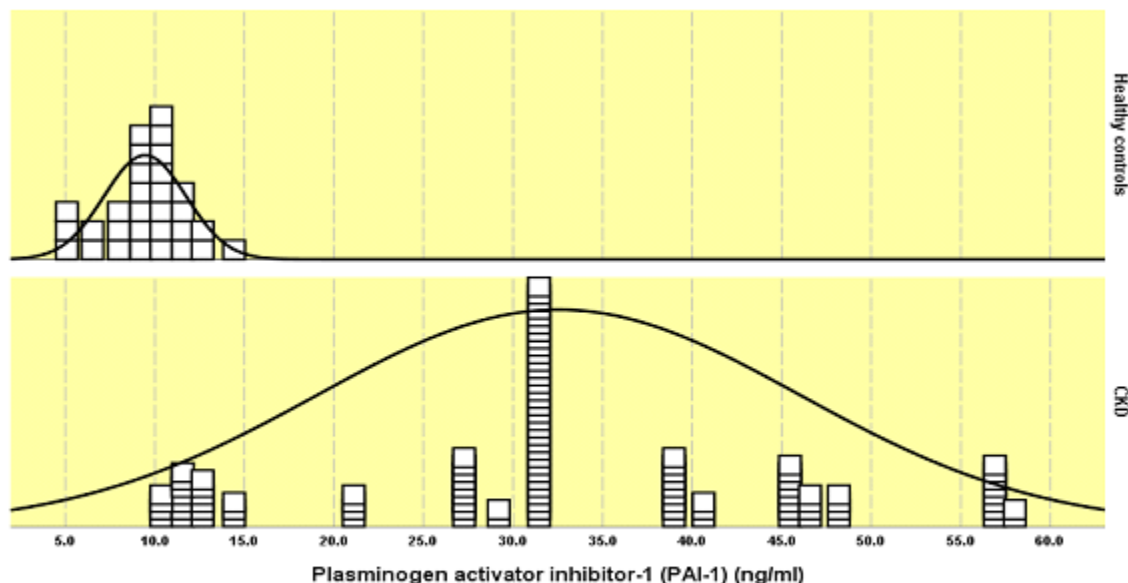


Figure 2: Distribution of PAI-1 values in the CKD and control groups.

In several other pathophysiological disorders, PAI-1 plays an important role, include metabolic syndrome, wound healing, diabetes, cancer and heart disease^[17]. PAI-1 has appeared recently as an important fibrogenic mediator in renal diseases, which include glomerulonephritis and diabetic nephropathy^[18]. By contrast PAI-1 dysfunction mitigates diabetic nephropathy and PAI-1 function disturbance dramatically lead thrombosis and fibrosis in mice^[19]. Consequently, repression of PAI-1 genetic expression could have important renoprotective effects and the development of different antagonists of PAI-1 could produce new therapeutic strategies^[20]. In humans, only trace amounts of PAI-1 are produced by healthy kidneys, whereas it is synthesized in higher levels in acutely or chronically injured kidneys^[21]

Latest observational studies have linked CKD to a threat of venous thrombosis closely associated with increased PAI-1 levels^[22]. The correlation between low eGFR and higher levels of hemostatic factors is clarified by several possible mechanisms. Reduced renal clearance can lead to higher levels of smaller hemostatic molecular weight markers. Results of a Dubin et al study showed that PAI-1 was 6.5 percent higher in patients with eGFR < 60 ml/min/1.73m² comparison with subjects

with eGFR > 90. The study suggested that hemostasis deregulation might play a significant pathology role in CKD^[23].

Ma and Fogo (2016) reported that fibrosis and glomerulosclerosis were strongly associated with increased regional PAI-1. In contrast PAI-1 inhibition blocks CKD development and can even promote glomerulosclerosis relapse, probably due to proteolysis effects. PAI-1 interactions with vitronectin, on the other hand, appear key in the renal interstitium and promote cell migration. There are numerous dynamic associations with angiotensin, aldosterone, TGF- β and kidney. More analysis of PAI-1's regional activity and its interactions with other fibrosis modulators may lead different active strategies to the treatment of progressing renal disease^[24]. The results of the present study correspond to the above results.

The present study showed a significant increase level of TGF- β 1 in CKD patients as compared to control subjects (22.70 \pm 10.16 vs. 1.71 \pm 1.30pg/ml), while serum TGF- β 1 level ranged between (10.33-46.40), and (0.37-6.38) in CKD, and healthy control groups respectively. As shown in table (2) and figure (3). TGF- β 1 as dependent outcome variable demonstrated a

strong association with the mild to moderate CKD patients. This observation fits well with the results of Wong et al. (2013) who indicates that elevated levels of TGF- β in this patient population indicate progressing renal disease [25].

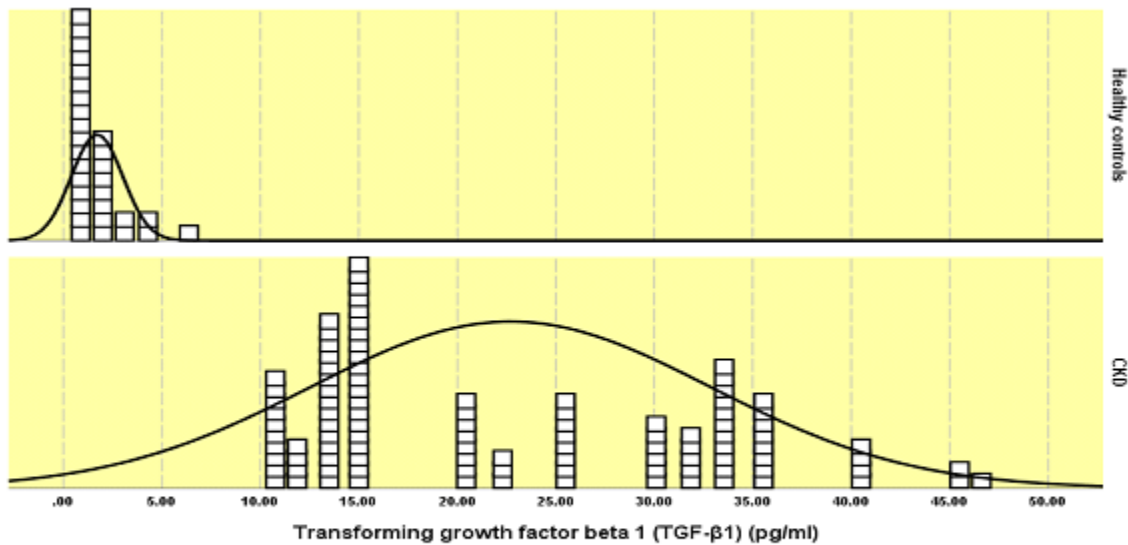
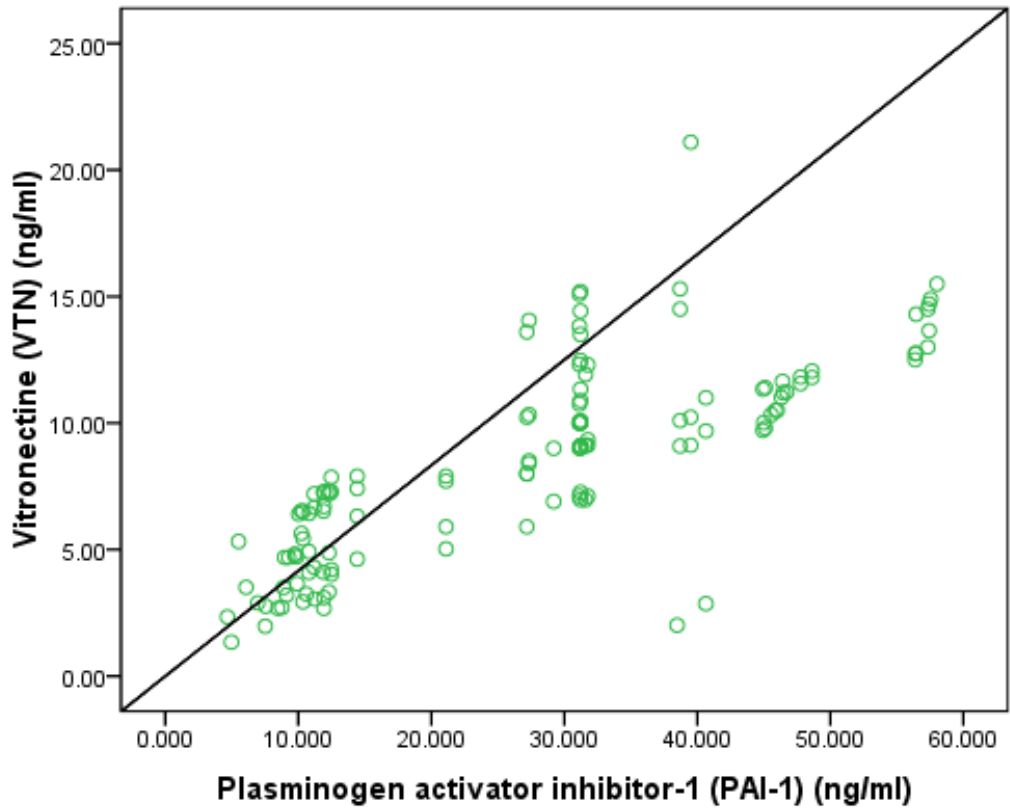


Figure 3 : Distribution of TGF- β values in the CKD and control groups

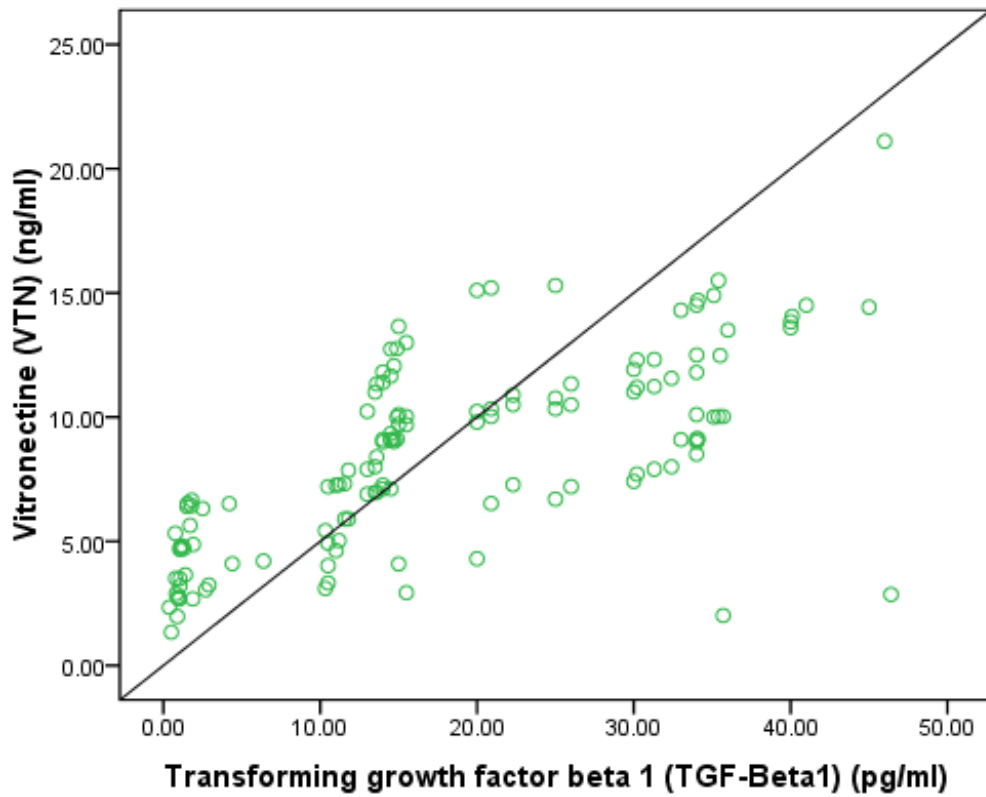
These findings indicate that TGF- β plays a significant role in renal disease glomerular and tubulointerstitial pathology by having contributed to pathological modifications which cause modifications in the glomerular filtration membrane, glomerulosclerosis and fibrosis, and tubular degeneration leading to irreversible renal dysfunction [26]. Mehta et al (2017) propose that elevated TGF- β can be a vascular disease marker which leads to decline in GFR, age mortality and CV events [27]. Unlike these results, an examination of TGF- β levels in the Chronic Renal Insufficiency prospective study in 3791 participants showed no cross-sectional correlation between TGF- β levels and CKD measurements [28].

The results showed a presence of strong positive correlation between Vtn and PAI-1, and TGF- β ($r=0.72$

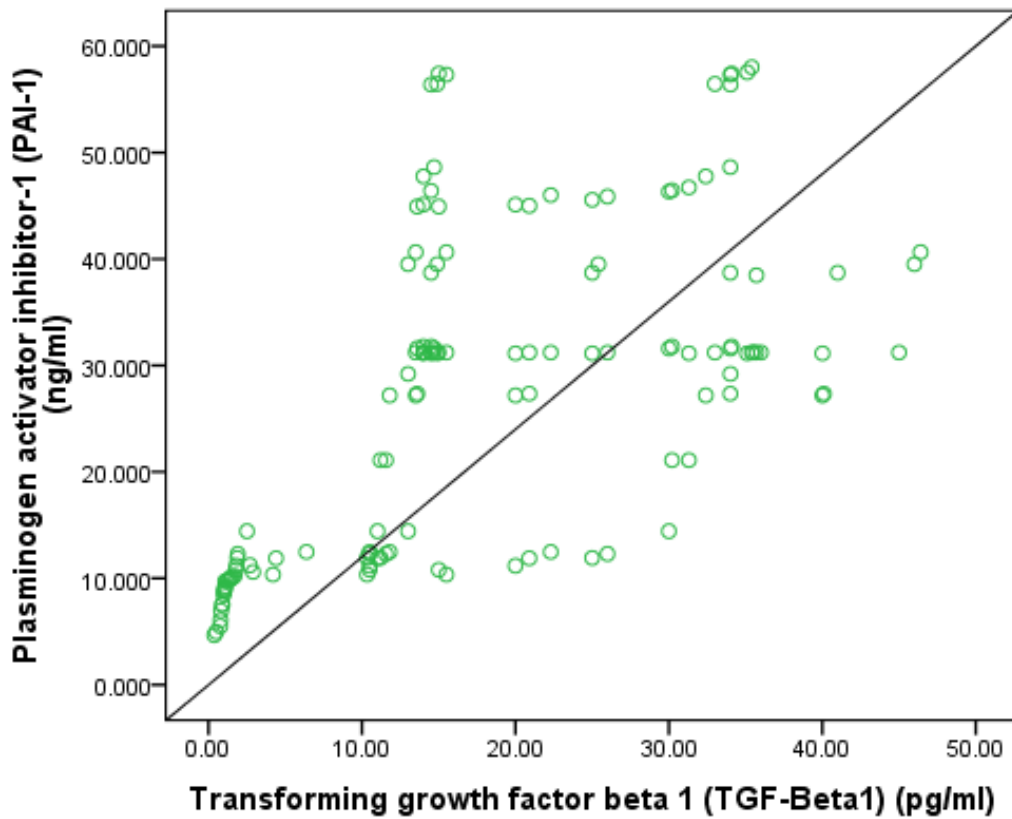
$1, p=0.0001$), ($r=0.698, p=0.0001$) and ($r=0.648, p=0.001$) in patients group as shown in fig 4(A,B and C) These result in agreement with [29]. VTN attaches with a high affinity to PAI-1 through its NH₂-terminal somatomedin B (SMB) domain, a connection favored to VTN receptor cooperation, resulting in the active conformation of PAI-1 stability. PAI-1 is a powerful renal fibrosis-promoting molecule, at least partially mediated by its ability to improve interstitial myofibroblast recruitment [30]. While less thoroughly investigated, VYN has been documented to associate a number of other molecules involved in chronic renal disease, include hepatocyte growth factor TGF- β 1, epidermal growth factor, connective tissue growth factor, fibroblast growth factor, vascular endothelial growth factor, anti-thrombin complexes, insulin-like growth factor II and proteoglycans [29].



(A)



(B)



(C)

Figure 4: The correlation between VTN & PAI-1 (A) VTN & TGF-Beta 1 (B) PAI-1 & TGF-Beta 1(C) in CKD

Conclusion

These results indicate that VN and PAI-1 are connected to TGF-β’s active form and can be used as a prediction for CKD’s progression

Conflict of Interest: Null

Source of Funding: Self

Ethical Clearance: This study was conducted with the consent of the volunteers and without mentioning the names with the complete privacy of volunteers.

References

1. Schar CR, Jensen JK, Christensen A, Blouse GE, Andreasen PA, Peterson CB. Characterization of a site on PAI-1 that binds to vitronectin outside of the somatomedin B domain. *J Biol Chem* 2008;283: 28487–28496,
2. Konstantinides S, Schafer K, Thinnes T, Loskutoff DJ. Plasminogen activator inhibitor-1 and its cofactor vitronectin stabilize arterial thrombi after vascular injury in mice. *Circulation* .2001;103: 576–583,
3. Jang YC, Tsou R, Gibran NS, Isik FF. Vitronectin deficiency is associated with increased wound fibrinolysis and decreased microvascular angiogenesis in mice. *Surgery*, 2000.127: 696–704
4. Eddy AA, Fogo AB. PAI-1 in chronic kidney disease: evidence and mechanisms of action. *J Am Soc Nephrol*. 2006;17: 2999–3012,
5. Huang, Y.; Border, W.A. and Noble, N.A. *Kidney Int*. 2006;69(10), 1713-1714.
6. Yu, L.; Border, W.A.; Huang, Y. and Noble, N.A. *Kidney Int*, 2003;64(3), 844-856.
7. Aldigier, J.C.; Kanjanbuch, T.; Ma, L.J.; Brown, N.J. and Fogo, A.B. . *J. Am. Soc. Nephrol.*, 2005;16(11), 3306-3314
8. Anne-Sophie Bargnoux, Nils Kuster, Etienne

- Cavalier, Laurence Piéroni, Jean-Sébastien Souweine, Pierre Delanaye, Jean-Paul Cristol. Serum creatinine: advantages and pitfalls. *J Lab Precis Med* .2018;3:71
9. Makiko Seki, Masaru Nakayama, Teppei Sakoh, Ryota Yoshitomi, Akiko Fukui, Eisuke Katafuchi, Susumu Tsuda, Toshiaki Nakano, Kazuhiko Tsuruya and Takanari study. *BMC Nephrology* .2012;20:115.
 10. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease, summary of recommendation statements. *Kidney Int Suppl*. 2013;3:5–14
 11. G. Eknoyan, N. Lameire, K. Eckardt, B. Kasiske, D. Wheeler, A. Levin et al., “KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease,” *Kidney International Supplements*.2013; 3(1): 5–14,
 12. Coresh J, Turin TC, Matsushita K, Sang Y, Ballew SH, Appel LJ, et al. Decline in estimated glomerular filtration rate and subsequent risk of end-stage renal disease and mortality. *JAMA*. 2014; 311: 2518–2531.
 13. Emily P. McQuarrie, Jamie P. Traynor, Alison H. Taylor, E. Marie Freel, Jonathan G. Fox, Alan G. Jardine, Patrick B. Mark. Association Between Urinary Sodium, Creatinine, Albumin, and Long-Term Survival in Chronic Kidney Disease. *Hypertension*. 2014;64:111-117
 14. Schwartz I, Seger D, Shaltiel S. Vitronectin. *Int J Biochem Cell Biol*. 1999;31:539–544
 15. Mayasundari A, Whittemore NA, Serpersu EH, Peterson CB. The solution structure of the N-terminal domain of human vitronectin: Proximal sites that regulate fibrinolysis and cell migration. *J Biol Chem*. 2004;279:29359–29366.
 16. Jesús M. López-Guisa, Allen C. Rassa, Xiaohe Cai, Sarah J. Collins, and Allison A. Eddy. Vitronectin accumulates in the interstitium but minimally impacts fibrogenesis in experimental chronic kidney disease. *Am J Physiol Renal Physiol*2011;300: F1244–F1254,
 17. Declerck PJ, Gils A. Threedecadesofresearchon-plasminogenactivatorinhibitor-1: amultifaceted serpin. *Semin Thromb Hemost*. 2013; 39(4):356–64.
 18. Ghosh AK, Vaughan DE. PAI-1intissuefibrosis. *JCellPhysiol*.2012; 227(2):493–507.
 19. Nicholas SB, Aguiniga E, Ren Y, Kim J, Wong J, Govindarajan N, et al. Plasminogenactivatorinhibitor1deficiencyretardsdiabeticnephropathy. *Kidney Int*. 2005; 67(4):1297–307.
 20. Ha H, Oh E Y, Lee H B. The role of plasminogenactivatorinhibitor 1 in renal and cardiovascular diseases. *Nat Rev Nephrol*. 2009; 5(4):203–11.
 21. Malgorzewicz S, Skrzypczak-Jankun E, Jankun J. Plasminogen activator inhibitor-1 in kidney pathology (Review). *Int J Mol Med* .2013;31:503-10.
 22. Folsom AR, Delaney JA, Lutsey PL, et al: Associations of factor VIIIc, D-dimer, and plasmin-antiplasmin with incident cardiovascular disease and all-cause mortality. *Am J Hematol*2009;84: 349-353,
 23. . Dubin R, Cushman M, Folsom AR, et al: Kidney function and multiple hemostatic markers: cross sectional associations in the multi-ethnic study of atherosclerosis. *BMC Nephrol*.2011;12: 3
 24. Li-Jun Ma and Agnes B. Fogo. PAI-1 and kidney fibrosis. *Front Biosci (Landmark Ed)*.2016; 14: 2028–2041
 25. Wong MG, Perkovic V, Woodward M, Chalmers J, Li Q, Hillis GS, Yaghobian Azari D, Jun M, Poulter N, Hamet P, et al. Circulating bone morphogenetic protein-7 and transforming growth factor-beta1 are better predictors of renal end points in patients with type 2 diabetes mellitus. *Kidney Int*. 2013;83(2):278–84.
 26. Ivonne Loeffler and Gunter Wolf.(2014). Transforming growth factor-β and the progression of renal disease. *Nephrol Dial Transplant*.2014; 29: i37–i45
 27. Tapan Mehta, Petra Buzkova, Jorge R. Kizer, Luc Djousse, Michel Chonchol, Kenneth J. Mukamal, Michael Shlipak, Joachim H. and Diana Jalal. Higher plasma transforming growth factor (TGF)-β is associated with kidney disease in older community dwelling adults. *BMC Nephrology* .2017; 18:98
 28. Gupta J, Mitra N, Kanetsky PA, Devaney J, Wing MR, Reilly M, Shah VO, Balakrishnan VS, Guzman NJ, Girndt M, et al. Association between albuminuria, kidney function, and inflammatory biomarker profile in CKD in CRIC. *Clin J Am Soc Nephrol*. 2012;7(12):1938–46.

29. Jesús M. López-Guisa, Allen C. Rassa, Xiaohe Cai, Sarah J. Collins, and Allison A. Eddy. Vitronectin accumulates in the interstitium but minimally impacts fibrogenesis in experimental chronic kidney disease, *Am J Physiol Renal Physiol*.2011;300: F1244–F1254
30. Schar, C. R., Jensen, J. K., Christensen, A., Blouse, G. E., Andreasen, P. A., & Peterson, C. B. . Characterization of a site on PAI-1 that binds to vitronectin outside of the somatomedin B domain. *The Journal of biological chemistry*.2008; 283(42), 28487–28496.

Study for Selection Criteria of Two Types Fixed Partial Dentures in Iraqi Population

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Abstract

Fixed prosthodontics is the area of prosthodontics focused on permanently attached (fixed) dental prostheses. The superb esthetic and biocompatible characteristic of ceramic and zirconia restorative materials make both the most pioneer materials for the construction of the fix prostheses by the dentist. Such dental restoration is called direct or indirect restorations according to their method of construction. They include crowns, bridges (fixed dentures), inlays, onlays, and veneers. Prosthodontist is a specialist dentist who have trained to select the proper types, material and design of the fixed prostheses. However, comprehensive information about the dental materials are available from the internet websites and social media, which improved the patient's knowlege and consequently they may share physician in their decision in selecting the tooth reconstruction materials. The current survey study concerned three factors that may affect patient's choice for the fix prostheses: (1) internet information, (2) doctor advice, (3) the cost. A total of 100 patients who attending the clinic of the Operative Dentistry in the last 16 months for aesthetic restorations were included in the survey. The samples included 72 female and 28 males of age ranged between 30 and 69 years. The survey based on the criteria for selection the type of fixed metal according to the following items,(1) internet and social media information's, (2) advice of doctor, and (3) the price. The results showed that 67 of patient's choose zircon while 33 of them choose porcelain fused to metal. Furthermore, the results revealed that the internet represented 36% of selection criteria chosen for this study, compared to 34% due to doctor advice and 30%. Due to cost of the treatment The P value were <0.001 significant. The primary reason for selecting zirconia over porcelain fused to metal was the doctor advice and the internet. Where the cost was the main reason in choosing Porcelain fused to metal,plus the sex, age, and marital status.

Keywords: Zirconia, PFM, Prosthodontics, Indirect.

Introduction

Due to its reliability, the porcelain fused to metal (PMF) was considered as gold standard fixed for partial dentures and crowns for the last 30 years. But the complete opacity of this metal requires a thick fuzzy

layer, which create difficulties in imitative esthetics as inherent in a natural tooth. The main problem for all ceramic type restorations are their fracture probability due to the occlusal forces¹.But still, the use of full ceramic prosthesis is increasing in last decade's². Ozer et al survey found that porcelain fused to zirconia crowns was identical to the PFM crowns in any type of coping system for molar or premolar teeth locations³.

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Generally the essential limitation of all ceramic material is their low mechanical stability⁴. The new Polycrystalline ceramics, Zirconia and alumina, are mor stable when employd as frame material. zirconia is Yttria-stabilized tetragonal polycrystals (Y-TZP), which has high flexural strength with the transformation toughening feachers. These materials are providing

both esthetic and good material property demanded for modern tooth restoration ^{3,5,6,7}.

This zirconia material of a particular advantages properties for dental applications including: high esthetics, excellent biocompatibility, low plaque accumulation, low thermal conductivity, and high strength make them demanded from both dentist and dental technicians ^{8,9}.

Since the most important requirement in dental prostheses is the accurate fitting to the abutment¹⁰. The progress in manufacturing (CAD/CAM) with the aid of the computer design improved the prosthetic devices techniques ^{8,11}.

Internet and social media have big effect on person's decision to in selection of the prosthesis, specially in health care as well as dental materials information. Even some of this informations may be not correct¹², But the advantages of health informations leading to better health outcome¹³. Although the social media has been widely used in Iraq, there has been limited information about their effect on people's decision to select the fixed prostheses.

This survey was done to analyze patient selection decision for crown and fixed dentures between zirconia fused to metal or porcelain fused to metal, according to the internet informations, doctor advice, and the cost were the t-test was used to make the comparison.

Material and Method

A 100 patients aged between 25-69 years, attending outpatients the Department of Operative Dentistry for restorations, and the esthetic area were included. The number of females were 72, and of males 28. This survey based on the selection of fixed crown or bridge employing either ceramic fused to metal or zircon. The selection material criteria based on the advice of doctors, internet informations, or the price. The patients marital Status and employment, was also recorded.

Result

The total recorded informations for all subjects were presented in table 1. The result revealed that the mean age was 41.5 ± 11.7 years. The age group between 40 – 49 years showed the highest frequency (38%) while age group between 60 – 69 years showed the lowest

frequency (10%). Female to male ratio was 2.57:1, and the employed subjects were slightly higher compared to unemployed. The majority of the patients was married (81%), table 1.

Table 1: Sociodemographic characteristic

Variables	Percentage
Number	100
Age (Years), mean ± SD	41.5 ± 11.7
<30 years	18.0%
30 – 39 years	19.0%
40 – 49 years	38.0%
50 – 59 years	15.0%
60 – 69 years	10.0%
Gender, n (%)	
Female	72%
Male	28%
Working status, n (%)	
Unemployed	38.0%
Student	15.0%
Employed	47.0%
Marital status, n (%)	
Unmarried	19.0%
Married	81.0%

Table 2: Assessment of dental status

Variables	Percentage
Number	100
Groups, n (%)	
Zircon	67.0%
Porcelain fused to metal	33.0%
Selection criteria, n (%)	
Doctor advice	34.0%
Internet	36.0%
Cost	30.0%
Teeth number, n (%)	
Anterior teeth	50.0%
Posterior teeth	40.0%
Both	10.0%

Tables 2,3 revealed that the male, and the married patients were significantly higher in choosing Porcelain fused to metal. In terms of selection criteria, the cost was the main cause in adopting Porcelain fused to metal. While the doctor's advice, and the internet information was the major cause in choosing Zircon.

Table 3: Comparison for the selection between the two types fixed restoration for all variables.

Variables	Zircon	Porcelain fused to metal	p-value
Number	67	33	-
Age (years), mean \pm SD	39.0 \pm 11.4	46.6 \pm 10.9	0.002 [S]
Gender, n (%)			
Female	54 (80.6%)	18 (54.5%)	0.009 [S]
Male	13 (19.4%)	15 (45.5%)	
Selection criteria			
Doctor advice	31 (46.3%)	3 (9.1%)	<0.001 [S]
Internet	34 (50.7%)	2 (6.1%)	
Cost	2 (3.0%)	28 (84.8%)	
Working status, n (%)			
Unemployed	25 (37.3%)	13 (39.4%)	0.852
Student	11 (16.4%)	4 (12.1%)	
Employed	31 (46.3%)	16 (48.5%)	
Marital status, n (%)			
Unmarried	18 (26.9%)	1 (3.0%)	0.004 [S]
Married	49 (73.1%)	32 (97.0%)	
Teeth number, n (%)			
Anterior teeth	37 (55.2%)	13 (39.4%)	0.330
Posterior teeth	24 (35.8%)	16 (48.5%)	
Both	6 (9.0%)	4 (12.1%)	

Discussion

This study focused on the patient chooses for the type of fixed prosthesis zirconia-based and PFM.

The selection was either by patient getting information from internet, or through doctor advice, plus the cost. The result showed that the selection of patient based on internet information demonstrated a significant effect. This indicated that patients actively contributed in decisions relating to the internet dental care information. Many authors postulated that a big number of patients used the internet as a source of information for this purpose¹⁴.

The second criteria regarded in this study were the advice of the dentist. The results showed that dentist advice was also one of the most causes for choosing Zircon, as illustrated in table 2. Doctor advice based on the following zirconia properties.

Zirconia used as a restorative material satisfying the esthetic and functional requirements. Zirconia framework is more accepted than metallic, especially when manufacturers introduce colored zirconia matching

the natural tooth colors¹⁵. Furthermore, the exceptional zirconia Strength make it adequate core material for dental crowns and bridges. Also its high esthetic directed to specific development of materials that are capable of replacing porcelain-fused-to-metal systems^{16, 17}.

Ozer et al in their survey on durability of posterior zirconia and porcelain-fused-to-metal crowns in private practice revealed that crowns fabricated with zircon core plus the three commercial zirconia coping systems showed superior long-term survival. Murray et al postulated that zirconia crowns were more durable than the conventional PFM ceramic¹⁵.

Nowadays dental manufacturers fabricate zirconia crowns and bridges with the assistance of the CAD CAM milling machine or 3D printing. The output of these techniques produce crowns with superb fitting^{8, 19}.

The metal based crowns and bridges provide excellent biocompatibility but still some patients possess allergic reactions using them. While zirconia owns excellent biocompatibility with extremely safe properties¹⁰.

Conclusion

1. The doctor advice and the internet were the main cause for choosing Zircon
2. The cost was the main cause for choosing Porcelain fused to metal
3. The male, and married patients were significantly higher in intending Porcelain fused to metal.

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Conflict of Interest: None

References

1. Jalalian, E., Atashkar, B., & Rostami, R. The effect of preparation design on the fracture resistance of zirconia crown copings (computer associated design/computer associated machine, CAD/CAM system). *Journal of dentistry (Tehran, Iran)*, 2011; 8(3), 123-129.
2. Komine F, Blatz MB, Matsumura H. Current state of zirconia-based fixed restorations. *Journal Oral Science*.2010;52:531–539.
3. Fusun Ozer, Francis K. Mante. A retrospective survey on long-term survival of posterior zirconia and porcelain-fused-to-metal crowns in private practice. *Quintessence international prosthodontics*. 2014;45(1):6-12.
4. Irena Sailer, Nikolay Alexandrovich Makarov, Daniel Stefan Thom, Marcel Zwahlenc, Bjarni Elvar Pjetursson. All-ceramic or metal-ceramic tooth-supported fixed dental prostheses, A systematic review of the survival and complication rates. Part I: Single crowns (SCs). *Dental Material journal* 2015;31(6):603-23.
5. Cavalcanti AN, Foxton RM, Watson TF, Oliveira MT, Giannini M, Marchi GM. Y-TZP ceramics: Key Concepts for Clinical application. *Operative Dentistry*. 2009;34: 344–351.
6. Shi JY, Li X, Ni J, Zhu ZY. Clinical Evaluation and Patient Satisfaction of Single Zirconia-Based and High-Noble Alloy Porcelain-Fused-to-Metal Crowns in the Esthetic Area: A Retrospective Cohort Study. *Journal Prosthodont*. 2016;25(7):526-530.
7. Ossama Saleh Abd El-Ghany, Ashraf HuseinSherief. Zirconia based ceramics, some clinical and biological aspects: Review. *Future Dental Journal*. 2016;2: 55-64.
8. Baig MR, Tan KB, Nicholls JI. Evaluation of the Marginal Fit of a Zirconia Ceramic Computer-Aided Machined (CAM) Crown System. *Journal Prosthetic Dentistry*. 2010;104: 216–227.
9. Herbert T.Shillingburg, David A. Sather, Edwin L. Wilson, Donald L. Mitchel, Luis J. Blanco. James C. Kessler: *Fundamentals of fixed Prosthodontics 4th*, Chapter 23/all-ceramic restoration. 2014; 425-466
10. Seok-Joon Ha and Jin-Hyun Cho. Comparison of the fit accuracy of zirconia-based prostheses generated by two CAD/CAM systems. *The Journal of Advanced Prosthodontics*.2016;8(6):439-448.
11. Ariel J.Raigrodski. Contemporary materials and technologies for All-Ceramic Fixed Partial Dentures: A review of the literature. *The Journal of Prosthetic Dentistry*. 2004; 29(6):557-562.
12. I. G. Chestnutt and K. Reynolds. How has the Internet affected dentistry?.*British Dental Journal*. 2006; 200: 161–165.
13. Murray E, Lo B, Pollack L, et al. The Impact of Health Information on the Internet on Health Care and the Physician-Patient Relationship: National U.S. Survey Among 1.050 U.S. Physicians. *Journal of Medical Internet Research*. 2003;5(3):e17.
14. Von Muhlen M, Ohno-Machado L Reviewing social media use by clinicians. *J Am Med Inform Assoc* 2012;19: 777-781.
15. Elie E Daou and Maha Al-Gotmeh. Zirconia Ceramic: A Versatile Restorative Material. *Dentistry- an open access journal*2014;4 (4): 2161-1122.
16. Bajraktarova-Valjakova, E., Korunoska-Stevkovska, V., Kapusevska, B., Gigovski, N., Bajraktarova-Misevska, C. & Grozdanov A. Contemporary Dental Ceramic Materials, A Review: Chemical Composition, Physical and Mechanical Properties, Indications for Use. *Open access Macedonian Journal of Medical Sciences*. 2018 ;6(9), 1742-1755.
17. Zarone F, Russo S, Sorrentino R. From porcelain-fused-to-metal to zirconia: Clinical and Experimental Considerations. *Dental Materials*. 2011; 27(1):83-96.

18. Attia A. Influence of surface treatment and cyclic loading on the durability of repaired all-ceramic crowns. *Journal of Applied Oral Science*. 2010;18(2):194-200.
19. J. Abduo, K. Lyons & M. Swain. Fit of zirconia fixed partial denture: a systematic review. *Journal of Oral Rehabilitation*. 2010;37:866–876

Periodic Acid Schiff (PAS) Staining: A Useful Technique for Demonstration of Carbohydrates

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Abstract

The term mucosubstances is used to denote all tissue components other than glycogen, rich in carbohydrates, which are present in connective tissue or as secretion of certain epithelial structures. Connective tissue mucosubstances are called “mucopolysaccharides”, while those secreted by epithelia are referred as “mucins”.

Objectives: To show the usefulness of PAS staining in identification of carbohydrates in normal and malignant lesions of mammary gland and endocervical gland .

Methodology: This is a retrospective, observational, analytical, case control study aimed to evaluate mucin histochemical pattern in normal and diseased lesions of mammary and endocervical glands. Twenty five histologically proven blocks of normal and Intraductal carcinoma of mammary gland, normal and adenocarcinoma of endocervical glands were taken. Tissue sections were stained by PAS technique.

Results: Results were tabulated according to colour intensity into different grades ranging from + to +++++. PAS staining of normal endocervical glands showed presence of PAS +ve substances like carbohydrate & mucins. PAS stain for adenocarcinoma cervix gave mild reaction with focal magenta shade, suggestive of presence of few neutral mucosubstances. PAS staining of normal mammary gland and of Intraductal carcinoma showed similar results. Ducts and lobules stained with magenta showed the presence of PAS positive substances like carbohydrate and neutral mucins.

Conclusion: Mucin histochemical patterns serve as valuable, cost-effective tool for diagnosis in histopathology and for the researchers in histology, where a slight change in the mucin pattern may help in the early diagnosis of disease process. PAS technique is perhaps the most versatile and widely used of techniques for the demonstration of glycoproteins, carbohydrates and mucins.

Keywords: *Mucins, PAS stain, Normal, Adenocarcinoma, Intraductal carcinoma.*

Introduction

Special stains belong to a diverse family of slide-

based stains that rely on basic chemical reactions for microscopic visualization and general identification of various tissues, structures, cells, organelles, carbohydrates, minerals and micro-organisms. Introduced to all college biology students through the simple bacterial test known as the Gram stain. Special stains use both, science and art to provide valuable and cost-effective information for pathology laboratory.¹

Periodic acid (HIO₄) is an oxidizing agent used initially by Jackson and Hudson (1937) for the chemical estimation of polysaccharides.² “McManus” (1946)

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was the first to apply Periodic acid to the histological demonstration of mucin, whereas Hochkiss (1948) emphasized the legitimacy of Periodic acid as a special histochemical reagent.² Dr. Joseph Forde Anthony McManus (1911-1980) was a Canadian pathologist who is best known for his formulation of one of the most frequently used stains in histopathology; the McManus Periodic-acid Schiff stain³. Periodic acid acts upon the 1,2 glycol linkage of carbohydrates in tissue sections to produce aldehyde which can be colored with Schiff's reagent. The method can be used in paraffin sections or frozen sections and is useful as a reaction for carbohydrates of tissue: i.e glycogen (in paraffin sections only) mucin, basement membrane, reticulin, colloid of thyroid and pituitary stalk, granular cells of renal arteriole etc.⁴

Chemistry^{5,6} PAS reaction demonstrates aldehyde groups formed by the oxidation of certain tissue carbohydrates and glycogen. The oxidation of the tissue sections is performed using periodic acid. After oxidation, tissue sections are treated with Schiff's reagent, a colourless mixture of basic fuchsin, HCl and sodium metabisulfite. During incubation, basic fuchsin binds to the newly formed aldehyde groups in the tissue. Rinsing the sections in running water after the Schiff reagent incubation causes the bound basic fuchsin molecules to assume a pink to red color due to molecular changes. Several counter stains may then be used to visualize other tissue elements. Hematoxylin counterstaining is very commonly used to demonstrate cell nuclei, although other counterstains may also be used. Some older method include treating the sections in a sulfurous rinse solution before running water wash. This can serve to reduce background staining by removing excess Schiff's reagent from the tissue.^{5,6}

Material and Method

The present study was conducted in the Department of Anatomy, Krishna Institute of Medical Sciences

University, Karad from May 2010 to June 2018. The type of study was observational, analytical and case control. Work protocol was submitted to the protocol and ethical committee for approval and necessary permission was taken.

Sample size was twenty five blocks of histologically proven normal and Intraductal carcinoma of mammary gland, normal and adenocarcinoma of endocervical glands. The tissues were fixed in 10% formal saline with 2% calcium acetate and a pinch of phosphotungstic acid to help for preservation of mucins. The tissues embedded in paraffin blocks were prepared by histopathological technique and cut at 5 – 6 microns. Sections were stained with Hematoxylin and Eosin for identification of the tissue and special stain PAS for identification of carbohydrates and results were interpreted. P.A.S-Periodic acid Schiff reagent stains all carbohydrates including mucosubstances. Therefore mucosubstances are P.A.S. positive. All the results obtained were tabulated according to colour intensity into different grades ranging from + to +++++.^{7,8,9}

Observations and Results

All the results were tabulated according to colour intensity into different grades ranging from + to +++++.^{7,8,9}

Colour Index:

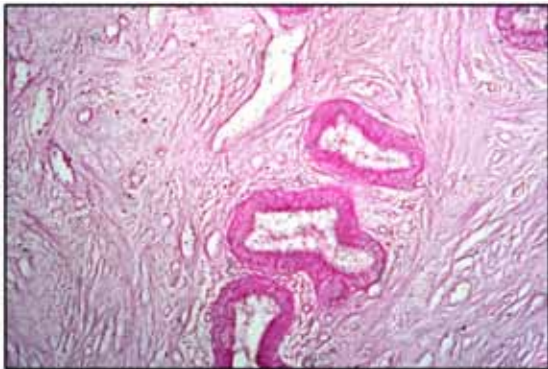
- ++++ : Very strong positive reaction.
- +++ : Strong positive reaction.
- ++ : Moderate reaction.
- + : Weak reaction.
- : Negative reaction.

Table Showing Histochemical result for PAS stain

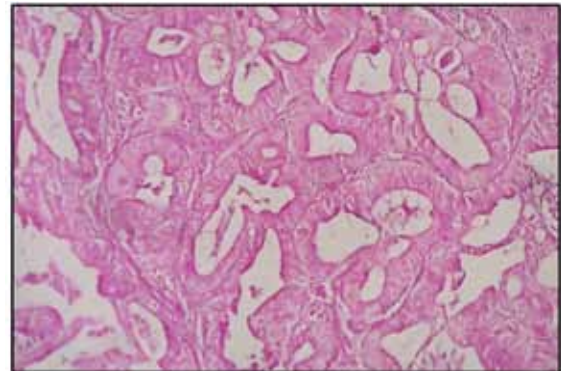
Sr.No.	Tissue stained	Result	Inference about Mucosubstances
1	Normal endocervical glands Photomicrograph 1	+++	PAS +vesubstances like carbohydrate & mucins present.
2	Adenocarcinoma endocervical glands Photomicrograph 2	++	PAS +ve Substances Present
3	Normal mammary gland Photomicrograph 3	++ (Duct cells, Duct lumen, Lobule cells and Lobule lumen)	PAS +ve Substances Present
4	Intraductal carcinoma breast Photomicrograph 4	++	PAS positive mucosubstances present.

Inference: Regarding special stains – PAS stain was used to assess presence of neutral mucosubstances. PAS stain for normal endocervix gave magenta colour with strong reactivity suggestive of presence of neutral mucin. Epithelium and glands, both gave moderate to strong reactivity. PAS stain for adenocarcinoma cervix gave mild reaction as focal magenta staining, suggestive of presence of minimal neutral mucosubstances compared to normal endocervix.

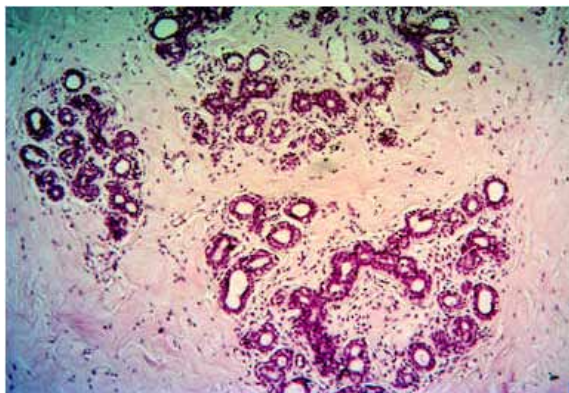
Sections of normal mammary gland stained with PAS showed the ducts and lobules stained magenta, confirming the presence of PAS positive substances like carbohydrate and neutral mucins. For Intraductal carcinoma breast, PAS stain gave moderate reaction as focal magenta staining, suggestive of presence of neutral mucosubstances. However the colour intensity was more than that of normal breast tissue.



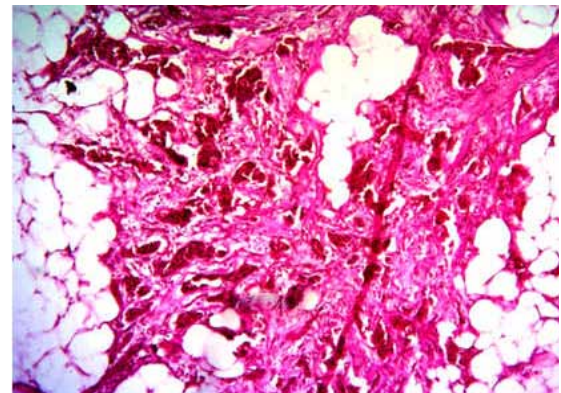
Normal endocervical glands
Photomicrograph 1 (PAS 10X)



Adenocarcinoma endocervical glands
Photomicrograph 2 (PAS 10X)



Normal mammary gland
Photomicrograph 3 (PAS 10X)



Intraductal carcinoma breast
Photomicrograph 4 (PAS 10X)

Discussion

Worldwide, cervical cancer is the fifth most deadly cancer in women¹⁰. It affects about 16 per 100,000 women per year¹¹. It accounts for 20-25% of all the cancers and 85% of all the female genital tract malignancies. Primary adenocarcinomas make 5-10% of all cancers of the cervix¹². Invasive breast cancer is the most common carcinoma in women, accounting for 23% of all cancers in women globally¹³ and now the most common cancer in Indian women, having recently overtaken cervical cancer in this respect.¹⁴

The term “mucosubstances” is used to denote all tissue components, other than glycogen, rich in carbohydrates which are present in connective tissue or as secretion of certain epithelial structures by Spicer et al.^{15,16}

Numerous types of mucins occur depending on the site of production. Examples of connective tissue mucins are chondroitin sulphate, heparin sulphate, keratin sulphate and hyaluronic acid. Epithelial mucins may be neutral or acidic. Neutral mucins are hexosamine units which may be associated with glucuronic or sialic acid; the reactive group being carboxyl. In sulphated mucins this group is blocked by a sulphate group which becomes the active group¹⁷. Strongly sulphated mucins are of connective tissue type; the weakly sulphated groups are of epithelial type. The non-sulphated mucins are sialic acid and hyaluronic acid (carboxylated D-glucuronic acid). These can be enzymatically digested, though enzyme resistant forms do occur.¹⁷

With the development of new histochemical method by special stains, specific chemical composition of mucosubstances is documented by various scientists. But there have been very few studies on human endocervical mucosubstances such as by J. N. Bulmer et al (1988)¹⁸, Vatsala Misra et al (1997)¹⁹, Zhao Shumei et al (2003)²⁰ and Hayashi, Isamu M.T et al (2003)²¹ and human mammary gland by Luciano Ozzello and Speer (1958)²², D J Cooper (1974)¹⁷, Muaz Osman Fagare (2015)²³ and S S.Spicer et al (2016)²⁴. The PAS reaction is a useful indicator of the presence of tissue carbohydrates and particularly so for glycogen when the technique incorporates a diastase digestion stage.^{25,26}

Summary and Conclusion

Mucin histochemistry of normal and malignant endocervical glands, normal and Intraductal carcinoma

of breast was undertaken in the department of Anatomy at Krishna Institute of Medical Sciences University, Karad from 2010 to 2018.

In the present study, Haematoxylin and Eosin was used as routine stain for identification and confirmation of the tissue and special staining with PAS was carried out for presence of carbohydrates.

- In the present study mucin histochemistry of normal endocervical glands showed mixture of mucosubstances, both neutral and acidic.
- Histochemical results for malignant endocervical glands showed very few mucins. Mixture of both neutral and acidic were found. Neutral mucins were in trace amounts. So there is a shift in mucin pattern as compared to normal.
- Mucin histochemistry of normal breast tissue showed that neutral as well as acidic mucins were present.
- Histochemical results for IDC breast showed a mixture of both neutral as well as acidic mucins, with predominance of neutral mucins.
- The present study correlates well with workers like, J. N. Bulmer et al (1988)¹⁸, Vatsala Misra et al (1997)¹⁹, Zhao Shumei et al (2003)²⁰ and Hayashi, Isamu M.T et al (2003)²¹ in the histochemical study of normal and adenocarcinoma of endocervix gland.
 - In the histochemical study of normal and neoplastic breast, the present study correlates well with workers, Luciano Ozzello and Speer (1958)²², D J Cooper (1974)¹⁷, Muaz Osman Fagare (2015)²³ and S S.Spicer et al (2016)²⁴

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References:

1. Carson FL. Histotechnology: A self-instructional text. 2nd ed. Chicago: ASCP Press; 1997.
2. Jass JR. Mucin staining. Origins of mucin staining. *Jr Clin. Pathol.* 1996; 787-90.
3. McMannus JFA. Histological demonstration of mucin after Periodic Acid. *Nature.* 1946; 158:202.

4. McMannus JFA. Histological and Histochemical uses of Periodic Acid. *Biotechnique and Histochemistry*. 1948; 23 (3): 99-108.
5. National Society for Histotechnology. Carbohydrate stain reference manual. Lanham, MD:National Society for Histotechnology; 1989.
6. Bancroft JD, Stevens A, editors. Theory and practice of histological techniques. 4th ed.London: Churchill Livingstone; 1996. p. 173–211.
7. Stanforth DA. Staining method :Carbohydrates and Amyloid. In Wulff S. Guide to special stains.1st editionCalifornia:Dako; 2004:48-49..
8. Drury RAB, Wallington EA. The theory and practice of staining in Carleton’s histological technique. 5th ed. Oxford University Press, Great Britain. 1980 : 107-118.
9. Tock EP and Tan NT. A histochemical study of mucins of the adult human nasopharynx. *J. Anat.*1969; 104(1): 81-92.
10. World Health Organization (Feb.2006), “Fact Sheet No.297: Cancer”. Retrieved; 2007-12-01.
11. GLOBOCAN 2002 Database: “Summary table by Cancer”. Retrived 2008-10-26.
12. Carcinoma of the cervix in Shaw’s text book of Gynaecology,10th edition, Ed. Padulidri V, Daftary SN,428-460,1989 .
13. Colditz G, Chia K.S. Invasive breast carcinoma: Introduction and general features.WHO Classification of tumours of the breast, 4th ed, Lyon: IARC; 2012. pg 14.
14. Ghoncheh M, Momenimovahed Z, Salehiniya H. Epidemiology, incidence and mortality of breast cancer in Asia. *Asian Pac J Cancer Prev*. 2016;17:47-52.
15. Spicer S.S, Leppi. T.J and Stoward. P.J. Suggestion of Histochemical terminology of carbohydrate rich tissue components. *J. Histochem. Cytochem.*1965; 13: 599-03
16. Tock EP and Tan NT. A histochemical study of mucins of the adult human nasopharynx. *J.Anat.* 1969;104(1): 81-92.
17. Cooper DJ. Mucin histochemistry of mucous carcinoma of breast and colon and non-neoplastic breast epithelium. *Jr Clin Pathol* 1974; 27(4): 311-314.
18. JV Bulmer, N.R. Griffin, RE-Kingston, M Wells. Minimal Deviation Adenocarcinoma (adenoma malignum) of the endocervix; A histochemical and immunohistochemical study of 2 cases (Nov 1988) *Gynecol Oncol.*–Volume 36, Issue 1, January 1990, Pages 139–146
19. Vatsala misra, SC Gupta, Anjali Goel, PA Singh: Re-classification of carcinoma cervix uteri by mucin histochemistry; *Indian J. patholmicrobiol*; 40(4): 463-468 1997.
20. Zhao Shumei, HayasakaTadashu, Osakabe, *International journal of gynaecological pathology* oct.2003 – vol 22 Issue 4- pp 393-397)
21. Hayashi I, Tsuda H,ShimudaT.Reappraisal of orthodox histochemistry for the diagnosis of minimal deviation adenocarcinoma of cervix. *J Surgical Pathol*2008, 24:559-562.
22. Luciano Ozzello and Speer, F. D.: The mucopolysaccharide in the normal and diseased breast, their distribution and significance. *Am. J. Path.* 34: 993-1009, 1958.
23. Muaz Osman Fagare. Evaluation of Mucin Histo-Chemical Pattern in Breast, Colonic, Ovarian and Lung Adenocarcinomas *International Journal of Life Sciences Research* ISSN 2348-3148 (online) 2015 Oct-Dec; 3(4):39-46.
24. Spicer S.S, Leppi. T.J and Stoward. P.J. Suggestion of Histochemical terminology of carbohydrate rich tissuecomponents. *J. Histochem. Cytochem.* 1965;13:599-03.
25. Alan stevans, Bancroft JD, Stevans A. Theory and practice of histological technique.3 rd ed. Churchill livingstone, New York. 1990;107-117
26. Subramanyam C.S.V. Microscope. Guidelines to its intelligent use. *Handbook of Workshop on Histopathology Technique And Intelligent Use of Microscope*. Belgaum. 1989 :2-4.

The Potential of Arbitrating Healthcare Disputes

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Abstract

The speedy progress of trade in Global Health Services is limited by legal barrier. Advances in technology and cross-border movement of people and health services form legal ambiguities and uncertainties for businesses and consumers involved in transnational medical malpractice disputes. This requires for a uniform means of redress which is more flexible and predictable as compared to litigation in a court room. Therefore, the voluntary, flexible and legally binding nature of arbitration agreements across jurisdictions make this form of dispute resolution efficient and adaptive to changes in the health services industry. With careful making of an approach that accounts for arbitration cost, reasonable recovery amount and complementary mechanisms such as no-fault compensation, international arbitration of medical malpractice disputes will change the legal risks borne by businesses and consumers more fairly and efficiently.

This paper argue that most medical disputes are better resolved by alternative dispute resolution mechanisms which will contribute in improving patient safety by encouraging candid and comprehensive reporting of risks. It also argues that medical disputes and patient safety needs to be viewed through a new lens, namely patient autonomy. It discusses the scope of India flourishing in the field of Medical Tourism and also the challenges faced by the foreign patients and the scope of Arbitration in amicably resolving the medical disputes in a cost effective and in a swift manner.

Keywords: *Healthcare Services, Healthcare Disputes, Malpractices, Compensation, Settlement of Healthcare Disputes, Arbitration.*

Introduction

Globalization of Health Services: Health services have started to be increasingly globalized. This globalization is considered as a new phase of world economic integration. The globalization of health service has been facilitate by advancement in information and communication technology, liberalization of foreign investment, greater international mobility of patients and also demographic dynamics. As a result, health services are in the realm of multilateral trade negotiations under the World Trade Organization (WTO). India is one of

the major participants. The health sector is growing rapidly ever since the setting up of the WTO in 1995 with inclusion of the services sector. Indian health industry, valued at \$65 billion in 2012, is highly fragmented and conquered by private players. The healthcare sector of India is assessed to \$100 billion in size in 2015, growing 20 *per cent* per year. The industry is expected to touch \$280 billion by 2020¹. There will be rising demand for specialized and quality healthcare services. According to Investment Commission of India, the healthcare industry has brought about remarkable evolution of an added 12 *per cent* per year during the previous four years, motivated by a number of factors like, increase in life expectancy, rise in income levels and awareness of health insurance amongst the people.

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Material and Method

The research is Doctrinal in nature whereby both Primary and Secondary sources of data have been evaluated and analyzed for this research in aiming at

definite conclusion. The data comprises of different pattern including commentaries, digest, articles, writings in journals, Case Law so on and so forth.

Cross Border Delivery Services: Several reasons account for the surfacing and proliferation of cross-border delivery of health services. One of the major motivator is the lack of access to health care suffered by many patients in different parts of the world². In both developing and industrialized countries, patients in rural areas are often deprived of medical care, as hospitals and health care providers are located in urban areas³. Additionally, cross-border delivery of health services helps to alleviate the stresses and shortages of medical professionals associated with providing round the clock medical care⁴. Cross border trade in healthcare services includes e-health business or tele-health services to provide diagnostic services (tele-radiology), medical opinion and consultations (telemedicine), laboratory testing, transmission and doling out of specialized data and records (medical transcription), medical coding and medical billing). India is a leader in exporting medical transcription, tele-pathology and tele-diagnostic service⁵.

Legal Barriers to Consumption of Health Services Abroad:

- i. **Potentially Liable Parties:** There are several potential liable parties in a medical tourism claim: foreign health care providers, intermediaries, employers and insurers⁶. If a foreign health care provider allegedly caused injury and circumstances of treatment convene the elements of traditional malpractice frameworks, it is logical to pursue a malpractice claim against this defendant⁷. Just as with cross-border telemedicine claims, however, a plaintiff needs to overcome personal jurisdiction and forum non conveniens challenges. Although procedural legal barriers hinder pursuit of a foreign health care provider defendant, the difficulty of finding and proving theories of liability impede pursuit of the remaining potential defendants⁶. Finally, another category of potential barriers worth noting in determining potentially liable parties are charitable and government immunity for healthcare institutions⁸.
- ii. **Determining Appropriate Jurisdiction to litigate and Enforce a Claim:** As discussed above, the injured party may pursue a claim against a foreign health care provider in his residence state or the

defendant's domicile state. If a plaintiff chooses his residence state, he faces the challenge of establishing personal jurisdiction, defending forum non conveniens motions and implementing any favorable judgments in a foreign court. It is not likely the case if suit is brought in defendant's domicile, as issues regarding place of injury and whether it is in the chosen forum's interest are well established. The major drawbacks to such option, however, are similar to the challenges of defending a cross-border tele-medicine claim in a foreign court.

- iii. **Determining Choice of Law:** Even after jurisdiction is established, parties to dispute must deal with additional challenge of choice of law determinations. Depending on laws of the countries concerned, a court's selection may be essential in deciding the outcome and remedies available⁷. As discussed earlier, each court adopts a diverse approach to determining choice of law.

Determining Appropriate Jurisdiction to Litigate and Enforce a Claim: In addition to determining which parties are liable, the injured party also has the challenge of selecting the suitable forum that will litigate and enforce the claim. The selected court must have jurisdiction over the same, as jurisdiction grants the court authority to prescribe, adjudicate and enforce judgment against persons and property⁹.

- i. **Establishing Jurisdiction in Plaintiff's Domicile State:** Firstly, not only do common and civil law countries have diverse approaches to assert personal jurisdiction, but countries from each legal system may make different determinations from their counter-parts because of their own individual interpretation of laws in question¹⁰. In civil law countries, a defendant may be sued in his domicile and in any jurisdiction where he commits a tort. Furthermore, it is important to consider the existence of any commercial or civil agreements that a country is a party to, as such membership may affect its rules regarding jurisdiction qua the fellow member states¹¹.
- ii. **Establishing Jurisdiction in Defendant's Domicile State:** In disparity with the attempt to sue a defendant in plaintiff's domicile state, no jurisdictional issues bar's adjudication of a claim in defendant's domicile state¹². In common law countries, the physical presence of the defendant or defendant's property within its territory is

sufficient to exercise jurisdiction. Such relative ease in bringing forth a claim in this forum, however, may be curtailed by a defendant's domiciliary use of forum non conveniens for dismissal¹³. In the event that a foreign plaintiff successfully brings suit in a defendant's domicile court, he may face additional challenges. In particular, those patients belonging from industrialized countries are likely subject to more onerous burden of proof and relatively in-adequate legal protection afforded by developing countries¹⁴. Critics point out to India's failure to devote adequate resources to claims and label its Medical Council Act as —outdated and ineffective¹⁵.

Findings: The Case for Arbitration As an Appropriate International Dispute Resolution Mechanism for Cross-Border Health Services Claims.

The right to health is a fundamental part of human rights and of our understanding of life in dignity. The right to enjoyment of the highest attainable standard of physical and mental health, to give it its full name, is not fresh. Internationally, it was first articulated in the 1946 Constitution of the World Health Organization (WHO)¹⁶. The 1948 Universal Declaration of Human Rights (UDHR) also mentions health as part of the right to an adequate standard of living. The right to health was yet again recognized as a human right in the International Covenant on Economic, Social and Cultural Rights (ICESCR) which was presented before the UN General Assembly in 1966 and adopted in 1976. Finally, the right to health or the right to health care is recognized in around 115 constitutions. And six other constitutions set out duties in relation to health, such as the duty on the State to develop health services or to allocate a specific budget to them. The Constitution of India does not provide for the right to health as fundamental right. However the Constitution directs the State to take measures to develop the condition of health care of the people. Subsequent to the famous decision of *Keshavananda Bharti Vs State of Kerala*¹⁷, the Supreme Court has also permitted individual citizen to approach the courts directly for protection of their human rights. In a series of cases dealing with the substantive content of the right to life, the Supreme Court has observed that the right to live with human dignity includes the right to good health. The court, while reiterating its stand for providing health facilities, held that a healthy body is the very foundation for all human activities. In a welfare state, it is therefore the obligation of the State to

guarantee the creation and the sustaining of conditions congenial to good health. Thus, the right to health, along with various other civil, political and economic rights, is afforded protection under the Indian Constitution as a Fundamental Right¹⁸. Arbitration, being closely inter-connected in promoting and protecting people's rights, empowering them and thus improving their health, it could be said that resolution of disputes by way of Arbitration is also a fundamental Human Right. In my view, Arbitration would definitely come under underlying determinants of health. In view of the fact that it is one of the most sacrosanct and valuable right of a citizen and equally sacrosanct and sacred responsibility of the State, every citizen is entitled to look towards the State to perform obligation with top priority. Right to resolve conflicts by amicable method of Arbitration, which directly affects the health of the community, will attract a priority programming for the State. Present substantive legal principles have yet to provide adequate theories of liability for injuries and damages arising from innovations in medical care and delivery of health services. Such legal uncertainties and ambiguities need a uniform means of redress which is more flexible and predictable than litigation in a court room. In light of such needs, arbitration provides a potential solution, as it is an ADR mechanism that has been successfully utilized on an international level¹⁹ and is more efficient and adaptive to changes in the health services industry than litigation but has the authority and binding force of a court decree.

Conclusion and Suggestions

Arbitration of Cross-Border Medical Malpractice Claims Offers an Efficient and Effective Method to Achieve the Goals of Accurate Judgments, Just Compensation and Deterrence of Negligent Medical Care.

i. Binding and Enforceability: The greatest advantage of arbitration over litigation in resolving cross-border disputes is the enforceability of arbitration agreement and award in foreign jurisdiction. These agreements and decisions are binding on parties, jurisdictions empowered by legislation enabling courts to enforce arbitration awards and countries which are members to various regional and international treaties recognizing other members' arbitration awards.

Alternatively, in the occasion a country is a non-signatory to the treaties in question, arbitration

agreements and awards may still be enforced under customary law through Friendship Commerce and Navigation Treaties (FCN treaties). Member countries of FCN treaties will enforce arbitration awards of member countries so long as enforcement does not violate a member country's public policy. When an award is made in a state that is neither a member of an FCN treaty nor any relevant commercial arbitration treaty, enforcement may be sought under the principle of comity.

- ii. Arbitrators Expertise:** Another key attribute of arbitration is its process of selecting qualified decision-makers for assessing complex, specialized cases such as medical malpractice claims. Arbitrators are more appropriate decision-makers than juries because parties to the dispute most often select arbitrators who have a background and expertise in the subject matter of the dispute. In the global and ever growing industry of health services, it is vital to have decision-makers who are neutral and independent and are able to adapt to existing substantive legal principles, to new conflicts and ambiguities which arise from constant transformations in medical care.
- iii. Neutral and Fair:** In addition to providing predictability in the decision-making process and a neutral medium for aggrieved parties, arbitration offer a quicker, efficient and flexible approach to resolve unique or particular issues of medical malpractice claims in exchange to traditional court proceedings for the following reasons. First, discovery time and procedures are restricted by the arbitrator or relevant procedural rules, which also means that parties require an arbitrator's acquiescence to take depositions. Second, there is no jury since the arbitrator also acts as a fact finder in the decision-making process and, usually has expertise in the area of the dispute. Third, the arbitrator has wide discretion for his decisions, but is bound to pursue the procedural and substantive rules of law as inscribed in the arbitration agreement. Finally, the grounds on which a party may appeal are much more restricted to those provided in an appellate court and such limited appellate rights may aid to quicker and more certain resolution of the dispute. As a result of such truncated measures, aggrieved parties who succeed, receive a greater portion of the judgment and in an earlier time frame than in litigation.

The above examination demonstrates the advantage of an international arbitration framework in resolving the legal complexity of cross-border medical malpractice claims. By itself, arbitration goes remote in eliminating many of the legal ambiguities and hurdles of litigation in traditional court systems. But this paper has also confirmed that another major advantage of arbitration is its adaptable and inclusive capacity to make the most of complementary mechanisms that further reduces contestable issues of liability and redress. This is a key advantage when addressing disputes involving conflicting medical malpractice regimes, expectations of recovery and business practices. The suggestion of a two –step dispute resolution mechanism employing no-fault compensation and arbitration has the potential to accommodate a wide range of claims and businesses and consumers from diverse economies and backgrounds. It offers an efficient and fair negotiation by reducing contestable issues of liability and offering several routes of reliable redress to the fullest extent viable.

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References

1. Gupta Amar, Gantz DA., Sreecharana Devin, et al. Evolving Relationship between Law, Offshoring of Professional Services, Intellectual Property and International Organizations. 21 INFO. RESOURCES MGMT. J.2008; 103.
2. Lior Herman. Assessing International Trade in Health Care Services,.European Centre for Intl Pol. Econ.(UK), Working Paper No. 03, 2009, (Internet) [cited 2020 Jan19]Available from : URL; <http://www.ecipe.org/publications/ecipe-working-papers/assessing-international-trade-in-healthcare-services/pdf>.
3. Gupta Amar. The 24-hour Knowledge Factory: Can IT Replace the Graveyard Shift?. Computer 2009; 42: 66.
4. Smith RD, Chanda R., Tangcharoensathien V. 'Trade in Health related Services'.Lancet, 2009;

- 373- 9663, 593–601.
5. Nathan Cortez. Recalibrating the Legal Risks of Cross-Border Health Care. 10 *Yale J. Health Pol., L. & Ethics* 1, 4 2010.
 6. Bales JF, DeMarco LA. Selected Topics in Medical Malpractice Litigation. 1993;669 *PLI/COMM* 381-448.
 7. Restatement (Third) of Foreign Relations Law of the United States. 1987; 401.
 8. Gary BB. Reflections on Judicial Jurisdiction on International Cases. 17 *J. Intl & comp. L.* 1, 1987:14.
 9. Paul RD. Human Rights Law Meets Private Law Harmonization: The Coming Conflict. 30 *Yale j. Intl.*2005; 211; 259-260.
 10. Harvard Law Review Association (UK), State-Court Jurisdiction. 73 *Harv. L. Rev.*1960; 911- 913.
 11. Walter WH. Forum Non Conveniens And Retaliatory Legislation: The Impact On The Available Alternative Forum Inquiry And On The Desirability of Forum Non Conveniens As A Defense Tactic. 56 *u. Kan. L. Rev.* 2008;609.
 12. Cortez Nathan. Patients without Borders: The Emerging Global Market for Patients and the Evolution of Modern Health Care. 83 *Ind. L.J.* 2008; 106.
 13. Dr. Puteri NJK. Medicine Beyond Borders: The Legal And Ethical Challenges. 28 *med. & L.*2009; 446. Burkett Levi. Medical Tourism Concerns, Benefits and the American Legal Perspective. 28 *J. Legal med.*2007; 223- 229.
 14. World Health Organisation, ‘The Right to Health’– Fact Sheet No. 31
 15. Kuszler PC. ‘Global Health and the Human Rights Imperative’. *Asian Journal of WTO and International Health Law and Policy.* 2(1),
 16. Khan SL. ‘Right to Health’.*SCJ.*1995; 2: 29-34, 2007; 99-124: 111-112 1.
 17. Vincent Vs UOI. *AIR* 1987 SC 990
 18. Neil Martha. International Arbitration Has Become a Lucrative Field After a Decade of Disfavor. 88-*sep a.b.a. j.* 2008:26- 28.
 19. Biukovic Ljiljan. International Commercial Arbitration In Cyberspace: Recent Developments. 22 *nw. J. Int’l l. & bus.* 2009;319: 344.

Pesticides: Slow but Silent Killer

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Abstract

Introduction: Abundant use of organophosphates, carbamates, organochlorides and pyrethroid pesticides develop several hazardous health effects on nervous, respiratory, endocrine, reproductive and immune systems of humans as well as animals. All these effects of pesticides are due to generation of oxidative stress, either by producing free radicals or by developing variations in antioxidant status.

Objectives: To access extent of oxidative stress developed by pesticides in pesticide sprayers of Satara District.

Method: Forty pesticide sprayers having age group between 25-35 were selected in present study as subjects. Control group comprised of healthy farmers of same age, not involved in spraying activity. Measurements of anthropometry like height, weight and detail history were taken for each participant. Blood sample was collected in plain bulb and serum was separated for the analysis of estimation of lipid peroxide by Kei Satoh Method. Unpaired t test was used to find out level of significance by comparing mean and SD of both groups.

Results: There was significant rise in MDA ($t= 14.09$, P value <0.0001) in pesticide sprayers as compared to controls.

Conclusions: Pesticides generate free radicals that damage the cell by altering cell permeability, energy metabolism, intracellular and extracellular impairment in transport systems. All these results in development of lipid peroxidation which damages various systems of human being.

Keywords: Pesticides, Free radicals, oxidative stress, lipid peroxidation, antioxidant.

Introduction

In developing countries, use of pesticides has gradually increased for increasing the food production and to control the vector-borne diseases. Approximately there are about 65,000 chemicals which are classified as pesticides. But unfortunately, most of them act on non-target organisms and develops depressing effects on

human health as well as on the environment.¹⁻² Pesticide contact occurs mainly during spraying of insecticides, mixing and loading of pesticides in the equipment and improper handling.³ So pesticide sprayers are at greater risk of pesticides exposure during spraying, loading and mixing of pesticides.⁴ They also have very less knowledge about proper use of pesticides as a result they do not follow any precautions required while handling the pesticides. They also do not use any kind of personal protective equipments (PPE) and personal hygiene.⁵⁻⁶

Low level but long term exposure of pesticides develops various biochemical changes that are responsible for development of adverse effects on human and animal health.⁷⁻⁸ Occupationally, pesticide

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exposure occurs through skin, inhalations and through mouth.⁶ Organophosphorous and carbamates are widely used pesticides which are non-persistent in environment.⁹ Pesticide induces oxidative stress either by producing excess amount of free radicals or by developing variations in antioxidant defense mechanism and in detoxification and scavenging enzymes.¹⁰ Wide use of pesticide for domestic and industrial purpose has increased tremendously and is becoming a major public health problem due to its immunotoxic and neurotoxic effects.¹¹

Data shows that lot of pesticides are immunomodulatory and cause immune enhancement such as hypersensitivity, autoimmunity or immune suppression. This may also boost incidences of infectious disease and neoplastic transformation. Another complication might be associated with interaction and feedback mechanism between central nervous and endocrine system.¹²⁻¹³ Cholinesterase activity is significantly decreased in pesticide sprayers which reflects strong association of pesticide exposure with neurological symptoms.¹⁴ Various enzymes, physiological systems like reproductive, nervous, endocrine, immune, cardiovascular, sensory and respiratory as well as hematological factors and skin are influenced by pesticides. Other impediment of pesticides are on metabolic disturbances, electrolyte and fluid imbalances and carcinogenic plus mutagenic changes.¹⁵ The main reason behind these are oxidative stress and that plays significant role in toxicity of various pesticides.¹⁶⁻¹⁷ For this reason, some pesticides were banned in foreign countries due to their harmful effects, but in India few pesticides of them are still used in various places due to less knowledge about their side effects.¹⁸ Therefore oxidative stress in pesticide sprayers was investigated in present study.

Materials and Method

Forty pesticide sprayers having age group between 25-35 years were selected in present study as subjects. Control group comprised of healthy farmers of same age, not involved in spraying activity. The socio-

economic status of both the groups was same. The study was carried out from November 2017 to Feb 2018, in Satara District. Before starting research, approval from Institutional Ethics Committee (IEC) was taken. There was exposure of pesticides, on sprayers for about 7-8 years. For history taking, both the groups were asked questions related to duration of work, smoking habits and diet. Measurements of anthropometry, like height and weight were measured for each participant. Informed written consent from all the subjects and controls was taken.

Inclusion criteria: The participants of the study were male pesticide sprayers with age group between 25-35 yrs, having about 7-8 years of exposure to pesticides.

Exclusion criteria: Subjects who were known case of diabetes mellitus, malignancy, tuberculosis, hepatitis and renal diseases were not included in the study.

Random selection of control subjects was done among those who were not involved in pesticide spraying activity, with same age group and socio economic status. Females were not the part of this study. Collection of blood sample: Plain bulb was used to collect blood sample. Sample was drawn by puncturing antecubital vein and serum was separated by centrifugation at 3000 rpm, after 30 min of collection. The obtained serum sample was used for estimation of lipid peroxide by Kei Satoh Method.¹⁹

Principle: Lipoproteins were precipitated from serum by the addition of 40 % trichloroacetic acid. Then the serum was mixed with thiobarbituric acid reagent and heated in boiling waterbath for 10 min. Pink colour formed was extracted and absorbance of this phase was determined at 530 μm .

Statistical Method: SPSS version- 20 was used for statistical analysis. Mean and standard deviation was calculated for each variable. To find out significance level, Unpaired t test was used. The difference was significant, if $P < 0.001^{***}$, $P < 0.01^{**}$, $P < 0.05^*$ when compared to control.

Results and Discussion

Table 1: Mean and standard deviation of anthropometric measurements of control group and pesticide sprayers.

Group	Control group Mean \pm SD (n=40)	Pesticide sprayer group Mean \pm SD (n= 40)	p value
Age in yrs.	30.35 \pm 3.06	31.40 \pm 2.78	0.11
Weight in kg.	64.22 \pm 3.56	62.52 \pm 3.76	0.04*
Height in cm.	167.54	165.98	0.22

Table 2: Mean and standard deviation of lipid peroxide in control and pesticide sprayers.

Biochemical Parameters	Control Subjects (N =40)	Pesticide Sprayer (N =40)	t value	P value
	Mean \pm SD Minimum – Maximum	Mean \pm SD Minimum – Maximum		
MDA (nmol/dl) ***	1.80 \pm 0.22 1.59 – 2.52	2.94 \pm 0.45 1.78– 4.90	14.09	<0.0001

There was significant rise in MDA (t= 14.09, P value <0.0001) in pesticide sprayers as compared to control.

It was observed from table 1 that in age and height, no statistical difference was observed in control group and pesticide sprayer group (P>0.05).

Free radicals are the atoms or molecules containing one or more unpaired electrons in an outermost shell. They are highly reactive and have tendency to accept electrons, acting as a reducing agent or to lose electrons, acting as an oxidizing agent, completing their outermost orbit. They generate new radicals by chain reaction and damage biomolecules in cells and tissues.²⁰

Pesticides generate free radicals actively that are further re-oxidized to produce superoxides. To neutralize these generated free radicals, consumption of antioxidant enzymes like superoxide dismutase, glutathione peroxidase and glutathione reductase occurs on large scale reducing the total antioxidant status of the recipient. Pesticides may irritate lung macrophages encouraging them to produce superoxide radicals. So overall effect of pesticide is production of more and more free radicals and to diminish antioxidant defense mechanism of the body.²¹

Formation of more and more reactive oxygen and nitrogen species results in increase in lipid peroxidation in numerous tissues. When free radicals are more, then there is use of natural endogenous antioxidant enzymes for protection against generated reactive oxygen species.²² Reactive oxygen species (ROS) is a

collective term used for oxygen containing free radicals. Intracellular generation of ROS mainly comprises superoxide radicals and nitric oxide radicals. Hence, oxidative stress is production of reactive oxygen species that leads to depletion in the antioxidant defense mechanism of the body. This in turn, induces lipid peroxidation along with cell membrane disruption and nucleic acid oxidation, resulting in cell damage.²³ Lipid peroxidation is a complex chain reaction in which there is degradation of polyunsaturated fatty acids of the cell membrane by free radicals.²⁴

In present study, table 2 shows highly significant increase in most important biomarker of lipid peroxidation, that is MDA (Malondialdehyde) between pesticide sprayers and control group with P<0.0001 which is in unison with the findings of some other researcher.²⁵⁻²⁶ This might be due to initiation of lipid peroxidation by pesticide in biological membrane of cell.²⁷⁻²⁸ Pesticides produce morphological changes on RBC membrane which is also closely associated with increased lipid peroxidation.²⁹⁻³⁰ Due to this cell become more susceptible for haemolysis. Many xenobiotics have been associated with lipid peroxidation of red blood cell. When lipid membrane of cell undergoes lipid peroxidation, membrane receptors may alter the structure as well as function of the cell, which results in altered ion flux.³¹

Animal studies show that pesticide induce oxidative stress in central nervous system as well as in liver.³²⁻³³ Pesticides generate oxidative stress either by producing

free radicals in excess quantity or by creating changes in antioxidant defense mechanism, including detoxification and scavenging enzymes.³⁴Oxidative stress plays an important role in toxicity caused by several pesticides which mainly includes organochlorides, pyrethroid and carbamates.³⁵In dimethoate toxicity, there is generation of oxidative stress by forming free radicals and it induces mainly hepatic lipid peroxidation in mice and rat.³⁶⁻³⁷Some pesticides cause immunotoxicity by inducing oxidative stress.³⁸Lipid peroxidation also causes DNA damage and directly inhibits Na⁺-K⁺-ATPase and glutamate transporters.³⁹Increased lipid peroxidation and decreased total antioxidant status produces epoxides which reacts with nucleophilic centers of the cell and bind covalently to DNA, RNA and proteins. This type of reaction may lead to mutagenicity, cytotoxicity, carcinogenicity and allergy. So, in aerobic organism, prevention of lipid peroxidation of the cell is an essential process which can restore normal mechanism of body.⁴⁰Inhibition of acetylcholinesterase (AChE) activity by pesticides is one of the markers of oxidative stress in workers exposed to pesticides.⁴¹Various health problems regarding poisoning of organophosphorus compounds can be attributed due to inhibition of cholinesterase enzymes because this enzyme plays a chief role in cell to cell communications.⁴²In our previous study it was observed that there was significant decrease in acetylcholinesterase level in pesticide sprayers when compared to control.¹⁸

In experimental animals, it was observed that, several pesticides increase lipid peroxidation in liver as well as in kidney.⁴³These generated free radicals cause oxidation of sulphhydryl group and modify certain amino acids of proteins. They also damage proteins by fragmentation, cross linking and aggregation resulting in loss of biological activity of proteins.⁴⁴Again cellular proteins are damaged by free radicals and leads to cellular malfunction, impaired membrane and transport function.²⁰

In short, oxidants are produced in the cells as a consequence of normal aerobic metabolism, oxidative burst from phagocytes or by xenobiotic metabolism. But pesticides by generating free radicals increases body's oxidant load and damages various system of body.

Conclusion

Pesticides generate free radicals actively and when free radical damages the cell, a series of reactions takes

place which includes alteration of cell permeability, intracellular and extracellular impairment in transport systems, intracellular energy metabolism. All this results in lipid peroxidation which causes negative effects on living organisms. The decrease level of MDA and increase antioxidant activity plays an important role in alleviation of peroxidation.

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References

1. Konradsen F, van der Hoek W, Cole DC, et al. Reducing acute poisonings in developing countries—options for restricting the availability of pesticides. *Toxicology* 2003; 192:249–61.
2. Hamilton D, Ambrus A, Dieterle R, et al. Pesticide residues in food acute dietary exposure. *Pest Manag Sci* 2004; 60:311–39.
3. Azmi MA, Naqvi SN, Azmi MA, Aslam M. Effect of pesticide residues on health and different enzyme levels in the blood of farm workers from Gadap (rural area) Karachi-Pakistan. *Chemosphere* 2006; 64(10):1739–44.
4. Waterson A. Pesticide health and safety and the work and impact of international agencies: partial successes and major failures. *Int J Occup Environ Health* 2001; 7:339–347.
5. Jørs E, Morant RC, Aguilar GC. Occupational pesticide intoxication among farmers in Bolivia: a cross-sectional study. *Environ Health* 2006; 5:10.
6. Joshi Gauri, Joshi A.G, et al. Effect of pesticides on lung function test in farmers of Satara District. Maharashtra, India. *IJPHRD* 2019; 10(7):186-191.
7. Banerjee BD, Seth V, Bhattacharya A, Pasha ST, Chakraborty AK. Biochemical effects of some pesticides on lipid peroxidation and free radical scavengers. *Toxicol Lett* 1999; 107:33–47.
8. Kanlender S, Ogutcu A, Uzunhisarcikli M, et al. Diazinoninduced hepatotoxicity and protective effect of vitamin E on some biochemical indices and ultrastructural changes. *Toxicology* 2005; 211:197–206.
9. Simonian AL, Good TA, Wang SS, Wild JR. Nanoparticle-based optical biosensors for the direct

- detection of organophosphate chemical warfare agents and pesticides. *Anal Chim Acta* 2005; 534(1):69–77.
10. Abdollahi M, Ranjbar A, Shadnia S, Nikfar S, Rezaiee A. Pesticides and oxidative stress: a review. *Med Sci Monit* 2004; 10(6):144–7.
 11. Hess EV. Environmental chemicals and autoimmune disease: cause and effect. *Toxicology* 2002; 182:65–70.
 12. Blakley B, Brousseau P, Fournier M, et al. Immunotoxicity of pesticides: a review. *Toxicol Ind Health* 1999; 15(1):119–32.
 13. Stiller-Winkler R, Hadnagy W, Leng G, et al. Immunological parameters in humans exposed to pesticides in the agricultural environment. *Toxicol Lett* 1999; 107(1–3):219–24.
 14. Gupta A, Gupta A, Shukla GS. Effects of neonatal quinalphos exposure and subsequent withdrawal on free radical generation and antioxidative defenses in developing rat brain. *J Appl Toxicol* 1998; 18:71–7.
 15. World Health Organization (1990) *Public Health Impact of Pesticides used in Agriculture*, Geneva.
 16. Ranjbar A, Pasalar P, Sedighi A, Abdollahi M. Induction of oxidative stress in paraquat formulating workers. *Toxicology letters*. 2002 May 28; 131(3):191-4.
 17. Lee CH, Kamijima M, Kim H, et al. 8-Hydroxydeoxyguanosine levels in human leukocyte and urine according to exposure to organophosphorus pesticides and paraoxonase 1 genotype. *Int Arch Occup Environ Health* 2006; 80:217–27.
 18. Gauri Joshi, A.G Joshi, et al. Pesticides: Deleterious Effects on Neurotransmission. *Indian Journal of forensic medicine and toxicology* 2019; 13(4):208-213.
 19. Satoh K. Serum lipid peroxide in cerebrovascular disorders determined by a new colorimetric method. *Clin Chim Acta*.1978; 90(1):37-43.
 20. Naik P. *Essentials of Biochemistry (for Medical Students)*. 2nd edition, JP Medical Ltd; 2011.
 21. Amer M, Metwalli M, et al. Skin disease and enzymatic antioxidants activity among workers exposed to pesticides. *Mediterranean health journal*, 2002; 8:2 and 3.
 22. Halliwell B. Free radicals, antioxidants and human disease: curiosity, cause or consequences. *Lancet*1994; 344:721-724.
 23. Shivarajashankara Y.M, Shivashankara A.R, et al. Effect of fluoride intoxication on lipid peroxidation and antioxidant systems in rats. 2001; 34:108-113.
 24. Halliwell B, Gutteridge J et al. Oxygen free radicals and iron in relation to biology and medicine: Some problem and concepts. *Arch Biochem. Biophys*.1986; 246:501-514.
 25. Dave SK. Occupational health services for Agriculture Workers. *Indian J Occup Environ Med*. 1998; 2:96-111.
 26. Wolfe H.R, Durham W.F. et al. Exposure of workers to pesticides. *Arch. Environ. Health*.1967; 14:622-633.
 27. Zavadnic I.B, Lapshina E.A, et al. Hypochlorous acid induced oxidative damage of human red blood cells: Effects of tert-butyl hydroperoxide and nitrite on the HOCl reactions with erythrocytes. *Bioelectrochemistry*.2002; 58:127-135.
 28. Koryagin A.S, Krylonova E.V. et al Effect of ubiquinone 10 on the blood system in rats exposed to radiation. *Bull. Exp. Biol. and Med*.2002; 133:562-564.
 29. Thapar A, Sandhir R, et al. Acephat induced oxidative damage in erythrocytes. *Indian journal Exp. Biol*.2002; 40:963-966.
 30. Datta C, Gupta J, Sengupta D. Interaction of organophosphorus insecticides phosphamidon & malathion on lipid profile & acetylcholinesterase activity in human erythrocyte membrane. *The Indian journal of medical research*. 1994 Aug; 100:87-9.
 31. Halliwell B, Chirico S. et al. Lipid peroxidation: Its mechanism, measurement and significance. *Am. J. Clin. Nutr*.1993; 57:715-725.
 32. Bebe F.N, Panemangalore M, et al Exposure to low dose of endosulphan and chlorpyrifos modifies endogenous antioxidants in tissues of rats. *J. Env. Sci. Health*.2003; 38:349-363.
 33. Suzuki T, Nojiri H, et al. Oxidative damages in isolated rats hepatocytes treated with organochloride fungicides captan, dichlofloumid and chloranthalonil. *Toxicology*, 2004; 204:97-107.
 34. López O, Hernández AF, Rodrigo L, Gil F, Pena G, Serrano JL, Parrón T, Villanueva E, Pla A. Changes

- in antioxidant enzymes in humans with long-term exposure to pesticides. *Toxicology letters*. 2007 Jul 10; 171(3):146-53.
35. Kale M, Rathore N, John S, Bhathagar D. Lipid peroxidative damage on pyrethroid exposure and alteration in antioxidant status in rat erythrocytes. A possible involvement of reactive oxygen species. *Toxicol Lett* 1999; 105:197–205.
36. Sivapiriya V. Jayanthisakthisekaran, Venkatraman, S.. Effects of dimethoate (O,O-dimethyl S-methyl carbamoyl methyl phosphorodithioate) and Ethanol in antioxidant status of liver and kidney of experimental mice, *Pesticide Biochem. Physiol.*, 2006; 85:115-121.
37. Kamath V, Joshi A. K. et al. Dimethoate induced biochemical perturbation in rat pancreas and its attenuation by cashew nut skin extract, *J. Nutr. Biochem*. 2008; 90:58-65.
38. Galloway T, Handy R. et al. Immunotoxicology of OP pesticides. *Ecotoxicology*, 2003; 1(4):345-363.
39. Esterbauer H, Gebicki J. et al. The role of lipid peroxidation and antioxidants in oxidative modification of LDL. *Free Rad.Biol.Med*.1992; 13:341-390.
40. Rikans L.E, Hornbrook K.R, et al. Lipid peroxidation, antioxidant protection and aging. *Biochem.Biophys. Acta*.1997; 1362:116-127.
41. Ranjbar AK, Pasalar P, Abdollahi M. Induction of oxidative stress and acetylcholinesterase inhibition in organophosphorous pesticide manufacturing workers. *Human & experimental toxicology*. 2002 Apr; 21(4):179-82.
42. Karalliedde LD, Edwards P & Marrs TC Variables influencing the toxic response to organophosphates in humans. *Food and Chemical Toxicology*.2003, 41:1-13.
43. Pawar S.S, Kachole M.S. et al. Hepatic and renal microsomal electron transport reactions in endrin treated female guinea pig. *Bull. Environ. Contam. Toxicol*.1978; 20:199-205.
44. Satyanarayana and Chakrapani. *Biochemistry. (With clinical concepts and case studies)*, 4th Edn, Elsevier publisher: 2013, 631.

Effectiveness of Vestibular Stimulation Training in Cerebral Palsy

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Abstract

Introduction: Various studies are carried out to improve posture and balance in children with cerebral palsy by using different approaches. But the aspect of vestibular stimulation exercises on improving posture and balance in children with CP have not yet been studied. Hence this study is design to see the effect of vestibular stimulation exercises on posture and balance in children with CP.

Methodology: Thirty children with clinical diagnosis of Cerebral palsy, were randomly allocated into control group and interventional group. Participants in control group were given Conventional Physiotherapy. Participants in intervention group were given Conventional Physiotherapy and vestibular stimulation exercises.

Results: The result of the study found extreme significant effects of the conventional physiotherapy in control group and extreme significant effects of conventional physiotherapy and vestibular stimulation exercises on posture and balance in children with CP in intervention group according to the results of the GMFM-88 and PBS. There is significant difference in mean score of GMFM-88 and PBS in intervention group as compared to the control group.

Conclusion: There will be significant effect of vestibular stimulation exercises on posture and balance in children with CP.

Keywords: Cerebral Palsy, Vestibular Stimulation, Posture, Balance.

Introduction

Cerebral palsy (CP) is well recognized neurodevelopmental condition beginning in early childhood and persisting through the lifespan. It is one of the most common causes of chronic childhood disability.^{1,2,3} It is a descriptive term applied to a group of

motor disorders of young children, in whom full function of one or more limbs is prevented by paresis, involuntary movement, or incoordination.^{4,5} It varies extremely from very mild to very severe motor disabilities with many comorbidities and complications.^{6,7,8}

It is estimated that the worldwide incidence being 2 to 2.5 per 1000 live births.^{9,10,11} In the United States, it is estimated that approximately 764,000 children and adults manifest one or more of the symptoms of CP and that 10,000 babies born annually develop CP and 1200–1500 are diagnosed at preschool age.^{12,13,14} Globally, CP prevalence data show some geographic differences, but overall, population-based reports have shown a fairly stable rate among the term group at 1 to 1.5 per 1,000 live births. In India the incidence of CP is high and it is 3 per 1000 live births.^{15,16,17}

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Commonly in CP child's leg and hip muscles are tight. The gait is typically characterized by a crouch gait where the knees are extensively flexed and ankles are in planter flexion. Lack of direction specificity in the leg muscles during backward body sway, points to a basic deficit in balance and postural control.^{9, 18, 19}

CP is characterized by insufficient force generation by affected muscle groups and decreased movement of force output.²⁰ The condition for normal growth appear to be regular stretching of relaxed muscle under normal physiologic loading, but in CP the skeletal muscle may not relaxed during normal stretching activity and furthermore, greatly reduced forces are generated during movement.²¹ In CP the impairment of posture and balance are due to poor selective control of muscle activity, poor regulation of muscle activity in anticipation of postural changes and body movements and decreased ability to learn unique movements.^{22, 23} In healthy individuals, changes in posture and maintenance of balance are preceded by preparatory muscle contractions that stabilize the body, whereas in CP there is poor anticipatory regulation of muscle sequencing during maintenance of posture and.^{24, 25}

Vestibular system is one of the sensory systems to control posture, equilibrium, balance and orientation. The vestibular system works on the principle of three reflexes, the vestibulocular reflex, vestibulospinal reflex and vestibulocollic reflex. These reflex pathways are responsible for postural control, making compensatory movements and adjustments of body in position.²⁶ Vestibular system also involved in the function of maintaining visual fixation during head movement and in maintaining posture. The studies suggest that, vestibular system is one of the systems affected in the children who have damage to the brain during birth, which is one of the causes for postural imbalance and poor equilibrium.²⁷

In physiotherapy the children with CP are managed by different approaches but very few studies are available to find effects of vestibular stimulation in CP. Thus the study aimed to find its effects in managing CP.

Methodology

Thirty participants with clinical diagnosis of Cerebral palsy were included in the study. They were

randomly allocated into control group (group A) and interventional group (group B). Training was given once a day, thrice a week for total 6 weeks. For control group, the training duration for each session was 30 minutes with 5 minutes of rest period and for intervention group, 60 minutes with 10 minutes of rest period in between.

Participants in group A were given Conventional Physiotherapy. It included Passive Soft tissue elongation of tight muscles, Lower limb resistance exercises, Movement transitions, balance board and foam board standing, walking and stair climbing.

Participants in group B were given Conventional Physiotherapy and vestibular stimulation exercises. It included Conventional Physiotherapy was the same as given to the control group and Vestibular Stimulation Exercises such as Swinging in standing in all directions, trampoline jumps, rocking movement in rocking chair, gaze stabilization exercises and visual pursuit exercises under supervision. Pre and post intervention data for Pediatric Balance Scale and GMFM-88 was taken for data analysis.

Data Analysis: Statistical analysis was done using Graph Pad InStat software- Trail version 3.10. Statistical measures such as mean, standard deviation (S.D) and test of significance such as Unpaired 't' test were utilized to analyze the data. The results were concluded to be statistically significant with $p < 0.05$ and highly significant with $p < 0.01$.

Pediatric Balance Scale (PBS): The balance was measured with the help of the PBS score. In group A, the pre intervention mean PBS score was 33 ± 5.141 and the post intervention mean PBS score was 40.4 ± 4.595 . The difference in pre and post intervention mean PBS score of group A was statistically extremely significant ('t' = 20.412, d.f = 14, 'p' < 0.0001). In group B, the pre and post intervention mean PBS score was 30.58 ± 6.037 and 43.67 ± 4.960 . And the difference in pre and post intervention mean PBS score was statistically extremely significant ('t' = 32.867, d.f = 11, 'p' < 0.0001). The difference in pre intervention mean PBS score of the two groups was statistically not significant ('t' = 1.124, d.f = 25, 'p' = 0.1359). The difference in post intervention mean PBS score of the group A and group B was statistically significant ('t' = 1.772, d.f = 25, 'p' = 0.0443).

Table 1: Comparison between pre and post intervention mean PBS score in group A and group B

PBS	Group A	Group B
	Mean \pm SD	Mean \pm SD
Pre	33.00 \pm 5.141	30.58 \pm 6.037
Post	40.4 \pm 4.595	43.67 \pm 4.960
't' value	20.412	32.867
d.f	14	11
'p' value	< 0.0001	< 0.0001
Result	Extremely significant	Extremely significant

Gross Motor Function Measure (GMFM-88):

The posture was measured with the help of the GMFM-88 score. In group A, the pre intervention mean GMFM-88 score was 58.14 ± 1.486 and the post intervention mean GMFM-88 score was 74.396 ± 0.963 . The difference in pre and post intervention mean GMFM-88 score of group A was statistically extremely significant ('t' = 33.418, d.f = 14, 'p' < 0.0001). In group B, the pre and post intervention mean GMFM-88 score was 57.076 ± 2.700 and 75.02 ± 0.534 . The difference in pre and post intervention mean GMFM-88 score was statistically extremely significant ('t' = 20.319, d.f = 11, 'p' < 0.0001). The difference in pre intervention mean GMFM-88 score of the two groups was statistically not significant ('t' = 1.302, d.f = 25, 'p' = 0.102). The difference in post intervention mean GMFM-88 score of the group A and group B was statistically significant ('t' = 2.006, d.f = 25, 'p' = 0.0279).

Table 2: Comparison between pre and post intervention mean GMFM-88 score of group A and group B

GMFM-88	Group A	Group B
	Mean \pm SD	Mean \pm SD
Pre	58.14 \pm 1.486	57.076 \pm 2.700
Post	74.39 \pm 0.963	75.02 \pm 0.534
't' value	33.418	36.646
d.f	14	11
'p' value	< 0.0001	< 0.0001
Result	Extremely significant	Extremely significant

Discussion

In children with CP, poor posture and equilibrium are the common problems interfering in functional

activity.²⁸ The vestibular apparatus is a part of inner ear or labyrinth which is responsible for maintaining posture and equilibrium of the body. It also helps to stand upright and move through space in antigravity position. It coordinates information from inner ear, visual, tactile and musculoskeletal system. Maintenance of an upright posture involves postural reflexes which include stretch reflex. They are aided by afferent sensory information from vestibular apparatus and efferent response is to the skeletal muscles.²⁶ The research suggest that, on standing upright, activity increases in the antigravity postural muscles to counteract the force of gravity. And this is maintained by vestibular apparatus.²⁸

Vestibular inputs activated by a change in head orientation alter the distribution of postural tone in the neck and limbs. These are called Vestibulocollic and vestibular spinal reflexes. Antigravity muscles are the muscles in the body that are active during quiet stance and include gastrosoleus, tibialis anterior, gluteus medius, tensor fascia lata, Iliopsoas, thoracic erector spinae in the trunk along with intermittent activation of abdominals.²⁹ Vestibular nuclei control selectively the excitatory signals to the antigravity muscles to maintain upright posture and equilibrium by functioning in association with the pontine reticular nuclei via lateral and medial vestibulospinal tracts.³⁰

In case of sensory integration dysfunction, there is possible role of the vestibular system stimulation in controlling muscle tonus. Stimulation of the vestibular system elicits a change in the tonic state of the skeletal muscle, specifically, the antigravity muscles. With the vestibular stimulation, normal muscular tone of the skeletal muscle can be obtained, thereby normalizing the postural tone.³¹

A study was carried out to find out reflex control of spine and posture in an attempt to identify the important role of the nervous system in maintaining reflex control of spine and posture. It concluded that visual and vestibular stimulation as well as joint and soft tissue mechanoreceptors play an important role in the regulation of static upright posture.³²

During vestibular stimulation exercises, there are stimulation of the otolithic and semicircular canal system which are sensitive to linear and angular head acceleration. In response to these vestibular stimulation exercises the vestibular reflexes get stimulated which helps to maintain posture and equilibrium.²⁶ Few studies

state that vestibular system plays an important role in balance and equilibrium and it reinforces the tone of extensor muscles of limbs and trunk thus is responsible for normal posture and gait.²⁹

The child can be placed in a normal posture such as sitting, kneeling or standing so as to stimulate a normal muscular tone. This allows for normal somatosensory perception and integration for future motor response, thereby producing postural security. The mechanism of postural security can be assumed to involve the vestibular system, in such areas as maintaining control of the head in space and body equilibrium.²⁹

Anatomically, the vestibular nuclei have a complex network of nerve fibers with the cerebellum which is described as the modulator of motor and postural activity. Vestibular primary and secondary fibers project to the cerebellum and, in turn, the cerebellum projects fibers back to the vestibular nuclei to form feedback circuits. This intimate neuroanatomical relationship between the vestibular system and cerebellum suggests that the vestibular afferent fibers play a role in sensory integration and somatic responses through the cerebellum and helps in maintaining posture and equilibrium. However, the precise role of the vestibular system in overall motor performance is not entirely clear.^{33, 34, 35}

The vestibular system controls the sense of movement, balance and coordination of vision. It sends signals to the neural structures that control eye and body movements and helps in maintaining static balance. This is an instantaneous process so that the body maintains balance and equilibrium without thinking about it.^{26, 27} The vestibular-ocular reflex by peripheral portion generates eye movements, which allow a clear view while the head is moving, while the vestibular-spinal reflex generates body motion compensation, to maintain head and postural stability and thus preventing falls.³⁶

Conclusion

The study concluded that both the vestibular stimulation exercises and conventional physiotherapy improve posture and balance in children with Cerebral Palsy, however, vestibular stimulation exercise group shows more improvement than conventional physiotherapy group.

Ethical Clearance: Taken from Krishna Institute of Medical Science Ethical committee.

Source of Funding: Self

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References

1. Rosenbaum, P. L. A report: the definition and classification of cerebral palsy. *Developmental Medicine and Child Neurology*, April 2006,49: 8–14.
2. Koman LA, Smith BP, Shilt JS. Cerebral palsy. *Lancet*. 2004; 363:1619–1631
3. United Cerebral Palsy. Press room: cerebral palsy – facts & figures. http://www.ucp.org/ucp_generaldoc.cfm/1/9/37/37-37/447. Accessed online, September 9, 2011.
4. Balf CL, Ingram T. T. S. Problems in the classification of cerebral palsy in childhood. *Br Med J*(1955). 16:163–166.
5. Norberto Alvarez. Cerebral palsy. www.emedicinehealth.com Accessed online on March, 5, 2011.
6. Sophie levitt. Treatment of cerebral palsy and motor delay. The clinical picture for therapy and management. 4th edition: Blackwell.
7. Types and forms of cerebral palsy. My Child. The ultimate resource for everything cerebral palsy. <http://cerebralpalsy.org/about-cerebral-palsy/types/> accessed 23 March 2011.
8. Facts about cerebral palsy. CDC. Centers for disease control and prevention. <http://www.cdc.gov/ncbddd/cp/data.html> accessed on 15 June 2011.
9. Stanley FJ, Blair E, Alberman E. Cerebral palsies: Epidemiology and casual pathways. London: Mac Keith 2000.
10. Bax M, Goldstein M, Rosenbaum P, Leviton A, Paneth N, Jacobsson B, Damiano DL. Proposed definition and classification of cerebral palsy (2005). *Dev Med Child Neurol*. 47: 571-576.
11. Rosen MG, Dickinson JC. The incidence of cerebral palsy. *Am J Obstet Gynecol* (1992) 167: 417-423. Chitra Sankar, Nandini Mundkur. Cerebral

- palsy- Definition, classification, etiology and early diagnosis. *Indian J Pediatr* (2005) 72(16): 865-868.
12. Wang B, Chen Y, Zhang J, Li J, Guo Y, Hailey D. A preliminary study into the economic burden of cerebral palsy in China. *Health Policy* (2008); 87: 223-234.
 13. Cerebral palsy fact sheet, www.ucp.org, accessed April 2011.
 14. Office CDC epidemiology program. Economic costs associated with mental retardation, cerebral palsy, hearing loss and vision impairments. United State, 2003. *MMWR Morb Mortal Wkly Rep* (2004); 53: 57-59.
 15. Sellier E, Surman G, Himmelmann K, et al. trends in prevalence of cerebral palsy in children born with a birth weight of 2,500 or over in Europe from 1980 to 1998. *Eur J Epidemiol*. 2010; 25: 635-642.
 16. Umesh Isalkar. Incidence of cerebral palsy remains steady for 20 years. http://articles.timesofindia.indiatimes.com/2010-10-04/pune/28226543_1_movement-and-posture-cerebral-palsy-interference-in-brain-development accessed on 19 may 2011.
 17. Else Odling, Marij E, Hendrik J. Stam. The epidemiology of cerebral palsy: incidence, impairments and risk factors. *Disability and Rehabilitation*. 2006; Volume 28, No. 4, Pages 183-191.
 18. Chitra sankar, Nandini Mundkur. Cerebral palsy- Definition, classification, etiology and early diagnosis. *Indian J Pediatr* 2005; 72(10): 865-868.
 19. Hoda Z. Abdel Hamid. Cerebral palsy. *Med scape reference*. <http://emedicine.medscape.com/article/1179555-overview>
 20. Engsborg JR, Ross SA, Olree KS, Park TS. Ankle spasticity and strength in children with spastic diplegia cerebral palsy. *Dev Med Child Neurol* 2000; 42:42-47.
 21. Graham HK, Selber P. Musculoskeletal aspects of cerebral palsy. *Journal of Bone and Joint Surgery* 2003; 85-B: 157-166.
 22. Hallet M, Alvarez N. attempted rapid elbow flexion movements in patients with athetosis. *Journal of Neurology* 1983; 46: 745-750.
 23. Leonard CT, Moritani T, Hirschfeld H, Forssberg H. deficits in reciprocal inhibition of children with cerebral palsy as revealed by H reflex testing. *Dev Med Child Neurol* 1990; 32: 974-984.
 24. Lesney I, Nachtmann M, Stehlik A, Tomankova A, Zajidkova J. disorders of memory of motor sequences in cerebral palsied children. *Brain and Development* 1990; 12: 339-341.
 25. Ehrsson HH, Fagergren E, Forssberg H. Differential fronto-parietal activation depending on force used in a precision grip task: An fMRI study. *Journal of Neurophysiology* 2001;85: 2613-2623.
 26. Marylou R. Barnes, Carolyn A. Cruchfield, Carolyn B. Hariza, Susan J. Hardman. Reflex and vestibular aspects of motor control, motor development and motor learning. *The vestibular system. Anatomy and physiology of the vestibular system*. Stokeville Publishing Company. 1990.
 27. Anne Shumway-Cook. Vestibular rehabilitation- an effective evidence-based treatment. *Vestibular disorder association*.
 28. Beckung E, Hagberg G. Neuroimpairments, activity limitation and participation restriction in children with cerebral palsy. *Dev Med Child Neurol* 2002; 44: 309-316.
 29. Anne Shumway-Cook, Marjorie H. Woollacott. *Motor Control: theory and practical applications*. Postural control. 2nd edition. Lippincott Williams Wilkins.
 30. Guyton AC, Hall JE. *Text book of Medical Physiology*. 692-697. 11th edition. Elsevier Founder Publication. 2006.
 31. Ayres, A.J. *Sensory integration and the child*. Los Angeles: Western Psychological Services. Taken from Unayik M. and Kahiyan H. 2011. Down syndrome: sensory integration, vestibular stimulation and Neurodevelopmental therapy approaches for children. *Intern. Encyclop. of Rehab.*. In: J.H. Stone, M. Blouin, editors Link: <http://cirrie.buffalo.edu/encyclopedia/en/article/en/article/48/>.
 32. Morningstar, M.W., Pettibon, B.R, Schlappi. H., Schlappi, M. and Ireland, T.V. Reflex control of spine and posture: A review of literature from a Chiropractic perspective and osteopathy. 2005. *J. Phys. Occup. Ther.*, 16(2): 1-21.
 33. Micheal C. Schubert, Lloyd B. Minor. Vestibulo-ocular physiology underlying vestibular hypofunction. *Physical Therapy* 2004; 84(4): 373-385.

34. Neal MV. The relationship between specific sinusoidal vestibular stimulation and the developmental behaviors of premature infants. *Dissertation Abstracts International* 30416A.
35. Mittal R, Narkeesh A. Review study on effect of stimulation of vestibular apparatus on postural muscle tone in cerebral palsy. *Journal of Exercise science and physiotherapy* 2012; 8(1): 11-19.
36. Bax M.C.O. Terminology and classification of cerebralpalsy. *Dev Med Child Neurol* (1964). 6:295–297.

Comparison of Neural Tissue Mobilization and Muscle Energy Technique on Hamstring Tightness in Chronic Low Back Pain

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Abstract

Introduction: Low back pain is one of the most common musculoskeletal problem in a general population and affecting both male and female population equally. Many therapeutic interventions are used to treat the symptoms of low back pain. Today the main aim lies at faster recovery rate so the present study was conducted with the aim to find out the effect of neural tissue mobilization and muscle energy technique on hamstring tightness in chronic low back pain.

Material and Method: In this comparative study 52 subjects were treated for hamstring tightness on chronic low back pain between the age group of 25-40 years. The pre and post test was measure by visual analog scale, Oswestry Disability Index Questionnaire, Straight leg raising test.

Results: The statistical analysis for neural tissue mobilization was Visual analog scale ($p = 0.0001$), Oswestry Disability Index Questionnaire ($p = <0.0001$), Straight leg raising test ($p = <0.0001$) showed significant improvement. The statistical analysis for muscle energy technique was Visual analog scale ($p = 0.0001$), Oswestry Disability Index Questionnaire ($p = <0.0001$), Straight leg raising test ($p = <0.0001$) showed significant improvement. The study had found that neural tissue mobilization and muscle energy technique shows equally improvement on hamstring tightness in chronic low back pain.

Conclusion: The study concluded that there was no significant difference between neural tissue mobilization and muscle energy technique on hamstring tightness in chronic low back pain. Both the technique showed the equally improvement on hamstring tightness in chronic low back pain.

Keyword: Chronic low back pain, hamstring tightness, neural tissue mobilization, muscle energy technique.

Introduction

Low back pain is one of the most common musculoskeletal problem in a general population and

affecting both male and female population equally. Many studied had found out that maximum 80% of adult population was suffering with low back pain and mostly it causes with the age group 20-40 years.¹ Chronic low back pain is a pain which last for more than 3 weeks. Low back pain change the psychological, physiological and sleep behaviour. There are various risk factors for low back pain like increase lumbar lordosis, decrease in abdominal muscle strength, decrease in back muscle flexibility and increase tightness of hamstring muscle. The most common cause of low back pain is body alignment or any alteration of movement.² Due to which it affect in daily activities and most commonly it impairs in functional tasks. Therefore, low back pain is one of

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the common problems in orthopaedic which is involve in physical therapy treatment today.³

One of the etiologies was found out that low back pain is occur due to lack of hamstring flexibility.^{4,5} Pervious study Hultman et al. had concluded that there correlation in hamstring length between chronic low back pain subjects and subjects with no or occasional low back pain.⁴ The most common task in daily activity is forward bending in which when subject forward bend a coupled movement occur with combination of lumbar flexion and pelvic rotation and this movement is known as lumbar-pelvic rhythm. This movement results in back extensors muscle that is erector spine and hip extensors muscle that is gluteals and hamstring muscles and if this muscle has lack of flexibility then subjects suffer with low back pain.⁶ Pervious study Stokes and Abery, had found out that tight hamstring muscle will decrease the lumber lordosis in sitting, therefore it increase pressure in the lumbar intervertebral discs. This increase stress on lumbar spine may affect to the low back problem.⁷

Various physical therapy intervention like exercise like stretching, strengthening is used for lengthening the muscle, manual therapy is used for relaxaing muscle and electrotherapy like TENS OR IFT is use for relieving pain and this treatment was used for chronic low back pain and hamstring tightness but a different intervention has not been used for hamstring tightness in chronic low back pain. So in this study the two treatment will be compare for the hamstring tightness in chronic low back pain that is neural tissue mobilization and other is muscle energy technique.

When nervous system made taut and made slack is called as neurodynamic or nerve glide staretch which also terms as neural tissue mobilization. This decreases neural mechanosensitivity by providing movement which leads to change in neurodynamics and modification of sensation and help to explain the observed increase flexibility.⁸ Either neural tension or slindingleads to joint movement. Neural tension means displacement of the nerve endings in opposite directions. Slinding means displacement of nerve endings in the same direction.⁹ This technique can be apply to other condition were nerve is involve. Prolong sitting, standing and other activity sciatic nerve is exposed to constant pressure. Sciatic nerve innervates the hamstrings. Hamstring flexibility is affected due to nerve adhesion in hamstring causing abnormal mechanosensitivity of sciatic nerve which limits the hamstring length in normal health individuals.

Neural tissue mobilization leads to decrease in neural mechanosensitivity by applying stretch to the nerve structure through posture and multijoint movement.¹⁰

Muscle energy technique is a manual technique developed by osteopaths that is now used in many different manual therapy professions. In this type of therapy, a patient contracts muscles by pushing against resistance provided by the therapist. The goal is to restore normal muscle and joint mobility.¹¹ Muscle energy technique is of two forms: post isometric relaxation and reciprocal inhibition. Post isometric relaxation exercise helps in lengthening of tight hamstring by its contraction and relaxation method. The term post isometric relaxation refers to the subsequent reduction in tone of the agonist muscle after isometric contraction. This occurs due to stretch receptors called golgi tendon organs that are located in the tendon of agonist muscle. Reciprocal inhibition refers to the inhibition of the antagonist muscle when isometric contraction occurs in the agonist. This happens due to stretch receptors within the agonist muscle fibers-muscle spindle. Muscle energy technique is used to lengthen a short or spastic muscle, to strengthen a physiologically weak muscle or group of muscles, to reduce localized oedema and relieve passive congestion and to mobilize an articulation with restricted mobility.¹²

Material and Methodology

The comparative study was carried out with 52 subjects in Krishna hospital, karad. A total of 52 subjects was divided equally into two groups by simple radom sampling (Group A and Group B). Both male and females between the age group of 25-40 years included.

The inclusion criteria in this study was both male and female, age group between 25-40 years and low back pain more than 6 month and exclusion criteria was History of any fracture of any body part, Already involved in any exercise program for lower extremity for last few month, History of any hamstring injury and History of neurological or orthopaedic disorder.

The outcome measures was Visual analoge scale, Oswestry disability index questionnaire, Straight leg raising test.

The materials used in the study was Plint, Hot moist pack, Goniometer, Data collection sheet, Consent form

Procedure: An approval for the study was obtained

from the Protocol committee and institutional Ethical Committee of KIMS DTU. Subjects were selected according to the inclusion and exclusion criteria. Subjects were explained about the procedure of the study and written consent was taken. Pre and Post assessment of Visual analog scale, Oswestry disability index questionnaire, Straight leg raising test was taken

to assess the subject. A total 20 subjects was equally divided into two groups. Group A received neural tissue mobilization were Group B received muscle energy technique. The intervention was conducted for 5 Days per weeks for 2 weeks. After two weeks post assessment was taken.

Findings:

1. Within the Group Comparison:

Group A:

Table No. 2: VAS, ODIQ and SLR OF Group A

Outcome	Pre	Post	t value	p value	Remark
VAS	6.462±0.9892	4.538±1.029	20.278	<0.0001	Significant
ODIQ	38.692±7.296	28.923±4.390	9.765	<0.0001	Significant
SLR	58±3.868	62.5±4.052	20.125	<0.0001	Significant

Interpretation: Above table pre and post comparison within the group. Post treatment there was significant improvement noted in group A.

Group B:

Table No. 3: VAS, ODIQ and SLR OF Group B

Outcome	Pre	Post	md	t value	p value	Remark
VAS	6.808±1.059	4.423±0.9021	2.385	21.291	<0.0001	Significant
ODIQ	39.769±7.426	27.923±4.019	11.846	11.866	<0.0001	Significant
SLR	58.5±5.062	63.115±5.023	-4.615	22.177	<0.0001	Significant

Interpretation: Above table shows pre and post comparison within the group. Post treatment there was significant improvement noted in group A.

2. Between the group Comparison:

Table No. 4: VAS, ODIQ and SLR comparison between both the groups

Outcome	Group A	Group B	t value	p value	Remark
VAS	4.538±1.029	4.423±0.9021	0.43	0.6691	Not Significant
ODIQ	28.923±4.390	27.923±4.019	0.8567	0.3957	Not Significant
SLR	62.5±4.052	63.115±5.023	0.4862	0.6289	Not Significant

Interpretation: Above table shows pre and post comparison between the groups. Post treatment there was not significant improvement noted in both the groups.

Discussion

This study “comparison of neural tissue mobilization and muscle energy technique on hamstring tightness in chronic low back pain” was conducted to compare the

two treatments that is neural tissue mobilization and muscle energy technique and find out which one is better treatment and relief pain for hamstring tightness in chronic low back pain. Now a days chronic low back

pain is a common complaint due to a sedentary lifestyle. Improper posture, prolonged sitting, improper lifting and muscle tightness are the causes of chronic low back pain. Muscle tightness may be linked to postural disturbances. Reduced extensibility resulting from increased hamstring stiffness could be contributing factors to low back injuries. Considering that forward bending is one of the most common movements in daily activities. Shortened hamstrings may increase the risk of injury to the spine from mechanical stresses. Hence this made indeed to study the effect of neural tissue mobilization versus muscle energy technique on hamstring tightness in chronic low back pain.

In previous study by Dr. Ujwal L “effect of muscle energy technique versus effect of neural tissue mobilization on hamstring tightness in young adults” had concluded that muscle energy technique and neural tissue mobilization techniques showed significant improvement in hamstring flexibility but Muscle energy technique is more effective than neural tissue mobilization for improving hamstring flexibility in young adults. In the present study we found that neural tissue mobilization and muscle energy technique both technique equally reduce the hamstring tightness along with chronic low back pain.⁸ In previous study by Shubham SK, “Comparison between the effects of reciprocal inhibition technique versus mulligan’s straight leg raise with distraction in hamstring tightness on subjects with chronic mechanical low back pain” had reported that reciprocal inhibition is more effective than mulligan’s straight leg raise with distraction technique in reducing hamstring tightness along with chronic low back pain.¹⁷ In previous study by Adel RA, “short term effects of neurodynamic stretching and static stretching technique on hamstring muscle flexibility in healthy male subjects” had reported that neurodynamic stretching is more effective than static stretching technique in reducing the hamstring flexibility in healthy male individuals.¹⁰ Another study by Rakhi S, “Effect of hydrotherapy based exercises for chronic nonspecific low back pain” had stated that conventional and hydrotherapy both are effective maneuvers in chronic nonspecific low back pain.¹⁸ In previous study by Rajesh S “Effect of hot moist pack and muscle energy technique in subjects with sacro-iliac joint dysfunction.” had reported that hot moist pack and muscle energy technique in combination can be useful in alleviating sacroiliac joint dysfunction in terms of pain, increase in lumbar range of motion and reduce disability.²⁰ In previous study by Devayani MM, “Comparison of hamstring tightness in skinfit clothing users versus loose

clothing users. Indian journal of physiotherapy and occupational therapy.” Had concluded that participants wearing skinfit clothing shows greater hamstring tightness and compared to those wearing loose clothing and the hamstring tightness can lead to back pain problems in younger individuals.²¹

The outcome measure for this study were Visual analog scale, Oswestry Disability Index Questionnaire and Straight leg raising test. The majority of studies included active knee extension, finger to toe test to identify the hamstring tightness. Oswestry Disability index questionnaire is one of the more reliable and valid for assessing the chronic low back pain. Then mean pain values recorded using VAS showed a significant level of pain in both groups with pre values of 6.462 in Group A and 6.808 in Group B. There was a significant reduction in pain levels post treatment with 4.538 and 4.423 mean values respectively. The mean disability status using Oswestry Disability Index questionnaire showed a significant difference in both groups with pre values of 38.692 in Group A and 39.769 in Group B. There was significant difference in disability level of post treatment with 28.923 and 27.923 mean values respectively. The mean tightness level using straight leg raising showed a significant level in both groups with pre values of 58 in Group A and 58.5 in Group B. There was a significant increasing range in post treatment with 62.5 and 63.115 mean values respectively. Comparison between the groups were not significant difference in reducing pain and decreasing tightness on hamstring tightness in chronic low back pain.

During lumbar flexion there is an anterior tilt of pelvic but if there is hamstring tightness the anterior tilt will reduce and increase the stress in lumbar spine, which hence it decrease the lumbar flexion. Therefore the tightness of back muscles will cause pain and reduce the functional mobility of the spine.

This study had some limitation but were majorly due to the small sample size. Further studies can be done on a larger sample size including small age groups.

Conclusion

The study concluded that there was no significant difference between neural tissue mobilization and muscle energy technique on hamstring tightness in chronic low back pain. Both the technique showed the equally improvement on hamstring tightness in chronic low back pain.

Conflict of Interest: The authors declare that there is no conflict of interest concerning the content of the present study.

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Ethical Clearance: The study was approved by the institutional ethics committee of KIMSUDU.

References

- Phillips RB, Mootz RD, Njiendo J, Cooperstein R, Konsler J, Mennon M. The descriptive profile of low back pain patients of field practicing chiropractors contrasted with those treated in the clinics of west coast chiropractic colleges. *Journal of manipulative and physiological therapeutics*. 1992 Oct;15(8):512-7.
- Norris CM, Matthews M. Correlation between hamstring muscle length and pelvic tilt range during forward bending in healthy individuals: An initial evaluation. *Journal of bodywork and movement therapies*. 2006 Apr 1;10(2):122-6.
- Deline A, Doublestein D. The relationship of hamstring length and chronic low back pain.
- Hultman G, Saraste H, Ohlsen H. Anthropometry, spinal canal width and flexibility of the spine and hamstring muscles in 45-55 years old men with and without low back pain. *Journal of spinal disorders*. 1992 Sep;5(3):24-53.
- Pope MH, Bevens T, Wilder DG, Frymoyer JW. The relationship between anthropometric, postural, muscular and mobility characteristics of males ages 18-55. *Spine*. 1985 Sep;10(7):644-8.
- Norris, C.M. Back Stability. *Human Kinetics*; 2000 Jul.
- Stokes IA, Aberly JM. Influence of the hamstring muscles on lumbar spine curvature in sitting. *Spine*. 1980;5(6):525-8.
- Dr. Ujwal L. Yeole,¹ Raaequa, M. Awati² and Dr. Pournima A. Pawar³ (2017). Effect of muscle energy technique vs effect of neural tissue mobilization on hamstring tightness in young adults. *International journal of current research*. 2017 Dec 27;9(12):62816-62819.
- Neto T, Freitas SR, Marques M, Gomes L, Andrade R, Oliveira R. Effect of lower body quadrant neural mobilization in healthy and low back pain populations: A systematic review and meta-analysis. *Musculoskeletal Science and Practice*. 2017 Feb 1;27:14-22.
- Ahmed AR, Samhan AF. Short term effects of neurodynamic stretching and static stretching techniques on hamstring muscle flexibility in healthy male subjects. *Int J Med Res Heal Sci [Internet]*. 2016 Jan 1;5(5):36-41.
- Franke H, Fryer G, Ostelo RW, Kamper SJ. Muscle energy technique for non-specific low-back pain. *Cochrane Database of Systematic Reviews*. 2015 Feb 27(2).
- Norkins C. C. Measurement of joint motion: A guide to goniometry, 4th edition
- Hsieh CY, Walker JM, Gillis K. Straight leg raising test comparison of three instruments. *Physical therapy*. 1983 Sep 1;63(9):1429-33.
- Leon chaitow: Muscle energy technique (3rd edition)
- Fairbank, T.C Jeremy. The owestry disability index. *Journal of spine*. 2000;25(22):2940-2953.
- Gould D . Visual analogue scale (VAS). *J Clin Nurs* 2001;10 :697 – 706 .
- Shubham SK, Sandeep BS. Comparison between the effects of reciprocal inhibition technique versus mulligan's straight leg raise with distraction in hamstring tightness on subjects with chronic mechanical low back pain. *Indian journal of physiotherapy and occupational therapy*. 2018 April-june;12(2):80-85
- Rakhi S, Sandeep BS. Effect of hydrotherapy based exercises for chronic nonspecific low back pain” had stated that conventional and hydrotherapy both are effective maneuvers in chronic nonspecific low back pain. *Indian journal of physiotherapy and occupational therapy*. 2019 Jan-Mar;13(1):133-138
- Chaurasiya BD. Human anatomy regional and applied 3rd edition. Vol. 2. New Delhi: CBS Publishers & Distributors; 1998.p.74.
- Sewani R, Shinde S. Effect of hot moist pack and muscle energy technique in subjects with sacroiliac joint dysfunction.
- Kanase SB, Monghe DM, Kanase SB, Shinde SB. Comparison of hamstring tightness in skinfit clothing users versus loose clothing users. *Indian journal of physiotherapy and occupational therapy*. 2017 Apr;11(2):64

Awareness of Physiotherapy Intervention in CA-breast

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Abstract

Introduction: Physiotherapy is a healthcare profession that assesses, diagnoses, treats and works to prevent diseases and disability. Physiotherapy is a part of primary health care system. Every person has right to access to primary health care services. Physiotherapy has an important role in various illness and disorders but people are less aware about its benefits. Amongst these various diseases one is breast cancer. Physiotherapy has important role in treating the complications of Ca-breast. However there is limited research available on awareness of Physiotherapy intervention on post-operative Ca-Breast.

Objective: To find the awareness of physiotherapy intervention in post-operative CA-Breast.

To find awareness of Physiotherapy among Doctors.

To find out the number of post-operative Ca-Breast subjects referred to Physiotherapy.

To find the awareness of Physiotherapy intervention in post-operative Ca-Breast among medical doctors.

Material and Methodology: Total 120 doctors were included in survey. The questionnaire were self- devised pre validated. A survey were conducted with clinical doctors. Questions were closed ended to prevent any statistical error.

Result: In this survey we found that there are 50 percent doctors who are aware about physiotherapy and 50 percent are aware about physiotherapy intervention in individuals with Ca-breast.

Conclusion: The study on Awareness of Various Aspects of Physiotherapy among Medical Residents. In this study identified a need for physiotherapists to educate medical residents about various fields of physiotherapy like community based rehabilitation and industrial health physiotherapy, their extensive role in each of the specialty, treatment modalities and evaluative procedures through continuing education programs.

Keywords: Ca-Breast, Physiotherapy, Awareness, rehabilitation.

Introduction

“Physiotherapy is defined as systematic method of assessing musculoskeletal, neurological, cardio-

respiratory disorder and psychosomatic illness with the help of manual therapies and mechanical agencies.”

There is a demand for profession as well as health care disciplines. Physiotherapy is a healthcare profession that assesses, diagnoses, treats and works to prevent diseases and disability.

Physiotherapy is a part of primary health care system. Every person has right to access to primary health care services. In 1999, the World Confederation for Physical Therapy (WCPT) adopted a general

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description of physiotherapy for worldwide use. It states that physiotherapy provides services to people and populations to develop, maintain and restore maximum movement and functional ability. In 2011, The USA labor describes Physiotherapists as primary healthcare professionals who diagnose and treat individuals of all ages. From newborns to the very oldest who have medical problems or other health-related conditions that limit their abilities to move and perform functional activities as well in their activities of daily life. Physiotherapists are highly skilled health professionals that work to improve the health outcomes of the community.

The recognition of physiotherapy in the country stills remains a question. Accordingly, there is an urgent need to change the attitudes towards physiotherapy. This can be done with the help of both government and public support.

Physiotherapy has an important role in various illness and disorders but people are less aware about its benefits. Amongst these various diseases one is breast cancer.

A mass of tissue formed as a result of abnormal, excessive, uncoordinated, autonomous and purposeless proliferation of cells even after cessation of stimulus which caused it called neoplasm or tumour.1 Ca-breast is the most commonly diagnosed cancer in women with 15% of prevalence. 1,2.

There are many features of cancer but certain feature of cancer which are common in all cancers is the development of new growth. 2,3

The new growth often forms a lump or tumour, a term frequently used synonymously with neoplasm. There are two types of neoplasm. These are benign neoplasm and malignant neoplasm. Benign is also called as simple tumour. That give significance of tumour itself not destroy the host. This type of tumour may causes disturbances of function e.g. bowel obstruction. In other malignant neoplasm or cancer, if it remain untreated, it destroys the host. The tumour may be encapsulated for a limited period, but again it infiltrates and grows faster to involve the neighboring tissues. i.e. distant secondary sites. Its gross and histological characters are commonly irregular and degenerative changes are frequent. Malignant tumours arising from epithelial cells are called 'carcinomas'; those from connective tissues are called 'sarcoma'. 2,3,4,5

New growth or neoplasm, implies the growth of newly formed cells from normal body cells or their preceding development cells of origin. The new growth often, but not invariably, forms a lump or tumour, a term frequently used synonymously with neoplasm. There are two types of neoplasm. As a surgical management these surgeries has some side effect. 2,3,4,5

Cancer has many treatment option such as chemotherapy, radiation therapy, medical management and surgical management option etc. mastectomy is one the surgery for breast cancer. 2,3

There are many types of mastectomy^{2,3}

- Simple mastectomy
- Radical mastectomy
- Modified radical mastectomy
- Skin spring
- Nipple spring
- Axillary lymph node dissection
- Senital lymph node dissection etc.

Some complications may occurs after breast cancer surgery like^{2,3}

- Wound infection
- Seroma
- Pneumothorax
- Tissue necrosis
- Hemorrhage
- Injury to neurovascular structure of the axilla
- Lymphedema etc.

These all complications occurs after breast cancer and badly affects patient's daily life even after done a such long and expensive medical treatment. Which affects patient's personal and social life.

Physiotherapy has important role in treating the complications of Ca-breast. However there is limited research available on awareness of Physiotherapy intervention on post-operative Ca-Breast.

Therefor this study will help in creating the awareness of Physiotherapy intervention in post-operative Ca-breast.

Material and Methodology

Total 120 doctors were included in survey. The questionnaire were self- devised pre validated. A survey were conducted with clinical doctors. Questions were closed ended to prevent any statistical error. Statistical analysis were done by using chi square test. Analysis were performed using instat statistical software.

Findings:

Questioner- [data collection sheet]

• Name : Age/Gender :

• Qualification/Specialization : Duration of working :

1. Do you know about Physiotherapy? :

(A) YES (B) NO

2. Do you recommend Physiotherapy treatment for your patients?

(A) YES (B) NO

3. Do you think Physiotherapy is important for Post-operative CA-Breast patients?

(A) YES (B) NO

4. Do you think all hospital should have Physiotherapy Department?

(A) YES (B) NO

5. Do you think CA-Breast patients should be referred to Physiotherapy?

(A) YES (B) NO

If YES:

(a) Pre-operative (b) Post-operative

(c) Both

6. Do you think patients have benefited from Physiotherapy treatment?

(A) YES (B) NO

7. Will you refer your patients to Physiotherapy?

(A) YES (B) NO

8. Do you know about Physiotherapy intervention after CA-Breast?

(A) YES (B) NO

9. Do you think patients should be referred to Physiotherapy treatment?

(A) YES

(B) NO

10. For which all Post-operative CA-Breast complications you refer patients to Physiotherapy?

A. Lymphedema

B. Post mastectomy pain syndrome

C. Axillary wed syndrome

D. Restricted range of motion

E. Erythema

Among all doctors between 30-40 age group 32 were male doctors and 15 were female doctors. And between 40-50 age group 40 were male and 33 were female. Out of this 44.44% were male and 31.25% were female.

I. In this questionnaire 60 doctors were aware of physiotherapy. In that 34 were male and 26 were female.

II. 40 doctors are recommend physiotherapy treatment for their patients. In that 26 were male and 14 were female.

III. Among all doctors 50 doctors think physiotherapy is important for post-operative CA-breast patients. In that 27 were male and 23 were female.

IV. Among all doctors 70 doctors think all hospital should have physiotherapy department. In that 30 were male and 42 were female.

V. Among all doctors 60 doctors think patients have beneficial from physiotherapy treatment. In that 29 were male and 31 were female.

VI. Among all doctors 90 doctors are going to refer their patients to physiotherapy. In that 50 were male and 40 were female.

VII. Among all doctors 40 doctors were knowing about physiotherapy intervention after CA-breast. In that 22 were male and 18 were female.

VIII. Among all doctors 90 doctors think patients be referred to physiotherapy treatment. In that 52 were male and 38 were female

In question no 5 among all doctors 50 doctors think CA-breast patients should be referred to physiotherapy. In that 15 doctors think patient should referred pre-operatively [10 were male and 5 were female], 10 doctors think post-operatively [6 were male and 4 were female] and 25 doctors think both [16 were male and 9 were female] the time patients referred to physiotherapy.

Among all doctors 20 doctors think [male were 10 and female were 10] for lymphedema complication they refer their patients to physiotherapy; 10 doctors think [male were 6 and female were 4] for PMPS; 30 doctors think [male were 18 and 12 were female] for axillary web syndrome; 20 doctors think [male were 9 and 11 were female] for restricted ROM; 40 doctors think [male were 33 male and 7 were female] erythema.

Conclusion

In this survey awareness of physiotherapy intervention in Ca-breast was done. It was concluded that oncologists and medical students are less aware about role of physiotherapy treatment in carcinoma breast.

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Conflict of Interest: Nil

References

1. Acharya RS, Khadgi B, Shakya NR, Adhikari SP, Basnet SM, Sharma S, Webb G, Saleh OS. Physiotherapy awareness among clinical doctors in Nepal. *Journal of Institute of Medicine*. 2011 Aug 1;33(2).
2. Pyszel A, Malyszczak K, Pyszel K, Andrzejak R, Szuba A. Disability, psychological distress and quality of life in breast cancer survivors with arm lymphedema. *Lymphology*. 2006 Aug 21;39(4):185-92.
3. Devoogdt N, Van Kampen M, Geraerts I, Coremans T, Christiaens MR. Different physical treatment modalities for lymphoedema developing after axillary lymph node dissection for breast cancer: a review. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2010 Mar 1;149(1):3-9.
4. Morrell RM, Halyard MY, Schild SE, Ali MS, Gunderson LL, Pockaj BA. Breast cancer-related lymphedema. In *Mayo Clinic Proceedings* 2005 Nov 1 (Vol. 80, No. 11, pp. 1480-1484). Elsevier.
5. Ahmed RL, Prizment A, Lazovich D, Schmitz KH, Folsom AR. Lymphedema and quality of life in breast cancer survivors: the Iowa Women's Health Study. *Journal of Clinical Oncology*. 2008 Dec 10;26(35):5689.
6. Ozaslan C, Kuru B. Lymphedema after treatment of breast cancer. *The American Journal of Surgery*. 2004 Jan 1;187(1):69-72.
7. Overgaard ZK. Risk factors of arm lymphedema in breast cancer patients. *Acta Oncologica*. 2000 Jan 1;39(3):389-92.
8. Murdaca G, Cagnati P, Gulli R, Spanò F, Puppo F, Campisi C, Boccardo F. Current views on diagnostic approach and treatment of lymphedema. *The American journal of medicine*. 2012 Feb 1;125(2):134-40.
9. Hayes SC, Janda M, Cornish BH, Battistutta D, Newman B. Lymphedema secondary to breast cancer: how choice of measure influences diagnosis, prevalence and identifiable risk factors. *Lymphology*. 2008 Aug 20;41(1):18-28.

Potential Barriers to Utilizing Health Services among Multi-Ethnic Communities in Samarinda City: A Qualitative Study

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Abstract

Background: Users of multi-ethnic services are sometimes faced with barriers when using health services. However, health care providers are sometimes not aware of these barriers, even though they may share a little more responsibility for them. To enlighten service providers, such as potential pitfalls that may exist, will be explored by various factors that trigger these barriers.

Objective: This study aims to explore and identify potential barriers to the utilization of health services among multi-ethnic communities in Samarinda city.

Method: There were 28 informants from 4 ethnic groups (Javanese, Buginese, Banjar ethnic, and Dayak ethnic) who were selected by purposive sampling according to the criteria set (n=28). Key informants from the community leaders and traditional leaders of each ethnic group (n = 4). Data analysis used content analysis to analyze the phenomena found in the study

Results: Potential barriers occur at three different levels: service user level, provider level, and system level. Barriers at the service user level were related to the characteristics of service users: socioeconomic conditions, heritage lifestyle, family support, income of the family head, entry to NHIS member, transportation and travel time. Barriers at the provider level were related to provider characteristics: attitudes, communication dan information style, ethnic matching program. System-level barriers were related to system characteristics: referral system.

Conclusion: Several potential barriers have been found but are more related to the level of service providers and the level of the health systems.

Keywords: *Potential barriers, utilization of health services, multi-ethnic, Samarinda city.*

Introduction

Indonesia is an archipelago consisting of 17,774 islands, where is the largest island of Borneo. Indonesia's population reaches 262 million, has 300 ethnicities and 730 language groups.^{1,2} The island of Borneo has 5 provinces, one of the largest provinces in East Kalimantan with its capital Samarinda. The ethnic groups in East Kalimantan are mostly Javanese, Bugis, Banjar, and Dayak ethnic group. Based on the 2016 Population Census, the Javanese (29.55 percent), the Bugis (18.26 percent), the Banjar ethnic group (13.94 percent) and the Dayak ethnic group (9.91 percent).³

Decentralization of government since 2001 has increasingly increased health system heterogeneity and worsening equity disparity. The Universal Health Coverage (UHC) system in Indonesia initiated in 2014 seeks to accommodate a diversity of potential and different health constraints. Since 1 January 2019, Indonesia enters the era of sustainable UHC. This success was assessed as an innovation in coverage of almost all of its population able to access health services.² However, several districts/cities in Indonesia National Health Insurance System (NHIS) membership coverage has not yet reached the UHC target, such as Samarinda city.⁴ The low coverage of NHIS has resulted

in community barriers to accessing health services they need.

This study aims to explore and identify potential barriers to the utilization of health services among multi-ethnic communities in Samarinda city.

Method and Method

Selection of Informants: The selection of informants by purposive sampling with the following criteria; they have used or are currently using health facilities; always alert and responsive to maintain the health of his family; and influential in making decisions on the use of health facilities; and willing as participants. Key informants were selected by purposive sampling based on the influence of their figures (community leaders and traditional leaders).

The target population for this study was 4 multi-ethnic community groups (Javanese, Buginese, Banjar ethnic, and Dayak ethnic) each of 7 people per ethnic group (n = 28). Key informants consisted of 1 person in each ethnic group (n = 4).

Data collection and analysis: Potential barriers to the utilization of health services in multi-ethnic communities in Samarinda city were explored through

in-depth interviews with 4 Javanese, Banjar, Bugis and Dayak ethnic groups (n = 24). Key informant interviews are conducted in the office or in their home. In-depth interviews are focused on behavioral models of Andersen's theory which include four main components: population characteristics; environment; health behavior; and health outcomes.⁷ Data analysis used content analyzes to analyze the phenomena found in study.⁵⁻⁸ This study also included decision-making factors and socio-psychological factors that were judged to be missed in the behavioral model of Andersen.⁹

Results

There were 32 informants in this study, consisting of 24 service user informants, all (100.0%) housewives who were considered to have high attention, were always alert and dominant in making decisions to use health services. Informants were taken from 4 ethnic communities (Javanese, Bugis, Banjar, and Dayak ethnic groups), every 7 people (n = 28). Generally, housewife informants do not work. Key informants were traditional community leaders/figures taken by 1 person from every ethnic group (n=4). Their education is high school average, and there are still some informants who are not covered by health insurance.

Table 1. Informant Characteristics

Characteristics	Housewife Informants	Key Informants
Gender:		
Woman	28 people (100,0 %)	-
Man	-	4 people (100,0%)
Age (Year)	24 - 68 year	34 – 57 year
Ethnic Group:		
Javanese	7 people (25,0 %)	1 person (25,0 %)
Buginese	7 people (25,0 %)	1 person (25,0 %)
Banjar ethnic	7 people (25,0 %)	1 person (25,0 %)
Dayak ethnic	7 people (25,0 %)	1 person (25,0 %)
Jobs		
Civil servants	-	1 person (25,0 %)
Privates/private entrepreneurs	6 people (12,5 %)	2 people (50,0 %)
Farmers	-	1 person (25,0 %)
Not working	22 people (87,5 %)	-
Education:		
University/Institute/	-	-
High school	20 people (71,4%)	3 people (75,0 %)
Middle high school	6 people (21,4 %)	1 person (25,0 %)
Elementary school	2 people (7,2 %)	-
Health Insurance:		
Have	23 people (82,1 %)	4 people (100,0%)
Do not have	5 people (17,9 %)	-

A number of potential barriers identified refer to the characteristics of service users in the form of predisposing characteristics, enabling characteristics and needs characteristics; health behavior in the form of the use of health services; health outcomes in the form of provider and environmental characteristics, namely organizational factors and health care systems.

Barriers are presented in three groups of barriers: (1) potential barriers at the service user level; (2) potential barriers at the provider level and (3) potential barriers at the system level.

Potential Barriers at the service user level:

Socio-economic conditions: Socio-economic conditions that are vulnerable to some multi-ethnic communities can act as barriers to utilizing health services.¹⁰ The existence of differences in social status between users and service providers allows for communication disruptions. These problems are not favorable to the user's perception of the use of the services provided.¹¹

Heritage lifestyle: For example, eating habits in Bugis ethnicity, diets that do not conform to medical recommendations, such as serving traditional foods, can also act as a barrier. Bugis people like to use high fat and high sugar in traditional diets may not accept a diet that is low in fat and low in sugar when they find it not tasteful because it tastes tasteless.¹²

Family as a 'healer': Lack of family and social support can act as a barrier to health care. Family support is beneficial in providing emotional support to service users.³⁰ In eastern culture, the presence of a family in a hospital is considered part of the patient's healing process.¹³

Ineffective communication: Ineffective communication is another major barrier in the partnership that should exist between patients and practitioners. The relationship between an ethnic minority patient and a physician is essentially vertical due to social differentials forced by unevenness on linguistic, cognitive and institutional levels. This gulf separates patients and physicians and invariably benefits the physician more than the patient.¹⁴ Still found, elderly patients from Dayak ethnicity were still being escorted by their children to the Community Health Center because of language difficulties.¹⁵

Perception and attitude towards health services and personnel: Denying perceptions and attitudes regarding health services and personnel can act as a barrier. This is particularly evident when the Dayak ethnic patients doubt the benefits of health services or do not see benefits. Some elderly Dayak ethnic patients may see service providers as strangers or a new group of people and growing too much respect for medical staff and paramedics. As is known, these Dayak ethnic patients have been known as protectors and healers in their communities. In turn, this can hold them back from asking important questions about their medical conditions and this form of abstract subordination prevents them from questioning authority as they see it.¹⁶

The income of the family head: Lack of the financial resources can be a barrier because economic conditions affect people's lives and their ability to get care that does not have NHIS. The lack of finance and being in the poverty line is problematic for the multi-ethnic community because they are in a vulnerable position.¹¹ The multi-ethnic community income picture is very varied, construction workers are around Rp. 1,800,000 per month. Fishermen are Rp. 3,000,000 per month, shrimp farmers are around Rp. 5,000,000 per month. Farmer's income is around Rp. 3,000,000 per month, and traders earn Rp. 4,000,000 per month. Based on the East Kalimantan Provincial Minimum Wage (PMW) in 2019, it is set at Rp. 2,747,561, - per month. This means that only shrimp farm workers and traders are relatively above the East Kalimantan PMW.¹⁷

Entry to NHIS membership: The inability to obtain health insurance can act as a barrier to using health services.¹⁰ Complexity in the management of NHIS membership, makes service users choose other alternatives by becoming a private patient even though it is considered to be very unfair, unequal as a fellow citizen. Nearly a quarter of the informants from this study claimed not to have an NHIS card. The administrative impression is complicated, the incompleteness of the requirements file makes them delay the administration of the NHIS card.¹¹

Transportation and travel time: Irregular public transportation on the outskirts of the city, combined with long travel times and transportation costs is another barrier to getting needed health services, especially ethnic Dayaks who live in the suburbs. The distance to the hospital is around 30 kilometers, if using a public

vehicle the one-way fee is around Rp. 45,000. Their transportation costs are likely to be taken from the cost of their household's daily consumption needs.¹⁸

Potential barriers at the provider level:

The behavior of providers: The attitude of health care staff is another significant barrier in the use of multi-ethnic health services, especially those who are vulnerable and tend to be discriminatory.¹⁵ There is a feeling of being treated differently from other service users, for example when queuing at the registration counter, the queuing for patient examinations in community health centers will upset them, and have a detrimental effect on the image of the public health center.

Communication and information style:

Authoritative communication from the style of service providers can act as a barrier. That is a confrontational way in which health workers sometimes approach service users can produce shame and discomfort, for example when routine references are made about missed appointments and other forms of non-compliance. The prognosis of the disease delivered directly and the use of medical terms can cause inconvenience to users of health services.¹⁹

Ethnic matching program: Treatment programs that serve certain ethnic-inhabited suburbs, where the absence of ethnic matching (users and service providers) have the potential to be a barrier. Our view is that ethnic Dayak ethnic matching programs can make care more accessible to users of the same ethnic service.

Potential barriers at the system level

Consumerist approach: The dispassionate consumerist approach can act as a barrier, particularly the impersonal and technical attitude of the physician. Patient multi-ethnic feel physicians forego their responsibility for patients' health. To some multi-ethnic patients, the consumerist approach to medical services is a novelty. The patient is encouraged to be a more assertive patient, but this often runs against the grain of older, more vulnerable patients. There are complaints too that the physician treats his patients in a matter-of-fact formal manner. This is contrary to the warm and sympathetic way some patients are used in their hometowns such as on the islands of Java and South Sulawesi where the hospitals are bigger and more advanced.¹⁵

Referral system: The referral system can act as a barrier because some service users feel uncomfortable with monitoring procedures that prevent them from getting adequate care.²⁰ Sometimes they bypass the referral system using services that have been accepted in the previous system.

Discussion

Daily barriers and consequences: Universality and specificity. Many problems are 'universal' barriers that can befall us all. Long queues at the registration counter, the inspection queue, for example, prevents all service users from using the services they are entitled to. In addition, they can take their time to take care of their daily needs (household needs). Ethnic groups which can be hampered due to distance and transportation costs such as ethnic Dayaks who live on the outskirts of Samarinda. A barrier that only afflicts some of the other multi-ethnic communities is participation in the NHIS. For those who have not been included in the NHIS with vulnerable economic conditions, they can act as a barrier. Economically vulnerable ethnic groups were found in almost all ethnic groups from the monthly average income that coincided with the East Kalimantan Provincial Minimum Wage (PMW) range.

The specificity of the situation: A complicated and established reference system by the Social Security Agency of Health (SSAH) can hamper further use of health services. Users of certain ethnic services may see health care as a luxury rather than what we consider a necessity. In this case, the use of the gatekeeper, who must refer to more forms of special services, is seen as a barrier. Also, the waiting list for promises creates barriers, as we explained earlier. Therefore, it is important to consider the specific context we face when identifying barriers to the use of health services.

The specificity of service users and time: Many phenomena that are increasingly blurred in the perspective of service users (health care users) in multi-ethnic commissions are likely due to the shifting of their cultural values and belief systems, where they are 'second generation' who have rapid acculturation. This has an impact on their increasing trust in modern medicine and the existing health care system.

As a result, even barriers that prevent them from using health services may also change

Conclusion

This study aims to raise awareness about various potential barriers so that the problem of barriers in health services among multi-ethnic communities becomes transparent. Some potential barriers have been found but are more related to the level of service providers and health systems.

Limitation: There are limitations to this study. The review is more than the utilization of community health center facilities compared to hospital use. In fact, the phenomenon of officer behavior and the nursing system will be more commonly found in hospitals because of the more complex problems.

Further Research: There is a need for further research. One of them is implementation studies reduce barriers from user service interactions with providers, especially multi-ethnic communities with service providers in hospitals.

Conflict Interests: There is no possibility of conflict interest.

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Ethical Clearance: The study has passed through The Health Ethics Commission of Public Health Faculty of Hasanuddin University, No. 2383/UN4.14.8/TP.02.02/2019.

References

1. Central Bureau of Statistics. Statistical yearbook of Indonesian 2018, Jakarta, 2018.
2. Agustina, Rina et.al. Universal health coverage in Indonesia: concept, progress, and challenges, *Lancet* 2019; 393: 75–102.
3. Central Bureau of Statistics Samarinda. Statistical yearbook of Samarinda 2016, Samarinda, 2016
4. Kaltim.Prokal.com.Total Participation Below Target. <https://kaltim.prokal.com/read/news/339258-number-participation-under-target.html>. accessed February 20, 2019.
5. Smith, Anthony D.The Ethnic Origins of Nations. Oxford: Blackwell, 1986.
6. Scheppers, et. al. Potential barriers to the use of health services among ethnic minorities: a review, *Family Practice* 2006 : 23: 325-34.
7. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health SocBehav* 1995; 36: 1–10.
8. Creswell, J. W. *Research Design: Qualitative, Quantitative and Mixed Approaches*. Fourth Edition, Yogyakarta: Student Library, 2018.
9. Kempen GI, Suurmeijer TP. Professional home care for the elderly: an application of the Andersen-Newman model in The Netherlands. *SocSci Med* 1991; 9: 1081–1089.
10. George S, Daniels K, Fioratou E. A qualitative study into the perceived barriers of accessing healthcare among a vulnerable population involved with a community center in Romania.*Int J Equity Health*. 2018 Apr 3;17(1):41.
11. Jones EM, Cason CL, Bond ML. Access to preventive health care: is the method of payment a barrier for immigrant Hispanic women?,*Women's Health Issues* 2002; 12: 129–137.
12. Arundhana, Andi Imam. Culture of eating and improving nutrition, <https://www.kompasiana.com/arundhana.s.gz/5519c3718133110a7b9de0c1/culture-eating-local-and-nutrition-improvement>. Accessed March 2019
13. Razak, Amran et.al. Economic Burden of Cancer Patients at Hasanuddin University Teaching Hospital, Makassar: A Qualitative Study, *IJPHRD*, December 2018, Vol. 9, No. 12, pg 1438-1443.
14. Singy P. Sante' et Migration: traductionide'aleou ideal de traduction? *La Linguistic* 2003; 39: 135–149
15. Remennick LI, Ottenstein-Eisen N. Reaction of new Soviet immigrants to primary health care services in Israel. *Int J Health Serv* 1998; 28: 555–574.
16. Diaz VA. Cultural factors in preventive care: Latinos. *Prim Care Clin Office Pract* 2002; 29: 503–517
17. Merdeka.com. The East Kalimantan Provincial Government stipulates the UMP 2019 Rp. 2.747,561, <https://www.merdeka.com/peristiwa/pemprov-kaltim-taskan-ump-2019-rp-2747561.html>, accessed March 18, 2019.
18. Panos PT, Panos AJ. A model for a culture-sensitive assessment of patients in health care settings. *Soc Work Health Care* 2000; 31: 49–62.
19. FRA – European Union Agency for Fundamental Rights. Inequalities and multiple discrimination in access to and quality of healthcare. 2013. <https://>

fra.europa.eu/sites/default/files/inequalities-discrimination-healthcare_en.pdf. Accessed March 2019.

20. Tirto.id. Acute Problems of the Referral System and Payment of SSAH. <https://tirto.id/masalah-akut-sistem-rujukan-dan-pembayaran-bpjs-kesehatan-c26x>. Accessed March 19, 2019.

The Effect of Astaxanthin Administration on Plasma Levels of Tumor Necrosis Factor- α and Palatine Tonsil Swab in Chronic Tonsillitis Patients

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Abstract

Background: Chronic tonsillitis is chronic inflammation of the palatine tonsils which can be caused by the presence of free radicals that stimulate the formation of pro-inflammatory cytokines such as Tumor Necrosis Factor- α (TNF- α) and interleukin-6 (IL-6). Astaxanthin as an antioxidant and anti-inflammatory is thought to reduce levels of proinflammatory cytokines.

Aim: To determine plasma levels of TNF- α and palatine tonsil smears in patients with chronic tonsillitis before and after administration of astaxanthin.

Method: Research with clinical trial design. Thirty-one subjects who met the inclusion and exclusion criteria in the Ear, Nose, Throat, Head and Neck Surgery clinic in Wahidin Sudirohusodo Hospital and Network Hospital were given astaxanthin 4 mg/day for 14 days. Plasma TNF- α levels and palatine tonsile smears were examined before and after administration of astaxanthin. Data were analyzed using SPSS 25th version. The statistical tests used Paired-t test and Independent-t test.

Results: Thirty-one subjects can be followed until the end of the study. Astaxanthin 4 mg per day for 14 days can reduce plasma TNF- α levels and palatine tonsil swab of patients with chronic tonsillitis ($p < 0.05$), and there is no significant difference in TNF- α levels between plasma and palatine tonsil swab both before and after administration astaxanthin ($p > 0.05$).

Conclusion: Astaxanthin can reduce plasma TNF- α levels and palatine tonsil swab in chronic tonsillitis patients.

Keywords: *Chronic tonsillitis, Tumor Necrosis Factor- α (TNF- α), TNF- α levels, palatine tonsil swab, astaxanthin.*

Introduction

Chronic tonsillitis is chronic inflammation of the palatine tonsils caused by bacterial or viral infections and can affect all ages, but predominantly occurs in children. Chronic tonsillitis is the most common disease of all recurrent throat inflammation.¹

Free radicals are one of the factors involved in the pathogenesis of chronic tonsillitis. Free radicals can stimulate the formation of proinflammatory cytokines such as TNF- α and IL-6. TNF- α is the main cytokine in the inflammatory response to bacteria and other

microbes. The main sources of TNF- α are macrophages, mononuclear phagocytes and antigen-activated T cells, NK cells (Natural Killer), and mast cells.^{2,3}

Cytokine measurements are generally done through blood tests and biopsies, but currently cytokine tests can be done using smears. A swab technique is generally used to examine microorganisms in mucosal tissue by making smears on the mucosal surface 3-5 times to take microorganisms or exfoliate cells in the area.^{4,5}

To inhibit and neutralize free radicals, the body forms antioxidants to prevent cell damage. The mechanism

of inhibition of antioxidants usually occurs by giving one electron to become a more stable compound. Antioxidants can also act as anti-inflammatory agents by inhibiting increased production of cytokines such as interleukin-6 (IL-6) or Tumor Necrosis Factor- α (TNF- α) which are proinflammatory cytokines.^{2,3,6,7}

Astaxanthin is an antioxidant group of carotenoids which also has anti-inflammatory activity by inhibiting the production of cytokines, such as TNF- α , prostaglandin E-2 (PGE-2), IL-6 and Nitric oxide (NO). As an anti-inflammatory, astaxanthin inhibits the production of inflammatory mediators by blocking the activation pathway of Nuclear Factor-k β (NF-k β).^{8,9,10,11}

Method

This research was conducted at the ENT-HN clinic at Wahidin Sudirohusodo Hospital and the Network Hospital. The time of the study began from August 2019 to October 2019. This study was approved by the Health Research Ethics Commission of RSPTN UH-RSWS (No: 647/UN4.6.4.5.31/PP36/2019).

The design of this study was clinical trial. The subject collection technique is carried out randomly until a specified amount is reached. In this study the number of subjects was 31. Subjects were chronic tonsillitis sufferers who met the inclusion criteria, namely age 12-40 years, did not consume antioxidant supplementation in the last 1 month, did not consume seafood and were willing to participate in research with give written consent (Informed Consent) and sign a letter of approval for medical treatment. Exclusion criteria are has systemic or metabolic diseases, has infectious diseases other than chronic tonsillitis, has lower respiratory tract diseases, has head and neck tumors, has allergic diseases and active smokers. Drop Out Criteria are the patient did not come in control, did not regularly take astaxanthin, or has chronic exacerbation of chronic tonsillitis during the study.

A total of 31 subjects were taken by the median cubital venous blood and palatine tonsile surface smears for examination of TNF- α levels. After that, 4 mg of astaxanthin therapy was given once a day for 14 days. On the 15th day, venous blood was taken again through median cubite vein and the palatine tonsilswab was examined for TNF- α levels.

Measurement of plasma TNF- α levels and palatine tonsill swab was carried out in the Molecular Biology

laboratory of the Hasanuddin University Hospital using the Enzym Linked Immunosorbent Assay (ELISA) method. Data analysis was performed using SPSS 25th version. The statistical tests used were Paired-t test and Independent-t test.

Results

This research was conducted at the ENT-HN clinic at Wahidin Sudirohusodo Hospital and the Network Hospital during the period August to October 2019. All subjects followed the study to completion. Data analysis was performed using SPSS 25th version. The statistical test used was the Paired-t test to compare TNF- α levels before and after administration of astaxanthin and the Independent-t test to compare plasma TNF- α levels with palatine tonsil swab. The results of the test were statistically significant if the p value <0.05.

Data analysis was performed on 31 subjects aged between 21-37 years with a mean of 27.7 ± 4.6 years. The distribution of subject characteristics is shown in the following table:

Table 1. Distribution of Samples by Sex

Sex	n	%
Male	13	41,9
Female	18	58,1
Total	31	100,0

From table 1 it was found that the most sex in this study were 18 female samples (58.1%), while 13 male samples (41,9%).

Table 2. Distribution of Samples by Age

Age (Years)	n	%
21-25	12	38,7
26-30	9	29,0
31-35	9	29,0
36-40	1	3,3
Total	31	100,00

Table 2 shows that the age of the samples varied between 21 to 37 years with the most samples in the 21-25 year age group of 12 samples (38.7%) followed by the 26-30 year age group of 9 samples (29.0%), then the groups aged 30-35 years as many as 9 samples (29.0%) and at least found in the age group 36-40 years with a total sample of 1 sample (3.3%).

Table 3. Comparison of TNF- α levels before and after administration of Astaxanthin

Sample	Time	n	Mean	SD	p
Plasma	Before	31	122,8	155,1	0,049
	After	31	99,5	116,3	
Palatine Tonsils Swab	Before	31	126,6	16,5	0,000
	After	31	62,7	23,4	

Table 3 shows the comparison of TNF- α levels before and after administration of astaxanthin. In plasma, a significant reduction in TNF- α levels was found after astaxanthin administration compared to before, namely from 122.8 to 99.5 or there was a decrease of 23.3 (19.0%). From the paired-t test results obtained p value

<0.05. In the palatine tonsil swab, a significant decrease in TNF- α levels was found after administration of astaxanthin compared to before, ie from 126.6 to 62.7 or there was a decrease of 63.9 (50.5%) with paired-t test, the value of p < .001.

Table 4. Comparison of TNF- α Plasma and Palatine Tonsil Swab

Time	Sample	n	Mean	SD	p
Before	Plasma	31	122,8	155,1	0,891
	Palatine Tonsil Swab	31	126,6	16,5	
After	Plasma	31	99,5	116,3	0,094
	Palatine Tonsil Swab	31	62,7	23,4	

Independent-t test: Table 4 shows a comparison of plasma TNF- α levels and palatine tonsil swab. Before giving astaxanthin, there was no significant difference in plasma TNF- α levels with palatine tonsil swab. From the independent-t test, p value > 0.05 was obtained. After administration of astaxanthin, the mean TNF- α level in plasma (99.5) was higher than in palatine tonsil swab (62.7), but the results of statistical tests showed that the difference was not significant, with a p value > 0.05.

Discussion

In this study, there were 31 patients with chronic tonsillitis who took blood samples from the cubital median vein and palatine tonsil swab for examination of TNF- α levels.

Table 1 shows the distribution of samples according to sex. that is, a higher proportion of women (58.1%) compared to men (41.9%). This is in accordance with research conducted by Yuliani et al (2015) in which chronic tonsillitis sufferers found more in women (76%) than men (24%). Fakh et al (2016) also found more chronic tonsillitis sufferers in women (56%) than men (44%). Different results were obtained from the research

of Sembiring et al (2013). From 20 samples, it was found that male sex was 55%, while female was 45%. Likewise in the study of Umami et al (2017). Of the 40 chronic tonsillitis patients, 23 (57.5%) were male and 17 (42.5%) female.^{7,12,13}

There are differences regarding the gender that is predominantly suffering from chronic tonsillitis. Several factors have been investigated including genetic factors and cultural differences, but there is no genetic and cultural involvement involved in sex differences that often experience chronic tonsillitis. So it can be concluded that there are no factors that affect gender differences in chronic tonsillitis. This is likely only the influence of the population in a population related to the predominance of certain sexes on the incidence of chronic tonsillitis, both men and women.¹³

From table 2 shows the distribution of samples by age group. The most age group in this study was age 21-25 years (38.7%). This is consistent with research conducted by Asyari et al (2019). From 96 samples, the highest number of samples obtained in the age group of 19-25 years was 36 (37.50%). Chronic tonsillitis is one of the most common ENT diseases, especially in

children and adolescents. There are many similarities in age range between studies. From a study conducted by Sapitri (2013) about the characteristics of chronic tonsillitis sufferers indicated by tonsillectomy at RadenMattaHer Hospital in Jambi, from the 30 samples obtained the most distribution aged 5-14 years (50%). In America, chronic tonsillitis is often found in children aged 5-10 years and young adults aged 15-25 years. In Scotland, the most common age of patients with chronic tonsillitis is 14-29 years, which is 50% of the population. Whereas in Russia the most common age of chronic tonsillitis sufferers is 15-30 years. Many factors that cause chronic tonsillitis are more common in children. The greatest immunological activity of tonsils is found at the age of 3-10 years. At school age, starting from the age of 5 years, children are more susceptible to viral and bacterial infections from the surrounding environment. One of the predisposing factors for chronic tonsillitis is the influence of several types of food, this is because children often consume foods with artificial sweeteners, containing many preservatives and poor oral care. In children also often suffer from acute respiratory infections or due to acute tonsillitis that is not treated adequately or left alone without treatment.^{13,14}

In this study found a decrease in TNF- α levels after administration of astaxanthin for 14 days both in plasma and palatine tonsil swab. In plasma, a significant decrease in TNF- α was found at 23.3 (19.0%), from 122.8 to 99.5 ($p < 0.05$). Likewise in the palatine tonsil swab, a significant reduction in TNF- α levels was found from 126.6 to 62.7 or a decrease of 63.9 (50.5%) ($p < 0.001$). The decrease in TNF- α levels is caused by administration of astaxanthin which acts as an anti-inflammatory by inhibiting the production of inflammatory mediators by blocking the activation pathway of Nuclear Factor- κ B (NF- κ B). Research conducted by Nobles (2012) found that astaxanthin has an anti-inflammatory effect which is characterized by a decrease in neutrophil and lymphocyte levels. Another study conducted by Ohgami et al (2003) about the potential of astaxanthine in inflammation shows that astaxanthin can reduce the production of Nitric Oxide, prostaglandin E2 and Tumor Necrosis Factor- α (TNF- α) in vitro in mouse macrophage cells. Another study by Lee et al (2003) which states that astaxanthine can inhibit the expression and formation of proinflammatory cytokine mediators such as TNF- α and IL-1. Aside from being an anti-inflammatory, astaxanthin is also known as an antioxidant. Astaxanthin can reduce reactive

oxygen species (ROS) so as to reduce lipid peroxidation. Astaxanthin reacts with peroxy or hydroxyl free radicals so that they are no longer harmful to the body. Thus the content of free radicals can be reduced.^{9,15}

Before administration of astaxanthin there was no significant difference in plasma TNF- α levels with palatine tonsil swab. After administration of astaxanthin, the average TNF- α level in plasma (99.5) was higher than in the palatine tonsil swab (62.7), but the results of statistical tests showed that the difference was not significant. This shows that there is a correlation of TNF- α levels between plasma and palatine tonsil swab. This is consistent with research conducted by Yusran et al (2011) regarding the correlation of TNF- α levels between examination of swab lesions with peripheral blood tests. From this study it was found that there was a correlation between TNF- α levels in peripheral blood and ulcer swab of Recurrent Stomatitis Aftosa Stomatitis patients. The correlation between TNF- α levels of palatine tonsil swab and plasma TNF- α levels of chronic tonsillitis patients suggests the possibility of using swab techniques to calculate cytokine levels, especially TNF- α in other studies to replace venous puncture techniques for blood specimen collection or biopsy techniques.^{4,5}

The conclusion of this study is that administration of astaxanthin can reduce plasma TNF- α levels and palatine tonsil swab with chronic tonsillitis. There is a correlation between plasma TNF- α levels with swab of palatine tonsil with chronic tonsillitis both before and after administration of astaxanthin.

It is recommended that the administration of additional astaxanthin therapy as an anti-inflammatory can be considered in the management of chronic tonsillitis. The swab technique can be used to calculate cytokine levels, especially TNF- α in patients with chronic tonsillitis to replace venous puncture techniques or biopsy techniques.

Ethical Clearance: Taken from Medical Faculty Ethical committee

Source of Funding: Self

Conflict of Interest: Nil

References

1. Ramadhan F, Sahrudin, Ibrahim K. Analisis Risiko Kejadian Tonsilitis Kronis pada Anak Usia 5-11 Tahun di Wilayah Kerja Puskesmas Puuwatu Kota

- Kendari Tahun 2017. *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*. Vol. 2. 2017; 6: 1-8.
2. Parwata IMO. *Bahan Ajar Bioaktivitas: Antioksidan*. Bali: Program Pasca Sarjana Universitas Udayana. 2015.
 3. Zheng W, Wang SY. *Antioxidant Activity and Phenolic Compounds in Selected Herbs*. ACS Publications. 2009; 49 (11) : 5165-5170.
 4. Yusran A, Marlina E, Sumintarti. Adanyakorelasikadar TNF- α antarapemeriksaanhapusansidengapemeriksaandaraperiferpasien stomatitis aftosarekuren. *Dentofasial*. 2011; 10(2): 71-75.
 5. Marlina E. *Teknik hapusan mukosamulut pada ulser RAS minor melalui perbedaan kadar TNF- α dan IL10*. Tesis tidak diterbitkan. Surabaya: Universitas Airlangga. 2010.
 6. Cvetkovic T, Vlahovic P, Todorovic M, Stankovic M. Investigation Oxidative Stress in Patient with Chronic Tonsilitis. *Auris Nasus Larynx*. 2009; 36: 340-344.
 7. Umami VM, Suprihati, Farokah. Pengaruh Vitamin C Dosis Tinggi Terhadap Peroksidasi Lipid dan Penyembuhan Luka Pasca Tonsilektomi. *ORLI* Vol. 47 2017; 1: 58-64.
 8. Hussein G, Sankawa U, Goto H, Matsumoto K, Watanabe H. Astaxantin, a carotenoid with potential in human health and nutrition. *J. Nat. Prod*. Vol 69. 2006; pp. 443-449.
 9. Lee SJ, Bai SK, Lee KS. Astaxantin Inhibits Nitric Oxide Production and Inflammatory Gene Expression by Suppressing I κ B Kinase-dependent NF- κ B Activation. *Mol. Cells*. 2003; 16: 97-105.
 10. Bangsawan PI. *Efek antiinflamasi Astaxantin terhadap volume edema dan ekspresi cox-2 dengan penggunaan parameter limfosit dan neutrofil pada tikus putih dewasa galur wistar*. Tesis tidak diterbitkan. Universitas Sriwijaya. Fakultas Kedokteran. Palembang. 2012.
 11. Kusumastuty I, Adi P, Budhi L, Ari F. Pengaruh Pemberian Daun Ubi Jalar Ungu (*Ipomoea batatas Lam*) terhadap Kadar TNF-A, IL-6 dan NF-Kb pada Tikus yang Dipapar Asap Rokok. *Jurnal Kedokteran Brawijaya*, Vol. 28. 2015; 3: 228-232.
 12. Yuliyani EA., Nuaba IGA, Ratnawati LM, Setiawan EP. *Distribusi Penderita Tonsilitis Kronis Yang Telah Menjalani Tonsilektomi Di Rsup Sanglah Denpasar Periode Januari 2014-September 2015*. Bagian Ilmu Kesehatan THT-KL Fakultas Kedokteran Universitas Udayana. Denpasar. 2015.
 13. Fakh IM, Novialdi, Elmatris. *Karakteristik Pasien Tonsilitis Kronis pada Anak di Bagian THT-KL RSUP Dr. M. Djamil Padang Tahun 2013*. *Jurnal Kesehatan Andalas*. 2013; 5(2): 436-442.
 14. Sapitri RV. *Karakteristik Penderita Tonsilitis Kronis Yang Diindikasikan Tonsilektomi Di RSUD Raden Mattaher Jambi*. Jambi. Universitas Jambi. 2013.
 15. Aisoi L. *Karakteristik Astaxantin Sebagai Antioksidan*. Program Studi Pendidikan Biologi. Universitas Cenderawasih Jayapura. *Novae Guinea Jurnal Biologi*. 2016; 1: 43-51.

Technology and Development Facility Information System Integration in Improving the Integrated Recording and Reporting in the Department of Health District South Buru

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Abstract

Development of technology facilities and health information systems integration in South Buru District Health Office has not been in kelolah and developed efficiently in because of lack of budget for the management and development of health information systems. This certainly affects the declining quality of the recording and reporting of existing integrated in the Department of Health. The purpose of this study to determine the development of technology and systems integration facility health information to improve the quality of recording and reporting of data. The research is a qualitative case study approach. The location of this research in the Department of Health South Buru. This research data collection techniques using in-depth interviews, review of documents and observation. Data were analyzed using content analysis.

Keywords: *Facilities Technology, Integration, SIK, Recording and Reporting Integrated Health Service.*

Introduction

Health Information System (HIS) in Indonesia is not running optimally and have not been up to provide the necessary information in the decision making process at various levels of the health system. Health Department and Community Health Center as medical practitioners have difficulties in reporting, where data from one report from one program to the other reports of other programs have a dataset that is almost the same, things are going in because of data communication has not run optimally in other words, has not progressed information systems integration between the health department and health centers^{1,2}.

The implementation of an integrated online data communications network between the 90% of district health offices/city, the provincial health department 100%, 100% hospital centers, 100% Technical Implementation Unit of the Ministry of Health Center; The implementation of an integrated online data communication network between all district health offices/city, provincial health departments, hospitals and UPT Center with the Ministry of Health. From some of these, the government seeks to develop a health

information system in accordance with its uniqueness and characteristics, namely the development of a regional health information system through software or a website.

Recording and Reporting System includes 3 things: (1) recording, reporting, and processing; (2) analysis; and (3) utilization. Recording the results of the activities by the executor is recorded in the books of the registers that apply to each program. The data is then direkapitulasikan into SP3 reporting format that has been recorded. The output of this danpelaporan recording of data and information is a valuable and valued when using the right method and right³.

Recording and Reporting of integrated health center sent to the District Health Office or the City every month. District Health Office or State reworks health centers report and send feedback to the Provincial Health Office and the Central Health Department. Feed back to the health center must be mailed report back regularly to the clinic to be used as the evaluation of the success of the program⁴.

Materials and Method

Informant Research: Informants in this study determined the suitability and adequacy principles. The technique of taking informants in this research is purposive sampling technique. The key informant was head of the Department of Health, regular informants in this study consisted of employees of Health Office of Program, Information and Public Relations, as well as the employee portion of health information systems/operator SIK field. Additional informants in this study the related fields, operator service providers, and the community. Total informants in this study of 10 people including three key informants and 7 ordinary informants criteria inclusion on informants that members of employees/staff are informed, policy and decision makers in the Department of Health, bersedian become informants voluntarily, Employees/staff have become ASN and served more than 1 year.

Method of Collecting Data: The data collection is done by extracting data from a variety of techniques and resources to clarify information in the field. The data obtained are of primary data. Primary data was obtained by in-depth interviews (depth interview), observation and study of the document.

Data Analysis: Data obtained from the results of interviews with informants were subsequently analyzed by content analysis method. Content analysis is a technique used to analyze and understand the contents of the information.

Results

In this study wanted to see the development of technological facilities and integration of health information systems to improve the recording and unified reporting in South Buru District Health Office. Integrated recording and reporting of health information systems in South Buru district, between the health department and health centers and public hospitals.

Health Information System Management: The information you want to know is how the management, recording and reporting of health information systems in South Buru District Health Office. Based on the results of these interviews will be undertaken to key informants and informant Ordinary obtained results that the management and implementation of health information systems at the District Health Office of South Buru, Table 1.

Table 1. Characteristics of informants by Sex, Age, and Occupation.

No.	Initials	Gender	Age/Yr	Office	Information
1	HNS	P	56	Secretary Office	Key informants
2	HML	P	42	Program Head, Information and Public Relations	Key informants
3	MLS	P	50	Program Secretary, Information and Public Relations	Key informants
4	MZ	L	35	Staff/Operator	Ordinary informants
5	AL	L	36	Staff/Operator	Ordinary informants
6	ICE	P	28	staff	Ordinary informants
7	DNH	P	26	staff	Ordinary informants
8	PD	L	36	staff	Ordinary informants
9	AK	L	40	staff	Ordinary informants
10	MS	P	32	staff	Ordinary informants

Source: Primary Data, 2019

Characteristically Data are obtained regularly from the performance data, the data is operational, monthly data, annual data and data managed by SPM (Minimum

Service Standards) and hereinafter in input in the Application PCARE and PUSDATIN.

Table 2. Characteristics of Key Informants (Depth Interview)

Initials	Gender	Age/Yr	Education	Office
HNS	P	56	S2	Secretary Office
HML	P	42	S2	Program Head, Information and Public Relations
MLS	P	50	S1	Secretary of Program, Information and Public Relations

Source: Primary Data, 2019

Openness integration of health information between the Department of Health, Community Health Centers and Hospitals: Information wants to be known by researchers from the aspect of information systems integration between the health offices and health centers and hospitals, namely whether the system of health in the Health Service Opera- suda integrated with health centers and public hospitals in South Buru district, as a whole or not. From the interviews that have

been done on all informants usual in this case the staff in the areas of Program, Information and Public Relations in get the same information about the integration of health information systems between the Department of Health, health centers and hospitals are still not maximal integration of information in because of lack of internet information network in most parts of South Buru district where a major impact in the delivery of data to the maximum.

Table 3. Characteristics of Ordinary Informants

Initials	Gender	Age/Yr	Education	Office
MZ	L	35	S1	Staff/Operator
AL	L	36	S2	Staff/Operator
ICE	P	28	S1	staff
DNH	P	26	S1	staff
PD	L	36	S1	staff
AK	L	40	S1	staff
MS	P	32	S1	staff

Source: Primary Data, 2019

Based on the results interview with key informants and informant usual in this case staaf/operators know that it is still not maximal pengintegrasian information system between the Department of Health, health centers and hospitals in because of lack of facilities Internet network so that the process pelaporanm data from health centers do through the data of line and not online.

Health Information Systems Development Facility: Based on the results interview with key informants and informant unusual obtained information that, there are a lot of shortcomings in district offices rush south in terms of meeting facilities for the development of health information system especially for rural areas, there are 10 of the 12 health centers that do not have Internet network, no control room information systems, lack of human resources in the IT field so that

the information management and data communication between the Health Service and health centers be run optimally.

Discussion

Processing Information System: Based on interviews depth, field observation and study documents obtained results that the management and implementation of health information systems at the District Health Office of South Buru Characteristically Data are obtained regularly from the performance data, the data is operational, monthly data, annual data and data governance with minimum service standards and hereinafter in input in the Application PCARE and PUSDATIN. As well as the Health Information System is managed in a transparent and open and involve a variety

of stakeholders in an effort to provide information about good health and quality to the people of South Buru, even more responsibility to the Ministry of Health as a form of accountability for performance as a Servant of the State, as well as providing health care for society in particular.

As for the management of health information systems in the district rushed the south have not been able to run properly, the lack of facilities management and supporting infrastructure such information, the lack of internet connection in public health centers inland, lack proposition supporting data communications such as computers and human resources in the IT field to be a problem that can degrade the quality Recording and reporting of data between health centers and district health offices South Buru.

Problem management health information system which is able to affect the integration and management of health information systems in the Health Service and also all the health centers in South Buru district. Based on research conducted by Eko Budi Susanto⁵ conducted at the health care center Pekalongan discussing the development of health care information systems is directed towards the establishment of an information system based on mobile are able to provide accurate information and research results melahiarkan prototype design information center The health service can meet user demand, because it has some features in the integration and communication of data such as a user can view schedule information doctors, hospitalization information, the amount of blood stocks in Pekalongan and national.^{6,7}

Results were also consistent with studies carried out by Erni Rahmawati⁸. In the District Health Office Boyolali, to create a system that is able to generate information that can support the planning of drug procurement by local governments that build Planning Information System for Drug Procurement method approach, combined counts between consumption method with method of epidemiology at the Health Office Boyolali has running as expected.

Based on research conducted by M. Taufik Rachman⁹ conducted in Puskesmas Bayan where management information system is very important especially dalama to input, data storage, and can occur kerangkapan patient files. Data processing so that information becomes ineffective and inefficient. Based on the study done by

Ellyza Sinaga¹⁰ conducted in the clinic MinggirSleman, regarding the evaluation of system infromasi health in community health centers, which as one of the organization's resources, information must also be managed well, especially the management of health information systems that exist The health care center

Integration of Health Information Openness between the Department of Health, Community Health Centers and Hospitals: Based on the results interview with key informants and informant usual, in this case staaf/operator, field observation and review of documents obtained information that was not maximal pengintegrasian information system between the Department of Health, health centers and hospitals in because of the lack of internet network facilities, the absence of the Control room and SIMPUS management facilities in the clinic so that the process of reporting data from health centers do through the data offline and not online. In improving the quality of the recording and reporting of health data between health centers and the Department of Health in Health Information Systems Integration needed areas and the need to support local governments rush south. From the results obtained that the integration of health information systems have not been running well.

The study was conducted by Mohammad Arif Rasyidi¹¹, which is implemented in the health center in Environmental Health Office Pasuruan and Malang, with the development of information systems integration program, developed information systems to assist the process of reporting to the health center partners. The study was conducted by Eko Budi Susanto⁵ in the implementation of the Information System of Health Services-Based Mobile That Integrates Institutions Health Service in Pekalongan.

Based Kepmenkes No. 511⁷, The analysis of the situation and policies that have been established, then one SIKNAS development strategy is the Health Information System Integration Existing, integrated definition do not intend to turn off/unify all the existing information systems. Information systems are more efficient when combined will be united. Other information systems, integration is more in the form of development: the division of duties, responsibilities and authorities as well as the mechanisms are interconnected. This integration is expected that all the existing information system will work in an integrated and synergistic formed SIKNAS.

Health Information Systems Development

Facility: The results showed there are still many shortcomings in South Buru District Health Department in terms of meeting facilities for the development of health information systems, especially for inland areas so that the information management and data communication between the Health Service and health centers be run optimally. Required the attention of South Buru District Government to give more attention to fulfillment of the Health Information System in South Buru district.

B. Research Hendro Manik P. King¹² carried out in health facilities in the city of Pontianak, concluded that support for health development efforts in order to reach all levels of society, we need a media to inform the public about the location of the nearest health care facility and show on the route to the HCF. The same thing also disclosed from research conducted ole Hutami Laksmi Kastanti¹³ explained that the District Health Office/City can fill, modify, view, and delete data health centers in the region, where it can be done efficiently with the information supporting facilities.

Results of research conducted by KhairinaIsnawati. Peat in Banjar district health center, which is about the implementation of regional health information system states that in implementing HMIS application and Advocacy with local government expected that the installation of Banjar Regency Internet network directly to the clinic, as well as drafting of local regulations regarding everything about the online reporting¹⁴.

Conclusions

Based on the results of research and data processing is done on the development of facilities and the integration of health information systems in improving the quality of the recording and reporting of data in South Buru District Health Office. The researchers concluded that, integration of health information systems have not been going well in because of lack of communication networks supporting facilities particularly in rural areas, lack of human resources in IT and the lack of local government support.

Ethical Clearance: Taken from Hasanuddin University committee

Source of Funding: Self

Conflict of Interest: Nil

References

1. Khairina Isnawati, Eko Nugroho, Lutfan Blue. Implementation and Application of Regional Health Information System (HMIS) Generic In UPT. Peat Puskesmas Banjar district. *Journal of Information Systems for Public Health*. 2016; Vol. 1 No. 1
2. Sandu Siyoto, Anwar Mallongi, Muh Irfan Ilham, Syamsiar Russeng, Mustafa. Target Cancer Risks of Exposure to Carbon Monoxide and Plumbum among Attendants of Parking Lots in Panakkukang Mall and Panakkukang Square Makassar City. *SRP*. 2019; 10(1): 151155. doi:10.5530/srp.2019.1.28
3. Putri Andini,. Recording and Reporting System Analysis Puskesmas (SP3) with Application of PHC Karangmalang SIMPUS Semarang Tahun 2013. *Scientific Articles*. FKM Dian Nuswantoro University. Semarang.
4. Hendro P. Manik B. King, Arif B. Putra N, M. Azhar Irwansyah. Design of Web-Based Geographic Information System Health Care Facilities in Pontianak. *Journal of Education and Research Information*. 2915; Vol.1 No. 2
5. Eko Budi Susanto, Paminto Supreme Christianto, M. Faizal Kurniawan. Based Health Services Information System That Integrates Mobile Kesehatan Service Agencies Pekalongan. *Research Journal Pekalongan*. 2016; Vol. 11
6. MoHRI.. Minister of Health Decree No. 511 of 2002 on Policies and Strategies for Development of National Health Information System (SIKNAS). Jakarta. Ministry of Health of the Republic of Indonesia. 2002
7. MoH RI. Minister of Health Decree No. 837 of 2007 on the Development of Online Computer Network National Health Information System. Jakarta. Ministry of Health of the Republic of Indonesia, 2007.
8. Erni Rahmawatie, Stephen Santosa.. Drug Procurement Information System Planning In Boyolali District Health Office. *Pseudocode Journal* 2015; Vol. 2 1
9. M. Taufik Rachman, Nidya Syahida daughter, Yana Isnaini. Implementation of Information Systems Administration Health Care Improvement In Health Center Bayan. *Journal of Public Administration*. 2018; Vol. 6 1
10. Ellyza Sinaga, Carlos. Evaluation of Application of Information Systems in Sleman district health

- center. *Journal of Information Systems for Public Health*. 2016; Vol. 1 2
11. M. Arif Rasyidi, Laylat Hidayah, Praise Andayani. For Information Systems Development Unit Environmental Health Department Community Health Center in Pasuruan and Malang. *Journal of Health Management Indonesia*. 2018; vol.2, 2
 12. Hendro P. Manik B. King, Arif B. Putra N, M. Azhar Irwansyah. Design of Web-Based Geographic Information System Health Care Facilities in Pontianak. *Journal of Education and Research Information*. 2015; Vol. 1 No. 2
 13. Laksmi Hutami Kastanti, Nature Faith Satoto, Didik Eko Widiyanto. Public Service Information System Evaluation Based Health Center Website At the Ministry of Administrative Reform and Bureaucratic Reform. *Journal of Technology and Computer* 2015; Systems. Vol. 3 No. 1
 14. Endah Sri Lestari, Sutopo Patria Jati, Aris Widodo Puji. Evaluation of the Health Information System in Central Java in the Context of National Health Information Systems Strengthening. *Journal of Health Management Indonesia*. 2016; Vol. 14.

Practice Of Exclusive Breastfeeding At Evacuation Site Post-Earthquake In Palu City, Indonesia

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Abstract

The problem of post-disaster exclusive breastfeeding is caused by the lack of knowledge, the level of education, the family support, the support of health workers, the health facilities, and the distribution of the assistance for the breastfeeding substitutes and the commercial porridge which is very accessible, can change the behaviour of the exclusive breastfeeding in the disaster-affected areas. This research aims to analyse the determinant of the success of the post-disaster exclusive breastfeeding. The research method was quantitative with the cross-sectional approach. The population was 52 mothers at three evacuation sites who had 6 to 8-month babies; taken by the Total Sampling. The data were analysed using the univariate analysis and the bivariate analysis. The results of the research were the characteristics of the respondents, namely: those who were 26 to 35 years old, were 63.5%; those who were in low education, were 86.5%, and those who were in higher education, were 13.5%; the pre-disaster breastfeeding practice was 73.1%; those who had less knowledge about breastfeeding were 80.8%; those who had received the assistance of PASI (breastfeeding companion) and commercial porridge were 76.9%; the unavailability of the health facilities was 65.4%; the lack of support from the health workers was 65.4%; and the less support from the families was 71.2%. The bivariate analysis showed that the variables of: education, knowledge, the status of receiving the assistance of PASI & commercial porridge, the availability of the health facilities, the support from the health workers, and the support from the families; all of these variables had a significant relationship to the practice of exclusive breastfeeding at the evacuation site, with a p value < 0.05 .

Keywords: *Exclusive breastfeeding, Refugee, Post-Earthquake.*

Introduction

The earthquake and liquefaction that followed by a large tsunami wave which occurred on 28 September 2018 with a magnitude of 7.7 on the Richter Scale, located in the Province of Central Sulawesi, have become a widespread concern, both from within and outside the country. The natural disaster which struck three areas: Palu City, Donggala Regency, and Sigi; resulted in approximately 1,948 of which were found dead, while 843 were still missing. Not only claimed lives and lost property, but also a large portion of transportation infrastructure, buildings and facilities were severely damaged, including changes of lands, coastal ecological

characteristics, and general geomorphology. The Palu City has become one of the areas seriously affected by disasters. The series of disasters that befell this area resulted in many residents who died, injured, and stated lost, along with their homes.

In emergencies (during disasters and post-disaster), many problems arise with regard to breastfeeding mothers, infants, and children under two years old, due to limited clean water and fuel for food needs¹. For the time being, mothers cannot breastfeed their babies due to severe stress, and there are also babies who lost their mothers (orphaned babies) so they cannot have breastfeeding for survival². In addition, the difficult things

to avoid are: the aid from other countries in the form of formula milk in large amount; the low-level education and knowledge of the mothers; the support from health workers; and the support from the families; therefore, the exclusive breastfeeding is low^{3,4}.

One area in Palu City that is seriously affected by the earthquake and liquefaction is the area in Tatanga Sub-district, and there is a refugee tent inhabited by mothers and the babies. Before the earthquake, the exclusive breastfeeding in this area was high, at 85.67% in 2017⁵. After the earthquake, the exclusive breastfeeding in the area is thought to have decreased.

Based on the research problem, namely the occurrence of earthquake, that the number of the high refugees, specifically the risky group, such as: pregnant women, nursing mothers, and babies, and residing in the refugee tents; has the potential to experience problems in feeding the babies, both in terms of quality and quantity. The exclusive breastfeeding is a challenge for the mothers who have babies in the evacuation site. Thus, this research aims to analyze the factors that influence the success of the exclusive breastfeeding at the evacuation site.

Materials and Method

Research Design: This is a quantitative research with a cross-sectional design. This research was conducted at three points of evacuation in the working site of PUSKESMAS Sangurara, Palu, from October to January 2018-2019.

Population and Samples: The population in this research were the mothers who had babies aged 6 to 8 months old, obtained as many as 52 people taken by the Total Sampling.

Data Collection: The research data consisted of: respondent characteristics data, independent variables, and dependent variable. The respondent characteristics data included: mother's age, baby's age, mother's education level, pre-disaster breastfeeding, post-disaster exclusive breastfeeding, which was measured using research questionnaire. The independent variables were the level of education, the level of mother's knowledge of breastfeeding, the Assistance Receipt Status of PASI & Commercial Porridge, the availability of health facilities, the support from health workers, and the support from families. The dependent variable was the exclusive breastfeeding at the evacuation site.

Data Analysis: The data analysis was the univariate and bivariate, namely the chi-square test with a significance level (α) of 5% using the SPSS software.

Results

Table 1: Characteristics of Respondents

Characteristics	n	%
Age		
17-25	12	23.0
26-35	33	63.5
36-45	7	13.5
Age of Baby		
6 Months old	18	34.6
7 Months old	14	26.9
8 Months old	20	38.5
Level of Education		
Low	45	86.5
High	7	13.5
Pre-Disaster Breastfeeding		
Fully Breastfeeding	38	73.1
Partially Breastfeeding	14	26.9
Post-Disaster Exclusive Breastfeeding		
Non-Exclusive	38	73.1
Exclusive	14	26.9
Knowledge		
Less	42	80.8
Fair	10	19.2
Assistance Acceptance Status of PASI and Commercial Porridge		
Accept	40	76.9
Do not accept	12	23.1
Health Facility Availability		
Unavailable	34	65.4
Available	18	34.6
Health Workers Support		
Less	34	65.4
Full	18	34.6
Family Support		
Less	37	71.2
Full	15	28.8

The Table 1 shows that the majority of respondents in the 26-35-year-old group is 63.5%. Most respondents having 8-month-old babies are at 38.5%. More than half of respondents with low education are at 86.5%. Most respondents fully breastfeeding before the disaster happened are at 73.1%. Most respondents give non-

exclusive breastfeeding in the aftermath are at 73.1%. The majority of respondents with low knowledge is at 80.8%. Most respondents receive the assistance acceptance status of PASI and commercial porridge are at 76.3%. More than half of the respondents have their health facilities unavailable are at 65.4%. Most respondents receive less support from health workers are

at 65.4%. And the majority of respondents receive less family support is at 71.12%.

Table 2 shows that all independent variables are the factors that influence the exclusive breastfeeding of the babies who are evacuating in Palu City, with a *p* value < 0.05.

Table 2: Bivariate Analysis

Variable	Exclusive Breastfeeding				N	p
	No		Yes			
	n	%	n	%		
Education Level						
Low	36	80	9	20	45	0.011
High	2	28.6	5	71.4	7	
Knowledge						
Low	34	81	8	19	42	0.016
Fair	4	40	6	60	10	
Assistance Acceptance Status of PASI & Commercial Porridge						
Accept	36	90	4	10	40	0.000
Do not accept	2	16.7	10	83.3	12	
Health Facility Availability						
Unavailable	30	88.2	4	11.8	34	0.002
Available	8	44.4	10	55.6	18	
Health Workers Support						
Less	30	88.2	4	11.8	24	0.002
Full	8	44.4	10	55.6	18	
Family Support						
Less	32	86.5	5	13.5	37	0.001
Full	6	40	9	60	15	

Discussion

Natural disasters, such as earthquake and tsunami, resulted in the loss of property and damage to health facilities and housing, so that the people who survived the incident are forced to flee and live in the refugees' tent. The riskiest group to experience health and nutritional problems is the group of babies and nursing mothers. Failure to exclusively breastfeed can occur to the mothers who have babies.

The results showed that the failure of exclusive breastfeeding in the refugee camp was 73.1%. Other research showed that the low exclusive breastfeeding occurred in the mothers living in refugee camp⁶.

The results of this research indicated that the

mother's education level was a factor influencing the success of breastfeeding. The high education status of the mothers, the high the breastfeeding as well. Several research show that there is a positive correlation between mother's education and the practice of initiating breastfeeding by van Rossem, *et al.*,⁷ the practice of exclusive breastfeeding⁸, and the duration of breastfeeding⁹.

The low education of the respondents shows that the knowledge level of the respondents about exclusive breastfeeding is also low. This research showed that there were 80.8% of respondents who had low knowledge about exclusive breastfeeding. The low knowledge showed that the majority of respondents who did not exclusively breastfeed were at 81.0%. Other research

shows that breastfeeding practices vary depending on the level of knowledge of the mother, i.e., a mother with a good level of knowledge will exclusively breastfeed and avoid the milk formula and the use of bottles^{10,11}

In addition to the factors of education and knowledge of the respondents that affect the exclusive breastfeeding in the evacuation site, there was the assistance of breastfeed substitutes and commercial porridge, given to the mothers. The results showed that most of the mothers who accepted the assistance did not exclusively breastfeed, namely at 90.0%. This caused the mother to fail to exclusively breastfeed at the evacuation site.

The distribution of formula milk substitutes and commercial porridge changes the practice of breastfeeding, and increases the supply of formula milk in the affected areas. The most worrying condition is that babies aged 0–5 months old also receive the formula milk^{12,13}. This condition explains that receiving such formula milk assistance is a condition that facilitates the mothers to fail to give exclusive breastfeeding.

The results of this research indicated that there was a significant relationship between the health facilities and the post-earthquake exclusive breastfeeding and liquefaction in Palu City. Health facilities close to mothers to conduct health checks and get information about health, both for those carrying babies. The unavailability of breastfeeding tents makes it difficult for mothers to breastfeed their babies.

Then, the results of this research indicated that there was a significant relationship between the health workers support and the post-earthquake exclusive breastfeeding and liquefaction in Palu City. The respondents with less support from health workers did not provide more exclusive breastfeeding at 88.2%. The support from health workers, in this case related to efforts to provide information, and emotional support to the nursing mothers, as well as not recommending the use of formula milk easily, and promoting breastfeed substitute products.

In post-natural disaster situations, the support from health workers is very important in supporting the mothers to exclusively breastfeed. The babies who are not exclusively breastfed have the potential to lack of nutrient intake, and affect the nutritional status of the babies. Water, sanitation and hygiene services, are the needs of refugees, and correlated with health and nutritional status, especially for babies and children¹³.

(Cronin, *et al.*, 2008). Other research shows that baby sitters need special support for breastfeeding after the natural disasters¹⁴.

In addition to the support from health workers, the support from families is also very important and supports the success of the exclusive breastfeeding in the evacuation site. Stress and trauma conditions can interfere with breastfeeding, therefore the family support, especially parents, husbands or relatives, greatly helps the baby's mothers to give exclusive breastfeeding. Research shows that stressed mothers will interfere with the success of breastfeeding¹⁵. Other research shows that there is a significant relationship between the husbands' support and the exclusive breastfeeding for babies, where the husbands will be able to actively seek information and participate in the success of exclusive breastfeeding for the babies¹⁶.

Conclusions

The practice of the exclusive breastfeeding at the evacuation site was very low, which was at only 26.9%. The factors significantly related to the practice of the exclusive breastfeeding at the evacuation site were the level of education and knowledge of the respondents about breastfeeding, the presence of the breastfeed substitute food (PASI) & the commercial porridge, the unavailability of health facilities caused by the natural disaster, and the low support from health workers and the families in supporting the mothers to give the exclusive breastfeeding.

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References

1. Datar, A., Liu, J., Linnemayr, S., Stecher, C., The Impact of Natural Disasters on Child Health and Investments in Rural India. *Soc Sci Med* 2013; 76, 83–91. <https://doi.org/10.1016/j.socscimed.2012.10.008>
2. Kyojzuka, H., Yasuda, S., Kawamura, M., Nomura, Y., Fujimori, K., Goto, A., Yasumura, S., Abe,

- M. Impact of the Great East Japan Earthquake on feeding method and newborn growth at 1 month postpartum: results from the Fukushima Health Management Survey. *Radiat Environ Biophys* 2016; 55, 139–146. <https://doi.org/10.1007/s00411-016-0636-7>
3. Nieuwoudt, S., Manderson, L., Frontline health workers and exclusive breastfeeding guidelines in an HIV endemic South African community: a qualitative exploration of policy translation. *Int Breastfeed J* 2018; 13. <https://doi.org/10.1186/s13006-018-0164-y>
 4. Straub, B., Melvin, C., Labbok, M., A descriptive study of Cambodian refugee infant feeding practices in the United States. *Int Breastfeed J*, 2008; 3, 2. <https://doi.org/10.1186/1746-4358-3-2>
 5. Dinas Kesehatan Kota Palu., Profil Kesehatan Kota Palu.2017
 6. Aakre, I., Lilleengen, A.M., Lerseth Aarsand, M., Strand, T.A., Barikmo, I., Henjum, S., Infant feeding practices in the Saharawi refugee camps Algeria, a cross-sectional study among children from birth to six months of age. *Int Breastfeed J* 2017; 12. <https://doi.org/10.1186/s13006-016-0098-1>
 7. van Rossem, L., Oenema, A., Steegers, E.A.P., Moll, H.A., Jaddoe, V.W.V., Hofman, A., Mackenbach, J.P., Raat, H., Are starting and continuing breastfeeding related to educational background? The generation R study. *Pediatrics* 2009; 123, e1017-1027. <https://doi.org/10.1542/peds.2008-2663>
 8. Acharya, P., Khanal, V., The effect of mother's educational status on early initiation of breastfeeding: further analysis of three consecutive Nepal Demographic and Health Surveys. *BMC Public Health* 2015; 15. <https://doi.org/10.1186/s12889-015-2405-y>
 9. Adnan, N., Muniandy, N.D., The Relationship between Mothers' Educational Level and Feeding Practices among Children in Selected Kindergartens in Selangor, Malaysia: A Cross-sectional Study. *Asian Journal of Clinical Nutrition* 2012; 4, 39–52. <https://doi.org/10.3923/ajcn.2012.39.52>
 10. Akinyinka, M.R., Olatona, F.A., Oluwole, E.O., Breastfeeding Knowledge and Practices among Mothers of Children under 2 Years of Age Living in a Military Barrack in Southwest Nigeria. *Int J MCH AIDS* 2016. 5, 1–13.
 11. Vijayalakshmi, P., Susheela, T., Mythili, D., Knowledge, attitudes, and breast feeding practices of postnatal mothers: A cross sectional survey. *Int J Health Sci (Qassim)* 2015.; 9, 364–374
 12. Piwoz, E.G., Huffman, S.L., The Impact of Marketing of Breast-Milk Substitutes on WHO-Recommended Breastfeeding Practices. *Food and Nutrition Bulletin* 2015.; 36, 373–386. <https://doi.org/10.1177/0379572115602174>
 13. Summers, A., Bilukha, O.O., Suboptimal infant and young child feeding practices among internally displaced persons during conflict in eastern Ukraine. *Public Health Nutr* 2018.; 21, 917–926. <https://doi.org/10.1017/S1368980017003421>
 14. Cronin, A.A., Shrestha, D., Cornier, N., Abdalla, F., Ezard, N., Aramburu, C., A review of water and sanitation provision in refugee camps in association with selected health and nutrition indicators--the need for integrated service provision. *J Water Health*, 2008; 6, 1–13. <https://doi.org/10.2166/wh.2007.019>
 15. DeYoung, S., Suji, M., Southall, H.G., Maternal Perceptions of Infant Feeding and Health in the Context of the 2015 Nepal Earthquake. *J Hum Lact* 2018.; 34, 242–252. <https://doi.org/10.1177/0890334417750144>
 16. Dozier, A.M., Nelson, A., Brownell, E., The Relationship between Life Stress and Breastfeeding Outcomes among Low-Income Mothers. *Adv Prev Med* 2012. <https://doi.org/10.1155/2012/902487>
 17. Fitri, N., Lestari, Y., Evareny, L., The Relation Between Husband Support with Exclusive Breastfeeding in Baby Age 6-12 Months in Air Dingin Health Center. *Journal of Midwifery*, 2017; 2, 74–81. <https://doi.org/10.25077/jom.2.2.74-81.2017>

Primary Women Infertility and Thyroid Disorders

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Abstract

The study was conducted to explore the prevalence of thyroid autoimmune disorders among primary infertile women. Hormonal and immunological serum markers were tested including: TSH, T3, T4, TPO Ab, prolactin and Interleukin-6. Thyroid abnormalities were observed in 38.5% of the primary infertile women. Thyroid autoimmunity was more prevalent among primary infertile women (9.6%) than pregnant (4.0%) and non-pregnant (4.3%) fertile women, but with no significant difference. Presence of thyroid hormones related clinical manifestation in infertile women was higher (26.9%) in comparison to pregnant fertile women and non-pregnant fertile groups. Abnormalities in menstrual cycles were much higher in infertile women (90.4%) than non-pregnant fertile women (27.7%). Serum level of IL-6 was with no significant differences among all study groups. In conclusion, AITD has a minor participation in the thyroid disorder-associated infertility and their menstrual abnormalities in comparison with the larger scale of the non-AITD participation. No role for the IL-6 in the thyroid associated primary infertility in women was detected.

Keywords: Infertility, Thyroid disorders, TPO, IL-6, menstrual cycle.

Introduction

Causes of female infertility are wide including anovulation due to hormonal disorders or follicle problem, polycystic ovary syndrome and others resulting in failure to produce mature eggs, malfunction of the hypothalamus and malfunction of the pituitary gland. Endometriosis is playing a major role in female infertility as 30-40% of patients with endometriosis are infertile, whereas other general factors may also participate in the infertility causes like age, smoking, sexually transmitted infection and body weight and eating disorders [1, 2, 3].

Thyroid disorders and their effects on infertility are highly debatable, and the prevalence of hypothyroidism in women of reproductive age varies between 2% and 4% and is largely due to autoimmune thyroid diseases

(AITD) in the presence or absence of autoantibodies [4]. Most of the studies have shown the association of thyroid disorder with menstrual disturbance and even anovulatory cycles as oligomenorrhea and menorrhagia and ovulatory dysfunction, due to numerous interactions of thyroid hormones with the female reproductive system [5]. In the study of Plowden *et al* (2016), it has been stated that women with subclinical hypothyroidism or thyroid autoimmunity are keeping their chances of conceiving and achieving a live birth and likely unaffected by marginal thyroid dysfunction [6], whereas in a Danish study it was stated that impaired fertility is associated with TSH, TPO antibodies, and mild (subclinical) hypothyroidism in a Danish population of women [7]. On the other hand, menstrual disturbances in hyperthyroidism had been described by Kakuno *et al* in 2010 and found that menstrual disturbances were with only severe cases of thyroid disorders but not mild or moderate and hence concluded that menstrual disturbances in thyroid disorders were less frequent than previously thought [8].

The underlying pathogenic mechanisms associating AITD and infertility remain largely speculative, as

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neither animal models nor *in vitro* data on this issue are available. It was noted that in infertile women, thyroid autoimmunity features are significantly more frequent than in healthy fertile controls as represented by the level of anti-TPO antibodies [9].

The aim of the current study was first to estimate thyroid disorder markers; T₃, T₄, and TSH as well as IL-6 and prolactin levels in infertile women in comparison with pregnant fertile and non-pregnant fertile women. Second thing was to evaluate serum anti-TPO positivity in all study groups. This marker is an indicator of association strength between autoimmune thyroid disease and infertility after the exclusion of any other possible causes for infertility.

Materials and Method

Subjects: This study was conducted in the Teaching Hospitals of Al-Kut City/Iraq for the period from Oct. 2017 to Mar. 2018. A total of 52 primary infertile (PI) females were selected with an age range of 17-43 years. Two apparently healthy control women groups were included; 50 non-pregnant fertile (NPF) (with at least one previous reproducible pregnancies) and 47 of pregnant fertile (PF). Inclusion criteria for infertile subjects were: primary infertile female, no cause of infertility, and normal male factors. Exclusion criteria for infertile subjects were; age limitations, abnormal male factors, past or current history of infertility-related

disease such as sexually transmitted infection (STI), uterine or pelvic pathology and others. Approximately 5 ml blood sample was collected from every participant and sera were separated.

Materials: The following kits were used in this study: Interlukin-6 (IL-6) kit (Immuntech, France), prolactin kit (Monobind, USA), thyroid stimulating hormone (TSH) kit (Monobind, USA), thyroid peroxide (TPO) kit (Human, Germany), thyroxin (T₄) kit (Monobind, USA), and triiodothyronine (T₃) kit (Monobind, USA).

Method: According to the manufacturer's instructions the following ELISA method were used: immuno-enzymometric assay for the estimation of (TSH) and prolactin (PRL), competitive enzyme immunoassay for the estimation of T₃ and T₄, indirect ELISA for the estimation of anti-TPO IgG antibody, and sandwich ELISA for the estimation of IL-6.

Statistical analysis: SPSS software, version 17 was employed for statistical analysis.

Results

Table 1 shows the thyroid hormones related clinical manifestations which were 26.9%, 16% and 12.8% in PI, PF and NPF women respectively with no significant differences. Table 1 also demonstrates the menstrual cycle status in PI & NPF women.

Table 1. Thyroid hormones-related clinical manifestation and menstrual cycle status as reported in study groups.

Study Groups	THRM				Menstrual Cycle status			
	Yes*		No		Normal (Regular)		Abnormal**	
	N ₂	%	N ₂	%	N ₂	%	N ₂	%
PI (n=52)	14	26.9	38	73.1	5	9.6	47	90.4
PF (n=50)	8	16.0	42	84.0				
NPF (n=47)	6	12.8	41	87.2	34	72.3	13	27.7
P value	PI X NPF = 0.0001 (HS)***							

THRM = Thyroid hormones related manifestation (including; weight loss, heat intolerance, increase thirst, weight gain, cold intolerance, increased appetite, flushing, irritability and others). NS: not significant. at P > 0.05, *= The presence of at least three THRM manifestations, **Abnormal; Irregular, short, prolonged, amenorrhea, menorrhagia, oligomenorrhea and others. ***HS: highly significant. at P < 0.01.

Thyroid function tests are depicted in Table 2. An abnormal thyroid hormones level was detected in 38.5% of the PI group including 34.6% with hypothyroidism

and 3.9% with hyperthyroidism. Lower levels of thyroid hormones abnormalities were reported in the other study groups with significant difference.

Table 2. Thyroid status as evaluated in the study groups.

Thyroid Function Test		PI (n = 52)		PF (n = 50)		NPF (n = 47)		P value
		N ₀	%	N ₀	%	N ₀	%	
Normal*		32	61.5	41	82.0	39	83.0	PI X PF = 0.022 (S) PI X NPF = 0.018 (S)
Abnormal	Hypo**	18	34.6	3	6.0	5	10.6	
	Hyper***	2	3.9	6	12.0	3	6.4	
Total		20	38.5	9	18.0	8	17.0	

Normal= T3, T4 and TSH serum levels are within normal range, Hypo= Hypothyroidism in which T3 and/or T4 serum level is below normal range and TSH serum level is above normal range, Hyper= Hyperthyroidism in which the T3 and/or T4 serum level is above normal range and TSH serum level is below normal range, S: Significant at P< 0.05

The menstrual cycle abnormalities in correlation with the thyroid status of PI women are tabulated in Table 3. The number of cases with abnormal menstrual cycle (including too short cycle, prolonged cycle and

amenorrhea), was 47/52 (90.4%) which were distributed as 18/52 (34.6%), 28/52 (53.9%) and 1/52 (1.9%) on hypothyroidism, euthyroidism and hyperthyroidism respectively.

Table 3. Correlation of thyroid abnormalities and menstrual cycle as illustrated in infertile women.

Menstrual Cycle	PI group (n=52) thyroid status						P value
	Hypo		Euo		Hyper		
	N ₀	%	N ₀	N ₀	%	N ₀	
Normal (n= 5)	0	0.0	4	7.7	1	1.9	Hypo x Hyper = 0.05 (S) Hypo x Euo => 0.05 (NS) Hyper x Euo = 0.05 (S)
Abnormal (n= 47)	18	34.6	28	53.9	1	1.9	

NS: Non Sig. at P> 0.05; S : Sig. at P< 0.05; N = Normal menstrual cycle, Ab = Abnormal menstrual cycle.

Anti-TPO (IgG) antibody was detected in 9.6% of PI group compared to 4.0% and 4.3% in PF and NPF respectively with no significant differences (Table 4).

Mean serum IL- 6 levels are shown in the same table with no statistical significant differences between all studied groups.

Table 4. Distribution of IgG TPO-Ab positivity and IL-6 level among study groups.

Study Group	IgG TPO-Ab				IL- 6				Mean±SD (Range)
	Positive		Negative		Undetectable		Detectable		
	N ₀	%	N ₀	%	N ₀	%	N ₀	%	
PI N ₀ =52	5	9.6	47	90.4	24	46.2	28	53.8	9.34± 7.98 (0.3-34.5)
PF N ₀ = 50	2	4.0	48	96.0	5	10	45	90	12.82±11.11 (1.1-30.0)
NPF N ₀ = 47	2	4.3	45	95.7	27	57.5	20	42.5	9.55±7.36 (4.7-27.8)
P value	PI X PF= 0.262 (NS)				PI X PF=0.052 (NS)				
	PI X NPF = 0.299 (NS)				PI X NPF=0.388 (NS)				

NS : Non Sig. at P< 0.05

Table 5 shows the correlation between thyroid status, prolactin (PRL) and anti-TPO antibodies in infertile women. For the total 18 cases with hypothyroidism there was 5/18 (27.8%) with elevated prolactin level. None

of the euthyroid and hyperthyroid cases was with an elevated prolactin level. In the same table, 5.6%, 9.4% and 50% of the hypothyroid, euthyroid and hyperthyroid respectively were positive for anti-TPO antibodies.

Table 5. Correlation of thyroid status with PRL and anti-TPO Ab in infertile women

Test		Thyroid status in PI group						p-value
		Hypo		Euo		Hyper		
		N ₂	%	N ₂	%	N ₂	%	
*PRL status	Normal	13	72.2	32	100	2	100	0.129 (NS)
	Elevated	5	27.8	0	0	0	0	
Anti-TPO Ab	Positive	1	5.6	3	9.4	1	50	
	Negative	17	94.4	29	90.6	1	50	

*PRL: prolactin

Discussion

The rationale of this study was based on progressive analytical steps to find out the strength of correlation and/or association between thyroid disorders and women's infertility.

The steps, in order, were first to examine the subjects of the infertile group for the presence or absence of any clinical manifestations that are related to the thyroid hormones abnormalities. The second and subsequent steps were to confirm or deny the menstrual cycle abnormalities, to evaluate the thyroid hormones level (T₃, T₄, and TSH) and to measure the IL-6 as a proinflammatory marker in the infertile women in comparison with the fertile women. The final step was to find out the prevalence of thyroid peroxidase antibodies (marker of autoimmune thyroid disease) and prolactin hormone.

In this study, there was a higher trend in thyroid hormones-related clinical manifestations in infertile group (26.9%) in comparison to the fertile groups (12.8 - 16.0 %) however this was not significant (Table 1).

In one study, TSH levels are significantly higher in a population of women without known thyroid dysfunction and with unexplained infertility as compared with a control group [10].

The higher prevalence of menstrual cycle abnormalities in PI group (90.4 %) compared to NPF group (27.7%) in the current study was expected and

was similar to the results of other previous study [11]. The contribution of thyroid gland disorders in such abnormalities was indicated by the higher thyroid hormones-related manifestations among PI group (Table 1). Thyroid disorders were more evident in infertile group (38.5%) than fertile groups (17.0 to 18.0%) with a significant *P value* (34.6% hypothyroidism and 3.9% hyperthyroidism). These results would strengthen the possibility of the influence of thyroid disorder on the infertility status and comes in consistency with a previous study [11].

Tables 2 and 4 elucidate the effect of thyroid status on the menstrual cycle irregularities. The majority of infertile women (90.4%) were with abnormal menstrual cycle of which (34.6%) with hypothyroidism, (53.9 %) with euthyroidism and (1.9%) with hyperthyroidism. The impact of hypothyroidism on menstrual function and ovulation is related to numerous interactions of thyroid hormones with female reproductive system. At the cellular level, thyroid hormones synergize FSH to exert direct stimulatory effects on granulosa cell functions. Circulating thyroid hormone concentrations were associated with subtle differences in menstrual cycle function outcomes, particularly sex steroid hormone levels in healthy women. Results contribute to the understanding of the relationship between thyroid function and the menstrual cycle [12].

Morphological changes observed with follicles in hypothyroidism might be associated with elevated prolactin production that would inhibit secretion as

well as function of gonadotropin. Even in the absence of hyperprolactinemia, hypothyroidism by itself reduces the fertility since thyroid hormones are necessary for the optimal production of both estradiol and progesterone and thus in oocytes development [13].

Increased IL-6 production has been claimed as one of the mechanisms by which amiodarone exerts its toxic effect on the thyroid gland and in addition, albeit controversial, that IL-6 secretion is supported by TSH [14]. However, in this study, no significant differences were noticed in the IL-6 among all study groups which was similar to other study [15].

Hyperprolactinemia was only detected in the hypothyroid PI women (27.8% as seen in Table 5) a result that was in consistency with that of Turanker and his coworkers [16].

The main marker of AITD is the autoantibodies, including anti-thyroid peroxidase (anti-TPO), anti-thyroglobulin (anti-Tg) and few others. In spite of that anti-TPO can also be found in sera of about 10 % of normal adults, this type of autoantibodies is more likely to be of pathogenic importance than other autoantibodies as it can fix complement and may directly damage thyroid cells [17].

Few studies have investigated the prevalence of AITD in infertile women [18]; however, the interpretation of these data is difficult because of the selection bias, the retrospective setting and the types of control population. Results from this study (Table 5) revealed no significant difference of anti-TPO among all study groups which was inconsistent with one other study [19]. However, in all studies (including the current one), the underlying pathogenic mechanisms linking AITD with infertility do not remain largely speculative, as neither animal models nor *in vitro* data on this issue are available.

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References

1. Shin JJ, Jee BC, Kim H, Kim SH. Major Disease Prevalence and Menstrual Characteristics in Infertile Female Korean Smokers. *J Korean Med Sci.* 2017 Feb; 32(2):321-328.
2. Rajalakshmi R, Kalaivani S. Prevalence of asymptomatic infections in sexually transmitted diseases attendees diagnosed with bacterial vaginosis, vaginal candidiasis, and trichomoniasis. *Indian J Sex Transm Dis.* 2016 Jul-Dec; 37(2):139-142.
3. Comstock IA, Diaz-Gimeno P, Cabanillas S, Bellver J, Sebastian-Leon P, Shah M, Schutt A, Valdes CT, Ruiz-Alonso M, Valbuena D, Simon C, Lathi RB. Does an increased body mass index affect endometrial gene expression patterns in infertile patients? A functional genomics analysis. *Fertil Steril.* 2017 Mar; 107(3):740-748.e2.
4. Oiwa A, Minemura K, Nishio SI, Yamazaki M, Komatsu M. Implications of thyroid autoimmunity in infertile women with subclinical hypothyroidism in the absence of both goiter and anti-thyroid antibodies: lessons from three cases. *Endocr J.* 2019 Feb 28;66(2):193-198. doi: 10.1507/endocrj.EJ18-0350. Epub 2018 Dec 18.
5. Kumar S, Mahesh DM, Vignesh G, Sagili H, Dhanapathi H, Hamide A. Congenital hypothyroidism presenting as menorrhagia in adulthood. *J Assoc Physicians India.* 2013 ep; 61(9):660-1.
6. Plowden TC, Schisterman EF, Sjaarda LA, Zarek SM, Perkins NJ, Silver R, Galai N, DeCherney AH, Mumford SL. Subclinical Hypothyroidism and Thyroid Autoimmunity Are Not Associated With Fecundity, Pregnancy Loss, or Live Birth. *J Clin Endocrinol Metab.* 2016 Jun; 101(6):2358-65.
7. Feldthusen AD, Pedersen PL, Larsen J, Toft Kristensen T, Ellervik C, Kvetny J. Impaired Fertility Associated with Subclinical Hypothyroidism and Thyroid Autoimmunity: The Danish General Suburban Population Study. *J Pregnancy.* 2015; 2015:132718.
8. Kakuno Y, Amino N, Kanoh M, Kawai M, Fujiwara M, Kimura M, Kamitani A, Saya K, Shakuta R, Nitta S, Hayashida Y, Kudo T, Kubota S, Miyauchi A. Menstrual disturbances in various thyroid diseases. *Endocr J.* 2010; 57(12):1017-22.
9. Van Voorhis, B.J. & Stovall, D.W. Autoantibodies and infertility: a review of the literature. *Journal of Reproductive Immunology,* 1997; 33, 239–256.

1. Shin JJ, Jee BC, Kim H, Kim SH. Major Disease

10. Jokar TO,* Fourman LT, Lee H, Mentzinger K, and Fazeli PK. Higher TSH Levels Within the Normal Range Are Associated With Unexplained Infertility. *J Clin Endocrinol Metab.* 2018 Feb; 103(2): 632–639.
11. Roupia Z., Polikandrioti M, Sotiropoulou P, Faros E, Koulouri A, Wozniak G, Gourni M. Causes of infertility in women at reproductive age. *Health Science Journal*, 2009; 3(2): 80-87.
12. Melanie H J, Penelope P H, Lyndsey A D, Juliana W M, James S Kesner, Jessica B S, Metrecia L T and Michele M. Thyroid hormones and menstrual cycle function in a longitudinal cohort of premenopausal women. *Paediatr Perinat Epidemiol.* 2018 May; 32(3): 225–234.
13. Binita G, Suprava P, Mainak C, et al. Correlation of prolactin and thyroid hormone concentration with menstrual patterns in infertile women . *J. Reprod. Infertil.* 2009; 10 (3): 207 – 212.
14. Nakajima K, Yamazaki K, Yamada E, Kanaji Y, Kosaka S, Sato K, Takano K . Amiodarone stimulates interleukin-6 production in cultured human thyrocytes, exerting cytotoxic effects on thyroid follicles in suspension culture. *Thyroid*, 2001; 11:101–109.
15. Guven S et al .Serum IL-6 Level may have role in pathophysiology of unexplained infertility. *American Journal of Reproductive Immunology*, 2009; 62(4): 564-568.
16. Turankar S, Sonone K, Turankar A. Hyperprolactinaemia and its comparison with hypothyroidism in primary infertile women. *J Clin Diagn Res.* 2013 May; 7(5):794-6.
17. Poppe K, Glinoeer D, Van Steirteghem A, Tournaye H, Devroey P, Schiettecatte J, Velkeniers B. Thyroid dysfunction and autoimmunity in infertile women. *Thyroid.* 2002; 12(11): 997-100.
18. Janssen O E, Mehlmaner N, Hahns S et al. High prevalence of autoimmune thyroiditis in patients with polycystic ovary syndrome. *Europ J Endocrinol.* 2004; 150: 363-396.
19. Geva E, Lessing JB, Lerner-Geva L, Azem F, Yovel I, Amit A. The presence of antithyroid antibodies in euthyroid patients with unexplained infertility and tubal obstruction. *Am J Reprod Immunol*, 1997; 37: 184–186.

Comparison and Correlation of CD⁴T Cells Count with Viral Load Prior to and after Initiating HAART in HIV Iraqi Patients

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Abstracts

Background: HIV that cause of AIDS worldwide distributed and the CD⁴ positive T cells consider chief target cells of HIV. Elimination of HIV is the final goal of HIV treatment, but is rarely achieved.

Objective: As CD⁴T cells count using flow cytometry recently available, we investigated whether CD⁴T cells count can substitute for HIV plasma viral load RNA quantification in treatment monitoring through comparison the change in CD⁴ positive T cells count in patients with HIV previous to & afterward initiating "highly/active/antiviral/therapy" 'HAART' & correlation of CD⁴ T cells counts with viral load prior to and after initiating HAART in HIV Iraqi patients.

Method: Within this study, 25 HIV patients were prospectively analyzed. Patients have been treated with Bilateral/Didanosine, combination (Efavirenz, Emtricitabine, and Tenofovir Disoproxil Fumarate), in addition to Quadruple combination (Elvitegravir, cobicistat, emtricitabine, tenofovir alafenamide (TAF). Quantitative CD⁴T cells count were determined with flow cytometry. HIV plasma viral load RNA were determined with RT-PCR at given time points.

Results: We find weak negative non-significant "correlation" ($R \approx -0.267$, $p \approx 0.197$ & $R \approx -0.161$, $p \approx 0.441$) among CD⁴ positive T cells counts & 'plasma viral load of HIV RNA' in both treated and untreated patients respectively. More importantly, there was significant concordance between an increase or decrease of CD⁴T cells counts with HIV RNA plasma viral load prior and after initiating of treatment. However, the curve and increase of CD⁴T cells count enabled prediction of eventual of viral clearance.

Conclusions: Quantitative CD⁴T cells count cannot substitute for HIV RNA plasma viral load quantification during assessment of antiviral therapy: However, the increase of CD⁴ T cells count does predict eventual HIV RNA plasma clearance. A 2 log₁₀ increase to above 200 IU/ml is associated with a high likelihood of HIV plasma RNA clearance.

Keywords: Plasma viral load of HIV, CD⁴ positive T cell counts, Pearson correlation.

Introduction

HIV that cause of AIDS worldwide distributed

and the CD⁴ positive T lymphocytes consider the chief target cells of HIV. The reduction of CD⁴ positive T lymphocytes establishes a significant assurance of AIDS (Becerra *et al.*, 2016)⁽¹⁾. Monitoring of successful or failure of HAART against HIV mainly through RT-PCR (Stevens *et al.*, 2010)⁽²⁾. High number of HIV plasma viral loads mean destruction high number of CD⁴T cells and increase of opportunistic infection. Treatment with highly active antiviral therapy (HAART) may decrease of HIV plasma viral loads and increase of CD⁴ T cells⁽³⁾.

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Previous study showed that in many viral diseases viral load correlates with viral proteins in the serum; for example, a relationship was demonstrated between levels of HIV viral load and p24⁽⁴⁾. Likewise, a strong correlation has been reported between serum CMV DNA viral loads and cytomegalovirus (CMV) pp65-positive cells⁽⁵⁾ Authors previously described a good correlation between levels of hepatitis C virus (HCV) core antigen determined by the Trak-C assay and HCV RNA viral load⁽⁶⁻⁸⁾. Accordingly, few studies have looked into the character of CD⁴ positive T lymphocytes quantification relation to treatment response and its prediction^(9,10) In light of the fact that quantitative assays for CD⁴ T cells have recently become available through using of flowcytometry, the aim of this stud was to investigate the correlation and concordant increase and decrease of CD⁴ positive T lymphocytes relation to "plasma viral load of HIV RNA" in patients before & after therapy with "highly/active/antiviral/therapy" "HAART" that include Bilateral Didanosine, Triple combination (Efavirenz, Emtricitabine, and Tenofovir Disoproxil Fumarate) and Quadruple combination (Elvitegravir, cobicistat, emtricitabine, tenofovir alafenamide (TAF).

Method

Routine databaseself-control experimentalstudy were conducted for symptomatic HIV-1 infected patients during a period between 5October 2018 and 1 May 2019 in central public health laboratory. The mean age of HIV, patients were (34.50±11.45 years). Quantitative CD⁴ positiveT lymphocytes countusing flowcytometry & "plasma viral load of HIV RNA" viaRT-PCRhad been measured at particular time points prior therapy initiation of for all patients. Of 25 HIV patients, seven patients have been treated with Bilateral/Didanosine, 12 patients have been treated with Triple combination (Efavirenz, Emtricitabine, and Tenofovir Disoproxil Fumarate) and 6 patients have been treated with Quadruple combination (Elvitegravir, cobicistat, emtricitabine, tenofovir alafenamide (TAF)(n=6). The antiviral therapies were performed within Institutional Reviewer Board (IRB) approved treatment protocols. Anbar medical College approved the protocol. All patients provided informed consent for participation in the study.

HIVRNA plasma viral loads quantification: HIVRNA plasma viral loads quantification was performed within the routine clinical case using RT-PCR at given time points prior and after to initiation of therapy for all patients according to manufacturer criteria

(Abbott laboratories, North Chicago, Illinois, USA).

Quantitative CD⁴ levels: Quantitative CD⁴T cells countwere determined with flowcytometry at given time points prior and after to initiation of therapy for all patients as descried by manufacturer company.

Statistical Examination: Statistical investigation had been done though using the "SPSS/software 24.0". Correlations between CD⁴ positive T lymphocytes count & "plasma viral loads of HIV RNA"prior & after therapywere calculated according to Pearson correlation. Difference in the efficacy of antiviral therapies and between HIV RNA plasma viral before and after treatment and between CD⁴T cells count before and after treatment was tested byWilcoxon signed rank test. Difference in the concordance results was tested by chi-square test.

Results

Correlation of CD⁴positiveT lymphocytes count & "plasma/viral/loads of HIV/RNA" were negatively correlated to 25 HIV infected patients. Aweak negative correlation amongstCD⁴positiveT lymphocyt countwith 'plasmaa/viral/load of HIV/RNA' after treatment as determined by Pearson correlation(R=-0.161; p-values 0. 441) (Figure 1B).

To exclude that this weak negative correlation is a treatment effect, we next study only those patients who had a sample available before therapy. CD⁴positive T lymphocytescount & plasma/viral/loads of HIV/ RNA' had been correlated with 25 HIV patients prior to initiation of therapy (R=-0.267; p-values 0. 0. 197) (Figure 1A). In these treatment-naïve patients, there was a weak correlation of "plasmaa/viral/load of HIV/RNA' "with CD⁴positiveT cells count (Figure 1A).

Plasma CD⁴positive T lymphocytes count versus 'plasma viral load of HIV/RNA' before treatment showed that mean of CD⁴positive T cells & "plasma viral load of HIV/RNA' "was 321.56 (IU/ml,566148.33 (copy/ml) respectively, whereasmean of CD4 T cells count increased to 652.08 (IU/ml) andmean of HIV RNA plasma viral loads decrease to 288957.7273 (copy/ml)after treatment. Corr. Coef (r) between CD⁴positive T lymphocytess count & "plasma/viral/loads of HIV/ RNA"prior & after treatment with HAART were -0.267 (P=0. 197),-0.161 (P=0. 441) respectively using Pearson's correlation coefficients (r)

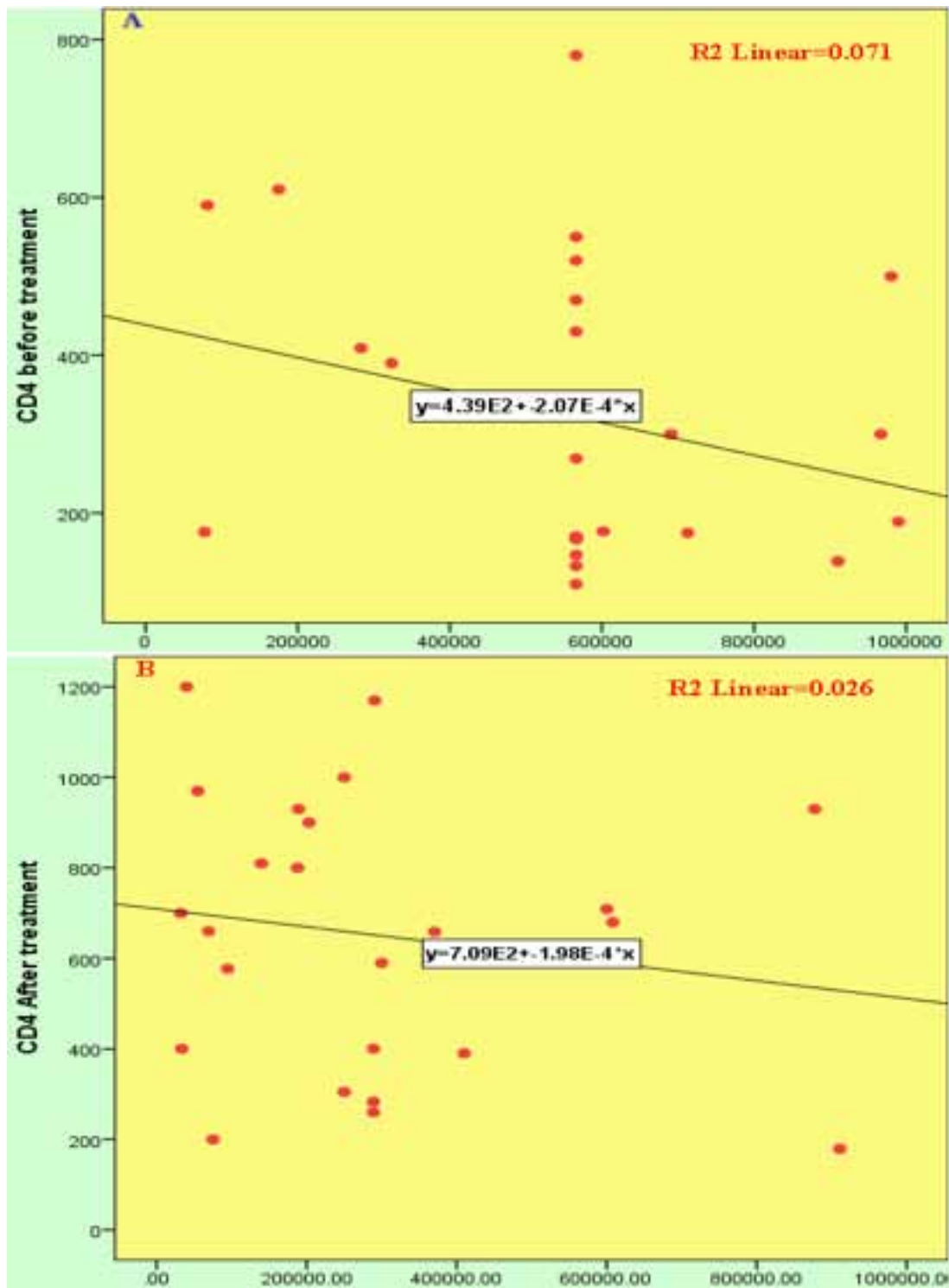


Figure 1: Correlation between CD⁴positive T lymphocytes count (IU/ml) & "plasma/viral/loads of HIV/RNA" in (A) untreated subjects (copy/ml) (B) in treated subjects (n = 25)

Concordance of increasing and decreasing of CD⁴positive T lymphocytes count with HIV RNA plasma viral loads throughout antiviral therapy.

We evaluated whether there is a negative relation concerning the increase or decrease of CD⁴positive T

lymphocytes count (**Figure 1**) in related to HIV RNA plasma viral loads changes.

This analysis revealed that before treatment, the minimum "plasma/viral/loads of HIV/RNA" & CD⁴positive T cells count were 77685 copy/ml, 110 IU/

ml respectively and the maximum "plasma/viral/loads of HIV/RNA"copy/ml and CD⁴positiveT cells count were 989866 copy/ml, 780 IU/ml respectively (the mean of "plasma/viral/loads of HIV/RNA"566148.33 copy/ml & CD⁴positiveT lymphocytes count 321.56 IU/ml),whereas after treatment the minimum "plasma/viral/loads of HIV/RNA"copy/ml and CD⁴positive T lymphocytes T cells counts were 32142.00 copy/ml, 179 IU/ml respectively & Maximum "plasma/viral/loads of HIV/RNA"copy/ml and CD⁴positive T lymphocytes T cells count were 910880.00 copy/ml, 1200 IU/ml respectively (the mean of "plasma/viral/loads of HIV/RNA"288957.7273 copy/ml & CD4 T cells count 652.08 IU/ml).

This analysis revealed that no significant difference for "plasma/viral/loads of HIV/RNA" & CD⁴positive T

lymphocytes count before and after treatment (P=0.197, P=0.441 respectively) (Table 1). This is weak negative correlation, through CD⁴positive T lymphocytes counts decreasing associated with increasing of "plasma viral load of HIV/RNA"before treatment & CD⁴positiveT lymphocytes count increasing associated with decreasing of "plasma viral load of HIV RNA"after treatment as shown in (Table1).

This study showed that statistically major change between "plasma viral load of HIV RNA"before & after treatment (P=0.001) and also there was statistically significant difference between CD⁴positiveT cells count before and after treatment via Wilcoxon test(P=0.001) (Table 1).

Table 1: Comparison of CD⁴positiveT lymphocytes count & "plasma viral loads of HIV RNA"before and after therapy(P=0.001)

Parameter	N	Minimum	Maximum	Mean	P.value
Plasma viral before treatment	25	77685	989866	566148.33	0.001
Plasma viral after treatment	25	32142.00	910880.00	288957.7273	
CD ⁴ T cells counts Before treatment	25	110	780	321.56	0.001
CD ⁴ T cells counts After treatment		179	1200	652.08	

This study showed that concordance between increasing of CD⁴positiveT lymphocytes count & decrease of "plasma/viral/loads of HIV/RNA"before and after treatment with different antiviral therapy as shown

in Table 2. However, this study was not extended to analysis the different strengths of different treatments, as too few patients at a scattered time points could be included prohibiting a real analysis(Table 2).

Table 2: Mean of CD⁴positive T lymphocytes count & "plasma/viral/loads of HIV/RNA"before and after treatment with different combination of antiviral therapy

Treatment type (No.)	CD4T cells counts before treatment	CD4 T cells counts after treatment	HIV RNA plasma viral loads before treatment	HIV RNA plasma viral loads after treatment
Bilateral/Didanosine (7)	244.00	569.71	675862.52	439544.2468
P. value before and after treatment	P=0.000		P≈0.001	
Triple combination(12)	353.08	609.50	535688.75	273481.7879
P. value before and after treatment	P=0.000		P≈0.001	
Quadruple combination(6)	349.00	833.33	499067.61	144225.3333
P. value before and after treatment	P=0.000		P≈0.002	
Total (25)	321.56	652.08	566148.33	288957.7273
P. value before and after treatment	0.459	0.226	0.375	0.079

Analyzing patients with an increase of CD⁴T cells counts to > 200IU/ml when analyzing all patients who achieved an CD⁴T cells counts > 200IU/ml (Figure 2), the graphical HIV RNA plasma viral loads near from negative organization suggests that there are three patients likely to eventually become HIV RNA plasma viral loads negative on the basis of a continuous sleep decline of their CD⁴T cells counts. Because of delay between performing this study and preparation for publication, we were able to proven this hypothesis.

Performing a multiple regression analysis including baseline CD⁴T cells counts baseline HIV RNA plasma viral loads in of the HIV patients and form of therapy revealed that an increase of CD⁴T cells counts to > 200IU/ml was the most relevant predictor of potential HIV RNA plasma viral loads clearance (P<0.001). A 2 log 10 increase to above 200 IU/ml is associated with a high likelihood of HIV plasma RNA clearance.

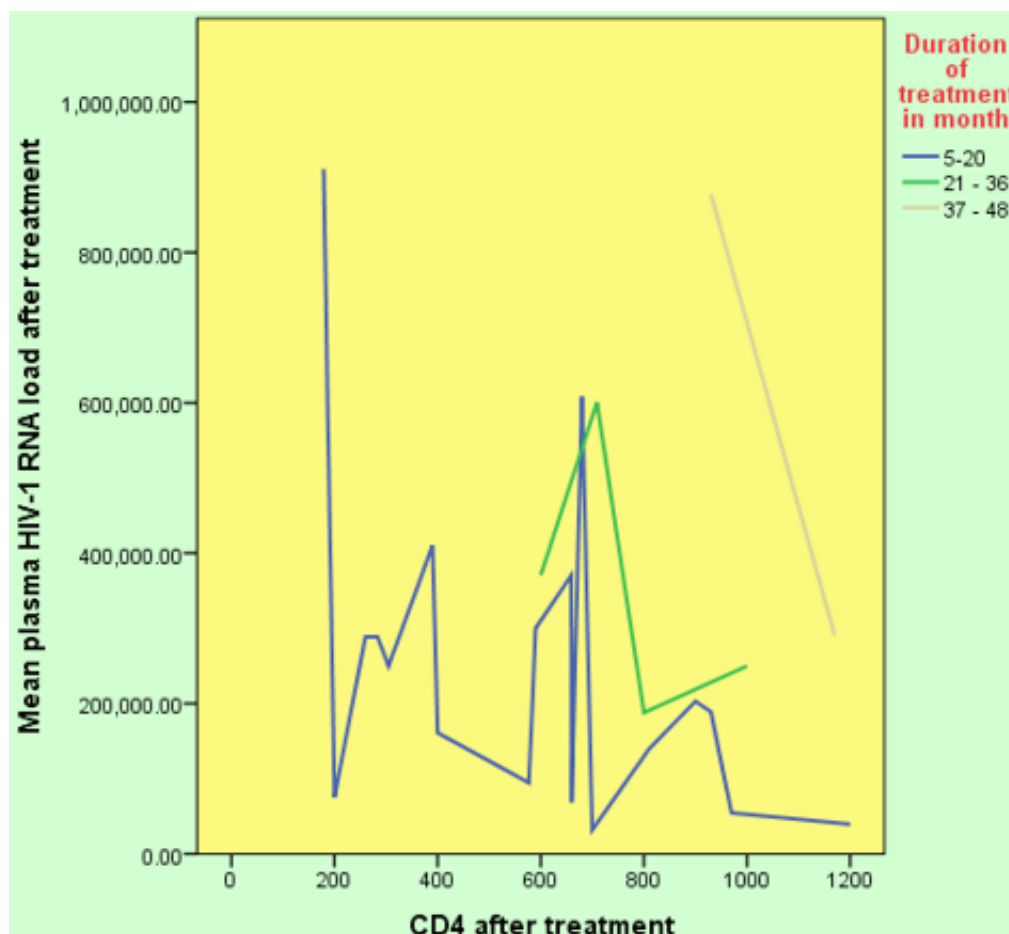


Figure 2: Increase in CD⁴TCD⁴positive T cells count with decrease "plasma/viral/loads of HIV/RNA"after antiviral therapy over time

CD⁴positive T cells count quantification can predict of HIV clearance: In the patients well to modern antiviral therapy, HIV RNA plasma viral loads will become undetectable at some point; however, it would be useful to be able to predict whether a patient might be eventually become with increasing CD⁴T cells counts or whether an alternative treatment approach is required (Figure 3 A,B).

Figure 3 A,B indicate the potential strength of CD⁴T cells counts in this regard: it enables further monitoring in in patients who have already become HIV RNA plasma viral loads negative. However, discriminating their CD⁴T cells counts curves indicates that only one of these patients will probably clear of CD⁴T cells counts in the long term (Figure 3, Figure 4).

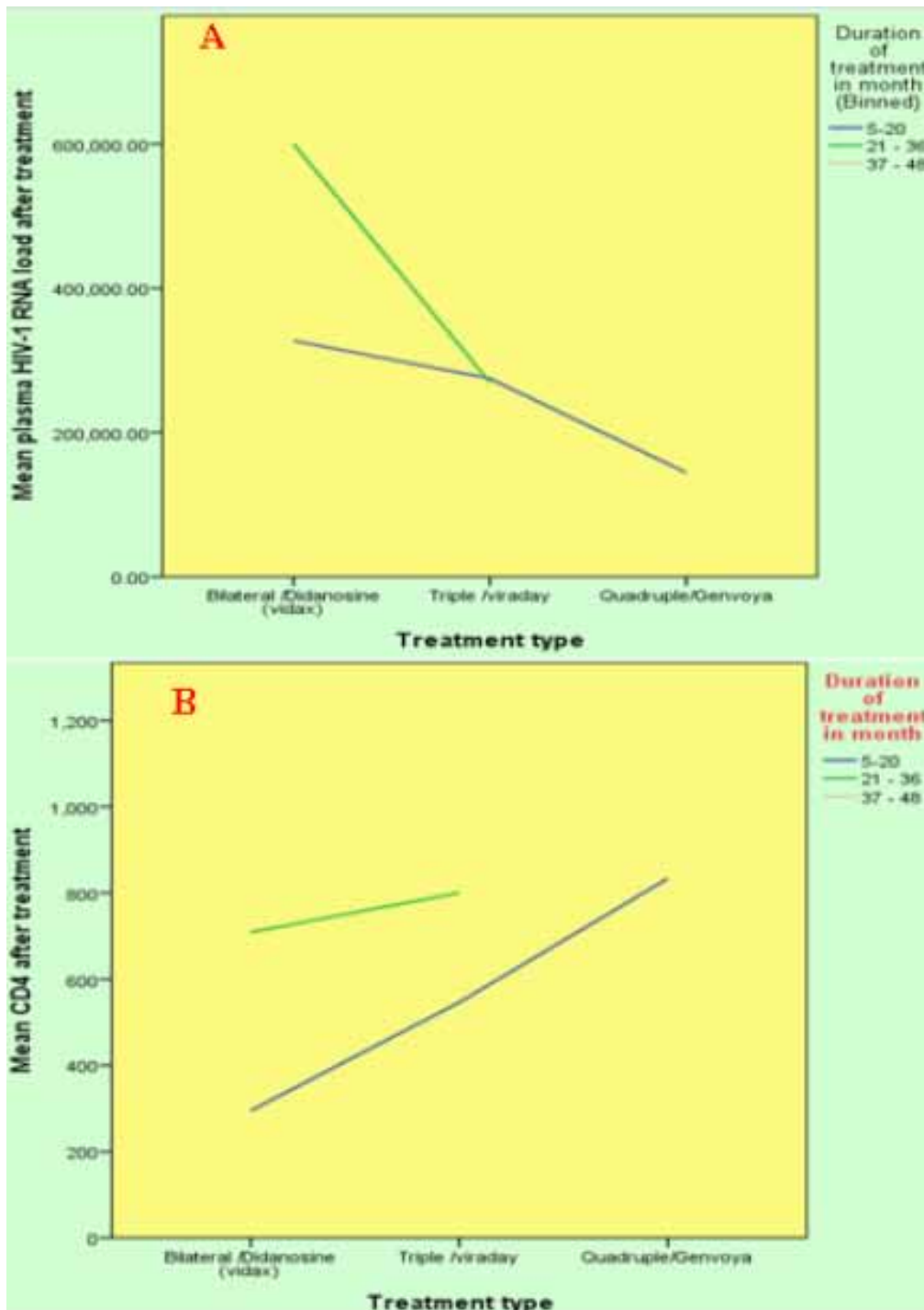


Figure 3: A. Decrease of HIV plasma viral loads with treatment B. Increase of CD⁴ T cells counts with different antiviral therapies over times

Discussion

In this study, we demonstrate only a poor negative correlation for CD⁴positive T cells count & "plasma viral load of HIV/RNA" could be shown. Poor negative correlation of "plasma viral load of HIV RNA" with

CD⁴positive T cells count could result from the HIV can infect other cells like macrophage, monocyte, dendritic cell and some rectal lining cells that express or contain low level of CD⁴ and core receptors (Brooks *et al.*, 2010). This study was consistent with a recent paper that did report a correlation but the R-value was only

0.26⁽¹²⁾, which is much lower than the r-value of > or = 0.5 usually accepted as correlation.

A slightly higher R-value of 0.37 was observed in CD⁴positive T cells positive HIV patients, where high CD⁴positiveT/cells count were also determined in HIV patients in the absence of detectable "HIV RNA plasma viral loads"⁽¹³⁾. Much higher correlations with R-values up to 0.79 were reported from America ⁽¹⁴⁾. When we tested 25 HIV patients with the flowcytometry assay, their CD⁴positiveT/cells count negatively correlated with "HIV/RNA/plasma/viral/loads" after therapy (R-values of - 0.161; P =0.441).

More important than the correlation of CD⁴T cells count with "HIV/RNA/plasma/viral/loads", is the concordance of decrease and increase of these parameters. In our analysis, good concordance was observed between vicissitudes in CD⁴positiveT cells count & "HIV/RNA/plasma/viral/loads". Similarly, disconcertant fluctuation of CD⁴positive count versus "HIV/RNA/plasma/viral/loads" described in/patients continuously responding to Quadruplecombination, patients developing resistance to Quadruplecombination⁽¹⁵⁾. As HIV RNA plasma viral loads mostly becomes undetectable during treatment with potent antivirals⁽¹⁵⁾, quantification of CD⁴positiveT cells count will be helpful to further monitor the therapeutic efficacy to antiviral therapies once "HIV RNA plasma viral loads" become negative, especially its aim is eventual HIV elimination . Our study shows for the first time the increase of CD⁴positiveT cells count during therapy with different antivirals predicts HIV clearance. We demonstrate here that CD⁴positive T cells kinetics can predict eventual HIV clearance, but also report that CD⁴positive T quantification cannot substitute for "HIV RNA plasma viral loads" quantification.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

1. Becerra JC, Bildstein LS, Gach JS. Recent insights into the HIV/AIDS pandemic. *Microb cell*. 2016;3(9):451.
2. Stevens WS, Scott LM, Crowe SM. Quantifying HIV for monitoring antiretroviral therapy in resource-poor settings. *J Infect Dis*. 2010;201(Supplement_1):S16–26.
3. Sharp PM, Hahn BH. Origins of HIV and the AIDS pandemic. *Cold Spring Harb Perspect Med*. 2011;1(1):a006841.
4. Knuchel MC, Tomasik Z, Speck RF, Lüthy R, Schüpbach J. Ultrasensitive quantitative HIV-1 p24 antigen assay adapted to dried plasma spots to improve treatment monitoring in low-resource settings. *J Clin Virol*. 2006;36(1):64–7.
5. Gouarin S, Vabret A, Scieux C, Agbalika F, Cherot J, Mengelle C, et al. Multicentric evaluation of a new commercial cytomegalovirus real-time PCR quantitation assay. *J Virol Method*. 2007;146(1–2):147–54.
6. Tillmann HL, Wiegand J, Glomb I, Jelineck A, Picchio G, Wedemeyer H, et al. Diagnostic algorithm for chronic hepatitis C virus infection: role of the new HCV-core antigen assay. *Z Gastroenterol*. 2005;43(01):11–6.
7. Pivert A, Payan C, Morand P, Fafi-Kremer S, Deshayes J, Carrat F, et al. Comparison of serum hepatitis C virus (HCV) RNA and core antigen levels in patients coinfecting with human immunodeficiency virus and HCV and treated with interferon plus ribavirin. *J Clin Microbiol*. 2006;44(2):417–22.
8. Daniel HDJ, Vivekanandan P, Raghuraman S, Sridharan G, Chandy GM, Abraham P. Significance of the hepatitis C virus (HCV) core antigen as an alternative plasma marker of active HCV infection. *Indian J Med Microbiol*. 2007;25(1):37.
9. Goicoechea M, Smith DM, Liu L, May S, Tenorio AR, Ignacio CC, et al. Determinants of CD4+ T cell recovery during suppressive antiretroviral therapy: association of immune activation, T cell maturation markers, and cellular HIV-1 DNA. *J Infect Dis*. 2006;194(1):29–37.
10. Witwer KW, Watson AK, Blankson JN, Clements JE. Relationships of PBMC microRNA expression, plasma viral load, and CD4+ T-cell count in HIV-1-infected elite suppressors and viremic patients. *Retrovirology*. 2012;9(1):5.
11. Brooks GF, Jawetz, Melnick, & Adelberg's medical microbiology/Geo. F. Brooks...[et al.]. New York; Chicago: McGraw Hill Medical,; 2010.

12. Pinto-Neto LFS, Vieira NFR, Soprani M, Cunha CB, Dietze R, Ribeiro-Rodrigues R. Lack of Correlation between Seminal and Plasma HIV-1 Viral Loads is Associated with CD4T Cell Depletion in Therapy-naïve HIV-1+ Patients. *Mem Inst Oswaldo Cruz.* 2002;97(4):563–7.
13. Chun T-W, Murray D, Justement JS, Hallahan CW, Moir S, Kovacs C, et al. Relationship between residual plasma viremia and the size of HIV proviral DNA reservoirs in infected individuals receiving effective antiretroviral therapy. *J Infect Dis.* 2011;204(1):135–8.
14. Iannello A, Tremblay C, Routy J-P, Boulassel M-R, Toma E, Ahmad A. Decreased levels of circulating IL-21 in HIV-infected AIDS patients: correlation with CD4+ T-cell counts. *Viral Immunol.* 2008;21(3):385–8.
15. Isaac LM, del Carmen M-GM, Guillermo V-RJ, Enrique R-MM, Sergio F-H, César R-B, et al. Effect of Tenofovir/Emtricitabine/Efavirenz with and without Chloroquine in Patients with HIV/AIDS C3: Double Blinded Randomized Clinical Trial. *J Pharmacovigil.* 2015;

Phytochemical Analysis, Antioxidant and Cytotoxic Potential of *Rumex Vesicarius* Extracts

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Abstract

Background: *Rumex vesicarius* L. (Polygonaceae), an edible plant, is documented to have many bioactive phytochemicals. In spite of its fully known antioxidant efficacy of crude extract *Rumex vesicarius* but still has the cytotoxicity.

Methodology: Methanolic extraction was prepared from leaves of *Rumex vesicarius* and was checked by GC/MS. Two parts of assay were classified as: First, evaluation of antioxidant potency using DPPH free radicals, while the two assays of MTT were utilized to determine anti-cancer effect on two different cell lines (MCF-7 and WRL68) for different concentrations (400 µg/ml, 200 µg/ml, 100 µg/ml, 50 µg/ml and 25 µg/ml and 6.2 µg/ml) and identified the efficacy of the crude extract on MCF-7 cell morphology, response to stress, potential of mitochondria and viability were evaluated with High Content Scanning and MTT.

Results: GC/MS analysis showed the methanol extract of *Rumex Vesicarius* L. had the highest percentage of L- Picolic Acid (35.98%), vitamin E (12.05%). *R. Vesicarius* showed antioxidant activity which increased when increasing of concentration, *R. Vesicarius* effect ranged from (75.935, 9.96%). The results showed *Rumex vesicarius* ability to inhibit cellular growth of both cell lines (WRL68 and MCF-7). This inhibition increases with increasing concentration. The best inhibition of growth was at 400 µg/ml of Methanol extract. The MCF-7 cell line was more effective than the WRL68 cell line, High Content Screening (HCS) assay of 200 µg/ml, 100 µg/ml, 50 µg/ml, 25 µg/ml and 12.5 µg/ml of methanol extract of *R. Vesicarius* showed toxic effects toward MCF-7 cell line after 24 hours of treatment in a dose-dependent manner with a reduction in the number of total cell count, reduction in the mitochondrial membrane potential (MMP), an increase in the nuclear intensity, increase in the membrane potential and increase in cytochrome C.

Conclusion: Methanolic extract of *Rumex vesicarius* contains many bioactive phytochemicals and appear to have cytotoxic and antioxidant activity against MCF-7 & WRL68 Cell line.

Keywords: *Rumex vesicarius*, Medicinal plants, Cytotoxicity, GC-MS analysis, High content screening.

Introduction

Rumex vesicarius is an annual plant, which belongs to family Polygonaceae, commonly known as "Bladder dock or Chukkakura or Khatta Palak"⁽¹⁾. *Rumex vesicarius* L is widely utilized as a medicinal herb or as food⁽²⁾. It is used in the treatment of liver defect, cancer, cardiovascular diseases and cataract⁽³⁾, digestive problems, toothache, nausea, pain, anti-inflammatory, antitumor as well as antischistosomal, and antimicrobial activities⁽⁴⁾. It was also found to have an

aphrodisiac effect⁽⁵⁾. Previous chemical investigations have shown the presence of polyphenols, flavonoids, carotenoids, tocopherols and ascorbic acid in different organs extract from *Rumex vesicarius* L.⁽⁶⁾, Polyphenols have essential roles such as functioning as antioxidant, anti-inflammatory, anticancer agents antimicrobial and antiallergic⁽⁷⁾.

Phenolic compounds, tannins, anthocyanin, and flavonoids can play a role in free radical scavenging inhibition through different mechanisms⁽⁸⁾. Plant leaves

are rich in ascorbic acid, citric acid and tartaric acid; it also contains glycoside, alkaloid, flavonoids, tannins and phenolic compounds⁽⁹⁾.

The aims of this study were to judge the antitumor and inhibitor activity of *R. vesicarius* crude extracts in vitro used the human breast glandular cancer MCF-7 and WRL68 cell line via has known of inhibitor activities against DPPH and evaluated the anti-tumour activity by using MTT assays and HCS for detective work the subsequent cellular parameters: membrane porosity, Cell viability, total nuclear intensity, cytochrome unlease and mitochondrial membrane potential changes.

Materials and Method

Materials: All artificial substances were luckily given from Al-Nahrain University, Department of Biotechnology. The MTT unit was nonheritable from desoxyribonucleic acid Biotechn, whereas 1 Cellomics® 1 Multiparameter of toxic three pack were obtained from ThermoScientifick (America).

Plant Materials: Leaves part of *R. vesicarius* were gathered from Ramadi University of Anbar, Iraq.

Methanolic Extraction: The leaves of *R. vesicarius* was dried and convert to powder form as 0.1 g then diluted with 400 mL alcohol methyl. Then homogenate the mixture using of a hot plate stirrer for four h at 37°C and then filtrated. The solvent was centrifugated with 1600 rpm at 10°C for 20 min. The alcoholic crude material was dried at 46°C using a rotary evaporator (Germany) under vacuum to get the dried extract.

GC/MS Analysis: The extract of *R. vesicarius* was analysis by [GC-2011 with equipped with DB-5MS column (30 m long zero.25 mm i.d. and 0.25 um thick, Agilent Technologies, J and W Scientific product, America)]. The temperature of gizmo and detector were set at 240 and 235°C, severally. The kitchen appliance temperature began with 100°C and raised till reach to 261°C for sixty sec. One µL of the sample as an aliquot of was injected, and gases noble gas was used. The mass varies scanned from [(50-550) amu. Identification of matter and essential oils was done by the Ministry of Science and Technology, Department of Water and Environmental analysis (using government agency Library)].

Evaluation of antioxidant activity using DPPH: activity of inhibitor was calculable utilizing DPPH as radical commonplace looking on an antecedent study⁽¹⁰⁾.

Cell culture: Adenocarcinoma of breast tissue MCF-7 cells⁽¹¹⁾. And Hepatic tissue WRL68 Cell Lines⁽¹²⁾ were purchased from USA Type Collection Cultured.

MTT cytotoxicity assay: The assay was done according to the instructions of the company, this test done according to⁽¹³⁾.

Multi-parameter cytotoxic assay: The double-parameter toxicity experiment was done on live the 5 orthogonal MCF-7 cells normally health index once received to *R. vesicarius* crude alcoholic extract in vitro. The parameters were: Viability cell count, total nuclear intensity, semi-permeable membrane porosity, mitochondrial membrane porosity and cytochrome unharness. Briefly, once twenty-four h of exposure with totally different concentrations of *R. vesicarius* alcoholic crude extract, the treated MCF-7 cells were stained with cell staining resolution for thirty min at 37°C. Cells were mounted, permeabilized and blocked before inquiring with primary cytochrome protein and secondary DyLight [649 conjugated goat anti-mouse IgG for sixty min] every. Plates were analyzed victimisation the ArrayScan HCS instrument.

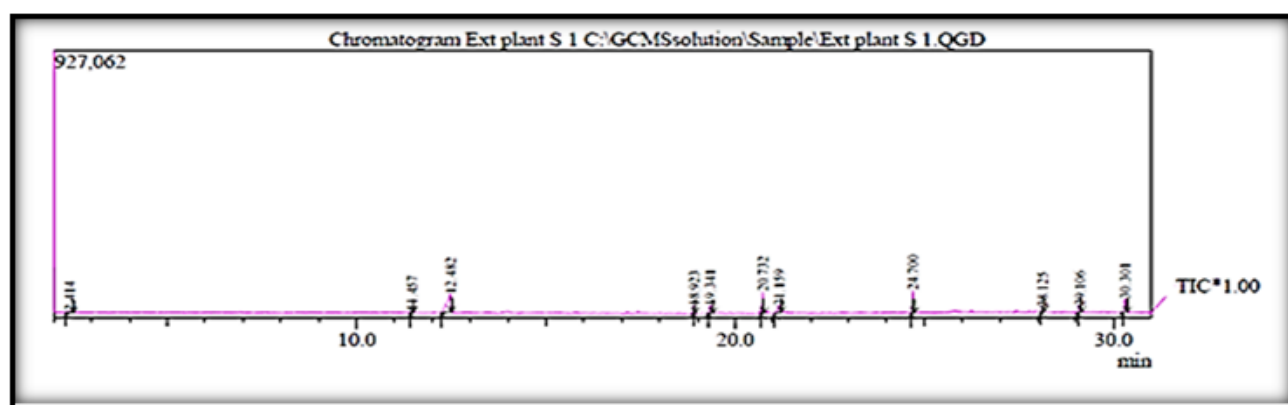
Statistical data: A unidirectional analysis of variance (ANOVA) was done to evaluate whether or not cluster different was vital. Knowledge was represent as (Mean ± standard error) (SE), and applied mathematics significances were allotted exploitation a Graph Pad Prism version.

Results

The analysis of GC/MS: methanol extract of *R. vesicarius* was showed in Table 1 and Fig 1, it appeared that the crud extract involves 24 active ingredients which represent 93.02%. The are many active ingredient was Pidolic Acid 35.98% followed by Phthalic acid, diisooctyl ester 12.09%, Vitamin E (α -Tocopherol) 12.05, 9,12,15-Octadecatrienoic acid, (Z,Z,Z)- 10.41%, 13-Tetradec-11-yn-1-ol 9.01%, n-Hexadecanoic acid 5.54%, γ -Tocopherol 4.75%, Formic acid, 1-methylethyl ester 3.59%, Hexadecanoic acid, 15-methyl-, methyl ester 2.87%, α -Tocopherol 2.67%, 2-Methoxy-4-vinylpheno 11.09%. In addition, 10 parts were present in an amount less than 1%. On the other aspect, 9.97% still non-identified constituent.

Table 1: Chemical contents of *R. vesicarius* alcoholic extract.

Peak	Rt (min)	Compound	Area %
1	2.41	Formic acid, 1-methylethyl ester	3.59
2	11.45	2-Methoxy-4-vinylphenol	1.09
3	12.48	Pidolic Acid - L	35.98
4	18.92	Hexadecanoic acid, 15-methyl-, methyl ester	2.87
5	19.34	n-Hexadecanoic acid	5.54
6	20.73	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-	10.41
7	21.15	13-Tetradecene-11-yn-1-ol	9.01
8	24.70	Phthalic acid, diisooctyl ester	12.09
9	28.12	Δ -Tocopherol	2.67
10	29.10	γ -Tocopherol	4.75
11	30.30	Vitamin E (α -Tocopherol)	12.05

**Fig. 1: GC-MS chromatogram of *Rumex vesicarius* L. of methanolic extract.**

Antioxidant activity of *Rumex vesicarius* crude extract: The DPPH scavenging effect of *R. vesicarius* methanol was estimated. Data showed that with elevating dose of extract, the scavenger percent activity was increase. The doses of plant that were utilized from 12.5-100 $\mu\text{g ml}^{-1}$ and the plant appear altitude antioxidant activity to give significantly value (75.63% at 100 $\mu\text{g ml}^{-1}$). The data in Table 1, when compared with ascorbic acid standard drug the free radical scavenging activity,

showed percent near from free radical scavenging activity, especially at high dose of extract with 50 and 100 $\mu\text{g ml}^{-1}$.

Cytotoxic result of *R. vesicarius* extracts on MCF-7 cells and WRL68 Cell Lines mistreatment the MTT assay: Our result results showed that *R. vesicarius* extract has poisonous effect on carcinoma cells in dose dependent manner (Table 2).

Table 2: Anticancer activity of methanolic extract of *R. vesicarius* leaves on MCF-7 and WRL68 cell lines by using MTT method after 24 h. of incubation at 37°C.

IC50	6.2	12.5	25	50	100	200	400	Concentration ($\mu\text{g/ml}^{-1}$)	
111.9	95.95 \pm 0.5	95.72 \pm 1.2	95.18 \pm 0.8	78.74 \pm 7.0	68.79 \pm 4.0	46.10 \pm 4.6	36.36 \pm 3.0	MCF7	Methanol extract
~ 12075	98.65 \pm 0.2	97.15 \pm 4.0	96.49 \pm 2.5	95.95 \pm 2.6	93.60 \pm 2.1	90.59 \pm 1.4	78.13 \pm 3.5	WRL68	

*MCF-7: human Breast cancer cell line, WRL68: human hepatic cell line.

Multi-parameter cytotoxic activity of *R. vesicarius* extract : Table (3) showed that 200 µg/ml of methanolic extract of *R. vesicarius* has cytotoxicity effect on MCF-7 cell line. 50 µg/ml, 25 µg/ml and 12.5 µg/ml Showed results close to those of the untreated cells which represent the negative control with a very few significant differences.

From (Table 3 and Fig 2) methanolic extract significantly increased the nuclear intensity of the MCF-7 cell line. This increasing was dose dependent (37.8 %, 8.2%, 7.3%, 2.8%, and 6.8% for 200µg/ml, 100µg/

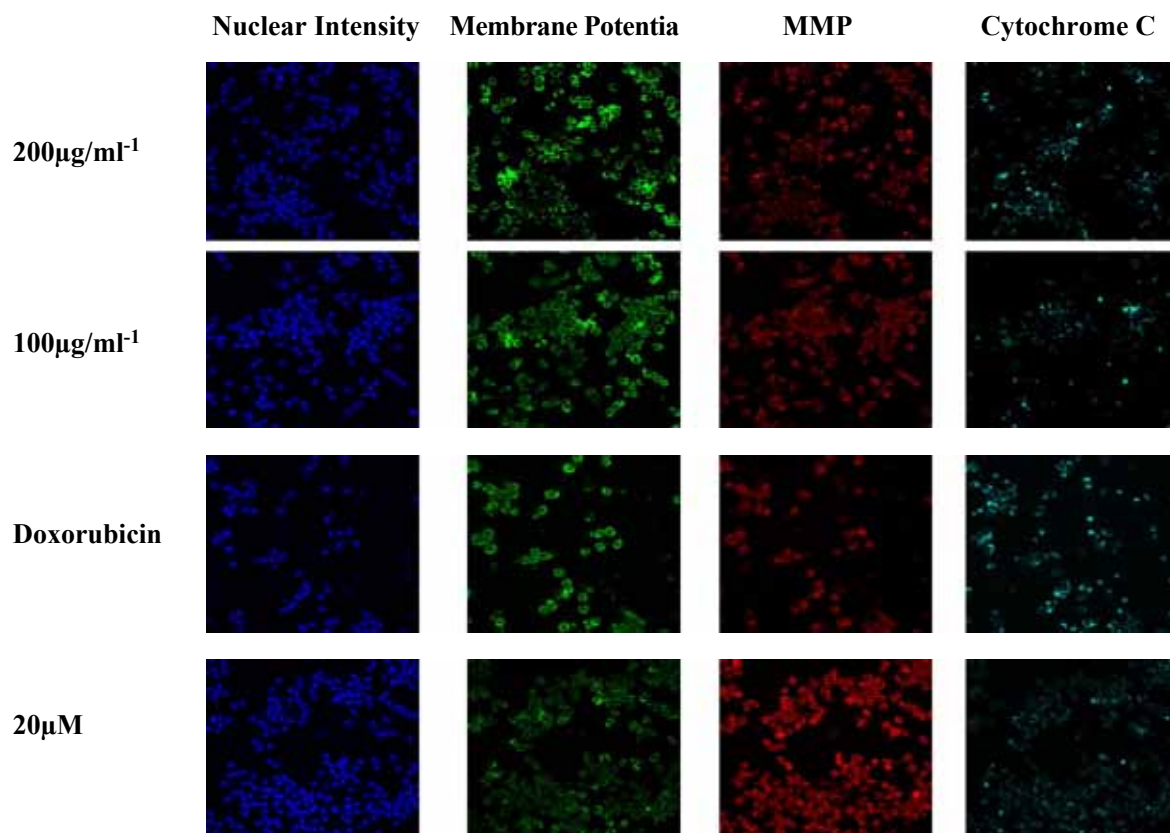
ml, 50µg/ml, 25µg/ml and 12.5µg/ml respectively). The highest percentage of increasing was 37.8% at 200µg/ml when compared with untreated. 100µg/ml, 50µg/ml, 25µg/ml, 12.5µg/ml did not show any significant differences from untreated.

Results of cytochrome C releasing listed in (Table 3) rise significantly with the increasing of concentration when compared with untreated and the percentages of increasing were 34.9%, 12.7%, 1.0%, 2.9% and 11.2% for 200 µg/ml and 100 µg/ml, 50 µg/ml, 25 µg/ml and 12.5 µg/ml respectively.

Table 3: Cytotoxicity effect of methanolic extract of *R. vesicarius* on multi cellular parameters after one day of overnight at 37 ° C.

Concentration (µg/ml ¹)	HCS Parameters (Mean±SD)									
	Valid Cell Count	IH*	NI**	IH*	MMP***	IH*	MP****	IH*	Cytochrome C	IH*
Dox 20	1411±90.6	58.6	878.5±72.83	101.7	245.0±26.87	307.5	250.3±26.87	87.3	732.0±166.3	73.2
Untreated	3411±163.4	0.00	435.5±34.65	0.00	552.5±96.87	0.00	133.6±19.10	0.00	422.5±87.8	0.00
200	2923±454.1	14.3	600.5±14.85	37.8	361.0±50.21	34.6	156.5±4.96	17.1	570.0±75.0	34.9
100	3238±226.4	5.0	471.5±33.23	8.2	426.5±45.70	22.8	151.5±20.52	13.3	476.5±173.6	12.7
50	3451±24.5	1.1	467.5±38.89	7.3	468.0±21.93	18.0	141.1±9.91	5.6	418.5±94.4	1.0
25	3441±186.8	1.0	423.0±50.92	2.8	505.0±21.93	8.5	140.1±11.32	4.8	410.0±37.9	2.9
12.5	3284±62.3	3.8	405.5±24.75	6.8	537.0±35.36	2.8	132.6±19.10	0.7	375.0±7.3	11.2

*In Hibiption, **Nuclear Intensity, ***Mitochondrial Membrane Potential, **** Membrane Potential



Vehicle Control: Fig.2: The analysis of *R. vesicarius* extract by HCS) after treated the (MCF-7) cell line after one day of incubation at 37°C. The stained cell by Hoechst 33342 (Blue)(Ex330nm/Em420nm) dye which capable of monitoring of cell loss, permeability dye nuclear morphology changes, (Green) (Ex491nm/Em509nm) for monitor the membrane permeability, MMP dye (red)(Ex552nm/Em576nm) for changes potential mitochondrial membrane (PMM) and with second antibody conjugated with DyLight TM for cytochrome C releasing.

Discussion

In the current report, analysis by GC-MS of the *R. vesicarius* extract of a plant of leaves showed the presence of 11 compounds. Pidolic Acid, Phthalic acid, diisooctyl ester, Vitamin E (α -Tocopherol), 9,12,15-Octadecatrienoic acid, (Z,Z,Z)-, 13-Tetradecyl-11-yn-1-ol, n-Hexadecanoic acid, γ -Tocopherol, Formic acid, 1-methylethyl ester, Δ -Tocopherol and 2-Methoxy-4-vinylphenol were consistent in the plant. These essential agent have all appear to have cancer inhibition, nematicide, pesticide, lubricant, antiandrogenic, insectifuge, 5-Alpha reductase inhibitor activity, antioxidant, hypochloesterolemic, haemolytic. There is a growing awareness in correlating the phytochemical compounds and their biological activities⁽¹⁴⁾.

Our study report the confirm of some of the essential agent identified by GC-MS analysis and their biological potency. Thus, this type of GC-MS analysis is the first line towards check the nature of active principles in this natural extract and this type of study will aid for further detailed in the future study.

Number of plants extract possess activity of antioxidant, which can limit the ROS in tissue and thus aid in a cure for different human problems, involves neoplasm, cardiovascular defect and inflammation⁽¹⁵⁾. The *R. vesicarius* crude extract is often utilized as a medicinal herb due to biological activities, thus antioxidant activities⁽¹⁶⁾. However, little report about the effect of extract on antitumor activity. The harmful effect recorded with MCF-7 cells received to alcoholic crude extract maybe because of the contents of bioactive compounds, where they believe to be the major active ingredients of *R. vesicarius* that lead to a huge variety of biological effects. Such results are in concord with⁽¹⁷⁾, which reported results showed that all extracts possessed concentration-dependent antioxidant activity.

In addition, this study concludes that *Rumex vesicarius* L possesses diverse therapeutic potentials that might be used as natural antioxidant and antibacterial⁽¹⁶⁾. Some studies demonstrate that all the extract of *Rumex vesicarius*. Shows the significant immunomodulatory effect on both humoral as well as cell-mediated immunity^(18; 19). On the other hand, the use of dye stained the membrane permeability and the elevated of intensity of this stains, especially at the massive dose received, potentiate the fact that the crude extract can stimulate apoptosis in MCF-7 cells, the permeability of plasma membrane increases may be because the loss integrity of membrane that dye penetrate cell easily^(20; 21).

The permeableness transition of mitochondrial pores, permitting the transition tiny molecules and ions, like atomic number 20 ions and therefore resulting in the decoupling of the metabolic process chain and unharness of cytochrome of the cytoplasm⁽²²⁾. Finally, the secrete of a cytochrome stimulate a variety of caspases, specifically amino acid proteases, that ar essentially support digestion of the cell from within in addition as degradation⁽²³⁾.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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References

1. Subramaniyan, V.; Shaik, S.; Bag, A.; Manavalan, G. & Chandiran, S. Potential action of *Rumex vesicarius* (L.) against potassium dichromate and gentamicin induced nephrotoxicity in experimental rats. *Pakistan journal of pharmaceutical sciences*, (2018). 31(2), 509-516.
2. El-Bakry, A.; Mostafa, H. & Alam, E. Antioxidant activity of *Rumex vesicarius* L. at the vegetative stage of growth. *Asian J Pharm Clin Res*, (2012). 5(4), 111-117.
3. Laouini, S. E. & Ouahrani, M.R. Phytochemical Screening, in Vitro Antioxidant and Antibacterial Activity of *Rumex Vesicarius* L. EXTRACT. *Scientific Study & Research. Chemistry & Chemical Engineering, Biotechnology, Food Industry*, (2017). 18(4), 367-376.

4. El-Hawary, S.A.; Sokkar, N. M.; Ali, Z. Y. & Yehia, M. M. A profile of bioactive compounds of *Rumex vesicarius* L. *Journal of food science*, (2011). 76(8), C1195-C1202.
5. Panduraju, T.; Rao, P. & Kumar, V. A study on antimicrobial activity of *Rumex vesicarius* Linn. *International Journal of Pharmacy and Technology*, (2009). 1(1), 21-25.
6. Mostafa, H.; Elbakry, A. & Eman, A. A. Evaluation of antibacterial and antioxidant activities of different plant parts of *Rumex vesicarius* L.(Polygonaceae). *Int. J. Pharm. Pharm. Sci*, (2011). 3(2), 109-18.
7. Kumar, N. & Goel, N. Phenolic acids: Natural versatile molecules with promising therapeutic applications. *Biotechnology Reports*, (2019). e00370.
8. Suleman, M.;Khan, A.; Baqi, A.; Kakar, M. S. & Ayub, M.. Antioxidants, its role in preventing free radicals and infectious diseases in human body. *Pure and Applied Biology (PAB)*, (2019). 28(1), 380-388.
9. Mittler, R. ROS are good. *Trends in plant science*, (2017). 22(1), 11-19.
10. Sabry, F. A. Antitumor and Antioxidant Activity of Different *Pelargonium graveolens* Crude Leaves Extracts. Ministry of Higher Education. (2016).
11. A Al-Tamimi, M., Rastall, B., & M Abu-Reidah, I. Chemical composition, cytotoxic, apoptotic and antioxidant activities of main commercial essential oils in Palestine: a comparative study. *Medicines*, (2016). 3(4), 27
12. Menshchikova, E.;Chechushkov, A.;Kozhin, P.;Kholshin, S.;Kandalintseva, N.;Martinovich, G. & Zenkov, N. Activation of Autophagy and Nrf2 Signaling in Human Breast Adenocarcinoma MCF-7 Cells by Novel Monophenolic Antioxidants. *Cell and Tissue Biology*, (2019). 13(2), 85-92.
13. Shing, C. *Coriulus versicolor*. *Herbs and Natural Supplements, Volume 2: An Evidence-Based Guide*, (2015). 2, 243.
14. Hariprasad, P. & Ramakrishnan, N. (2011). GC-MS analysis of *Rumex vesicarius* L. *IJDDR* 2011; 3 (2): 256, 263.
15. Krishnaiah, D.;Sarbatly, R. & Nithyanandam, R. A review of the antioxidant potential of medicinal plant species. *Food and bioproducts processing*, (2011). 89(3), 217-233.
16. Manure, J. & Naikwade, N. Immunomodulatory activity of leaves of *RUMEX vesicarius* LINN. and *symplocos racemosa* ROXB. *International journal of pharmaceutical sciences and research*, (2018). 9(4), 1537-1544.
17. Tukappa, A. & Londonkar, R. L. Evaluation of antibacterial and antioxidant activities of different methanol extract of *Rumex vesicarius* L. *Am. J. Drug Discov. Dev*, (2013). 3, 72-83.
18. Abraham, V. C.;Towne, D. L.;Waring, J. F.;Warrior, U. & Burns, D. J. Application of a high-content multiparameter cytotoxicity assay to prioritize compounds based on toxicity potential in humans. *Journal of biomolecular screening*, (2008). 13(6), 527-537.
19. Hamzah, K. J. & Hasso, S. A. Molecular prevalence of *Anaplasma phagocytophilum* in sheep from Iraq. *Open Veterinary Journal*, (2019). 9(3), 238–245.
20. Ye, N.;Qin, J.;Shi, W.;Liu, X. & Lin, B. Cell-based high content screening using an integrated microfluidic device. *Lab on a Chip*, (2007). 7(12), 1696-1704.
21. Jasim, A. M.;Hasan, H. F. & Awady, M. J. Preparation of Vorapaxar loaded with Vitamin E TPGS and PVA emulsified PLGA nanoparticles In vitro studies. *Research Journal of Pharmacy and Technology*, (2019). 12(9), 4503-4510.
22. Susin, S. A.;Zamzami, N. & Kroemer, G. Mitochondria as regulators of apoptosis: doubt no more. *Biochimica et Biophysica Acta (BBA)-Bioenergetics*, (1998). 1366(1-2), 151-165.
23. Tafani, M.;Karpinich, N. O.;Hurster, K. A.;Pastorino, J. G.;Schneider, T.;Russo, M. A. & Farber, J. L. Cytochrome c release upon Fas receptor activation depends on translocation of full-length bid and the induction of the mitochondrial permeability transition. *Journal of Biological Chemistry*, (2002). 277(12), 10073-10082.

Is Irisin a Phenotypic Parameter in Over-Weight Women with Polycystic Ovary Syndrome?

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Abstract

Polycystic ovary syndrome (PCOS) is the most public hormonal chaos and the cause of the infertility in the women of reproductive age, offering a varied set of clinical parameters. Irisin had assumed to have a duty in metabolic conditions and PCOS. However, the correlation between irisin and metabolic conditions in PCOS is not clear. The purpose of this control cases study was to evaluate the plasma levels of Irisin in women with overweight PCOS and its correlations with other phenotypic parameters of PCOS. The study involved 90 PCOS women and 40 control healthy women. The PCOS women were diagnostic by BMI as overweight. Statistical analysis was performed by using the SAS (2012) program¹. Chief results measure was to determine the plasma Irisin levels in overweight cases. In addition, some phenotypic and anthropometric parameters including BMI, lipid profile, sex hormones, FBG, Insulin, and HOMA-IR had measured in groups of the study. Results of fasting Irisin levels showed significantly elevated differences in overweight PCOS women as compared to the levels in overweight control women ($P < 0.047$). The plasma Irisin levels in overweight PCOS women showed significantly positively correlated with BMI, FBG, HOMA-IR, FSH, lipid profile except HDLc and LH/FSH ratio exhibited significantly negatively correlated ($P < 0.01$). Even though there is as until now no proof for a causal association between irisin and PCOS, it is potential that the alterations in Irisin concentrations may be considered as a phenotypic parameter for the diagnosis or development of PCOS, and may act a new PCOS test to follow this syndrome under diverse management of treatments.

Keywords: Polycystic ovary syndrome, PCOS, irisin, BMI, IR, HOMA-IR, lipid profile, myokines, anovulation, infertility.

Introduction

Polycystic ovary syndrome (PCOS) is not a disease, It is a syndrome that means a group of phenotypic characteristics that may increase in severity or diminish in appearance, variously linking with lack a fixed reason on which the recognition could be used "gold standard"². PCOS is a complex trouble state includes a set of signs. The most chief of these signs are hyperandrogenemia (HA),

Ovulatory Dysfunction (oligo- or anovulation) (OD) and polycystic ovary morphology³. However the etiology of PCOS is up to now unknown, but an collaboration of genetic factors and environmental factors may play synergistically as the dominant effect to its clinical parameters appearance⁴. Irisin was announced for the first once in 2012 by the investigation set of Spiegelman from Harvard University, which were exposed and described a small peptide produced in skeletal muscles (SkM) in the company of action-encouraged and is potent to achieve browning fatty⁵. Irisin term derives from the Greek go-between spirits Iris, which encoded by fibronectin type III domain containing 5 (*FNDC5*) gene. It is a novel hormone-like glycosylated protein, which is mainly yielded by physical exercise (PhE) of SkM tissues. Though practice has been displayed to rise

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Irisin level circulation, the stimulate of PhE strength on Irisin production still vague^{6,7}. It is expressed in the ovarian tissue, placenta and newborn rope serum. Besides, Irisin is a fresh and hopeful hormone for IR and T2DM^{8,9}. In another hand PCOS is the HA, IR state-owned, similar fatness and T2DM¹⁰. While earlier investigations have recommended an association the Irisin and the metabolic factors related with fatness and T2DM, the outcomes have been varying¹¹. Several studies proved this Irisin ranks were meaningfully upper in PCOS than normal females and linked with HA advised that Irisin can be a key analyst of HA, metabolic syndrome (MetS) and IR^{12,13}. Despite the fact that some additional investigations stated parallel^{14,15} or lesser¹⁶ blood Irisin ranks in PCOS than non-PCOS females.

Study Design and Subjects: The current dissertation is a case-control study related to females with PCOS as cases and controls with regular reproductive past. The Rotterdam criteria-2003³ was assumed to ninety PCOS females (n=90)withages reached between (19-42) years with a Mean±SE (29.16 ± 0.53) years.PCOS and control groups were identified by a gynaecologists of the “Fertility Center in AL-Sadder Teaching Hospital in Najaf Governorate”, and “Infertility center in Maternity and Children Hospital in Babylon Governorate”, Iraq during the duration from July 2017 to August 2018. The identification was complete agreeing the criteria of identification of PCOS. Doubted PCOS causes were omitted. Controller group has forty (n=40) womenwhich ages reached between (19-42 years) with a Mean±SE(27.40 ± 0.88) were nominated deprived of any past of OD,sterility, and clinical marks of HA.They have regular menstruation period, with normal ovaries as they were observed by the gynaecologists which no take contraceptive, not smokers with no past of somewhat disease.

Intended for the controller set they were the age,weight and length. Females agonized from diseases DM,autoimmune diseases, thyroid maladies, high blood pressure, CVD, prolonged kidney diseases and had historical of using someadditional therapy for example Hypolipidemic agents, medications that prevent pregnancy or ovulation inducement, cortisone-like medicines (corticosteroids), lowering the glucose level and treating hypertension medications within6 months were omitted. All causes of PCOS and healthy females were married. The measurements in these

studies included anthropometry [length, waist to hip ratio (WHR), and BMI]. All of the investigated sets were verified within 2nd to 3rd days of menstruation.The lab experiments were passed out in laboratories of the College of Pharmacy at the University of Kufa.

Blood Samples Collection: Venous blood samples were gathered from females’ donors to the study (n=130, PCOS and controls). Plasma samples were got after centrifugation EDTA tubes as stated by standard protocols,thenstored at -20 °C until examination¹⁷.

Phenotypes Analysis: Irisin, FSH, LH, E2, PRL, and Insulin concentrations were quantified fixed in employing trade enzyme-linked immunosorbent (ELISA) assays (Elabscience, USA), and (abcam, U.S.A) for Total Testosterone levels, in conformity with the maker’s instructions.The concentrations of fasting; TG, cholesterol, LDLc, VLDLc, HDLc, and FBG were measured by traditional spectrophotometry procedures(Biolabo, France),in conformity with the maker’s instructions.Besides anthropometric measures; WHR and BMI¹⁸. The homeostatic model assessment (HOMA-IR)¹⁹, lipids ratios, and LH/FSH ratio were calculated.

Statistical Analysis: The statics that works in the current study are (mean ±SD, the T-test for two variables and ANOVA test by the SAS (2012) program¹. The ranking of significance, which applied, was ≤ 0.05 in all-statistical analysis. Estimate of correlation coefficient between variables in this study.

Results

The phenotypes results of Irisin levels in PCOS group compared to the control showed high levels with significant differences (P<0.047). In addition, all of the following phenotypes: FBG, Insulin, HOMA-IR, lipids profile, lipids ratios, sex hormones, LH/FSH ratio and BMI showed highly significant differences at least (P<0.001) between the study categories(**Table I**). The correlation study carried out between irisin and the rest phenotypes results. Irisin correlation showed positivelysignificant correlation with BMI, lipid profile, FSH, FBG, HOMA-IR. While Irisin showed negatively significant correlation with LH/FSH ratioand HDLc. However the rest of thephenotypes gave a variety andpredictable of correlation relationships(**Table II**) (**Table III**)(**Table IV**).

Table I. The Comparison Between phenotypes features of Control and PCOS Patients' Groups

Parameters	Mean \pm SE		P-Value
	Control	Patients	
Number	40	90	-
Irisin (ng/ml)	9.11 \pm 0.39	9.67 \pm 0.22	0.047*
Age (year)	27.40 \pm 0.88	29.16 \pm 0.53	0.078 NS
WHR	0.810 \pm 0.011	0.827 \pm 0.006	0.134 NS
BMI (kg/m ²)	25.00 \pm 0.31	29.80 \pm 0.42	0.0001 ***
FSH (mIU/ml)	6.70 \pm 0.30	5.39 \pm 0.17	0.0001***
LH (mIU/ml)	4.75 \pm 0.29	9.71 \pm 0.23	0.0001***
LH/FSH ratio	0.760 \pm 0.06	2.093 \pm 0.11	0.0001***
E2 (pg/ml)	32.52 \pm 1.64	25.37 \pm 1.25	0.001***
Prolactin (ng/ml)	12.25 \pm 0.46	31.24 \pm 0.89	0.0001***
Total Testosterone (nmol/L)	1.005 \pm 0.07	2.971 \pm 0.10	0.0001***
FBG (mg/dl)	91.17 \pm 1.19	117.03 \pm 2.01	0.0001***
Insulin (ng/ml)	6.96 \pm 0.07	20.7 \pm 0.6	0.0001***
HOMA-IR	0.261 \pm 0.01	1.74 \pm 0.06	0.0001***
Triglyceride(mg/dl)	119.47 \pm 5.53	159.96 \pm 3.11	0.0001***
Total Cholesterol(mg/dl)	170.55 \pm 2.90	187.16 \pm 3.58	0.0043**
HDLc(mg/dl)	61.55 \pm 1.67	50.40 \pm 0.76	0.0001***
VLDLc(mg/dl)	23.90 \pm 1.12	32.01 \pm 0.61	0.0001***
LDLc(mg/dl)	85.02 \pm 3.59	104.78 \pm 3.79	0.0017**
Cholesterol/HDLc Ratio	2.86 \pm 0.10	3.84 \pm 0.12	0.0001***
LDLc/HDLc Ratio	1.462 \pm 0.09	2.182 \pm 0.11	0.0001***
VLDLc/HDLc Ratio	0.405 \pm 0.02	0.656 \pm 0.02	0.0001***

SE: Standard Error, P-Value: Probability, **: ($P < 0.01$), ***: High Significant ($P < 0.001$), NS: Non-Significant, Numbers: numbers of group, WHR: Waist/Hip Ratio, BMI: Body Mass Index, FSH: Follicular Stimulating Hormone, LH: Luteinizing Hormone, E2: Estradiol, FBG: Fasting Blood Glucose, HOMA-IR: Homeostatic Model Assessment of Insulin Resistance, HDLc: High Density Lipoprotein Binding Cholesterol, VLDLc: Very Low Density Lipoproteins Binding Cholesterol, LDLc: Low Density Lipoprotein Binding Cholesterol.

Table II. The Correlation of Irisin, Sex Hormones, and lipid profile Levels with Anthropometric and Glycemic Parameters in PCOS Patients

Parameters	Correlation Coefficients-r					
	BMI	FBG	HOMA-IR	Insulin	WHR	Age
Irisin	0.40**	0.29 **	0.17 *	0.04 NS	0.09 NS	0.14 NS
FSH	0.30 **	-0.05 NS	-0.12 NS	-0.18 *	0.04 NS	0.27 **
LH	0.06 NS	0.24 **	0.39 **	0.43 **	-0.02 NS	0.03 NS
LH/FSH ratio	-0.17 NS	0.12 NS	0.25 **	0.31 **	-0.05 NS	-0.11 NS
E2	-0.01 NS	-0.02 NS	-0.19 *	-0.27 **	0.14 NS	-0.12 NS
Prolactin	0.41**	0.46 **	0.51 **	0.46 **	0.09 NS	0.04 NS
Total Testosterone	0.49 **	0.48 **	0.56 **	0.50 **	0.14 NS	0.08 NS
Triglyceride	0.74**	0.49 **	0.48 **	0.35 **	0.26 **	0.13 NS
Total cholesterol	0.66**	0.38 **	0.28 **	0.14 NS	0.28 **	0.07 NS
HDLc	-0.50**	-0.42 **	0.39 **	-0.31 **	-0.18 *	-0.23 **
VLDLc	0.74**	0.48 **	0.34 **	0.35 **	0.26 **	0.13 NS
LDLc	0.59**	0.36 **	0.51 **	0.14 NS	0.25 **	0.11 NS
Cholesterol/HDLc Ratio	0.68**	0.45 **	0.39**	0.23 **	0.24 **	0.16 *

*: ($P < 0.05$), **: ($P < 0.01$), NS: Non-Significant, WHR: Waist/Hip Ratio, BMI: Body Mass Index, FSH: Follicular Stimulating Hormone, LH: Luteinizing Hormone, E2: Estradiol, FBG: Fasting Blood Glucose, HOMA-IR: Homeostatic Model Assessment of Insulin Resistance, HDLc: High Density Lipoprotein Binding Cholesterol, VLDLc: Very Low Density Lipoproteins Binding Cholesterol, LDLc: Low Density Lipoprotein Binding Cholesterol.

Table III. Correlation of Irisin and Hormones Levels with Lipid Profile Levels in PCOS Patients

Parameters	Correlation coefficients –r						
	FSH	LH	LH/FSH	E2	Prol	Total Testo	Irisin
Triglyceride	0.13 NS	0.15 NS	-0.02 NS	-0.13 NS	0.38 **	0.47 **	0.43 **
Total chol	0.23 **	0.04 NS	-0.08 NS	0.07 NS	0.25 **	0.27 **	0.25 **
HDLc	-0.04 NS	-0.29 **	-0.12 NS	0.16 *	-0.41 **	-0.39 **	-0.24 **
VLDLc	0.12 NS	0.15 NS	-0.01 NS	-0.13 NS	0.39 **	0.47 **	0.43 **
LDLc	0.19 *	0.09 NS	-0.03 NS	0.05 NS	0.27 **	0.26 **	0.21 **
Chol/HDLc Ratio	0.17 *	0.15 NS	-0.02 NS	-0.02 NS	0.35 **	0.38 **	0.32 **

SE: Standard Error, P-Value: Probability, * (P<0.05), ** (P<0.01), NS: Non-Significant **: (P<0.01), NS: Non-Significant, FSH: Follicular Stimulating Hormone, LH: Luteinizing Hormone, E2: Estradiol, Prol: Prolactin, Total Testosterone: Total testosterone, Chol: Cholesterol, HDLc: High Density Lipoprotein Binding Cholesterol, VLDLc: Very Low Density Lipoproteins Binding Cholesterol, LDLc: Low Density Lipoprotein Binding Cholesterol.

Table IV. Correlation Irisin with Other Hormones Levels in PCOS Patients

Hormones	Correlation -r with Irisin	Level of sig.
FSH	0.26	**
LH/FSH Ratio	-0.29 **	**
LH	-0.15	NS
E2	-0.05	NS
Prolactin	0.14	NS
Total Testosterone	0.13	NS

P-Value: Probability **: (P<0.01), NS: Non-Significant, FSH: Follicular Stimulating Hormone, LH: Luteinizing Hormone, E2: Estradiol.

Discussion

This study showed that PCOS women have high irisin concentrations in overweight PCOS women when compared to corresponding controls even after adjusting for confounding issues as age, and WHR. These changes are parallel with the main presentation of HA lead to appearance PCOS, and are related to elevated levels of LH, LH/FSH ratio and lipid profile. Therefore, irregular of irisin levels could illustrate novel PCOS phenotypes. Additionally, our information recommended that these changes might participate in the progress of comorbidities, such as IR, dyslipidemia, and obesity in PCOS women. In spite of the pathway by it the irisin levels are high in PCOS women continue investigated, this information shows that the metabolizing forms of PCOS women are different in nature from those of T2D or obesity patients even though PCOS women have a trend advanced T2D in future^{20,21}. The determination of high irisin levels in PCOS women is harmonic with modern information revealed high irisin levels in cases with MetS²². In view of the fact that irisin remarkably elevates energy expenditure in brown and beige adipose

tissues, it is feasible that irisin raised in PCOS women as a defensive system act against surplus energy influx²³. Otherwise, the raised irisin level can act as an “irisin resistance” condition^{24,25}, similar that of IR in that elevated Insulin levels failed to influence the required result.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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References

1. SAS. 2012. Statistical Analysis System, User's Guide. Statistical. Version 9.1th ed. SAS. Inst. Inc. Cary. N.C. USA.
2. Dewailly D. Diagnostic criteria for PCOS: Is there a need for a rethink? Best Pract Res Clin Obstet

- Gynaecol. 2016;37:5-11. doi:10.1016/j.bpobgyn.2016.03.009
3. Fauser BCJM. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril.* 2004;81(1):19-25. doi:10.1016/j.fertnstert.2003.10.004
 4. Palioura E, Diamanti-Kandarakis E. Polycystic ovary syndrome (PCOS) and endocrine disrupting chemicals (EDCs). *Rev Endocr Metab Disord.* 2015;16(4):365-371. doi:10.1007/s11154-016-9326-7
 5. Boström P, Wu J, Jedrychowski MP, et al. A PGC1- α -dependent myokine that drives brown-fat-like development of white fat and thermogenesis. *Nature.* 2012;481(7382):463-468. doi:10.1038/nature10777
 6. Manish G, Sukriti K, Gupta A, Keshav GK, Syed RM. Irisin : A clue for metabolic disorders. 2018;(1):5-9.
 7. Ghanbari-Niaki A, Saeidi A, Ahmadian M, et al. The combination of exercise training and Zataria multiflora supplementation increase serum irisin levels in postmenopausal women. *Integr Med Res.* 2018;7(1):44-52. doi:10.1016/j.imr.2018.01.007
 8. Zhang LJ, Xie Q, Tang CS, Zhang AH. Expressions of irisin and urotensin II and their relationships with blood pressure in patients with preeclampsia. *Clin Exp Hypertens.* 2017;39(5):460-467. doi:10.1080/10641963.2016.1273945
 9. Salem H, Yatchenko Y, Anosov M, et al. Maternal and neonatal irisin precursor gene FNDC5 polymorphism is associated with preterm birth. *Gene.* 2018;649:58-62. doi:10.1016/j.gene.2018.01.097
 10. Polyzos SA, Anastasilakis AD, Efstathiadou ZA, et al. Irisin in metabolic diseases. *Endocrine.* 2018;59(2):260-274. doi:10.1007/s12020-017-1476-1
 11. Foda AA, Foda EA, Abel-Aal I. Serum Irisin levels as a marker in some phenotypes of PCOS. *Middle East Fertil Soc J.* 2017. doi:10.1016/j.mefs.2017.09.005
 12. Condorelli RA, Calogero AE, Di Mauro M, et al. Androgen excess and metabolic disorders in women with PCOS: beyond the body mass index. *J Endocrinol Invest.* 2018;41(4):383-388. doi:10.1007/s40618-017-0762-3
 13. Adamska A, Karczewska-Kupczewska M, Lebkowska A, et al. Serum irisin and its regulation by hyperinsulinemia in women with polycystic ovary syndrome. *Endocr J.* 2016;63(12):1107-1112. doi:10.1507/endocrj.EJ16-0249
 14. Pukajło K, Łaczmański Ł, Kolackov K, et al. Irisin plasma concentration in PCOS and healthy subjects is related to body fat content and android fat distribution. *Gynecol Endocrinol.* 2015;31(11):907-911. doi:10.3109/09513590.2015.1065482
 15. Gao S, Cheng Y, Zhao L, Chen Y, Liu Y. The relationships of irisin with bone mineral density and body composition in PCOS patients. *Diabetes Metab Res Rev.* 2016;32(4):421-428. doi:10.1002/dmrr.2767
 16. Abali R, Temel Yuksel I, Yuksel MA, et al. Implications of circulating irisin and Fabp4 levels in patients with polycystic ovary syndrome. *J Obstet Gynaecol (Lahore).* 2016;3615(May):1-5. doi:10.3109/01443615.2016.1174200
 17. Azziz R, Carmina E, Dewailly D, al. et. Positions statement: criteria for defining polycystic ovary syndrome as a predominantly hyperandrogenic syndrome: an Androgen Excess Society guideline. *J Clin Endocrinol Metab.* 2006;91:4237-4245.
 18. Gao Q LY and GZ. Decreased learning and memory ability in rats with fluorosis: increased oxidative stress and reduced cholinesterase activity in the brain. *Fluoride.* 2009;42(4):277-285.
 19. Younis LA. The Impact of FTO Gene Polymorphisms on Risk Prediction of Type 2 Diabetes mellitus in Obese Iraqi Population. 2017.
 20. Chang CL, Huang SY, Soong YK, Cheng PJ, Wang C-J, Liang IT. Circulating Irisin and Glucose-Dependent Insulinotropic Peptide Are Associated With the Development of Polycystic Ovary Syndrome. *J Clin Endocrinol Metab.* 2014;99(12):E2539-E2548. doi:10.1210/jc.2014-1180
 21. Tziomalos K, Katsikis I, Papadakis E, Kandaraki EA, Macut D, Panidis D. Comparison of markers of insulinresistance and circulating androgensbetween women with polycystic ovarysyndrome and women with metabolicsyndrome. *Hum Reprod.* 2013;28(3):785–793.
 22. Park KH, Zaichenko L, Brinkoetter M, et al. Circulating irisin in relation to insulin resistance and the metabolic syndrome. *J Clin Endocrinol*

- Metab. 2013;98(12):4899-4907. doi:10.1210/jc.2013-2373
23. Boström P, Wu J, Jedrychowski MP, et al. A PGC1- α -dependent myokine that drives brown-fat-like development of white fat and thermogenesis. *Nature*. 2012;481(7382):463-468. doi:10.1038/nature10777
24. Garcés MF, Peralta JJ, Ruiz-Linares CE et al. I levels during pregnancy and changes associated with the development of pre-eclampsia. *JCEM* 2014;99:2113–2119. Irisin levels during pregnancy and changes associated with the development of pre- eclampsia. *J Clin Endocrinol Metab*. 2014;99:2113–2119.
25. Sesti G, Andreozzi F, Fiorentino TV et al. High circulating irisin levels are associated with insulin resistance and vascular atherosclerosis in a cohort of nondiabetic adult subjects. *Acta Diabetol*. 2014;51:705–713.

First Report of Colistin Resistance Gene *mcr-1* in Carbapenem-Resistant Clinical Isolates of *Klebsiella Pneumoniae* in Iraq

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Abstract

Background: The prevalence of the plasmid-borne colistin resistance gene *mcr-1* in bacteria poses a potential threat to patient treatment, particularly when hospitalized spreading of this gene causes great concern as it can transmit between different bacteria species. The aims of this study were to investigate the presence of the *mcr-1* gene among carbapenem-resistant *Klebsiella pneumoniae* (CRKP) isolates from different clinical specimens and determine the clonal origin of strains carrying the *mcr-1* gene using Multi-locus sequence typing (MLST) method.

Method: In this study, 22 CRKP isolates from clinical specimens collected from the major four hospitals in Najaf/Iraq were examined. All isolates were identified by a standard biochemical test and confirmed by an automated Vitek®2 system. Antimicrobial susceptibility test was done on 12 antibiotics by the disk diffusion method. All isolates tested to detect the presence of the *mcr-1* gene using the PCR method. Determine the sequence typing by MLST for all *mcr-1*-positive CRKP isolates.

Results: Out of 147 *K.pneumoniae*, 22 carbapenem resistance isolates from different clinical specimens were detected. Antibiotic sensitivity test results revealed that all isolates (100 %) were resistant to ampicillin, Cefepime, Cefoxitin, Ceftazidime, and Ceftriaxone; however, most of the CRKP isolates (86.4 %) are sensitive to colistin. The *mcr-1* gene was found in three (13.6%) of the 22 isolates of CRKP. These three isolates are resistant to all classes of antibiotics. The MLST results revealed that three *mcr-1*-positive CRKP isolates were related to three different sequence types: ST147, ST1, and ST11.

Conclusion: The spread of CRKP isolates containing plasmid-borne *mcr-1* gene is worth our attention due to the consider of colistin as the last resort treatment against drug-resistant pathogens that increasingly identified in Najaf Hospitals/Iraq.

Keywords: Carbapenem-Resistance *K.pneumoniae*, Colistin, *mcr-1*, MLST, CRKP.

Introduction

Enterobacteriaceae, especially *K.pneumoniae* is considered to be the major organisms that cause

nosocomial infection^(1,2). *K.pneumoniae* causes some important infections, including bacteremia, neonatal meningitis, urinary tract infections as well as wound and soft tissue in developing countries⁽³⁾. Carbapenem antibiotics play an important role in the treatment of severe nosocomial infections caused by multidrug-resistant organisms *Enterobacteriaceae*⁽⁴⁾. Increased use of carbapenems leads to the activation of resistance genes against these antibiotics, resulting in their resistance⁽⁵⁾. Carbapenem-resistant *K.pneumoniae* (CRKP) infections remain a significant morbidity and mortality concern

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worldwide⁽⁶⁾. Colistin is now commonly used as a last resort antibiotic in the treatment of carbapenem-resistant *K.pneumoniae*⁽⁷⁾. Colistin is a cationic peptide which binds to bacterial lipopolysaccharide (LPS) leading to the leakage of intracellular components from the cell membrane⁽⁸⁾. However, increasing the use of colistin antibiotics has resulted in the emergence of colistin resistance in carbapenem resistance *K.pneumoniae* infection, and resistance rates are steadily increasing⁽⁹⁾. The common mechanism of colistin resistance is thought to change the two-component regulatory systems of PmrAB or PhoPQ due to chromosome-mediated mutations⁽¹⁰⁾. Recently, Liu *et al.*, (2016)⁽¹¹⁾ reported the emergence of plasmid-mediated colistin resistance gene *mcr-1* from clinical *E. coli* and *K.pneumoniae* isolates in China. Over a short period time, the *mcr-1* gene was recorded in a range of gram-negative bacterial isolates worldwide, indicating suggesting probable horizontal transmission of colistin resistance^(11,12). Many plasmids were involved in the spread of *mcr-1*, such as IncHI2 and IncI2⁽¹³⁾. Plasmid-mediated colistin resistance *mcr-1* was observed in clinical isolates of *K. Pneumoniae* in different countries including⁽¹⁴⁻¹⁷⁾. The aim of this study was to investigate the prevalence of the colistin resistance gene *mcr-1* in carbapenem resistance *K. pneumoniae* (CRKP) isolates from different clinical specimens in Najaf hospitals/Iraq and to determine the clonal origin of CRKP carrying the *mcr-1* gene.

Materials and Method

Bacterial Strains: 22 carbapenem-resistant *K. pneumoniae* isolates collected from different clinical specimens in Najaf hospitals/Iraq during the period from February to September 2018 were studied. Bacterial isolates were identified to the level of species by using the standard biochemical tests according to method described by^(18,19), confirmatory identification was carried out by VITEK ®2 system according to manufacturer's instructions.

Antimicrobial Susceptibility Testing: Antimicrobial susceptibility testing of carbapenem-resistant *K.pneumoniae* isolates performed on Mueller-Hinton agar plates using the Kirby-Bauer disk diffusion method. The isolates tested against the following antibiotics: Ampicillin (10µg), Cefazidime (30 µg), Ceftriaxone (30 µg), Cefepime (30 µg), Cefoxitin (30 µg), Imipenem (10 µg), Meropenem (10 µg), Gentamicin (10 µg), Amikacin (30µg), Levofloxacin (5µg), Colistin (10µg) and Ofloxacin (5µg). The plates were incubated

at 37°C for 18 hours under aerobic conditions and inhibition zones diameter was measured and interpreted according to the guidelines of the Clinical and Laboratory Standards Institute (CLSI 2019)⁽²⁰⁾. *E. Coli* ATCC 25922 used as standard isolate in this test .

Molecular detection of the mcr-1 gene : DNA extraction and purification from fresh bacterial colonies using the ABC DNA Isolation Kit (Qiagen, Candia). Polymerase chain reaction (PCR) was done to investigate the presence of *mcr-1* gene in all CRKP isolates. The primers for the PCR amplification of *mcr-1* gene were as follows:

forward primer (5'-GTGTGGTACCGACGCTCGG-3')

reverse primer (5'-CAAGCCCAATCGGCGCATC-3').

A total of 34 cycles were conducted as follows: 94°C pre denaturation for 5 minutes, 94°C denaturation for 20 seconds, 50°C annealed 20 seconds and 72°C extension for 30 seconds⁽²¹⁾. The PCR products analyzed by 1.5% agarose gel electrophoresis. The PCR amplicon size was 413 bp.

Multi-locus Sequence Type (MLST): Multi-locus sequence typing conducted on the three *mcr-1*-positive CRKP isolates. Specific primers were used to amplify fragments of these seven housekeeping genes in *K. Pneumoniae*, including (*gapA*, *infB*, *mdh*, *pgi*, *phoE*, *rpoB*, and *tonB*) as described by Diancourt *et al.* (2005)⁽²²⁾. The PCR product were send for Sanger sequencing method using ABI3730XL, DNA sequences automated by Macrogen Corporation – Korea. Allelic profiles and sequence types (STs) were determined according to MLST databases website (<https://www.pasteur.fr/recherche/genopole/PF8/mlst/Kpneumonia.html>).

Results

A retrospective study was conducted on 147 *K. pneumoniae* randomly collected from different clinical specimens in Najaf hospitals to identify carbapenem-resistant isolates by using the Kirby-Bauer disk diffusion method. In the present study, 22 isolates were identified as carbapenem-resistant *K.pneumoniae*. The distribution of carbapenem-resistant *K.pneumoniae* isolates according to source specimens was as follows: burn, 36.3% (n=8); urine, 31.8% (n=7); wound, 27.3% (n=6); and cerebrospinal fluid, 4.6% (n=1). It is important to mention that most of the isolates were collected from the burn specimens (Table-1).

Table (1): Distribution of Carbapenem resistant *K. pneumoniae* isolates obtained from different clinical specimens.

Clinical Sample	No. (%) of CRKP
Burn	8(36.3%)
Urine	7(31.8%)
Wound	6(27.3%)
CSF	1(4.6%)
Total	22 (100%)

CSF: cerebrospinal fluid: Based on the results of the antimicrobial susceptibility tests, all CRKP isolates (100%) showed resistance to ampicillin, Cefepime, Cefoxitin, Ceftazidime, and Ceftriaxone. However, the lowest resistance rate was observed for imipenem (50%) and colistin (13.6%). Antibiotics resistance patterns of carbapenem resistance *K. pneumoniae* isolates that presented in Figure (1). The results show that 19 (86.4%) of the isolates categorized as XDR phenotype, while 3 (13.6%) of isolates were resistant to all antibiotics tested categorized as PDR phenotype..

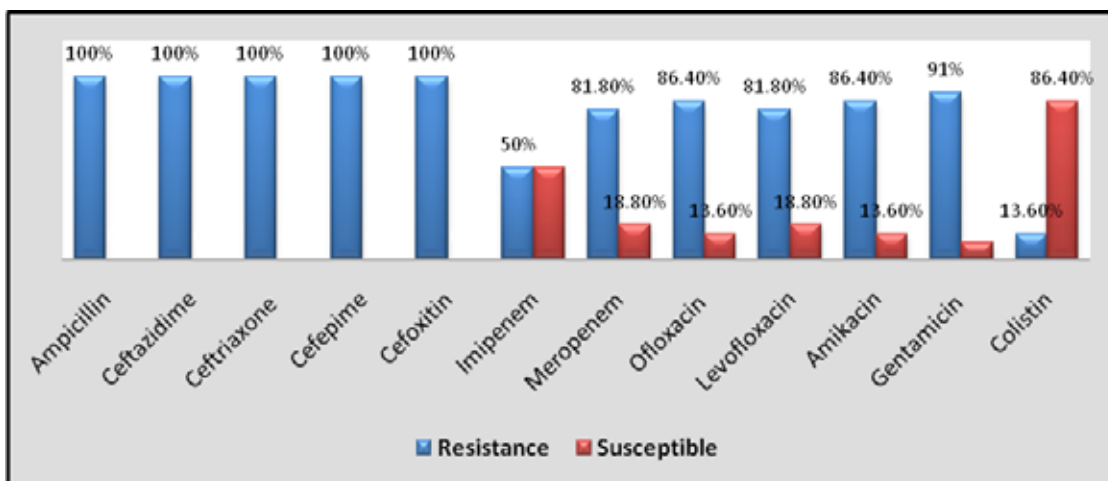


Figure (1): Antibiotic susceptibility patterns of carbapenem-resistant *K. pneumoniae* isolates .

Based on the PCR results, 3(13.6%) of carbapenem-resistant *K. pneumoniae* isolates harbor the *mcr-1* gene (Figure 2). The clinical significance of the three *mcr-1*-positive carbapenem-resistant *K. pneumoniae* isolates is summarized in Table (2). All the isolates recovered from female patients. Two of the isolates (KP4 and KP7 isolates) were identified in wound infection and one (KP19 isolate) from burn infection. All of the patients had received prior broad-spectrum antibiotics. However, none of the patients had previously received

polymyxin B or colistin. All the three *mcr-1*-positive carbapenem-resistant *K. pneumoniae*-related infections were classified as nosocomial infections (obtained from inpatients). The three isolates show resistant to all the 12 antibiotics tested, which means they could be categorized as pan-drug resistance agents. The MLST results showed that the three *mcr-1* positive isolates were assigned to three different Sequence Typing STs: ST147, ST15, and ST11.



Figure (2): Gel electrophoresis of PCR amplification has with *mcr-1* (413 bp) primer for CRKP extracted DNA. The electrophoresis was carried out for 80 min at 70 volts. M: DNA molecular marker; Lane (4 and 7) positive *mcr-1* gene.

Table (2): Clinical characteristics of colistin-resistant isolates among carbapenem-resistant *K. pneumoniae* carried the *mcr-1* gene (n= 3).

Isolate symbol	Source	Patient gender	Patient age	Hospital	Hospitalization	Type of multiple resistance	Sequence Types (STs)
KP4	Wound	Female	55 years	Al-Sader	Inpatient	Pan-drug resistance	147
KP7	Wound		36 years	Medical			15
KP19	Burn		46 years	City			11

Discussions

In our study, 22 carbapenem-resistant *K. pneumoniae* isolates were collected from different clinical specimens in teaching hospitals in Najaf/Iraq. The results show that the prevalence rate of carbapenem-resistant *K. pneumoniae* isolates in burns was higher than that of other specimens.

In this study, the carbapenem-resistant isolates were fully resistant to the beta-lactam antibiotics as ampicillin, Cefepime, Cefoxitin, Ceftazidime, and Ceftriaxone. Half of these isolates had resistance to imipenem antibiotic. However, there was less resistance to colistin (13.6%).

Several reports documented the association of resistance to carbapenem and resistance to 3rd cephalosporins with colistin resistance among various *Enterobacteriaceae* species⁽²³⁾. It is, therefore, necessary to study the incidence of colistin resistance in isolates that produce extended-spectrum β -lactamase (ESBL) resistance⁽²⁴⁾.

The PCR result for detect *mcr-1* gene shown that all colistin-resistant *K. pneumoniae* isolates harbored the *mcr-1* gene. Hence, the prevalence of *mcr-1* among 22 carbapenem resistant *K. pneumoniae* in this investigation was 13.6% (Figure 2). This result in the present study agreement with Rolain *et al.*, (2016)⁽¹⁴⁾ that found 12.5% of *K. pneumoniae* isolates in Laos carried *mcr-1* gene. The prevalence of *mcr-1* gene in *K. pneumoniae* isolates is still rare in Europe and other countries⁽²⁵⁾. This is the first report on the dissemination of the *mcr-1* gene in carbapenem-resistant *K. pneumoniae* isolated from clinical specimens in Iraq and this result provides added insight into the mechanism of colistin resistance among *K. pneumoniae* isolates in Najaf hospitals. The main problematic for clinicians is the transfer of *mcr-1* to carbapenemase producers in a hospital environment, which could result in the production of XDR and even PDR isolates⁽²⁶⁾. Based on the study results, all *mcr-1* positive isolates exhibited a possible PDR phenotype.

Unfortunately, all these isolates were obtained from hospitalized patients with wound (KP4 and KP7 isolates) and burn (KP19 isolate) infections in Al-Sader Medical City. The occurrence of PDR resistance in Al-Sader Medical City in Najaf, a governorate with low restrictions on antibiotics admission and high burden of infectious diseases and is extremely alarming, due to the possibility of PDR transmission to other bacterial isolates and the development of impossible treated infections, which may be related with increase mortality rates. Furthermore, the present of this gene in Al-Sader Medical City, with no evident association to previously described MCR-1-producers, confirms their global emergence of *mcr-1*-harboring *K. pneumoniae* isolates. Appropriate control measures for the use of colistin in Iraqi hospitals and effective diagnosis of *mcr-1* gene in bacterial isolates, are essential to prevent future widespread of colistin resistant isolates in Iraq.

The result shows that all three *mcr-1*-positive carbapenem-resistant *K. pneumoniae* isolates recovered from female patients (Table 2). In this study, two *mcr-1*-positive carbapenem-resistant *K. pneumoniae* isolates from wound infection. *mcr-1*-positive *K. pneumoniae* isolates from wound infection have been shown in a recent report by Moosavian and Emam (2019)⁽²⁷⁾ in southwest Iran.

In the present study, the high genetic diversity among *mcr-1*-carrying isolates (KP4, KP7, KP19) where they belong to ST147, ST15, and ST11, respectively, suggesting that the distribution of the *mcr-1* gene is so far not primarily associated with any specific clonal lineage.

ST147, identified in this study in female patient with wound infection that recognized as PDR isolate. Pragasam *et al.*, (2016)⁽²⁸⁾ show (1/8) colistin-resistant *K. pneumoniae* clinical isolates belonging to ST147 isolated from patients in South India between 2013 and 2015. In another study in Tunisian by Jaidane *et al.*, (2018)⁽²⁹⁾ was recognized as one isolate of ST147 among colistin-resistant *K. pneumoniae*.

In the study, ST15 was recovered from female wound infections. ST15 defined as a globally successful international clone, which recently show associated with colistin-resistant infections⁽³⁰⁾.

Conclusion

The spread of CRKP isolates containing the plasmid-borne *mcr-1* gene is worth our attention due to their use as the last treatment line against extensively drug-resistant pathogens that increasingly recognized in Najaf hospitals/Iraq.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

- Gupta N, Limbago BM, Patel JB and Kallen AJ. Carbapenem-resistant Enterobacteriaceae: epidemiology and prevention. *Clin Infect Dis.* 2016; 53:60–67.
- Yao J, Zhao F, Wu J, Liu J, Zhou M, Xia S, Wang S, Yi H, Lin M, Gao S, Zhou T, Xu Z, Niu Y and Bao Q. Sequencing and genetic variation of multidrug resistance plasmids in *Klebsiella pneumoniae*. *PLoS ONE.* 2016;5(4):18–24.
- Al-Agha M, Paasch F, Goossens H and Malhotra-Kumar S. Current trends in culture-based and molecular detection of extended-spectrum- β -lactamase-harboring and carbapenem-resistant Enterobacteriaceae. *J. Clin Micro.* 2017;50:1140–1146.
- Biswas S, Brunel JM, Dubus JC, Reynaud-Gaubert M and Rolain JM. Colistin: an update on the antibiotic of the 21st century. *Expert Rev Anti Infect Ther.* 2012;10:917–34.
- Tsai SS, Huang JC, Chen ST, Sun JH and Wang CC. Characteristics of *Klebsiella pneumoniae* bacteremia in community acquired and nosocomial infections in diabetic patients. *Chang Gung Med J.* 2013;33:532–539.
- Munoz-Price LS, Poirel L, Bonomo RA, Schwaber MJ, Daikos GL, Cormican M, Cornaglia G, Garau J, Gniadkowski M, Hayden MK, Kumarasamy K, Livermore DM, Maya JJ Nordmann P, Patel JB, Paterson DL, Johann P, Villegas MV, Wang H, Woodford N and Quinn JP. Clinical epidemiology of the global expansion of *Klebsiella pneumoniae* carbapenemases. *Lancet Infect Dis.* 2013;13:785–796.
- Kaye KS, Pogue JM, Tran TB, Nation RL and Li J. Agents of last resort: polymyxin resistance. *Infect. Dis Clin North Am.* 2016;30:391–414.
- Quan J, Li X and Chen Y. Prevalence of *mcr-1* in *Escherichia coli* and *Klebsiella pneumoniae* recovered from bloodstream infections in China: a multicentre longitudinal study. *Lancet Infect Dis.* 2017;17(4):400–410.
- Gales AC, Jones RN and Sader HS. Contemporary activity of colistin and polymyxin B against a worldwide collection of Gram-negative pathogens: results from the SENTRY antimicrobial surveillance program (2006–09). *J Antimicrob Chemother.* 2011;66:2070–2074.
- Halaby T, AlNaiemi N and Kluytmans J. Emergence of colistin resistance in Enterobacteriaceae after the introduction of selective digestive tract decontamination in an intensive care unit. *Antimicrob Agents Chemother.* 2013;57(7):3224–3229.
- Liu YY, Wang Y and Walsh TR. Emergence of plasmid-mediated colistin resistance mechanism MCR-1 in animals and human beings in China: a microbiological and molecular biological study. *Lancet Infect Dis.* 2016; 16:161–164.
- Poirel L, Jayol A and Nordmann P. Polymyxins: antibacterial activity, susceptibility testing, and resistance mechanisms encoded by plasmids or chromosomes. *Clin Microbiol Rev.* 2017;30:557–596.
- Lai CC, Lin YT and Lin YT. Clinical characteristics of patients with bacteraemia due to the emergence of *mcr-1*-harbouring Enterobacteriaceae in humans and pigs in Taiwan. *Int J Antimicrob Agents.* 2018; 52(5):651–657.
- Rolain JM, Olaitan AO, Chabou S, Okdah L and Morand S. Dissemination of the *mcr-1* colistin resistance gene. *Lancet Infect Dis.* 2016;16:147–150.
- Di Pilato V, Arena F, Tascini C, Cannatelli A, Henrici L and Fortunato S. *mcr-1.2*, a new *mcr* variant carried on a transferable plasmid from a colistin-

- resistant KPC carbapenemase-producing *Klebsiella pneumoniae* strain of sequence type 512. *Antimicrob Agents Chemother.* 2016;60:5612–5615.
16. TeoJQ, OngRT, Xia E, KohTH, KhorCC, LeeSJ, LimTP and Kwa AL. *mcr-1* in multidrug-resistant *bla_{KPC-2}*-producing clinical Enterobacteriaceae isolates in Singapore. *Antimicrob Agents Chemother.* 2016;60:6435–6437.
 17. Granata Gand Petrosillo N. Resistance to colistin in *Klebsiella pneumoniae*: a 4.0 strain?. *Infect Dis Rep.* 2017;9:7104–7108.
 18. Collee JG, Fraser AG, Marmiom BP and Simmon A. Mackie and McCartney Practical Medical Microbiology. 4th ed. Churchill Livingstone Inc., USA. 1996.
 19. MacFaddin JF. Biochemical tests for identification of medical bacteria. 3rd ed. Lippincott Williams and Wilkins, USA. 2000.
 20. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Twenty-Ninth Informational Supplement .CLSI document M100-S29. Wayne, PA: Clinical and Laboratory Standards Institute. 2019.
 21. Eiamphungporn W, Yainoy S, Jumderm C, Tanarsuwongkul R, Tiengrim S and Thamlikitkul V. Prevalence of Colistin Resistance Gene *mcr-1* in Colistin-Resistant *Escherichia coli* and *Klebsiella pneumoniae* Isolated from Humans in Thailand. *J. Global Antimicrob Resistance.* 2018;15:32–35.
 22. DiancourtL, Passet V, Verhoef J, GrimontPand BrisseS. Multilocus sequence typing of *Klebsiella pneumoniae* nosocomial isolates. *J Clin Microbio.* 2005;143:4178–4182. 23.4
 23. Ghafur A, Vidyalakshmi PR, Murali A, Priyadarshini K and Thirunarayan MA. Emergence of pan-drug resistance amongst gram negative bacterial! The first case series from India. *J Microbiol Infect Dis.* 2014;4:86–91.
 24. DuH, Chen L, Tang YW and Kreiswirth BN. Emergence of the *mcr-1* colistin resistance gene in carbapenem-resistant Enterobacteriaceae. *Lancet Infect Dis.* 2016;16:287–278.
 25. PrimN, RiveraA and Rodriguez-NavarroJ. Detection of *mcr-1* colistin resistance gene in polyclonal *Escherichia coli* isolates in Barcelona, Spain, 2012 to 2015. *Euro Surveill.* 2016;21(3):301–303.
 26. Olaitan AO, Chabou S, Okdah L, Morand S and Rolain JM. Dissemination of the *mcr-1* Colistin Resistance Gene. *Lancet Infect Disease.* 2016;16:18–22.
 27. MoosavianM and Emam N. The first report of emerging mobilized colistin-resistance (*mcr*) genes and ERIC-PCR typing in *Escherichia coli* and *Klebsiella pneumoniae* clinical isolates in southwest Iran. *Infect Drug Resist.* 2019;12:1001–1010.
 28. PragasamAK, Shankar C, Veeraraghavan B, Biswas I, Nabarro LE and Inbanathan FY. Molecular mechanisms of colistin resistance in *Klebsiella pneumoniae* causing bacteremia from India - a first report. *Front Microbiol.* 2016;7:21–35.
 29. JaidaneN, Naas T and OueslatiS. Whole-genome sequencing of NDM-1-producing ST85 *Acinetobacter baumannii* isolates from Tunisia. *Int J Antimicrob Agents.* 2018;52(6): 916–921.
 30. MatheussenV, XavierBB, Mermans I, Weerd A, Lammens C, Goossens H, Jansens H and Malhotra-Kumar S. Emergence of colistin resistance during treatment of recurrent pneumonia caused by carbapenemase producing *Klebsiella pneumoniae*. *Diagn Microbiol Infect Dis.* 2019;12(5):88–92.

Evaluation of Serum and Urinary Neutrophil Gelatinase Associated Lipocalin (NGAL) in Children with Nephrotic Syndrome

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Abstract

Background: Nephrotic syndrome in children is a common disease in the world, and is a group of clinical symptoms and include (loss of protein in the urine, low protein level in the blood, the accumulation of fluid in the body or edema, and high blood lipids). The cause of Nephrotic Syndrome is unknown. Neutrophil gelatinase associated lipocalin is a protein encoded in humans by the LCN2 gene. NGAL interferes with natural immunity by blocking iron, causing the growth of germs to be reduced. It is expressed in kidney, prostate, respiratory and digestive cells. NGAL is used as a vital guide to kidney injury.

Method: Neutrophil gelatinase-associated lipocalin concentration was measured in blood plasma using enzyme-linked immunosorbent assay (ELISA) and urine NGAL by Abbott i1000, measured plasma and urine level of NGAL in 20 patients with steroid resistance nephrotic syndrome, 20 patients with steroid sensitive nephrotic syndrome, 17 patients with early diagnosed nephrotic syndrome compare with 20 healthy volunteers enlisted as normal controls.

Results: Urine NGAL and plasma NGAL are significantly increase in SRNS, SSNS, EDNS compared with control group.

Conclusion: NGAL can be used to diagnostic biomarker to predict steroid Sensitive or steroid resistance in children with Nephrotic syndrome (NGAL is a differentiating marker between SSNS and SRNS).

Keywords: *Nephrotic Syndrome; Lipocalin; Neutrophil Gelatinase; serum.*

Introduction

Nephrotic syndrome is an edema, proteinuria, hypoalbuminaemia, and hyperlipidemia clinical constellation. The main pathology of this clinical syndrome is enhanced permeability of the glomerular filtration barrier to proteins (Sampson et al 2015).

nephrotic range proteinuria is defined as proteinuria more than 1000 mg/m² per 24 hours or spot urinary protein/creatinine ratio more than 2 mg/mg. the proteinuria in children NS is relatively selective, constituted mainly by albumin ⁽¹⁾. NS is collection of symptoms including heavy proteinuria (protein/creatinine ratio >2mg/mg), hypoalbuminaemia (<2.5mg/L), hypercholesterolemia and general edema. This resulting from altered permeability of the glomerular basement membranes⁽²⁾. Nephrotic syndrome (NS) is an alteration in renal function leads to increased permeability to plasma protein like albumin in the glomerular basement membrane. Edema, marked or persistent proteinuria and hypoalbuminaemia include signs and symptoms. There were three types of NS identified: primary NS (MCNS), secondary NS and

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congenital NS. NS were found. NS is the most prevalent form of minimal change NS, it represents 80 percent of instances and happens at any era; it is most prevalent in men⁽³⁾. NGAL is protein of the lipocalin superfamily. NGAL) also known to as lipocalin-2, siderocalin, uterocalin, and 24p3 is a polypeptide .NGAL is a critical component of innate immunity to bacterial infection and is expressed by immune cells, hepatocytes, and renal tubular cells in various disease states.

Materials and Method

Study design case control study: The present study include 77 Iraqi participants (20 with SRNS, 20 with SSNS,17 with EDNS,20 normal healthy control group) the Age range (3-13)years, the age and gender matched to the patients and control group. Blood sample and Urine collected from February 2019 to June 2019. The following biochemical parameters have been studied.

NGAL ELISA: ELISA kit uses the principle Sandwich-ELISA. The micro-plate ELISA providing in ELISA kit pre covered with an antibody specific to Human NGAL. Standards or samples are added to the micro-plate ELISA wells and combine with the specific antibody. And then a biotinylated detection antibody specific for Human NGAL and Avidin Horseradish Peroxidase (HRP) conjugate are added consecutively

to each micro-plate well and incubation. Wash away the free components. The substrate solution is added to each well in micro-plate ELISA. Only those wells that contain Human NGAL, biotinylated detection antibody and Avidin-HRP conjugate will appear blue in color. The enzyme substrate reaction is terminated by the addition of stop solution and the color turns yellow. The optical density (OD) is measured spectrophotometric at a wavelength of 450 nm . The OD value is proportional to the concentration of Human NGAL .Calculation of the concentration of Human NGAL in the samples compared to the OD of the samples to the standard curve.

Statistical Analysis: Statistical analysis was carried out by using SPSS version 23 and Microsoft excel 2010. the numerical data expressed as mean \pm SD. Comparison between mean plasma and urineNGAL concentration groups were performed. Receiver Operating Characteristics (ROC) Curve was calculated to estimate the sensitivity and specificity of the used NGAL.

Results

There was highly significant difference in mean NGAL among study groups ($P < 0.0001$); the level was highest in SRNS, SSNS, and EDNS patients with highly significant difference ($P < 0.0001$) in comparison with control subjects

Table (1): Mean and standard deviation for urine and plasma NGAL

Parameters	Controls (N=20) (mean \pm SD)	SRNS(N=20) (mean \pm SD)	P-value
Urine NGAL	64.7 \pm 19.8	174.3 \pm 18.4	<0.0001
Plasma NGAL	2.19 \pm 0.92	11.4 \pm 1.4	<0.0001
Parameters	Controls (N=20) (mean \pm SD)	SSNS (N=20) (mean \pm SD))	P-value
Urine NGAL	64.7 \pm 19.8	80.9 \pm 9.0	0.002
Plasma NGAL	2.19 \pm 0.92	5.5 \pm 1.14	<0.0001
Parameters	Controls (N=20) (mean \pm SD))	EDNS (N=17) (mean \pm SD)	P-value
Urine NGAL	64.7 \pm 19.8	128.4 \pm 41.1	<0.0001
Plasma NGAL	2.19 \pm 0.92	9.3 \pm 3.4	<0.0001
Parameters	SRNS(N=20) (mean \pm SD)	SSNS (N=20) (mean \pm SD)	P-value
Urine NGAL	174.3 \pm 18.4	80.9 \pm 9.0	<0.0001
Plasma NGAL	11.4 \pm 1.4	5.5 \pm 1.14	<0.0001
Parameters	SSNS(N=20) (mean \pm SD)	EDNS(N=17) (mean \pm SD)	P-value
Urine NGAL	80.9 \pm 9.0	128.4 \pm 41.1	<0.0001
Plasma NGAL	5.5 \pm 1.14	9.3 \pm 3.4	<0.0001

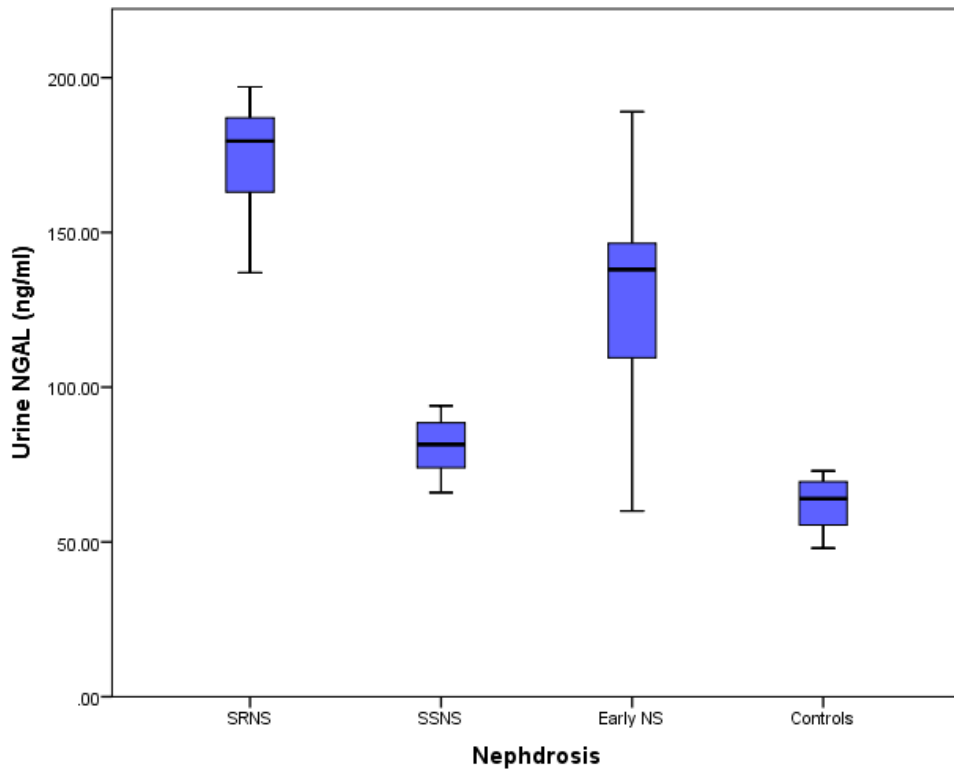


Figure (1): urine NGAL distribution among children with NS and controls

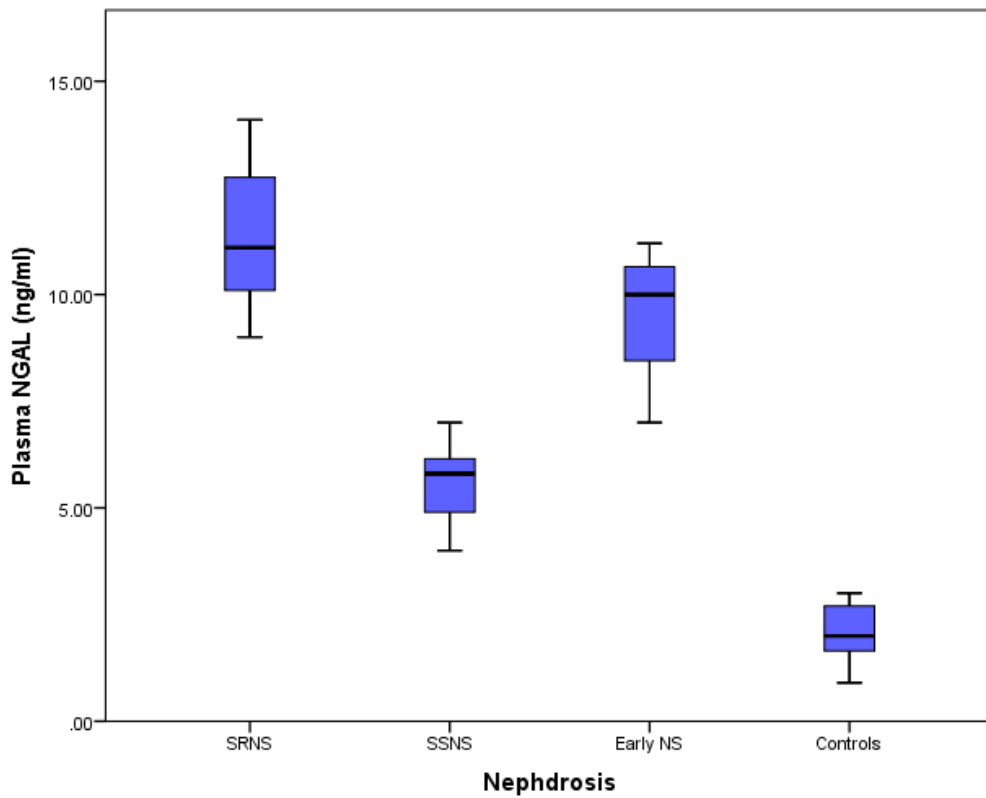
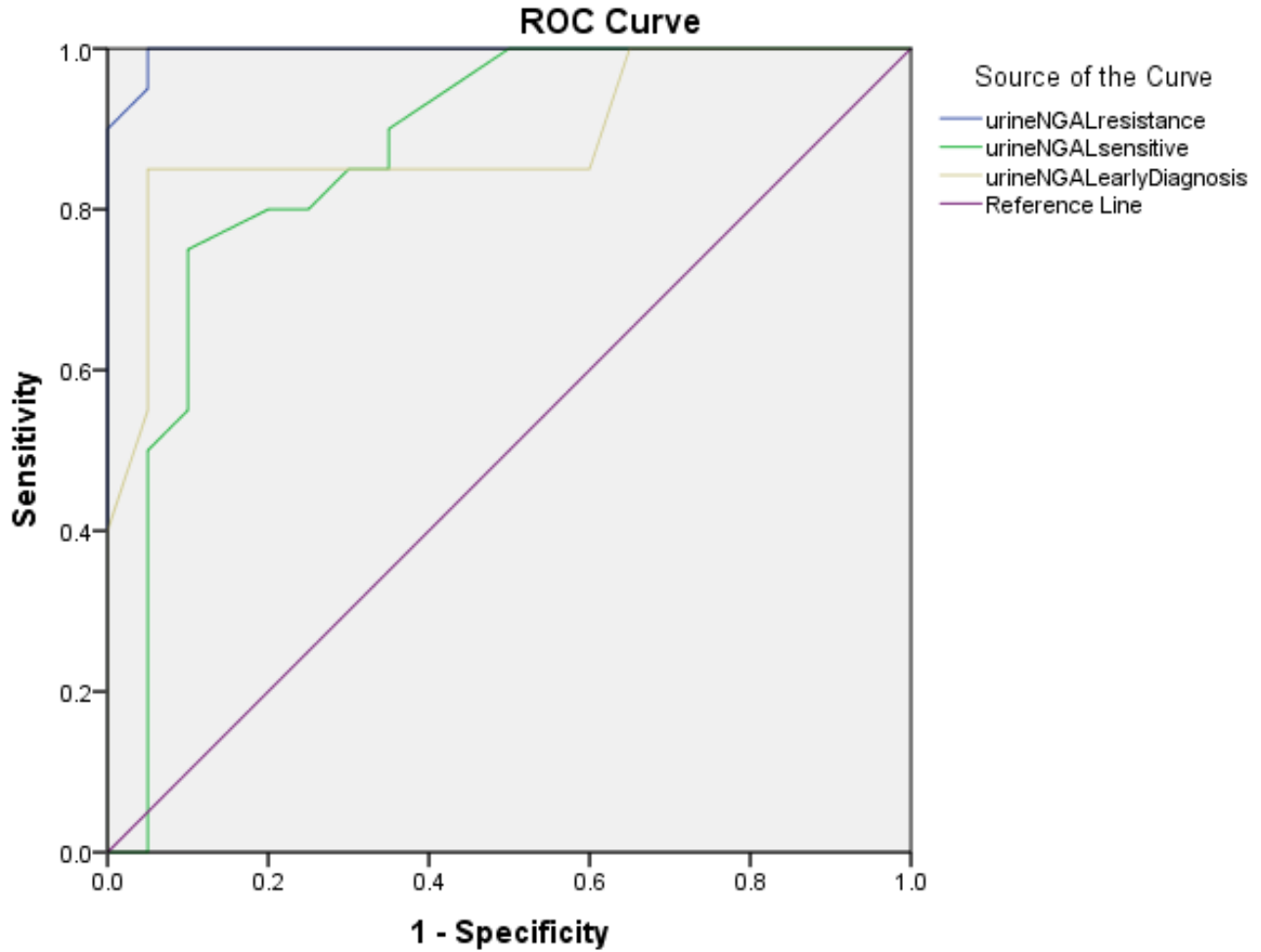


Figure (2): Plasma NGAL distribution among children with NS and controls

Determination the expected value (cutoff value) of NGAL in urine of children with Nephrotic syndrome: The Receiver Operator Characteristic (ROC) curve shows a significant differentiated ability of elevation urine NGAL as shown in figure (3).

The cutoff value of urine NGAL concentration in SRNS was 137 ng/ml with sensitivity 95% and specificity 95%, whereascutoff value of urine NGAL concentration in SSNS was75 ng/ml with sensitivity 75% and specificity 90%,whereascutoff value of urineNGAL concentration in EDNS was90 ng/ml with sensitivity 85% and specificity 95%.



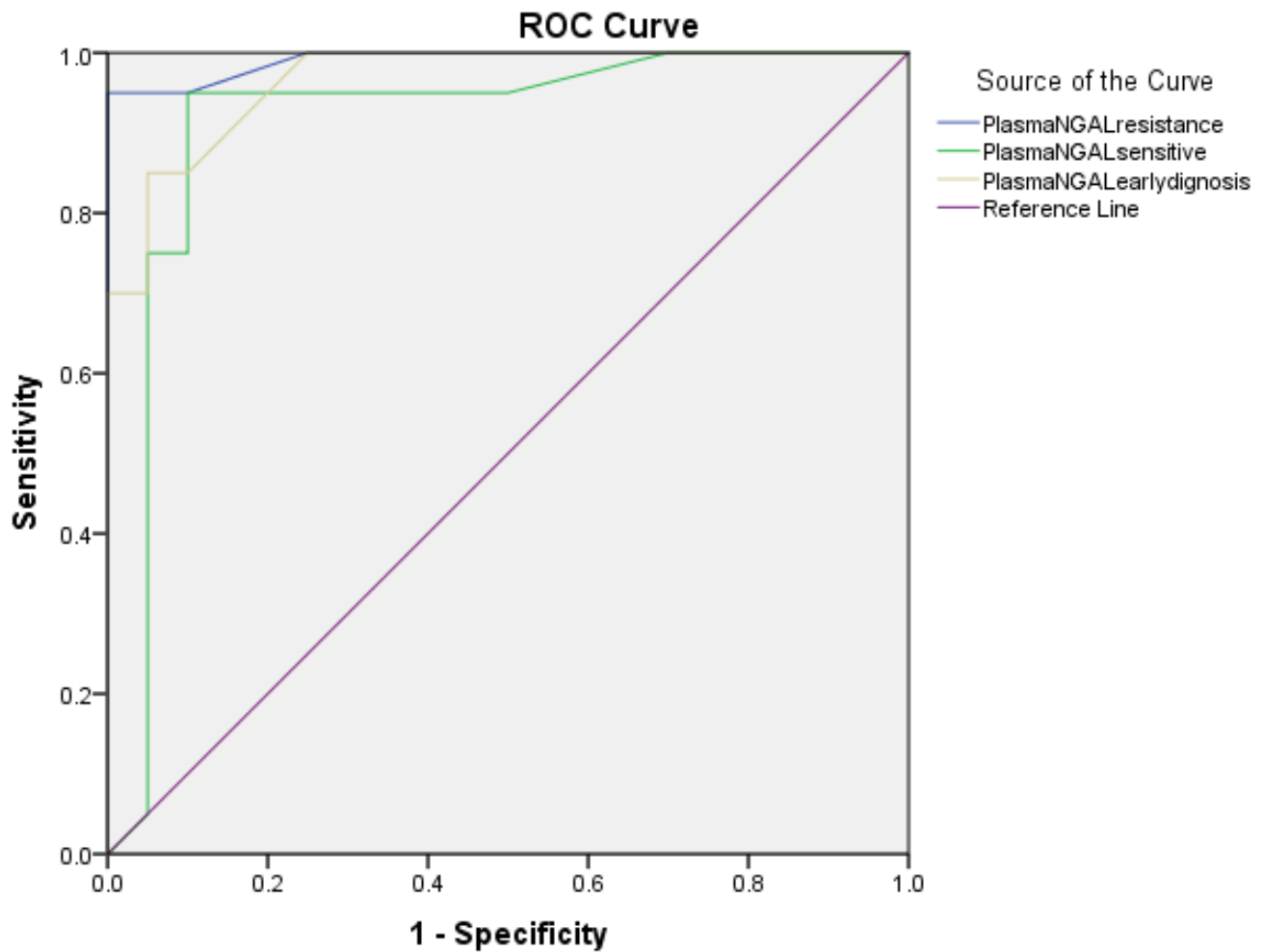
Diagonal segments are produced by ties.

Figure (3): ROC curve of NGAL (ng/ml) in urine of nephrotic syndrome children compared with control subject

Determination the expected value (cutoff value) of NGAL in plasma of children with Nephrotic syndrome: The Receiver Operator Characteristic (ROC) curve shows a significant differentiated ability of elevation plasmaNGAL as shown in figure (4).

in SRNS was 4.0 ng/ml with sensitivity 95% and specificity 90%,whereas the cutoff value of plasmaNGAL concentration in SSNSwas 3.5 ng/ml with sensitivity 95% and specificity 90%, Whereas the cutoff value of plasmaNGAL concentration in EDNS was6.0 ng/ml with sensitivity 85% and specificity 95% .

The cutoff value of the plasmaNGAL concentration



Diagonal segments are produced by ties.

Figure (4): ROC curve of NGAL (ng/ml) in plasma of nephrotic syndrome children compared with control subject

Discussion

The present study showed the mean ± SD of NGAL in urine of SRNS, SSNS, EDNS and controls groups were (174.3±18.4), (80.9±9.0), (124.1±43.6) and (56.5±12.3). respectively and showed elevated of urine NGAL in SRNS,SSNS and EDNS compare with control group,

And the mean ± SD of NGAL in plasma of SRNS, SSNS, EDNS and controls groups were (11.4±1.4), (5.5±1.1), (9.3±3.4) and (2.19±0.92) respectively and showed elevated of NGAL in SRNS, SSNS and EDNS compare with control group.

Secreted NGAL in the distal nephron in nephrosis especially in chronic state (SRNS) lead to continuous release of NGAL in blood and excreted in urine while

in SSNS the release of NGAL is through periods not continuous. This explains difference in concentrations between groups of nephrotic syndrome. In early diagnosed nephrotic syndrome amount of NGAL begin release relation to severity state, this agree with ⁽⁴⁾.

Other study Bolignano and Buemi 2009 explain the effects of Cyclosporine treatment (immunosuppressant drugs) in SRNS can cause nephrotoxicity due to progressive glomerular vasoconstriction leads increase urine NGAL concentrations.

Correlations among NGAL concentrations and proteinuria concentration and also between plasma NGAL and urine NGAL values were noted^{(5),(6)}. However, although possible, this model does not exclude that the same tubular cells can contribute equally considerably to

the massive elevation of urine NGAL, at least in part: from this point of perspective, at least two mechanisms could be possible. Firstly, the aforementioned cubilin-megalin carrier, responsible for NGAL resorption, acts through a mechanism of nonspecific protein endocytosis that recognizes several other serum ligands such as albumin, beta2-microglobulin, and serum immunoglobulin. In confirmation of this, murine models of knockout mice for megalin soon develop a condition of severe nonselective proteinuria, even in the absence of documentable glomerular histological lesions⁽⁷⁾. Under conditions of sustained proteinuria (e.g., nephrotic syndrome), this nonspecific carrier soon becomes saturated because of the massive tubular protein overload, causing further loss of plasma proteins that in part contributes to determine the extent of final proteinuria⁽⁸⁾. It is also to be considered that the main site of the damage induced by proteinuria through complement activation is precisely the brush border of the tubular cells, where the most of the cubilin-megalin complexes are located: this condition would further contribute to compromise NGAL endocytosis by its carrier. Ultimately, it cannot be excluded, however, that the same tubular cells, subjected to stress from the insult caused by the activity of complement factors, actively produce and release high amounts of NGAL with a defensive significance similar to what observed in experimental models of acute kidney damage. In accordance with this, previous studies have shown that the tubular epithelium responds to a sustained load of plasma proteins through the release of multiple “stress proteins” including KIM-1, whose urinary levels accordingly rise in a dramatic way⁽⁹⁾.

Conclusions

Neutrophil Gelatinase Associated Lipocalin can be used to diagnostic biomarker to predict steroid Sensitive or steroid resistance in children with Nephrotic syndrome (NGAL is a differentiating marker between SSNS and SRNS).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

1. Bagga, A. and Mantan, M., Nephrotic syndrome in children. *Indian Journal of medical research*, 2005. 122(1), p.13.
2. Rees, L., Bockenhauer, D., Webb, N.J. and Punaro, M.G., 2019. *Paediatric nephrology*. Oxford university press.
3. Abbas, A.A.H., Mahdi, Y.S. and Ali, S.H., Immunoglobulin E, Interleukin-17A and Transforming Growth Factor- β 1 Levels in Children with Nephrotic Syndrome. *Int. J. Curr. Microbiol. App. Sci*, 2016. 5(6), pp.908-915.
4. Bennett, M.R., Piyaphanee, N., Czech, K., Mitsnefes, M. and Devarajan, P., NGAL distinguishes steroid sensitivity in idiopathic nephrotic syndrome. *Pediatric Nephrology*, 2012. 27(5), pp. 807-812.
5. Bolignano, D., Donato, V., Coppolino, G., Campo, S., Buemi, A., Lacquaniti, A. and Buemi, M., Neutrophil gelatinase-associated lipocalin (NGAL) as a marker of kidney damage. *American Journal of Kidney Diseases*, 2008. 52(3), pp.595-605.
6. Bolignano, D., Lacquaniti, A., Coppolino, G., Donato, V., Campo, S., Fazio, M.R., Nicocia, G. and Buemi, M., Neutrophil gelatinase-associated lipocalin (NGAL) and progression of chronic kidney disease. *Clinical Journal of the American Society of Nephrology*, 2009. 4(2), pp.337-344.
7. Leheste, J.R., Rolinski, B., Vorum, H., Hilpert, J., Nykjaer, A., Jacobsen, C., Aucouturier, P., Moskaug, J.Ø., Otto, A., Christensen, E.I. and Willnow, T.E., Megalin knockout mice as an animal model of low molecular weight proteinuria. *The American journal of pathology*, 1999. 155(4), pp.1361-1370.
8. Christensen, E.I. and Gburek, J., Protein reabsorption in renal proximal tubule—function and dysfunction in kidney pathophysiology. *Pediatric nephrology*, 2004. 19(7), pp.714-721.
9. Van Timmeren, M.M., Vaidya, V.S., van Ree, R.M., Oterdoom, L.H., de Vries, A.P., Gans, R.O., van Goor, H., Stegeman, C.A., Bonventre, J.V. and Bakker, S.J., High urinary excretion of kidney injury molecule-1 is an independent predictor of graft loss in renal transplant recipients. *Transplantation*, 2007. 84(12), p.1625.

Analysis of Patients with PCOS According to Demographic Factors & Hormonal Assay in Babylon Government in Iraq

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Abstract

Introduction: PCO is a significant alteration in hormonal state that happens in females which leads to ovulatory reasons of subfertility & amenorrhea in reproductive period. Polycystic Ovarian Syndrome was collecting of presenting symptoms and signs.

If we had two of the following presenting signs and symptoms, we called this condition as PCO.

1. Oligomenorrhea & amenorrhea (menstrual and ovulating problem).
2. Signs of hyperandrogenemia (clinical or biochemical).
3. U/S features of polycystic ovaries which include (thick stroma on the periphery of the ovaries, which include multiple small follicles > 10 and largest one < 9 mm, while the ovarian size > 10 cm³). Aims of the study :- analysis of Iraqi women in AL- Hilla city who present with problems in her menstrual cycle or fertility and assess their period of age when maximum symptoms and signs were appear, BMI, hereditary factors, occupation, residence, marital status and laboratory investigation to confirm our diagnosis (FSH, LH, AMH, PRLACTIN, TESTESTERONE) then vaginal u/s was done for married women and abdominal u/s done for unmarried one.

Patients and Method: Case controlled study carried out for women that suffer from problems in her menstrual cycle and fertility from outpatient clinic in Babylon teaching hospital and some private clinics, in period of 1 year from (June 2017 to June 2018).

100 complaining women were participated in this study randomly after verbal and written consent which taken from them.

Results: 100 women were shared in this study, we observed that percentage of infertility increase at the current time due to PCO for unknown reason, in addition to elevation percentage of PCOS frankly according to The Rotterdam criteria (symptoms and signs of presenting women), this multisystemic disorders disturb fertility to large extent because hormonal disturbances such as increase LH/FSH ratio, Prolactin & AMH also increase ovarian volume due to thick stromal layer of the ovary then we assess affecting factors and relieving factors, its relation to patients age, BMI, occupation, residence and her hereditary state and hormonal analysis to document the diagnosis.

Conclusions: Found a significant increase of infertility in couples especially in our country in relative to the past, previously the incidence of infertility is about 12% of total couples and the incidence of PCO in general female about 35% (married or unmarried, may be due to delay discovery especially in unmarried group) & 45% in married women decreasing with progress of age

Keywords: Sociodemographic characters, Antimullarian hormone AMH, infertility, menstrual disturbance, Polycystic ovary PCOS, risk factors.

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Introduction

Women present with irregular cycle, prolonged amenorrhea or oligomenorrhea, excessive hair growth on her face and body, scalp hair loss, acne, dark skin pattern

on body folds such as thighs & neck and history of gaining weight.⁽¹⁾

Incidence of infertility in the world about 12%, but in actually, mostly in Iraq, it has more incidence than that written in books for a lot of causes which need a lot of studies & researches to know the real problem and try to find their probable explanations⁽²⁻⁶⁾.

Various principles for diagnosis of Ovarian Syndrome, mostly have been recommended. The Rotterdam criteria which are highest largely used diagnostic criteria for PCOS

It has been agreed that female with Polycystic Ovary Syndrome had a possible connection with future health complications such as Metabolic disorders (such as diabetes mellitus), cardiovascular disorders & uterine hyperplasia, neoplasia and malignancy, insulin resistance, which was present in this disorder regardless of BMI, but exploited by obesity, mainly responsible for all these health complications⁽⁷⁾. It was newly documented a compromised cardiopulmonary functional capacity strictly related to insulin resistance in women with these diseases⁽⁸⁾. Hence, should be diagnosed as rapidly as possible to avoid and treat related disorders earlier if possible. Diagnosis of Polycystic Ovary Syndrome mainly depended on clinical features as a diagnostic method for this syndrome. Also the occurrence of Polycystic Ovary Syndrome differ from region to region⁽³⁾.

Causes of Polycystic Ovary Syndrome at this time is unknown, even though researchers reflect hereditary and ecological features had major causes for its presence. Main risk factor for it was having a family history of PCOS.

There is no cure for this syndrome but there are methods to improve symptoms. This involves lifestyle modifications like decreasing weight, well diet, taking adequate exercise, and leaving smoking if present. The

prevalence of Polycystic Ovary Syndrome differs with diagnostic principles. PCO on U/S were distinguished in up to 25%-30% from reproductive aged females^(4,6)

Anti-mullerian hormone, (AMH) was one of potential blood test for assessment of female fertility done at any time of the cycle, especially to detect ovarian reserve and there are other important tests currently used in the last decades for evaluation of the remaining ovarian ovaries supply which is antral follicles count⁽⁹⁾

Fertility professionals repeatedly use a combination of fertility investigations to best assess female's ovarian reserve, including transvaginal U/S to count the number of antral follicles & ovarian size and AMH levels.

Materials and Method

One hundred female (married and unmarried) were taken in this cross sectional study randomly. Their histories about important related symptoms such as (acne, amenorrhea and excessive hair growth) were recorded, their age between (21 - 44) years, for married patients, period of infertility (3 -20) years, their BMI (24-37)Kg/m², occupation (employer, housewife), Residence (urban, rural area), risk factors (obesity, hereditary factors) and others past medical disease (diabetes, hypertension, asthma, epilepsy). Then their hormonal analysis (FSH, LH, Prolactin, AMH) were done, also their ovarian size by U/S, at day 2-4 of the cycle.

Polycystic Ovary Syndrome: was irritating conditions for females, often challenging for treatment. PCOS is the most common endocrine defect in reproductive-age women.

Results

Figure 1 shows that the percentage of PCO in women which is diagnosed clinically (sign and symptom) represented 33.0%

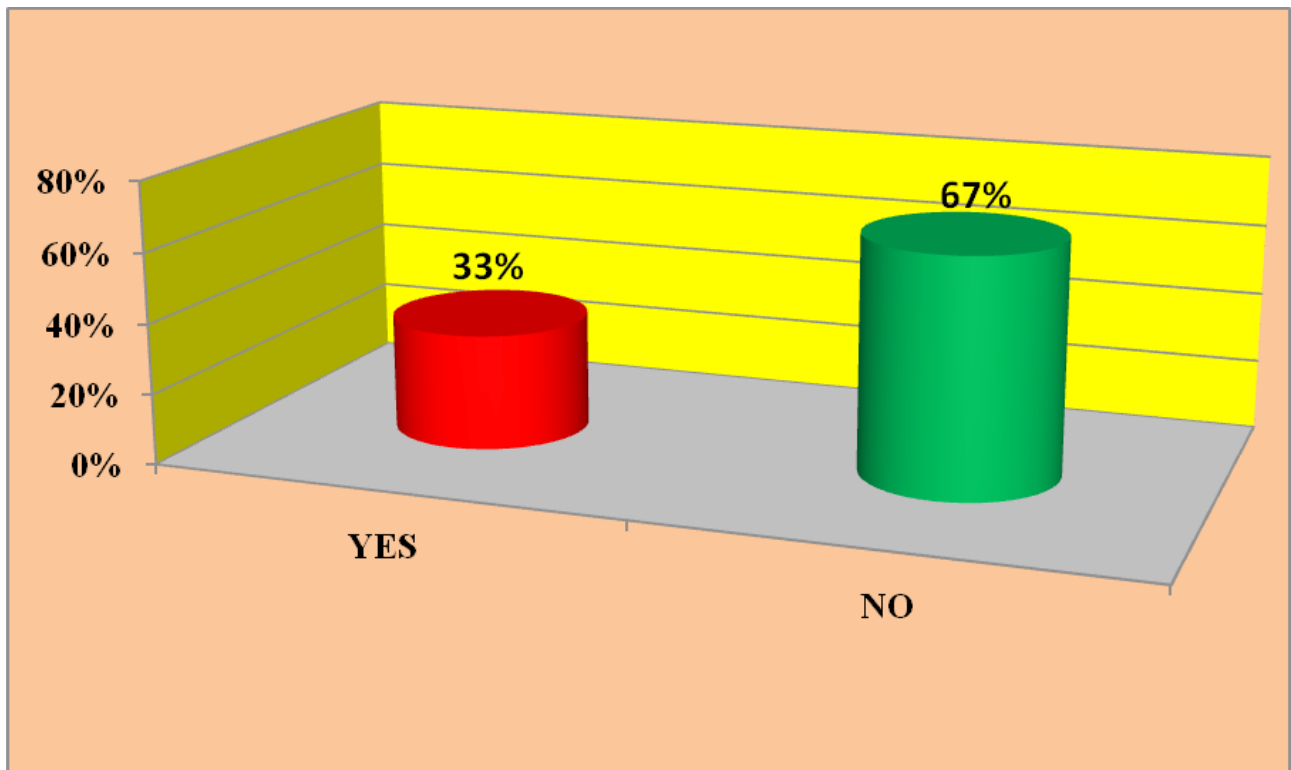


Figure 1: Distribution of the patients with poly cystic ovary diagnosed by sign & symptom.

Table 1: Mean and standard deviation of variables of the women with PCO

Variable	Mean ± SD	Range
LH	12.19±4.55	(3.9-18)
FSH	5.97±1.8	(3.6-9.9)
LH/FSH ratio	2.07±0.77	(1.08-3.75)
AMH	6.62±2.17	(2.2-9.0)
Prolactin	33.97±10.36	(22.0-50.0)

Table 2 shows the associated symptoms that 100.0% of women with PCO had amenorrhea and 57.6% had hirsutism.

Table 2: Distribution of the sign and symptom of infertile women with PCO.

Variable	Number	Percentage (%)
Amenorrhea		
Present	33	100.0%
Absent	0	0.0%
Total	33	100.0%
Hirsutism		
Present	19	57.6%
Absent	14	42.4%
Total	33	100.0%

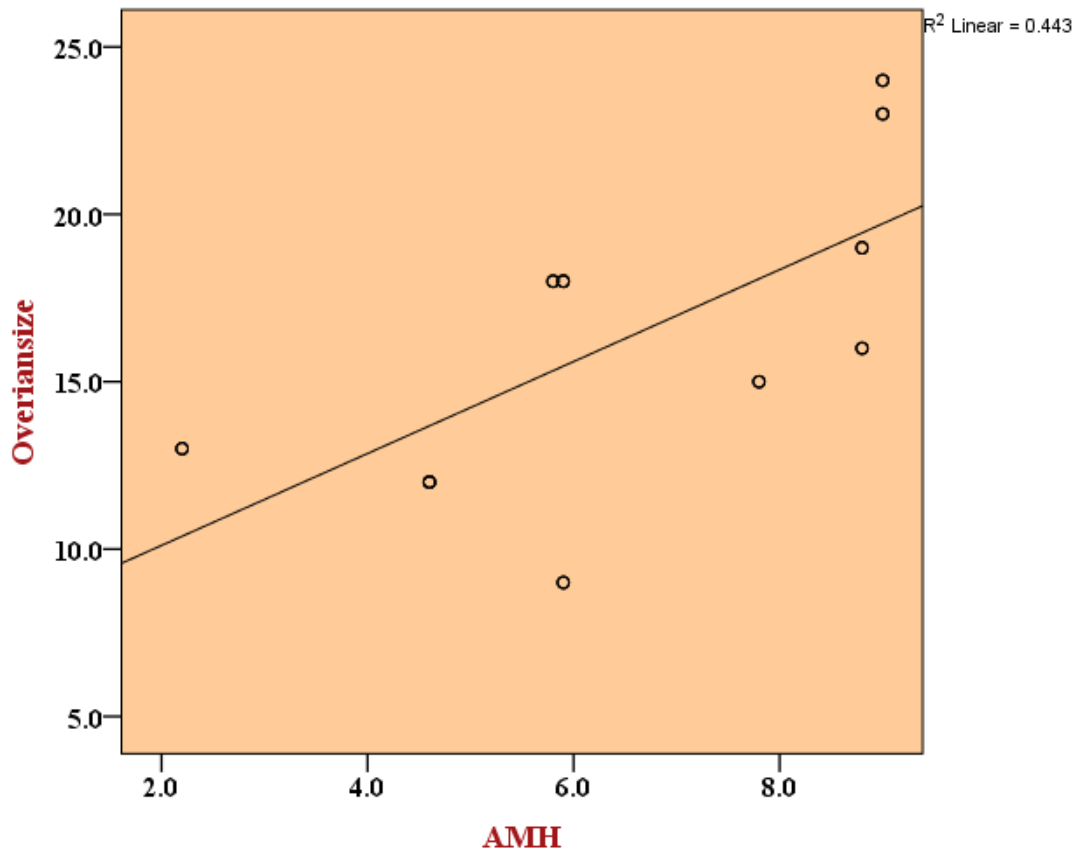


Figure 2: Correlation between AMH and ovarian size of the women with PCO. (positive correlation)

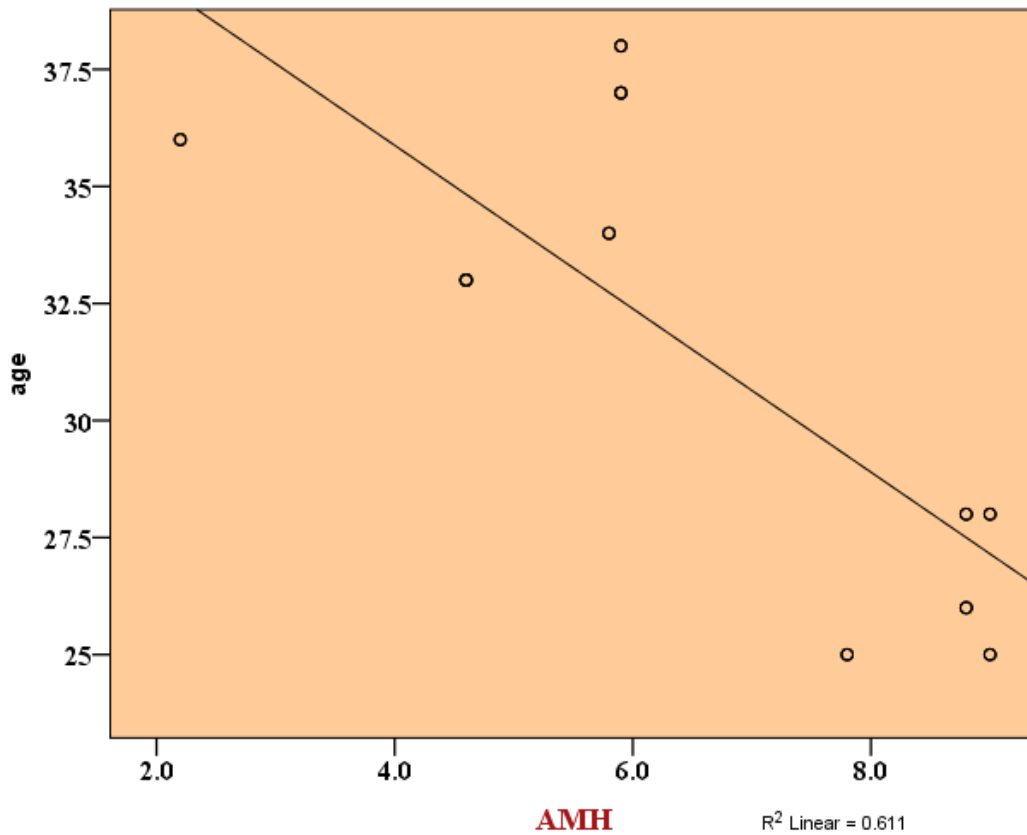


Figure 3: Correlation between AMH and age of the women with PCO. (reversed or negative correlation)

Table 3 shows that t test was conducted to show the mean difference of AMH, prolactin and LH/FSH ratio according to the presence of PCO in infertile women. It was significant mean differences in all circumstances (P value < 0.05)

Table 3: Mean difference of AMH, prolactin and LH/FSH ratio in PCO infertile women.

Study Variable	PCO	N	Mean ± SD	t-test	P –value
AMH	Yes	33	6.62±2.17	9.831	<0.001*
	No	67	2.46±1.54		
Prolactin	Yes	33	33.97±10.36	2.137	0.035*
	No	67	29.16±10.67		
LH/FSH ratio	Yes	33	2.07±0.77	8.979	<0.001*
	No	67	0.78±0.38		

*P value ≤ 0.05 was significant.

Discussion

Since women with PCOS are very sensitive to gonadotrophin stimulation, information of age related AMH is clinically important. Wisner et al, and found that the decline in level of AMH as the age progresses was linear and slower in PCOS when compared to normal women without PCOS (9).

Ovarian size correlates negatively with age . A percentile normogram will be useful to inform a woman about her ovarian reserve relative to her age group . The ovarian reserve decline rate relative to age group is important because of the declining fertility with increasing age (7).

The prevalence of PCOS is conventionally estimated at 4% to 8% of all reproductive age female, from studies performed in Spain, Greece and the USA (10-13). The prevalence of PCOS world has recently been shown to be 18% (17.8 ± 2.8%) in the first community-based prevalence study based on current Rotterdam diagnostic criteria (14), while in our study the prevalence of PCOS in Iraqi women in AL-Hilla city was estimated about 33%, which is higher than the percentage in the world .

PCOS has also been noted to affect 28% of unselected obese and 5% of lean women (15-18). Hopefully, lifestyle intervention including dietary, exercise and behavioral therapy, stop smoking if present and leave sedentary life as can as possible, improves the symptoms and signs of this syndrome(19).

Also, there is not significant correlation between occupation of the women and their residence .

There is dramatic increased in incidence of PCOS in our country than the world which lead to frightened condition in the present(irregular cycle and infertility) and in the future from its late complications such as metabolic disorders (diabetes mellitus), increased cholesterol level in the blood, heart problem and uterine complications which include typical endometrial hyperplasia,atypical endometrial hyperplasia and lastly may end with endometrium carcinoma .

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

References

1. Diamanti-Kandarakis E, Kouli CR, Bergiele AT, Filandra FA, Tsianateli TC, Spina GG, Zapanti ED, Bartzis MI. A survey of the polycystic ovary syndrome in the Greek island of Lesbos: hormonal and metabolic profile. *J Clin Endocrinol Metab.* 1999;84:4006–4011. doi: 10.1210/jc.84.11.4006
2. Knochenhauer ES, Key TJ, Kahsar-Miller M, Waggoner W, Boots LR, Azziz R. Prevalence of the polycystic ovary syndrome in unselected black and white women of the southeastern United States: a prospective study. *J Clin Endocrinol Metab.* 1998;83:3078–3082. doi: 10.1210/jc.83.9.3078

3. Asuncion M, Calvo RM, San Millan JL, Sancho J, Avila S, Escobar-Morreale HF. A prospective study of the prevalence of the polycystic ovary syndrome in unselected Caucasian women from Spain. *J Clin Endocrinol Metab.* 2000;85:2434–2438. doi: 10.1210/jc.85.7.2434
4. Polson DW, Adams J, Wadsworth J, Franks S. Polycystic ovaries--a common finding in normal women. *Lancet* 1988; 1:870-872
5. Johnstone EB, Rosen MP, Neril R, Trevithick D, Sternfeld B, Murphy R, Addaun-Andersen C, McConnell D, Pera RR, Cedars MI. The polycystic ovary post-rotterdam: a common, age-dependent finding in ovulatory women without metabolic significance. *The Journal of clinical endocrinology and metabolism* 2010; 95:4965-4972
6. Clayton RN, Ogden V, Hodgkinson J, Worswick L, Rodin DA, Dyer S. How common are polycystic ovaries in normal women and what is their significance for the fertility of the population? [see comments]. *Clin Endocrinol* 1992; 37:127-134
7. Marcondes JAM, Hayashida SAY, Barcellos CRG, Rocha MP, Maciel GAR, Baracat EC. Metabolic syndrome in women with polycystic ovary syndrome: prevalence, characteristics and predictors. *Arquivos Brasileiros de Endocrinologia e Metabologia.* 2007;51(6):972–979.
8. Vigorito C, Giallauria F, Palomba S, et al. Beneficial effects of a three-month structured exercise training program on cardiopulmonary functional capacity in young women with polycystic ovary syndrome. *Journal of Clinical Endocrinology and Metabolism.* 2007;92(4):1379–1384
9. Wisner A, Shalom-Paz E, Hyman JH, Sokal-Arnon T, Bantan N, Holzer H, et al. Age-related normogram for AFC in women with PCOS. *Reprod Biomed Online.* 2013;27(4):414–18.
10. Azziz R, Woods KS, Reyna R, Key TJ, Knochenhauer ES, Yildiz BO. The prevalence and features of the polycystic ovary syndrome in an unselected population. *J Clin Endocrinol Metab.* 2004;89:2745–2749. doi: 10.1210/jc.2003-032046.
11. March WA, Moore VM, Willson KJ, Phillips DI, Norman RJ, Davies MJ. The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. *Hum Reprod.* 2010;25:544–551. doi: 10.1093/humrep/dep399.
12. Alvarez-Blasco F, Botella-Carretero JI, San Millan JL, Escobar-Morreale HF. Prevalence and characteristics of the polycystic ovary syndrome in overweight and obese women. *Arch Intern Med.* 2006;166:2081–2086. doi: 10.1001/archinte.166.19.2081.
13. Azziz R, Sanchez LA, Knochenhauer ES, Moran C, Lazenby J, Stephens KC, Taylor K, Boots LR. Androgen excess in women: experience with over 1000 consecutive patients. *J Clin Endocrinol Metab.* 2004;89:453–462. doi: 10.1210/jc.2003-031122.
14. Azziz R, Marin C, Hoq L, Badamgarav E, Song P. Health care-related economic burden of the polycystic ovary syndrome during the reproductive life span. *J Clin Endocrinol Metab.* 2005;90:4650–4658. doi: 10.1210/jc.2005-0628.
15. Clark AM, Thornley B, Tomlinson L, Galletley C, Norman RJ. Weight loss in obese infertile women results in improvement in reproductive outcome for all forms of fertility treatment. *Hum Reprod.* 1998;13:1502–1505. doi: 10.1093/humrep/13.6.1502.
16. Yoo RY, Sirlin CB, Gottschalk M, Chang RJ. Ovarian imaging by magnetic resonance in obese adolescent girls with PCOS: a pilot study. *Fertil Steril.* 2005;84(4):985–95.
17. Agarwal A, Verma A, Agarwal S, Shukla RC, Jain M, Srivastava A. AFC in normal (fertility-proven) and infertile Indian women. *Indian J Radiol Imaging.* 2014;24(3):297–302.
18. Almog B, Shehata MB, Shalom-Paz E, Tan SL, Tulandi T. Age related normogram for AFC: McGill reference guide. *Fertil Steril.* 2011;95(2):663–66.
19. Ferraretti AP, Lappi M, Magli MC, Muzzonigro F, Resta S, Gianaroli L. Factors affecting thawed oocyte viability suggest a customized policy of embryo transfer. *Fertil Steril.* 2010;94(4):1308–13.

Assessment of Serum Afamin and Preptin Levels as a Potential Diagnosis Markers for Cardiovascular Patients Undergoing Catheterization

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Abstract

The Cardiovascular disease (CVD) is a main cause of worldwide morbidity and mortality overwhelms any of the circulatory system disease. Therefore, The aims of presented study were to assess whether an Afamin, and Preptin levels are associated with Cardiovascular diseases; to find if there is an association between Afamin and preptin levels with insulin resistance in progressive of patients with cardiovascular diseases before and after treatment by catheterization.

A case-control study, comprised of 60 patients diagnosed as cardiovascular disease (30 male, 30 female), their ages ranged between 35-65 years old, and were matched with patients age and number of male and female of 60 healthy control. The estimation of the levels of biochemical parameters in the patients and control groups revealed a significant elevations ($P < 0.01$) of the of Preptin (85.73 ± 41.97 vs 41.58 ± 23.50 pg/mL), Insulin (17.53 ± 10.94 vs 6.89 ± 4.71 μ IU/mL), HOMA-IR (8.03 ± 4.85 vs 2.39 ± 0.82) in patients before treatment by catheterization than the control group. But, they were significantly lower ($P < 0.01$) in Afamin level (1.59 ± 0.36 vs 1.95 ± 0.26) and HOMA- β (111.42 ± 43.88 vs 145.58 ± 36.51 pg/mL), in patients before catheterization, when compared with healthy group. Furthermore, the result showed, significant decreases ($P < 0.01$) of Preptin (1.94 ± 0.33 pg/mL) Insulin (9.99 ± 3.62 μ IU/mL), HOMA-IR (3.03 ± 1.21). Also, were shown a significant increased ($P < 0.01$) in level of Afamin in patients groups to (1.94 ± 0.33 pg/mL) after treatment by catheterization. The result demonstrated that Afamin levels were a significant negative correlation with preptin and HOMA-IR. On the other side the preptin levels revealed a significant positively connected with BMI, Insulin and HOMA-IR.

The conclusions of the current study for the first time revealed that circulating Afamin and Preptin levels are strongly involved in the progress of cardiovascular diseases and could independently predict pathogenesis improvement of the of cardiovascular disease. They were associated with atherosclerosis disease that was considered one of the most important leading causes of Cardiovascular disease.

Keywords: Cardiovascular disease, Catheterization, Afamin, Preptin, Insulin resistance.

Introduction

Cardiovascular diseases (CVDs) involve the cardiovascular system: heart, blood vessels, and the circulatory. CVDs remain the biggest cause of deaths worldwide ¹. Cardiovascular diseases is sometimes called "heart disease", in medical terms, they are not precisely the same thing. Heart disease is a universal

item for states affecting the configuration of the heart and the way it works².

All heart diseases consider cardiovascular diseases. Anyway, not all cardiovascular diseases consider heart diseases. For instance stroke that affects blood vessels of the brain, but not the heart himself³.

One of the major risk factors of cardiovascular diseases is arteriosclerosis; it builds up when the arteries that supply the blood to the heart become partially or wholly blocked. This is usually caused by fatty deposits built up inside the arteries⁴.

Human Afamin is a serum glycoprotein and was presented to be an exact binding protein for vitamin E possibly responsible for vitamin E that moves in body fluids⁵.

Preptin is a new hormone that is derived from proinsulin-like growth factor I and is stated to play role in mineral metabolism. It is produced in pancreatic β -cells, and is co-secreted with insulin by the cells⁶. Preptin is considered a 34-amino acid peptide hormone secreted from the β cells of pancreas sideways with insulin, amylin, and pancreatic polypeptide⁷. Preptin, a peptide first explored in 2001. Males have less preptin levels than females⁸. Preptin is thought to be a physiological insulin enhancer induced by glucose⁹.

Materials and Method

A case control study design. In total, of 60 subjects aged 35–65 years. The study case group contained 30 patients that have CVD (21 males, 9 females) and they are admitted to hospital. All diagnosed in the “open heart Unit” at “AL-Sader Teaching Hospital” in Najaf Province-Iraq. During the period from November 2018 to March 2019. And 30 healthy volunteers age and gender matched the patients as the control group. A detailed interview addressing personal history, blood pressure, family history, demographic information and laboratory examination was performed. All the patients underwent cardiac catheterization and serum collection for these patients in the pre- and post-cardiac catheterization was done.

Patients that have hepatic disease, strokes, renal disease, any acute or chronic inflammatory illness, pregnancy and lactating mothers, alcoholics, cerebrovascular accidents, rheumatoid arthritis, autoimmune disease, patients of juvenile and type 1 diabetes mellitus were expelled from the study.

All members have given written approval and this protocol was permitted by the moral and human research committee.

Collection of Specimens and Biochemical Analysis: Blood sample was drawn from fasting venous

from all the subjects, 5ml of blood after 12 hours fasting were drawn from CVD patients and healthy group among 8:30- 10A.M.

Hypertension was diagnosed as a systolic blood pressure >140 mmHg and/or diastolic blood pressure >90 mmHg. The BMI was measured as the relation of weight (Kg) to height squared (m^2), by unit kg/m^2 , fasting analysis of serum glucose, lipid profile (TC, TG, LDL.c, and HDL.c) levels were calculated by colorimetric method for the quantitative *in vitro* diagnostic measurement using kit (BIOLABO (France)).

The Afamin and Preptin were using the Competitive ELISA principle (Elabscience (USA)). The serum Insulin concentration were defined by ELISA kits (Calbiotech (USA)). Insulin-resistance index (Homeostatic model assessment-insulin resistance (HOMA-IR)) was estimated as follows: $HOMA-IR = [glucose (mg/dL) \times insulin (\mu U/ml)] / 405$.

$$HOMA-\beta = 360 \times Insulin / (Glucose - 63) \%^{10}$$

Biostatistical Analysis: The results were subjected to statistical analysis and analyzed using computer facility of Microsoft Excel 2013 and SPSS-20 (statistical package for social science-version 20). The results were presented as numbers, and mean \pm SD (Standard deviation). Significance of difference was assessed using paired t-test for two dependent means. The one-way ANOVA (Analysis of variance to compare the differences among the studied groups. The correlation of parameters was determined using Pearson's correlation coefficient, taking $p \leq 0.05$ lowest limit of significance¹¹.

Results and Discussion

The clinical feature of the CVD patients and controls are shown in Table (1) which consists of the data of both patients before and after catheterization and the control group. In the current study, there was no significant in age. While, BMI, SBP, and DSP showed a significant increase in patients compared control group. The present result has found a higher significance in the fasting blood glucose ($p=0.01$), Insulin ($p=0.01$) HOMA- β ($p=0.01$) and HOMA IR ($p=0.01$) in all these groups, except Insulin ($p=0.459$) compared between the Control and Patients (Post-catheterization) also, HOMA-IR value ($p=0.438$) compared between values of Patients (Post-catheterization) and the Control group. The total serum of cholesterol, triglycerides, LDL.c levels were increased significantly, while, decreased

levels of HDL.c(p<0.001) was seen in CVD patients when matched to control group.

As presented in table (2) revealed univariate analysis of Afamin with biochemical parameters that the all parameters have a positive correlation with Afamin, except the Age, BMI, FBG, HOMA-IR, TG, TC, LDL.c VLDL.c, Preptin, shown a negative correlation. There is a significance negative correlation between Afamin with the levels of HOMA-IR, TG, LDL.c, VLDL.c and Preptin levels.

In table (3) shown the Preptin levels have a significant positive correlation with BMI, insulin, HOMA-IR. While, a significant negative correlation with Afamin levels.

Cardiovascular diseases (CVD) and artery diseases (CAD) are the leading causes of morbidity and mortality in the developed countries and are emerging as an epidemics in the developing countries ¹².

Coronary Heart Disease (CHD) is the most common reason of death from CVD. The risk factors such as

smoking, diabetes mellitus, hypertension, high dietary fat intake, body mass index, lack of physical exercise, besides the traditional lipid panel which have been recorded to be risk factor by itself for the development of CVD ¹¹.

Insulin performed like an endothelial reliant vasodilator in physiological levels, but Insulin resistance or hyperinsulinemia cause the loss of NO bioactivity in the wall of the vessel and thereby to endothelial dysfunction¹³. Compensatory hyperinsulinaemia happens when pancreatic β cell secretion rise to preserve normal blood glucose levels in the setting of peripheral Insulin resistance in adipose tissue and muscle¹⁴. CVD is as a rule connected with atherosclerosis, Atherosclerosis is a chronic vascular disease, which the arteries experience lose flexibility and thicken as a result of cholesterol sedimentation in the wall of artery.

In the first stages of the disease cholesterol gathers within arterial macrophages, change them to bubbles cells that are lipid-loaded.⁴ And atherosclerosis it may happen.

Table (1) Clinical parameters compared between patients before and after catheterization and control group because of obesity overcharged as a result of absence of exercise, and increased blood pressure raise the risk of developing atherosclerosis ¹⁵.

Parameters	Control Mean± SD No.30	Patients Pre-cath. Mean±SD	Patients Post-cath. Mean±SD	P- value
Age	55.265±7.5	53.61±9.2	53.61±9.2	a) NS b) NS
BMI	26.965±4.9	36.665±5.2	36.665±5.2	a) <0.01 ** b) <0.01 **
SBP (mm/Hg)	128.5±3.7	144.5±3.8	139.5±4.4	a) <0.01 ** b) <0.01 ** c) <0.01 **
DBP (mm/Hg)	75.5±3.2	93±3.5	93±4.1	a) <0.01 ** b) <0.01 ** c) <0.01 **
FBG (mg/dl)	97.78±8.26	173.81±36.95	120.20±35.32	a) <0.01 ** b) <0.01 ** c) <0.01 **
Insulin(μIU/ml)	6.89±4.71	17.53±10.94	9.99±3.62	a) <0.01 ** b) 0.459NS c) <0.01 **
HOMA IR	2.39 ±0.82	8.03 ± 4.85	3.03 ±1.21	a) <0.01 ** b) 0.438NS c) <0.01 **
HOMA-β	145.58±36.51	111.42±43.88	130.42±24.85	a) <0.01 ** b) <0.01 ** c) <0.01 **

Parameters	Control Mean± SD No.30	Patients Pre-cath. Mean±SD	Patients Post-cath. Mean±SD	P- value
TG mg/dL)	106.40±19.73	257.34±87.12	197.22±35.36	a) <0.01** b) <0.01** c) <0.01**
TC (mg/dL)	164.13±16.40	276.40±43.82	246.06±42.79	a) <0.01** b) <0.01** c) <0.01**
LDL.c(mg/dL)	88.95±14.90	183.71±43.89	165.36±44.79	a) <0.01** b) <0.01** c) 0.115NS
VLDL.c(mg/dL)	21.28±3.95	52.51±16.63	40.05±12.98	a) <0.01** b) <0.01** c) <0.01**
HDL.c(mg/dL)	53.90±7.54	38.09±8.46	39.47±7.19	a)<0.01** b) <0.01** c) 0.497NS
Afamin(pg/mL)	1.95±0.26	1.46±0.53	1.94±0.33	a)<0.01** b) 0.816NS c) <0.01**
Preptin(pg/mL)	41.58±23.50	85.73±41.97	58.93±23.99	a) <0.01** b) <0.01** c) <0.01**

a) Significant difference between values in Control and Patients (Pre- catheterization). b) Significant difference between values in Control and Patients (Post- catheterization). c) Significant difference between values in Patients (Pre- catheterization) and Patients (Post- catheterization), BMI: Body mass index, NS =non-significant at the > 0.05 level, Data represented as Mean ±SD, SD: Stander deviation, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, **=significant differences at 1%, NS =non-significant at the 0.05 level, FBG: fasting blood glucose, HOMA-IR: Homoeostasis model assessment-insulin resistance. TG: triglyceride, TC: total cholesterol,HDL-c :high density lipoprotein-cholesterol, LDL :low density lipoprotein, VLDL.c: Very low density lipoprotein- cholesterol.

Hypercholesterolemia and triglyceridemia consider independent risk factors that alone or composedcan hasten the advancement of CVD and development of atherosclerotic lesions. HDL may be defensive by reversible cholesterol abiggerelevation of LDL may also cause a bigger decrease of HDL because there is reciprocal correlation between the concentration of LDL and HDL ¹⁶ .

Table (2): Results of univariate analysis of Afamin level with investigated biochemical parameters in the patients group

Variables	r	P
Age (Year)	-0.229	0.233
BMI (kg/m2)	-0.008	0.964
SBP (mm/Hg)	0.040	0.513
DBP (mm/Hg)	0.042	0.6 42
FBG (mg/dL)	-0.221	0.240
Insulin (μIU/mL)	0.122	0.522
HOMA-IR	-0.490	0.037*
HOMA-β	0.073	0.706
TG (mg/dL)	-0.098	0.05*
TC (mg/dL)	-0.306	0.101
LDL-C (mg/dL)	-0.370	0.038*
VLDL-C (mg/dL)	-0.025	0.047*
HDL-C (mg/dL)	0.246	0. 541
Preptin (pg/mL)	-0.321	0.048*

P- Value ≤ 0.05 = significant, r : Pearson correlation

Table (3): Results of univariate analysis of Preptin level with investigated biochemical parameters in the patients group

Parameters	r	P
Age (Year)	0.031	0.612
BMI (kg/m ²)	0.304	0.031*
SBP (mm/Hg)	0.052	0.421
DBP (mm/Hg)	0.131	0.150
FBG (mg/dL)	0.065	0.731
Insulin (μIU/mL)	0.20	0.001*
HOMA-IR	0.390	0.001*
HOMA-β	-0.341	0.01*
TG (mg/dL)	0.094	0.620
TC (mg/dL)	0.010	0.960
LDL.c (mg/dL)	-0.018	0.924
VLDL.c (mg/dL)	0.145	0.446
HDL.c (mg/dL)	-0.313	0.092
Afamin	-0.321	0.048*

P- Value ≤ 0.05 = significant, r : Pearson correlation

Also, noticed the Afamin levels are a significantly elevated (P<0.01) in patients post- catheterization compared with the pre- catheterization. In the study of clinical assay evaluation, middle Afamin concentrations were only a bit decreased in patients with heart failure. Patients with pneumonia, heart failure and co-morbidity of pneumonia, in addition to sepsis showed markedly reduced Afamin concentrations. Although the physiological properties of this protein are not fully characterized, many lines of evidence now indicate that Afamin possesses vitamin E-binding properties, which play a crucial role in protection against oxidative damage¹⁷.

In addition, Afamin is known to be expressed mainly in the liver and to be abundant not only in human serum it is also in the extra vascular fluids like follicular, seminal, and cerebrospinal fluids, suggesting that it plays a role in fertility and neuroprotection¹⁸.

Very lately, the human plasma vitamin E-binding protein Afamin was stated to be very significantly related with criteria for metabolic syndrome in three independent human overall populations. The study by (Kronenberg *et al.*) likewise found that Afamin most intensely connected with triglycerides and waist perimeter in older populations of females and males¹⁹.

Also, illustrated the Preptin levels in patients were significantly decreased (P<0.01), during post-

catheterization, compared with the pre- catheterization. The elevation or decreases in the circulatory Preptin amount were found associated with Insulin levels in people²⁰.

Preptin was found to improve Insulin secretion following glucose stimulation in cultured b-cells, in the secluded perfused rat pancreas²¹. Preptin is thought to be a physiological Insulin secretion enhancer induced by glucose. stated that the circulating level of Preptin was 398 ± 13 ng/L in normal-weight persons, with levels in men being lower than in women. Studies have high Preptin levels in patients with metabolic disorders including gestational diabetes mellitus, type 2 diabetes mellitus, polycystic ovary syndrome, and impaired glucose tolerance⁶.

Conclusion

In conclusion, The present study concluded for the first time that decreased Afamin and increased preptin levels are strongly involved in the progress of cardiovascular diseases and could independently predict the improvement of the pathogenesis of cardiovascular disease in CVD patients treatment by catheterization. They were associated with atherosclerosis disease that was considered one of the most important leading causes of CVD. The fundamental molecular mechanisms of Afamin and Preptin, on CVD still have not been clarified. This requires deeper investigation.

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Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Reference

1. Air, Labrosciano C T Tavella, R Beltrame J F & Ranasinghe I. Readmissions following hospitalisations for cardiovascular disease: a scoping review of the Australian literature. Aust. Heal. Rev. (2019).

2. Sugamura K & Keane J F. Reactive oxygen species in cardiovascular disease. *Free Radic. Biol. Med.*51, 978–992 (2011).
3. Ayanian J Z & Epstein A M. Differences in the use of procedures between women and men hospitalized for coronary heart disease. *N. Engl. J. Med.*325, 221–225 (1991).
4. Aad Get al. Muon reconstruction performance of the ATLAS detector in proton–proton collision data at $\sqrt{s} = 13$ TeV. *Eur. Phys. J. C*76, 292 (2016).
5. Zeiner M Set al. Trocar seal assembly. (2016).
6. Celik O et al. An appraisal of serum preptin levels in PCOS. *Fertil. Steril.*95, 314–316 (2011).
7. BUCHANAN C M, PHILLIPS R J, & COOPER G J S. Preptin derived from proinsulin-like growth factor II (proIGF-II) is secreted from pancreatic islet β -cells and enhances insulin secretion. *Biochem. J.*360, 431–439 (2001).
8. Li N et al. Lower circulating preptin levels in male patients with osteoporosis are correlated with bone mineral density and bone formation. *BMC Musculoskelet. Disord.*14, 49 (2013).
9. Canoy D & Buchan I . Challenges in obesity epidemiology. *Obes. Rev.*8, 1–11 (2007).
10. Aravind P & Prasad M N V. Cadmium-induced toxicity reversal by zinc in *Ceratophyllum demersum* L.(a free floating aquatic macrophyte) together with exogenous supplements of amino- and organic acids. *Chemosphere*61, 1720–1733 (2005).
11. Members W Get al. Executive summary: heart disease and stroke statistics—2010 update: a report from the American Heart Association. *Circulation* 121, 948–954 (2010).
12. Yusoff K. Vitamin E in cardiovascular disease: has the die been cast? *Asia Pac. J. Clin. Nutr.*11, S443–S447 (2002).
13. Hansson G K, Libby P & Tabas I. Inflammation and plaque vulnerability. *J. Intern. Med.*278, 483–493 (2015).
14. Kreisberg R A & Reusch J E B. Hyperlipidemia (high blood fat). *J. Clin. Endocrinol. Metab.*90, b (2005).
15. Baqer H, Gumar A S & Alsafy B M. Diagnosis of Atherosclerosis by using digital image processing. *Univ. Thi-Qar J.*12, 119–126 (2017).
16. Shameer P, Prasad PVS & Kaviarasan PK . Serum zinc level in vitiligo: a case control study. *Indian J. Dermatology, Venereol. Leprol.*71, 206 (2005).
17. Voegelé A F et al. Characterization of the vitamin E-binding properties of human plasma afamin. *Biochemistry*41, 14532–14538 (2002).
18. Jerkovic L et al. Afamin is a novel human vitamin E-binding glycoprotein characterization and in vitro expression. *J. Proteome Res.*4, 889–899 (2005).
19. Kronenberg F et al. Plasma concentrations of afamin are associated with the prevalence and development of metabolic syndrome. *Circ. Cardiovasc. Genet.*7, 822–829 (2014).
20. Caf F, Algul S & Koyun M. Investigation of the irisin, preptin and adropin levels in the blood serum of *Alburnus tarichi*. *Cell Mol Biol (Noisy le Gd.)*63, (2017).
21. Cheng K C et al. Characterization of preptin-induced insulin secretion in pancreatic-cells. *J. Endocrinol.* 215, 43 (2012).

Microorganism Distribution that Causes Abortion in Females of Fallujah City

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Abstract

The research included the study of microbiological content in the reproductive system and urinary tract infections for abortions cases in the city of Fallujah. For this purpose, 121 swabs were taken, including 50 swabs of the genital system (27 Vaginal and 23 Endo cervical swabs) and 71 swabs of urine. The result refer to that only 27 samples gave negative bacterial growth, while the other 94 samples showed growth of more than one species of bacteria on different media. The bacterial population isolated from the urine was highest (81.7%), followed by vagina (74.1%) and the endo cervical (69.6%). The results showed that the ratios of the isolated bacterial samples were *Escherichia coli* (54.4%), *Streptococcus agalactiae* (17%), *Staphylococcus aureus* (12%), *Klebsiella* (8.5%), *Pseudomonas aeruginosa* (5.3%), *Proteus* (1%) and *Candida albicans* (1%). The *E. coli* was the most common type bacterial isolates. Antibiotic sensitivity tests against 24 antibiotics were reveal that bacteria *Escherichia coli* have multiple resist against different antibiotics, most isolates were highly resistant to Aztroenam followed by cefotaxime and ciproflaxime respectively, while their resistance to other antibiotics varied. The results also showed that *Proteus* which isolated from urine samples and *Candida albicans* which isolated from vaginal specimens were the lowest percentage, where only one isolate was obtain for each and the *Candida abicans* were resistant to all of different antibiotics used in this study.

Keywords: Females; abortion; Microorganism; Health

Introduction

Women who infected with bacteria during pregnancy period to risk of miscarriage or childbirth before the pregnancy is complete⁽¹⁾, most of these cases caused by bacterial genital tract infection⁽²⁾.

The genital tract, especially the vagina, may be infected with virulance microorganisms, such as *Gardnerella vaginalis*, group B streptococci, *Staphylococcus aureus*, *Ureaplasma urealyticum* and *Mycoplasma hominis*, which can displace Lactobacilli

that can change vaginal pH from 3.8 to 7^(3,4). Bacteria of genital tract are found in 40%-50% of women of reproductive age which causing bacterial vaginosis^(5,6), which diagnosed by using microscopy examination of vaginal swab samples and treated with appropriate antibiotics such as metronidazole⁽⁷⁾. Also, infection of the bacterial genital tract during pregnancy periods is not only risk to the mother but also to the neonate for example the infection with *Streptococcus agalactiae* can cause severe pneumonia, meningitis in neonates which often causes neonatal sepsis⁽⁸⁾ and a study showed that *Streptococcus agalactiae* premature rupture of membranes, leading to miscarriage or premature birth and a series of adverse pregnancy effects⁽⁹⁾. So Bacterial vaginosis has been closely related to abortion and premature birth^(10,11,12). Also *E. coli*, which main causes of urinary tract infections, is one of an important factors in abortions and premature births⁽¹³⁾.

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A recent study recommended further research to clarify whether bacterial infections increase the risk of miscarriage and whether early diagnosis and treatment could improve reproductive outcomes⁽¹⁴⁾ of miscarriage in women of Fallujah city.

Materials and Method

Collection Samples: These study was conducted at in Fallujah city, Samples were collected monthly from January 2019 to April 2019. Women who were booked at gynecologists in antenatal clinics, during the study period were randomly selected, after that the Pregnant women receiving antibiotic treatment within 72 hours of days were excluded because of the fact that antibiotics should prevent or destroy pathogens,

Sampling Technique: One hundred (121) pregnant woman during the research period that either had any of the symptoms suggestive of urinary tract infections or without any symptoms were recruited into the study upon informed consent. Sample were divided in to three section:

- 1. urine culture examination (71) sample:** Urine collection by sterile universal containers was given to the pregnant woman and midstream to avoid contamination, urine specimens collected and carried immediately to the microbiology unit for sample cultured and Microscopy.
- 2. High vaginal swab (27) sample.**
- 3. Endocervical swab (23) sample.**

Culture Technique: All the samples were inoculated

Into Brain – Heart Infusion broth was incubated at 24 hours, 37 C, after that from the growth inoculated Blood agar, Mannitol salt agar and MacConkey agar by using calibrated loop technique⁽¹⁵⁾. by streaked way may be obtained the appropriate way to the single-cell colony, The plates were incubated for 24 hours at 37 0 C⁽¹⁵⁾

Identification of Bacterial Isolates: Complete identification of each bacterial isolates was based on a cultural examination, morphological examination, and biochemical characterization

Antibiotic Resistant: Antimicrobial susceptibility was performed by modified Kirby Bauer

Disk Diffusion technique⁽¹⁶⁾, used multiantibiotic disc to the detection all strain that isolated and know ability effect on strain by sensitivity or resistant for antibiotic.

Results and Discussion

the study conducted on randomly pregnant women sample in Fallujah city, From a total of 121 sample included urine, Vagina swabs, and endocervical swabs there were only 27 samples gave negative bacterial growth, while the number of bacterial growth were 94 isolates, showed more than one bacterial species on different culture media.

Prevalence rate of urine isolates were 81.7% while the vaginal isolates were 74.1% and endo cervical isolates were 69.6% from a total of positive specimens. Table (1).

Table (1): Distribution of different swabs which gave negative and positive results for bacterial inoculation on different media.

Patients	Total No. of specimens	Positive specimens	Negative specimens	Prevalence of Positive Specimens
Urine swabs	71	58	13	81.7%
Vaginal swabs	27	20	7	74.1%
Endo cervical swabs	23	16	7	69.6%
Total	121	94	27	

The results revealed there were six genera of bacteria were identified in addition to one species of yeast, which include *Escherichia coli* 54.4%, *Streptococcus agalactiae* 17%, *Staphylococcus aureus* 12.8%,

Klebsiella 8.5%, *Pseudomonas aeruginosa* 5.3%, *Proteus* 1%, and *Candida albicans* 1% respectively. Table (2).

Table (2): Bacterial species which isolated from urine, vaginal and endo cervical swabs and its Percentage

Bacterial Species	Urine		Vaginal		Endo cervical		Total	
	No.	Percentage (%)	No.	Percentage (%)	No.	Percentage (%)	No.	Percentage (%)
Staphylococcus aureus	6	10.4%	6	30%	0	0%	12	12.8%
Streptococcus agalactiae	6	10.4%	4	20%	6	37.5%	16	17%
Escherichia coli	40	69%	6	30%	5	31.3%%	51	54.4%
Proteus	1	1.7%	0	0%	0	0%	1	1%
Klebsiella	3	5.1%	2	10%	3	18.7%	8	8.5%
Pseudomonas aeruginosa	2	3.4%	1	5%	2	12.5%	5	5.3%
Candida albicans	0	0%	1	5%	0	0%	1	1%
Total	58	100%	20	100%	16	100%	94	100%

The causes of miscarriage in many cases are unknown. However, approximately 50% of early miscarriages showed abnormal chromosomal aberrations in the aborted fetus as changes in the structures or number of chromosomes⁽¹⁷⁾. Studies have shown that 78% of 101 histopathological samples of miscarriages were infected with bacterial (chorioamnionitis) compared with control samples which were uninfected⁽¹⁸⁾.

Our results agree with the findings of ⁽¹⁹⁾ which found that the staphylococcus was predominant in urogenital diseases of pregnant women with threatened abortion also *Streptococcus agalactiae* was isolated in 11.8 %, While it was contrary to what was obtained from isolates of *E. coli*, where 69% was obtained in the urine while the researcher got 19%⁽²⁰⁾.

Researcher⁽²¹⁾ found that induced abortion associated with group B *Streptococcus* (known as *Streptococcus agalactiae*) colonization. So the presence of these species in the genital tract could be one of the causes of abortion and suggesting that colonization of *Streptococcusagalactiae* in the genitourinary tracts may could be the risk factor for early-onset diseases⁽²²⁾, and the colonization of these species in pregnant women is also an important cause of premature rupture of membranes, advanced miscarriage, premature birth and a series of disadvantage pregnancy outcomes⁽²³⁾

Also the researcher⁽²⁴⁾ founded that bacterial vaginosis not only related with abortion (spontaneous or induced), but also are associated with an increased risk of infertility.

The researcher found the urogenital infections are the most important health problems affecting (in)

pregnancy women causing (of) cystitis, miscarriage, infertility and possibly death⁽²⁵⁾.

The vaginal flora play essential role for reduction of pH resultant acid provided protection against infection but an overgrowth of bacteria especially in vagina reduction or cause absence of vaginal flora ⁽²⁶⁾ which often associated with late miscarriages ⁽²⁷⁾. Also the ⁽²⁸⁾ confirmed the role of the bacterial vagina (BV) as a predictor of miscarriage after 13 weeks' gestation.

And our results were agreement with ⁽²⁹⁾, who found that the mostly bacterial species were *Escherichia coli* which account to 80% to 85% the infection of UTI followed by *Staphylococcus* species that constitutes to 10% to 15%. of the infection. In addition to bacterial species *Klebsiella*, *Pseudomonas*, *Proteus* species which plays a minor role in the infection. Therefore, the untreated infection of UTI during pregnancy may lead to premature labor or result in miscarriages which causes to infant's death.

The⁽³⁰⁾ isolated many species of bacteria included: *Chlamydia trachomatis*, *Enterococcus*, *Escherichia coli*, *Gardnerella vaginalis*, *Klebsiella pneumoniae*, *Mycoplasma hominis*, *Neisseria gonorrhoeae*, *Staphylococcus*, and *Streptococcus* from patients assessed for chronic endometritis. And the prevalence of chronic endometritis in infertile patients estimated to 2.8%-39% and as high as 60% diagnosed with unexplained abortion⁽³¹⁾.

The vaginal pathogens could passage to the cervix, through dilatation of the cervix and the loss of the cervical mucus plug during the miscarriage resulting in the infection of the endometrium and increased vascular

permeability due to bacterial infections of endometrium allow the passage of the pathogen into the systemic circulation which causes of septic shock syndrome and the *Klebsellia* play important role in that case⁽³²⁾ and the researcher ⁽³³⁾ found there were association between *Escherichia coli* and miscarriage in a study conducted on some cases in Nigeria

With regard to *Candida albicans* infections during pregnancy which association of chorioamnionitis, the researcher ⁽³⁴⁾ found that it can lead to late abortion.

The results of antibiotics sensitivity tests against 24 antibiotics showed there were multi resist for *Candida albicans* which isolated from vagina where was resist in 100% ratio to all antibiotics used in this study, followed by *Proteus*, which resisted 8 antibiotics in percentage 100% included cefipime, cefotaxime, doxycycline, aztroenam, nalidixic acid, imipenem, norfloxacin and levofloxacin. Whereas the *Pseudomonas aeruginosa* was resist to aztroenam, nalidixic acid and norfloxacin in 100% and resisted in 83.3% against cefotaxime, ciproflaxine, ceftriaxone and nitrofurantoin, while was less resistance against the other antibiotics where the resistance ranged from 66.7% to 0%.Figure (1).

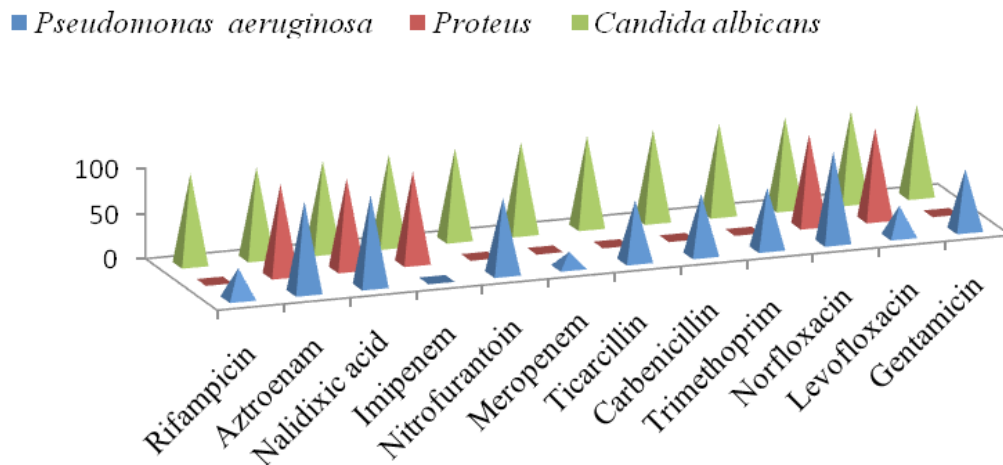


Figure (1): Antimicrobial susceptibility of *Pseudomonas aeruginosa*, *Protus* and *Candida albicas*.

The *E.coli* resisted against cefotaxime, ceftriaxone and aztroenam in 92.5%, 85.8% and 85% respectively while it was low resist to the other antibiotics ranged between 69.5% and 2.5%.*Klebsiella* isolates were resisted against aztroenam in 100% and against gentamicin in 89% but moresusceptibility to the others.

The obtained results that *Klebsiella*, *Streptococcus agalactiae*, *Escherichia coli* and *Staphylococcus aureus* showed highly resist against Aztroenam of in percentage

(100%, 88.7%, 85% and 83.5%) respectively. The determination of resistance demonstrated that *Escherichia coli* had been resisted ciproflaxine in 92.5% and ceftriaxone in 85.8% while *Staphylococcus aureus* was resistance to the Nalidixic acid in 100%. and the results apparent that resistance rates in all bacterial species varied between moderate resistance and sensitive against other antibiotics which used in this study. Figure (2).

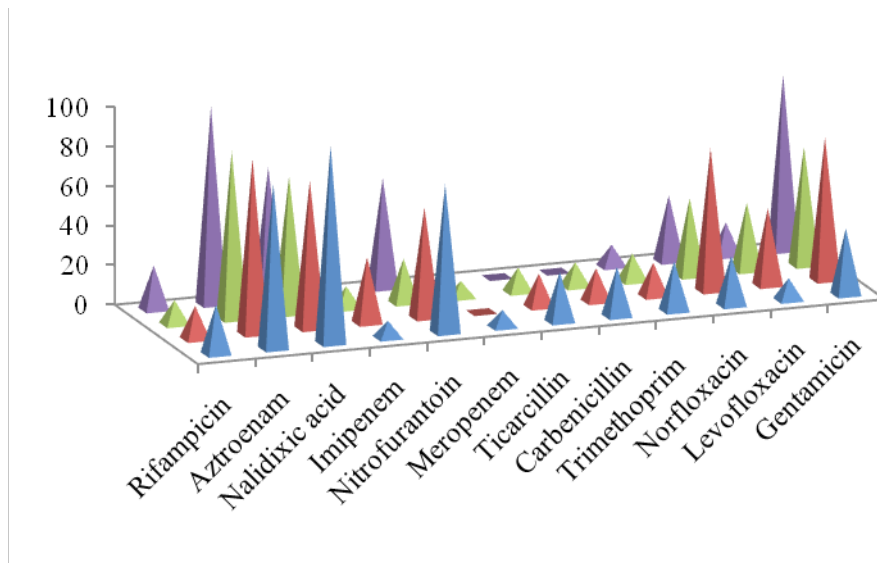


Figure (2): Antimicrobial susceptibility of Staphylococcus aureus, Streptococcus agalactiae, Escherichia coli and Klebsiella

These results disagree to findings of⁽³⁶⁾ who found that bacterial vaginosis isolates were high level of sensitivity to Norfloxacin (75.6 %), ciprofloxacin (79.6 %) and gentamicin (77.6 %) whereas our results were opposite these results most of the bacterial isolates were resistance to the Norfloxacin (25%-100%) and but agree with resistance of gentamicin which were (33.5% - 100%) except the Proteus was sensitivity.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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References

1. Summers PR. Microbiology relevant to recurrent miscarriage. Clin Obstet Gynecol 1994;37:722–729.
2. Soper DE, Mayhall CG, Dalton HP. Risk factors for intraamniotic infection: a prospective epidemiologic study. Am J Obstet Gynecol 1989;161:562–568.
3. Casari E, Ferrario A, Morengi E, Montanelli A. Gardnerella, Trichomonas vaginalis, Candida, Chlamydia trachomatis, Mycoplasma hominis and Ureaplasma urealyticum in the genital discharge of symptomatic fertile and asymptomatic infertile women. New Microbiol 2010;33:69–76.
4. Wilson JD, Ralph SG, Rutherford AJ. Rates of bacterial vaginosis in women undergoing in vitro fertilisation for different types of infertility. BJOG 2002;109: 714 –717.
5. Morris M, Nicoll A, Simms I, Wilson J, Catchpole M. Bacterial vaginosis: a public health review. 2001;108(5):439-50.
6. Tolosa JE, Chaithongwongwatthana S, Daly S, Maw WW, Gaitán H, Lumbiganon P et al. International Infections in Pregnancy (IIP) study: variations in the prevalence of bacterial vaginosis and distribution of morphotypes in vaginal smears among pregnant women. Am J Obstet Gynecol. 2006;195(5):1198- 204.
7. Donders GG, Zodzika J, Rezeberga D. Treatment of bacterial vaginosis: what we have and what we miss. Expert Opin Pharmacother 2014;15:645 –657.
8. Romanik M, Nowosielski K, Poreba R, et al. Streptococcus group B serotype distribution in anovaginal isolates of women in term pregnancy. Neuro Endocrinol Lett. 2014;35:301–305.
9. Li YP, Kuok CM, Lin SY, et al. Group B Streptococcus antimicrobial resistance in neonates born to group B Streptococcus-colonized mothers:

- single-centersurvey. *J Obstet Gynaecol Res.* 2016;42:1471-1475.
10. Hay PE, Lamont RF, Taylor-Robinson D, Morgan DJ, Ison C, Pearson J. Abnormal bacterial colonisation of the genital tract and subsequent preterm delivery and late miscarriage. *BMJ* 1994;308:295–298.
 11. Rocchetti TT, Marconi C, Rall VLM, Borges VTM, Corrente JE, Da Silva MG. Group B streptococci colonization in pregnant women: risk factors and evaluation of the vaginal flora. *Arch Gynecol Obstet* 2011;283:717–721.
 12. Tavo V. Prevalence of *Mycoplasma hominis* and *Ureaplasma urealyticum* among women of reproductive age in Albania. *Med Arch* 2013;67:25.
 13. McCormick T; Ashe RG; Kearny PM. Urinary Tract Infections in pregnancy. *Obstetrician and Gynaecologist* 2008;10: 156-162.
 14. Sevi G., Nick W., Kate C., Gary E., Sarah E.M, and Andrew W. The role of infection in miscarriage. *Human Reproduction Update.* 2016; 22(1):116–133.
 15. Vandepitte, J; Verhaegen, J; Engbaek, K; Rohnor, P. Piot, P; Heuk, C C(2003). *Basic Laboratory Procedures in Clinical Bacteriology*, 2nd edition. WHO. Geneva. pp32 – 35.
 16. Bauer, A. W., W. M. M. Kirby, J. C. Sherris, and M. Turck. 1966. Antibiotic susceptibility testing by a standardized disk method. *Am. J. Clin. Pathol.* 45:493-496.
 17. Suzumori N, Sugiura-Ogasawara M. Genetic factors as a cause of miscarriage. *Curr Med Chem* 2010;17:3431–3437.
 18. Allanson B, Jennings B, Jacques A, Charles AK, Keil AD, Dickinson JE. Infection and fetal loss in the mid-second trimester of pregnancy. *Aust N Z J Obstet Gynaecol* 2010; 50:221–225.
 19. Anatolijs N. and Elvīra T. The most common isolated microorganisms and its clinical manifestation in hospitalised women suffering from urogenital diseases in Latvia. Naumčīks A et al. *Int J Reprod Contracept Obstet Gynecol.* 2015;4(4):959-962.
 20. Montero Alonso R, Barbadillo Izquierdo F, Ansó Oliván S, Marrero Calvo M, Carpintero Martín I, Sastre Huerta E et al. [Neonatal sepsis caused by *Streptococcus agalactiae*. What should be done?]. *An Esp Pediatr.* 1998;48(3):288-92.
 21. Zhiyao C., Guoming W., Xuelian C., Shunming L., Xiaolin W., Zhenjiang Y., Chuan'an W. and Xiaohua Y. Group B streptococcus colonisation and associated risk factors among pregnant women: A hospital based study and implications for primary care. *Int J Clin Pract.* 2019;73:e13276.
 22. Colbourn T, Gilbert R. An overview of the natural history of early onset group B streptococcal disease in the UK. *Early Hum Dev.* 2007;83:149-156.
 23. Li YP, Kuok CM, Lin SY, et al. Group B Streptococcus antimicrobial resistance in neonates born to group B Streptococcus-colonized mothers: single-centersurvey. *J Obstet Gynaecol Res.* 2016;42:1471-1475.
 24. Xin T., Shu-qi G., Lei C., Li-si C., Muh-fa H., and Chiung-lang W. Relationships between female infertility and female genital infections and pelvic inflammatory disease: a population-based nested controlled study. *CLINICS* 2018;73:e364: 1-6.
 25. Al-Badr A, Al-Shaikh G. Recurrent urinary tract infections management I women: A review. *Sultan Qaboos Univ. Med. J.* 2013; 13: 359-367.
 26. Giovanni N., Manuela M., Elisabetta M., Gian C., Gaspare C. and Maurizio M. Role of the infections in recurrent spontaneous abortion. *The Journal of Maternal-Fetal and Neonatal Medicine*, 2011; 1-7.
 27. Hay PE, Lamont RF, Taylor-Robinson D, Morgan DJ, Ison C, Pearson J. Abnormal bacterial colonisation of the genital tract and subsequent preterm delivery and late miscarriage. *BMJ* 1994;308: 295–298.
 28. Oakeshott P, Hay P, Hay S, Steinke F, Rink E, Kerry S. Association between bacterial vaginosis or chlamydial infection and miscarriage before 16 weeks' gestation: prospective community based cohort study. *BMJ* 2002;325:1334–1338
 29. Ranganathan V. Urinary tract infection: an overview of the infection and the associated risk factors. *J Microbiol Exp.* 2014;1(2):42–54.
 30. Inmaculada M., Ettore Cicinelli, M., Iolanda Garcia-G., Marta Gonzalez-M., Davide B., Felipe V., Dominique D., Leonardo R., Diana Valbuena, M. and Carlos Simon, M. The diagnosis of chronic endometritis in infertile asymptomatic women: a comparative study of histology, microbial cultures, hysteroscopy, and molecular microbiology. *Am J Obstet Gynecol* 2018;218:602.e1-16.

31. Cicinelli E, Matteo M, Tinelli R, et al. Prevalence of chronic endometritis in repeated unexplained implantation failure and the IVF success rate after antibiotic therapy. *Hum Reprod.* 2015;30:323-30.
32. Apostolos K., Stefania P., and George M. Septic shock due to *Klebsiella pneumoniae* after medical abortion with misoprostol-only regimen. *Fertility and Sterility.* 2010; 94(4): 1529.e2-5.
33. Okoroiwu .G. and Wachukwu C. Studies on the Role of *Escherichia coli* in Pregnancy Related Miscarriages (Spontaneous Abortions) In Upland Area of Rivers State of Nigeria. *Am. J. PharmTech Res.* 2015; 5(6): 386-394.
34. Donders G., Moerman P., Caudron J. and Van Assche F. Intra-uterine *Candida* infection: a report of from two mothers four infected fetuses. *European Journal of Obstetrics & Gynecology and Reproductive Biology.* 1990 (38): 233-238.
35. Wondemagegn M., Mulat Y., Yohannes Z., and Bayeh A. Common causes of vaginal infections and antibiotic susceptibility of aerobic bacterial isolates in women of reproductive age attending at Felegehiwot referral Hospital, Ethiopia: a cross sectional study. *BMC Women's Health.* 2015; 15:42: 1-9.

Resistive Index of Intrarenal Vessels in Patients with Ureteric Calculi

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Abstract

Background: Urolithiasis is a common health problem with potential harmful effects on the renal parenchyma if inappropriately addressed. Doppler US is a non-invasive imaging modality with the potential to better characterize obstructive uropathy than grey scale US. **Objective:** to evaluate the Doppler ultrasound findings in patients with renal ureteric calculi and correlate them with other US findings related to obstruction by the calculus.

Method: This analytic cross-sectional study was conducted in the ultrasound unit at the Consultation Center/ Al-Nahrain Medical College for the period from September 2017 to January 2018. A net of thirty five patient with renal stones were enrolled in the study. Greyscale and Doppler US were performed for both the affected and the contralateral sides. Certain US and Doppler findings were evaluated.

Results: 13 (37.15%) of our patients had mild, 13 (37.15%) moderate and 9 (25.7%) severe hydro nephrosis. The average of RI that considered affect the kidney was 0.68, and non-congested kidney was 0.56.

Conclusion: In patients with acute renal colic we use Gray scale sonography with Doppler US in diagnosis of renal stones.

Keywords: Renal colic, ureteric stones, Doppler US, Obstruction, Resistive index.

Introduction

Urolithiasis is usual urological problems, renal colic is usual complain face urologist in practice ⁽¹⁾. Obstructive uropathy is define as blockage of usual urine flow at some parts of urinary tract, the evidence of blockage diagnosed by US depend on the anatomical measurement of dilation of the pelvicalyceal system and ureter near the point of obstruction, scintigraphy has more direct evidence of diagnosis of obstruction, but Doppler US nowadays have more functional data in assumed renal obstruction ⁽²⁾. Obstruction lead to high pressure inside urinary tract, causing physical and physiologic

alterations, obstructive nephropathy lead to permanent loss of renal task ⁽²⁾. The pain occur when stone become in ureter or renal pelvic is sever recurrent that radiated to flank and groin and inner thigh, this colic associated by urgency, blood in urine, sweating, nausea and vomiting with agitation⁽³⁾. Stone that found in upper and mid part of urinary tract lead to sever pain in back or flank region, this pain is become very sever when the stone pass down the ureter and cause temporary obstruction, and the pain become less sever when the stone sited in a specific site if there is incompletely obstructive ⁽³⁾. When the stone at lower part of ureter lead to groin or testicular pain in male or labia majora pain in female, this occur due to damage to olio inguinal or genital branch of the genitofemoral nerves ⁽³⁾. CT scan is very effective in the early diagnosis, management scheduling and follow up of patients with urolithiasis ⁽⁴⁾. Non-contrast CT have more benefit than basic radiography and ultrasoundsensitivity (>95%) and specificity (>96%) for diagnosis and detection of stone. It is faster to diagnosis

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and not need to give intravenous contrast^(5,6,7). US use in the emergency unit can be helpful in diagnosis and avoid CT lead to decrease aggregate radiation mount without any complication, pain levels and hospitalization⁽⁸⁾. More stone can diagnosed by US as hyperechogenic foci with posterior shadowing (Figure 1). US cannot detect

small stone < 5mm, due to loss of posterior shadowing, in med ureter the stone not diagnose whatever their size can be concealed by superimposing intestinal loops and gas more likely in obese patients also due to vascular calcifications, clots⁽⁹⁾. The accuracy of US in diagnosis renal stones depend on size and place of these stones⁽¹⁰⁾.



Figure 1: Ureteric stone seen as echogenic foci with posterior shadowing⁽⁸⁾

The RI is defined as: (peak systolic velocity – lowest diastolic velocity)/peak systolic velocity. When resistance become high in distal vessels this lead to decrease in diastolic flow and lead to increase of RI and vice versa⁽¹¹⁾. A plain abdominal (KUB) film can identify large radiopaque calculi. However, smaller calculi and/or radiolucent stones may go undetected. Obstruction/hydronephrosis cannot be adequately assessed⁽¹⁰⁾. **Aim of study** :to evaluate the Doppler ultrasound findings in patients with renal ureteric calculi and correlate them with other US findings related to obstruction by the calculus.

Method

This analytic cross-sectional study was conducted in the ultrasound unit at the Consultation Center/Al-Nahrain Medical College for the period from September 2017 to January 2018 A net of thirty five patient with renal colic were enrolled in the study.

Inclusion Criteria: All adult patients with renal colic suspected of having ureteric stones and referred to the US unit in AL-Nahrain Medical College consultation center who have definite uerteric calculus detected either through the US exam or by other imaging modalities (mainly CT).

Exclusion Criteria: Patient with contralateral renal or ureteric stones, patients with ipsilateral renal stones, patients with chronic illnesses that may affect the hemodynamics of intrarenal vessels (hypertension, DM, advanced atherosclerotic disease).

Examination technique: brief clinical data were retrieved from the patient prior to scanning including the side, duration of colic and the presence of associated symptoms. Notes were made regarding whether the patient had performed any other imaging tests prior to ultrasound referral (KUB or CT) and their results were evaluated .All patients included in the study were

examined by grey scale ultrasound using Logiq P6 pro ultrasound machine (GE healthcare, USA) utilizing the convex ultrasound probe with a frequency of 3.5 MHz . Patients were first examined in the supine position and lateral decubitus positioning was performed as necessary. Both the affected and the contralateral kidneys were evaluated for size (normal or enlarged) degree of hydronephrosis (mild, moderate or severe) and if visible the stone was evaluated for maximum dimension and site (upper, mid, lower ureter or VUJ) . Doppler interrogation was performed afterwards. Both arcuate and interlobar arteries in the affected and the contralateral kidneys were evaluated by pulsed Doppler imaging during attempted breathhold and after adequate patient positioning, three measures for each reading were taken and the average was recorded. Thereafter the urinary bladder was evaluated by color Doppler to detect

the presence or absence of ureteric jet at the side of ureteric stone. Statistical analysis was done using SPSS Software V24. Data were presented in tables and cross-tables and graph design (pie charts). P-value < 0.05 is significant.

Results

The study sample included 35 patients presented with ureteric stones. (51.4%) of the patients were males and (48.6%) were females. Age range of these subjects was 10-60 years. Most (71.4%) of the patients included in the study were below 40 years.

We had 22 patients (62.9%) presented within 5 days of their complaint. On the other hand, a significant proportion of patients (37.1%) had delayed presentation after 5 days (table 1).

Table 1: Duration of symptoms (days)

Duration of colic					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	22	62.9	62.9	62.9
	5-10	7	20.0	20.0	82.9
	>10	6	17.1	17.1	100.0
	Total	35	100.0	100.0	

Regarding the size of the stone 37.1% of patients had stones sized 5-10 mm, 34.3% of patients had stone within the size range of 10-15 mm (table 2)

Table 2: Size of stone

	Frequency	%
<5	1	2.9
5-10	13	37.1
11-15	12	34.3
>15	9	25.7
Total	35	100.0

Most of the stones were within the upper part of the ureter 34.3%, slightly lower percent were within the lower ureter (31.4%) with equal proportion found within the midrate and VUJ (17.1%)

Slightly higher percent of the affected kidneys (51.43 %) were enlarged in size. Only 28.6% of the affected kidneys had reduced cortical thickness. Hydro nephrosis with variable grades was present in all affected kidneys (table 3).

Table 3: Hydro nephrosis grade

	Frequency	%
Mild	13	37.1
Moderate	13	37.1
Sever	9	25.7
Total	35	100.0

Evaluating the ureteric jet revealed it was present in 20 out of 35 cases (57.1%) .The mean RI of arcuate arteries in the affected kidneys was (0.69) compared with the mean RI in the contralateral normal kidneys (0.57) .Likewise, the mean RI of interlobar arteries in the affected kidney (0.68) compared to the mean RI of interlobar arteries in the contralateral kidney (0.57) Taking 0.68 value as a cutoff between normal and abnormal RI the sensitivity of the RI in arcuate arteries and interlobar arteries as a marker of ureteric obstruction by stones were 95% and 94.4% respectively. The specificity of RI in arcuate and interlobar arteries were 68% and 65.4% .No significant correlation between the mean RI of the arcuate arteries and the following parameters.

RI of arcuate vs. grade of hydro nephrosis P value=0.73. RI of arcuate vs. size of the stone P value =0.43. Likewise, no significant correlation between the mean RI of the interlobar arteries and the other parameters evaluated in the study. RI of interlobar vs.

grade of hydro nephrosis P value=0.95. RI of interlobar vs. size of the stone P value =0.11. RI of interlobar vs. site of the stone P value =0.74. The only significant association was between RI of arcuate arteries and site of the stone as in table 4.

Table 4: Association of RI within arcuate arteries with the site of the stone

		Site of stone				Total
		VUJ	Lower ureter	Upper ureter	Mid ureter	
Mean RI (arcuate aa) of affected side	≤0.68	2	8	6	0	16
	>0.68	4	3	6	6	19
Total		6	11	12	6	35

P value = 0.033 (significant).

Discussion

Hydro nephrosis Pyelocaliectasis: can be define as obstruction or blockage of urinary tract under US examination 13 (37.15%) of total patients with mild, 13(37.15%) moderate and 9 (25.7%) severe hydro nephrosis. In our study no one of patients with absence of hydronephrosis. Contrast to another study done by Platt JF et al. ⁽¹²⁾, showed that 30% of patients had no dilation and with obstruction. This difference from our study is due to late presentation and variable degree of obstruction cause by stone, 1 (2.9%) of patients with <5 mm size of obstruction, and max. size in current study was 22 mm. The site of the obstructing calculus was upper ureter in 12 (34.3%) of our patients, lower ureter in 11 (31.4%), mid ureter in 6 (17.1%) and VUJ in 6 (17.1%).

Sensitivity: The sensitivity of Resistivity Index in predicting ureteric obstruction was 95% .92% sensitivity have documented by Platt et al. ⁽¹²⁾by use US (RI) in diagnosis of obstruction, while another study done by Haroun A ⁽¹³⁾ stated that sensitivity was 64 %. In current study RI of obstruction and blocked kidney was 0.68 and non- obstructed was 0.56. this 2 values was within normal range (≤ 0.68) with significant difference, only 54.28% of patients had obstruction present with high RI,Platt et al. ⁽¹²⁾ showed the mean of RI (0.77±0.05) in patients with obstructed kidney (acute or chronic). So this results revealed that RI was elevated due to renal and non-renal diseases (>0.7). the cause of decrease of RI in our study was 34.2% of patients had obstruction with elevated RI > 0.71. Cronan JJ et al.⁽¹⁴⁾ showed that only 37% of patients with any levels of obstruction diagnosed

by RI by used US. So the differences between studies is due to change in degree of obstruction and vasodilatation and then vasoconstriction may not happen reliably in clinical exercise. In some patients with renal colic the obstruction is irregular so RI supposedly not raise even this irregular obstruction continue. The hemodynamic variations in congested kidneys were intrarenal rather than general measures ⁽¹⁴⁾.RI in control group was < 0.68 in all patients.

Conclusion

In patients with acute renal colic we use Gray scale sonography with Doppler US in diagnosis of renal stones.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

1. Onur MR, Cubuk M, Andic C, Kartal M, Arslan G. Role of resistive index in renal colic. Urol Res. 2007; 35: 307-12.
2. Alina-Gabriela Pauna. The role of urinary tract obstruction in occurrence of renal failure. Curr Health Sci J. 2010;36(3):136-38
3. Sherif R. Aboseif, Karl-Erik Andersson . SMITH &

TANAGHO'S GENERAL UROLOGY .McGraw Hill Lange. 2013;17:259–12

4. Teichman JMH (2004) Clinical practice. Acute renal colic from ureteral calculus. *N Engl J Med* 350:684–693
5. Smith RC, Verga M, McCarthy S, Rosenfield AT. Diagnosis of acute flank pain: Value of unenhanced helical CT. *AJR Am J Roentgenol.* 1996;166:97–101.
6. Dhar M, Denstedt JD. Imaging in diagnosis, treatment, and follow-up of stone patients. *Adv Chronic Kidney Dis.* 2009;16:39–47.
7. Pfister SA, Deckart A, Laschke S, Dellas S, Otto U, Buitrago C, et al. Unenhanced helical computed tomography vs intravenous urography in patients with acute flank pain: Accuracy and economic impact in a randomized prospective trial. *Eur Radiol.* 2003;13:2513–20.
8. Dalla Palma L, Stacul F, Mosconi E, PozziMucelli R (2001) Ultrasonography plus direct radiography of the abdomen in the diagnosis of renal colic: still a valid approach? *Radiol Med* 102:222–225
9. Smith-Bindman R, Aubin C, Bailitz J, et al. Ultrasonography versus computed tomography for suspected nephrolithiasis. *N Engl J Med.* 2014;371:1100–1110. doi: 10.1056/NEJMoa1404446.
10. Ripollés T, Agramunt M, Errando J, et al. Suspected ureteral colic: plain film and sonography vs unenhanced helical CT. A prospective study in 66 patients. *Eur Radiol.* 2004;14:129–136.
11. Bude RO, DiPietro MA, Platt JF, Rubin JM, Miesowicz S, Lundquist C. Age dependency of the renal resistive index in healthy children. *Radiology* 1992; 184:469–473.
12. Platt JF, Rubin JM, Ellis JH. Acute Renal Obstruction: Evaluation with Intrarenal duplex Doppler and conventional US. *Radiology.* 1993;686:685-88.
13. Haroun A. Duplex Doppler sonography in patients with acute renal colic: prospective study and literature review. *Int Urol Nephrol.* 2003; 35(2): 135-40.
14. Cronan JJ. Contemporary concepts in imaging urinary tract obstruction. *Radiol clin North Am.* 1981;29:527

Phenolic Compounds Role in Rat Immunity Changes that Caused by *Entamoeba histolytica*

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Abstract

The present study was designed to show the potential role of phenolic compounds against the toxicity of *Entamoeba histolytica*. The study used 20 adult male rats that distributed to four groups (each group consist 5 rats); control group that received normal saline, second group rat injected intraperitoneal with *E. histolytica* at dose 10³ cyst/ml. third group rat injected intraperitoneal with *E. histolytica* at dose 10³cyst/ml and treated with 100ug/ml of phenolic compounds for four weeks. Fourth group rat injected intraperitoneal with *E. histolytica* at dose 10³cyst/ml and treated with 250ug/ml of phenolic compounds for four weeks. The results show high significant increased ($P < 0.05$) in levels of Interferon gamma (INF- γ) and Tumor necrosis factor- α (TNF α) in group that injected with *E. histolytica* compared with control group. About oxidative stress, Levels of Malondialdehyde (MDA), Glutathione (GSH) and catalase show high significant changes ($P < 0.05$) in group that injected with *E. histolytica* compared with control group. After using phenolic compounds, levels of INF- γ , TNF- α MDA, GSH and catalase in treated groups show non-significant changes ($P < 0.05$) compared with control group. It was concluded that phenolic compounds have been potential role against *E. histolytica*.

Keywords: *E. histolytica*; phenolic compounds; oxidative stress.

Introduction

Amoebiasis, or amoebic dysentery, is a term used to describe an infection caused by the protozoan *Entamoeba histolytica*^[1]. Most infections are asymptomatic, but invasive intestinal disease may occur manifesting with several weeks of cramping, abdominal pain, watery or bloody diarrhea, and weight loss^[2]. Amebiasis has been defined as the pathological conditions arising from harboring the protozoan parasite *E. histolytica*, with or without clinical manifestation^[3]. Amebiasis is a major cause of morbidity and mortality worldwide, mostly in tropical and sub-tropical countries characterized by inadequate health services and sanitation infrastructure. The majority of deaths are a consequence of severe complications associated with intestinal or extra-intestinal invasive disease^[4]. Momordica is a genus of about 60 species of annual or perennial herbaceous climbers belonging to family Cucurbitaceae^[5]. Cucurbitacins are reported to be the main active constituents of *M. charantia* that have anti-hyperglycemic^[6], anti-

hyperlipidemic^[5], hepatoprotective^[7], anti-obesity, anti-cancer^[8] and anti-viral activities^[9]. Phenolic compounds or polyphenols are one of the most frequent and widespread groups of substances in the world of plants, with more than 8000 identified phenolic structures^[10-11]. Phenolic compounds are among the health-promoting phytochemicals. Phenolic compounds are receiving much attention because of their antioxidant properties^[12]. Epidemiological studies have related dietary intake of phenolic-rich food with lower incidence in the appearance of several chronic diseases^[13-14].

Material and Method

Samples Collection: Stool samples were collected from patients with diarrhea from private laboratory randomly. Small amount of sample was examined on direct microscopic examination of feces to ensure that contain the parasite.

Culturing the Parasite: Small amount of positive stool sample was cultured on the LES-media (NIH

modification of Boeck and Drbohlav, s media) [15]. Culture tube incubated vertically at 37°C for 48h. For experimental inoculation, actively growing trophozoites were sediment after chilling the culture tubes for 5min in an ice-water bath.

Animal Model: Twenty adult male albino rats in this study, (wt 200-250 gm with age 4-6 month) obtained from Veterinary college/Kirkuk University, and kept on a standard pellet diet for two weeks to ensure its normal and there isn't any infection.

Extraction and purification of phenolics: A dried sample of bitter melon 10 g extracted for 30 min. by stirring at 400 PC with 200 ml of cold aqueous ethanol %65 containing 0.5% Sodium metabisulphite. The homogenate was filtered through four layers of cheesecloth, and the residue was then extracted with two additional portions (100 ml each) of the same extraction solution as described above. The combined filtrate was centrifuged at 7000 rpm for 15 min. at 400 PC and residue was discarded. Ethanol was removed from the supernatant by rotary evaporator under vacuum at 350 PC, and the mass is measured. Pigments were eliminated by two successive extractions with petroleum ether. After addition of 20% ammonium sulphate and 2% metaphosphoric acid to the aqueous phase, the compounds were extracted three times with ethyl acetate. The extracts were combined, evaporated and then dried under vacuum at 350 PC. The residue was re-dissolved in methanol (1:1) for analysis [16].

Determination of phenolic compounds: The phenolic compounds of the bitter melon were determined using High Performance Liquid Chromatography (HPLC) [17]. The absorbance was monitored at 254 nm. C-18 Chromatographic column was used. The mobile phase consisted of 100 % methanol. A sample size of 5 µl from the intact phenolics was injected for the HPLC analyses.

Experimental design: Twenty adult male albino rats were used in this study and then divided as follow (each group consist six rats):

A. Control group received standard pellet diet only.

B. Male rat injected (intraperitoneal) with *E. histolytica* at dose 10^3 cyst/ml.

C. Male rat injected (intraperitoneal) with *E. histolytica* at dose 10^3 cyst/ml and treated with 100µg/ml of phenolic compounds for four weeks.

D. Five Male rat injected (intraperitoneal) with *E. histolytica* at dose 10^3 cyst/ml and treated with 250µg/ml of phenolic compounds for four weeks.

Measurements:

INF- γ and TNF- α in serum: Blood of the mice was withdrawn from all groups and were subjected for separation of sera. INF- γ and TNF- α Concentrations were determined by commercially available ELIS Kit.

Plasma Peroxidation levels (MDA), Glutathione (GSH) and Catalase: MDA (malonaldehyde), was measured based on the colorimetric reaction with thiobarbituric acid (TBA) using spectrophotometer [18]. GSH level estimated by mixed 2.3 ml buffer with 0.2ml of the sample and then added 0.5ml of 5,5-dithio-bis-(2-nitrobenzoic acid) (DTNB). The mixture was analyzed by spectrophotometer [19]. Catalase was measured by using the procedure of Biovision-USA kits.

Statistical Analysis: The Data were analyzed using a statistical Minitab program. A statistical difference between the means of the experimental groups was analyzed using one-way analysis of variance (ANOVA).

Results

INF- γ and TNF- α : INF- γ and TNF- α in rats injected with *E. histolytica* show significant increased ($P < 0.05$) compared with control rats. INF- γ and TNF- α levels in third and fourth groups show no significant changes ($P < 0.05$) compared with control rats as shown in figures (1-2).

MDA, GSH and catalase: MDA, GSH and catalase in rats injected with *E. histolytica* show significant increased ($P < 0.05$) compared with control rats. MDA, GSH and catalase levels in third and fourth groups show no significant changes ($P < 0.05$) compared with control rats as shown in figures (1-2).

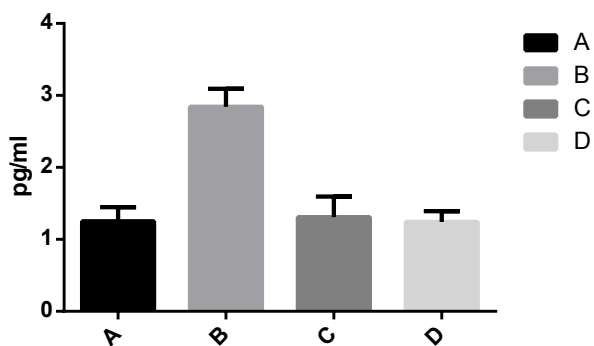


Figure (2): Levels of TNF-alpha in all groups

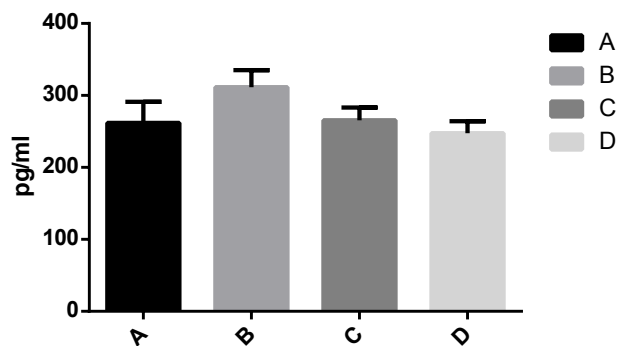


Figure (1): Levels of INF-gamma in all groups

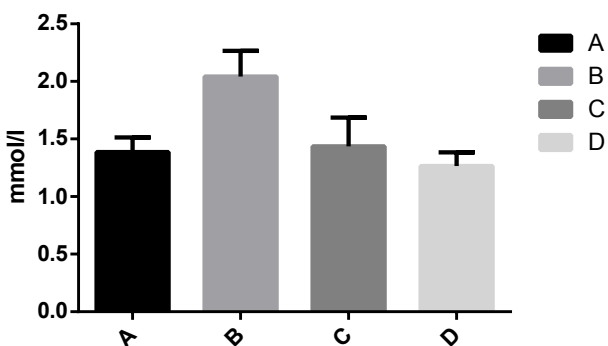


Figure (3): Levels of MDA in all groups

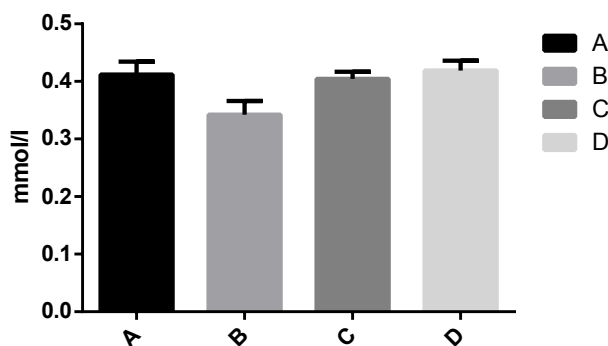


Figure (4): Levels of GSH in all groups

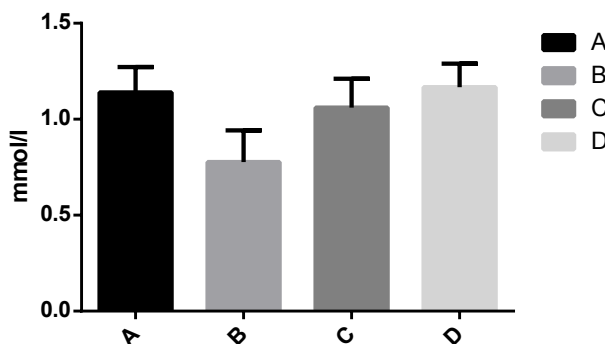


Figure (5): Levels of catalase in all groups

Discussion

The present study shows a toxicity effect of *E. histolytica* on immunity of mice, where results show increases the levels of INF- γ and TNF- α . Mieh^[20] referred that the infection with *E. histolytica* lead to increase the levels of TNF- α and suggest that TNF- α have a role in the defense against *E. histolytica* infection. Otherwise, Exogenous IFN- γ can activates neutrophils and macrophages for killing *E. histolytica* in vitro^[21], Seydel et al.^[22] suggested that IFN- γ and nitric oxide (NO) are important in host defense against the protozoan parasite

E. histolytica, also it able to activate host neutrophils and macrophages to kill amoebic trophozoites in vitro and may play similar function in the murine model of amebic liver abscess, which explains the high levels of INF- γ in the present study. Also, results show increased levels of MDA and decrease GSH and catalase levels in rats injected with *E. histolytica*, Al-Kaky^[23] who referred that the patients with *E. histolytica* show increased in levels of MDA and decreased in GSH compared to control group. Suggest that the increased of MDA levels and decreased in GSH back to the ability of parasite

to increase the free radical which induce cytological changes. On the other hand, phenolic compounds in this study show improved immunity of mice and its role against *E. histolytica*, polyphenols are known for their antioxidant activities; they scavenge a wide-ranging selection of ROS. Polyphenols can scavenge radicals and chelate metal ions, for example quercetin chelates iron ion [24]. They also inhibit multiple enzymes responsible of ROS generation [25]. phenolic compounds stimulate antioxidant enzymes like superoxide dismutase (SOD), catalase, and glutathione (GSH) peroxidase (Px) which lead to ROS detoxification [26].

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Reference

1. Haque R, Huston CD, Hughes M, Houpt E. and Petri WA. Amebiasis. *J. Med.* 2003; 348(16): 1565–1573.
2. Kantor, M, Anarella A, Andrea E, Alan S, Jose T, Jose G, Robert H. and Christopher O. Entamoeba Histolytica: Updates in Clinical Manifestation, Pathogenesis, and Vaccine Development. *Canadian J. Gastroent. Hepa.* 2018; 2018: 1-6.
3. WHO, PAHO, UNESCO. A consultation with experts on amoebiasis: Mexico City, Mexico 28-29 January, 1997. *Epidemiol Bull.* 1997; 18:13-14.
4. Fotedar R, Stark, D, Beebe N, Marriott D, Ellis J and Harkness J. Laboratory diagnostic techniques for Entamoeba species. *Clin Microbiol Rev.* 2007; 20: 511–532.
5. Ahamad J, Saima A and Showkat RM. Review Article Momordica charantia Linn. (Cucurbitaceae): Review on Phytochemistry and Pharmacology. *Res. J. Phytochem.* 2017; 11 (2): 53-65.
6. Choudhary, SK, Chhabra G, Sharma D, Vashishta A, Ohri S and Dixit A. Comprehensive evaluation of anti-hyperglycemic activity of fractionated Momordica charantia seed extract in alloxan-induced diabetic rats. *Evidence-Based Complementary Alternat. Med.* 2012; 10:1155-1159.
7. Tennekoon, KH, Jeevathayaparan S, Angunawala P, Karunanayake EH and Jayasinghe KSA. Effect of Momordica charantia on key hepatic enzymes. *J. Ethnopharmacol.*, 1994; 44: 93-97.
8. Ganguly C, De S and Das S. Prevention of carcinogen-induced mouse skin papilloma by whole fruit aqueous extract of Momordica charantia. *Eur. J. Cancer Prevention*, 2000; 9: 283-288.
9. Tsao R. Chemistry and Biochemistry of Dietary Polyphenols. *J. Nutr.* 2010; 2: 1231–1246.
10. Tanase C, Sanda C and Daniela-Lucia M. A Critical Review of Phenolic Compounds Extracted from the Bark of Woody Vascular Plants and Their Potential Biological Activity. *J. Mol.* 2019; 24: 1182-1200.
11. Gutiérrez-Grijalva E P, Dulce LA, Nayely L, Ramón IC and José BH. Review: dietary phenolic compounds, health benefits and bioaccessibility. *Arch. Latino. Nutr.* 2016; 66(2):87-100
12. Sharma R. Polyphenols in health and disease: practice and mechanisms of benefits. Polyphenols in human health and disease, Academic, San Diego, 2014; 2014: 757-778.
13. Rein Mj, Renouf M, Cruz Hernandez C, Actis Goretta L, Thakkar SK, da Silva Pinto M. Bioavailability of bioactive food compounds: a challenging journey to bioefficacy. *Br j Clin Pharmacol.* 2013;75(3):588-602.
14. Mohammed S. T. Role of Kefir Milk on The Pathogenesis of Entamoeba histolytica. *Iraqi J. Sci.* 2016; 57(2B): 1116-1124
15. Zhu C, Deng. X and Shi F. Evaluation of the antioxidant activity of Chinese Hickory (Carya cathayensis) kernel ethanol extraction. *African Journal of Biotechnology.* 2008; 7(3): 2169- 2173.
16. Cai R, Hettiarachy NS and Jalauddin M. High Performance Liquid Chromatography for determination of phenolic constituents in 17 varieties of Cow peas. *J. Agric. Food. Chem.* 2003; 51: 1623-1637.
17. Abdul kareem EA, Abdul Monaim HM and Rafah RH. Biochemical and histological study of the effect of sterol extract from pistachio on the level of antioxidants in the liver tissue green. *J. Pur. Sci.* 2016; 5(21): 82-87.
18. Mahmood NA. Glutathion-S- transferase Enzyme and Malondialdehyde (MDA) in Colorectal Cancer and in Healthy Control. *J. Can. Med. Gen.* 2010; 3(1): 21-26.

19. Mieh RK. Study of TNF- α and IL-17 level in children infected with *Entamoeba histolytica*. *J. Col. Bas. Edu.* 2016; 21(91):1-6.
20. Denis, M and Chadee, K. Cytokine activation of murine macrophages for in vitro killing of *Entamoeba histolytica* trophozoites. *J. Infect. Immun.* 1989; (57): 1750–1756.
21. Seydel KB, Smith, SJ and Stanley SL. Innate immunity to amebic liver abscess is dependent on gamma interferon and nitric oxide in a murine model of disease. *J. Infect. Immun.* 2000; 68: 400–402.
22. Al-Kaky IS. Lipid peroxidation and some hematological changes in *Entamoeba histolytica* patients. *Raf. J. Sci.* 2006; 17(9): 10-16.
23. Heim, KE, Tagliaferro, AR and Bobilya DJ. Flavonoid Antioxidants: Chemistry, Metabolism and Structure-Activity Relationships. *J. Nutr. Biochem.* 2002; 13: 572–584
24. Mishra A, Sharma AK, Kumar S, Saxena AK and Pandey AK. *Bauhinia Variegata* Leaf Extracts Exhibit Considerable Antibacterial, Antioxidant, and Anticancer Activities. *Biomed. Res. Int.* 2013; 2013: 915-922.
25. Sporn MB and Liby KT. NRF2 and Cancer: The Good, the Bad and the Importance of Context. *J. Nat. Rev. Cancer.* 2012; 12: 564–571.

Breast Cancer in Fallujah District (Iraq), A Comparative Pathological Study

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Abstract

Background: The most common cancer in the world is breast cancer. For Iraq, this tumor is the number one cancer in women, but unfortunately there is a dearth of academic studies covering this tumor, despite some studies have indicated a general increase in cancer in Iraq, especially in Fallujah, and these studies attributed the reason to the possible use of carcinogenic weapons in repeated wars in this region.

The aim of this study is to determine the average age of breast cancer patients at diagnosis, and also the type, side, pathological stage and grade of tumor, in order to do statistical assessment with different studies in the Arab region and the world as well as the other Iraqi region.

Materials and Method: This is a retrospective descriptive study of breast cancer, cases of breast cancer were collected over two periods, the first extended from 1st February 2011 to 30 December 2014, and the second between 1st June 2017 and 31 October 2019, and 342 cases had been recorded in this study.

Results: The average female-age at time of diagnosis: 47.59 (SD: 13.11), cases with age <50 y: 66.4%, patients in early TNM stage (pT0 & pT1 categories) forming only 4.68%. concerning the types of tumor: infiltrative ductal carcinoma of no special type: 86.26%, medullary type: 7.02% mucinous: 2.05 & invasive lobular: 4.09%, malignant phyllodes: 0.29%, and metaplastic carcinoma: 0.29%. Left (185)/Right (157) = 1.157 and the percent of both sides involvement was 2.6%.

Conclusion: The average age of breast cancer in Fallujah is earlier than other Arab and Western countries and even in certain areas of Iraq, and it comes with late stage and higher grade.

Keywords: Breast Cancer, Iraq, Fallujah.

Introduction

Breast cancer is the most common cancer in the world and it is also the leading cause of cancer deaths

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in women^(1,2,3,4) approximately 25% of all cancers and 15% of cancer deaths are caused by breast cancer^(5,6). In low- & middle-income countries, the survival of those patients tends to be short because of late diagnosis, and lack of medical care & availability of standard treatment⁽⁵⁾. The incidence rate of breast cancer in the Arab countries is much lower than in Western countries, and the prevailing expectations among Arab doctors that breast cancer has a tendency to affect the early age group and comes at a later stage⁽⁷⁾.

In Iraq, one third of cancers are caused by breast cancer, accounting for the most recorded cancer^(8,9,10,11).

In Western countries there is an increase in the incidence of breast cancer with constant or decreasing mortality^(1,12) but in the Middle East, there is still a noticeable rise in the incidence particularly in young females, with late stages and diagnosis and eventually with poor survival rate ⁽¹¹⁾Statistics in Iraq showed an increase in incidence of breast cancer between 2000 and 2009 from 26.6 per 100,000 to 31.5 per 100,000, such incidence sets Iraq in the low-risk region, but unfortunately it affects the young age group^(9,6). There is a lack of official records of Iraqi hospitals in terms of documenting the clinical aspects including tumor size, grade, stage in presentation, hormonal (estrogen and progesterone receptors), Her2neu status, and lymph nodes status. ⁽¹¹⁾This inevitably applies to hospitals in Fallujah, which necessitates scientific research provides important statistical information, especially as this region has been subjected to frequent wars and the use of weapons that some articles suggested that these weapons may be the cause of increasing the rate of cancer and birth defects in this region⁽¹³⁾.

Materials and Method

This study is designed as a retrospective descriptive study, the cases had been collected over two periods, the first extending from 1st February 2011 to 30 December 2014, and the second between 1st June 2017 and 31 October 2019, the interruption interval from 31 December 2014 to 30 May 2017, was due to military operations in the region against armed groups that led to a mass migration of the populace and the disruption of health services and lack of records. Breast cancer cases n=403 cases (314 cases in the first period and 89 cases in the second period) were collected from pathology laboratories that cover Fallujah and its sectors, and histological diagnosis was confirmed by two pathologists. The variables included in the study were the age & sex of the patient, the type & size of the tumor, degree of differentiation, the side of the tumor, and the condition of the lymph node.

In any case that did not contain any of the previously established variables as well the cases from outside Fallujah and its sectors were excluded. The excluded cases = 44 cases, and the enrolled case= 342 cases.

For staging, the seventh's edition of American Joint's Committee was applied ⁽¹⁴⁾, and Nottingham Histologic Score system was used for grading⁽¹⁵⁾.

Scientific Committee in the College of Medicine - University of Anbar agreed to act in accordance with the laws in force.

Results

The patient age at diagnosis: 47.59 (+ 13.11): The frequency distribution of age is shown in (Table-1).

Table-1 Frequency distribution of age at diagnosis of breast cancer

Age group	Frequency	Percent	Cumulative Percent
<30	21	6.1	6.1
31-40	87	25.4	31.6
41-50	119	34.8	66.4
51-60	60	17.5	83.9
61-70	39	11.4	95.3
71-80	12	3.5	98.8
>80	4	1.2	100.0
Total	342	100.0	

Tumor Stage at Presentation (T category of TNM system): Figure-1

T0 is 2/342= 0.58 %.

T1 is 12/342=4.10%.

T2 is 212/342 = 61.98%.

T3 is 109/342= 31.78%.

T4 is 7/342 =2.04%.

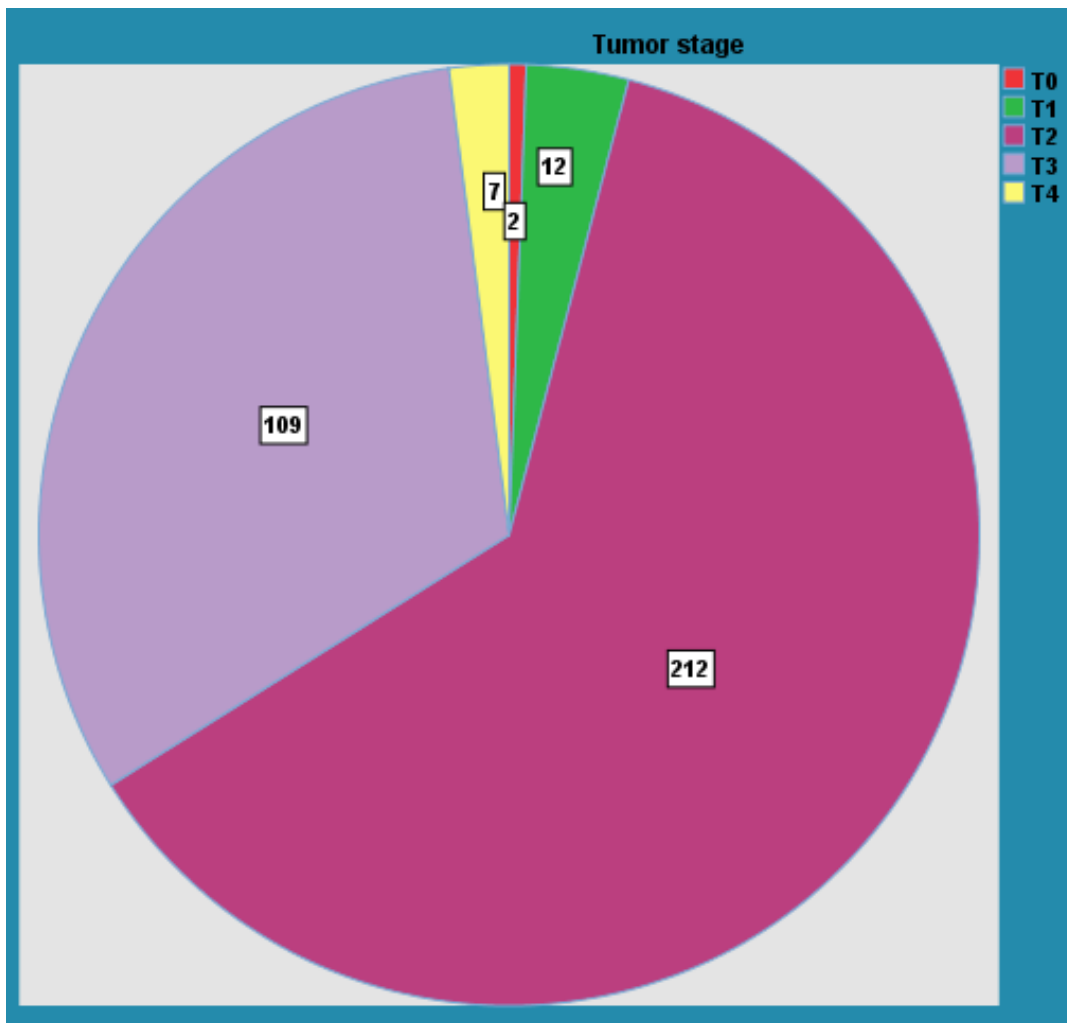


Figure-1. Showing tumor stage of breast cancer at presentation.

Tumor Grades:

I = 53/342 (15.49%).

II = 161/342(47.08%).

III = 128/342 (37.42%).

Tumor Types: (Figure 2)

- Invasive ductal carcinoma not otherwise specified, NOS: 295/342 = 86.26%.
- Medullary: 24/342 (7.02%).
- Invasive lobular: 14/342 (4.09%).
- Mucinous: 7/342 (2.05%).
- Metaplastic carcinoma: 1/342 (0.29%).
- Malignant phyllodes: 1/342 (0.29%).

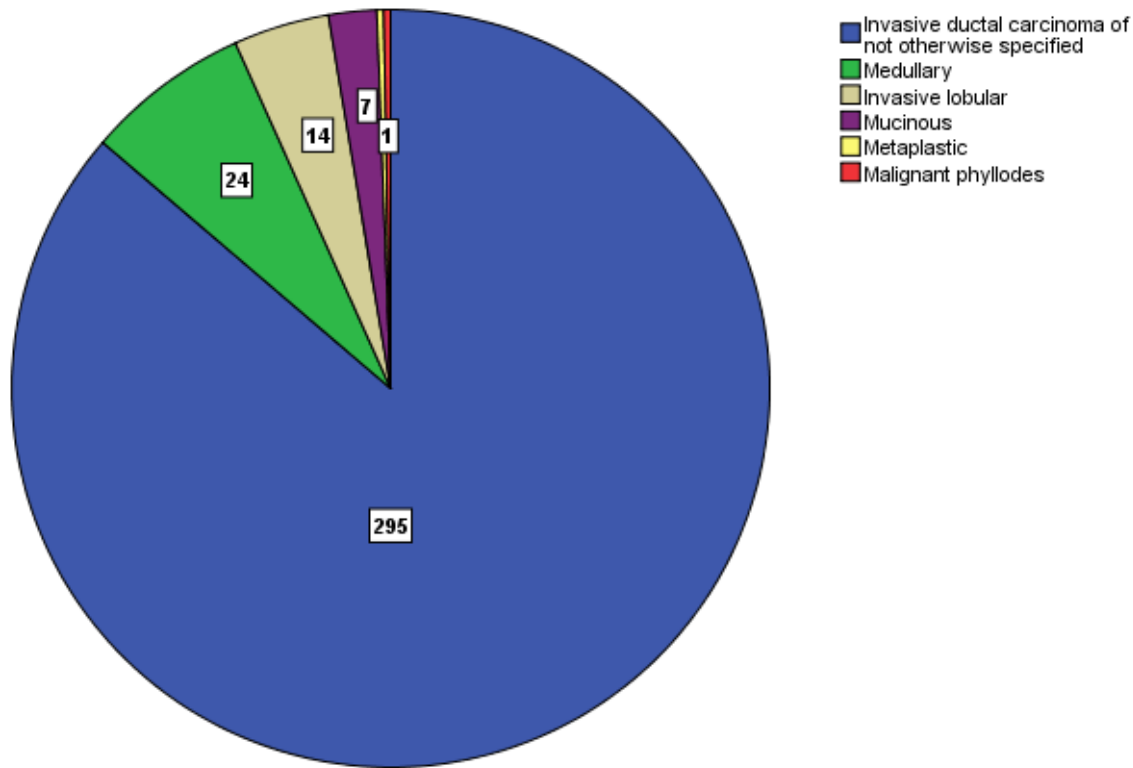


Figure 2: Showing tumor types of breast cancer at presentation

Tumor side: Left breast side (185)/Right breast (157) = 1.17.

Both breasts: 9/292 = 2.6%.

Discussion

Age of patient at presentation: The average of patients' age in this study is 47.59 (SD: 12.15), which is statistically lower than the following comparative studies:

- Al-Hashemi study that achieved in Iraq- 2009, where the average age of breast cancer patients was 52 years, $p < 0.0001$ ⁽⁹⁾.
- Mullah Karim *et al.*'s study conducted in northern cities of Iraq in 2015, this study included 536 cases and the average age was 49.42 (+ 11.6), $p < 0.025$ ⁽⁴⁾.
- Divya A. *et al.* study, that performed the United States in 2015 and the median age was 59 (+ 13.07, $p < 0.0001$)⁽¹⁶⁾.
- Najjar and Esson study, which covered 12 Arab countries in 2010, where the average age was 48 (+ 2.8), $p < 0.04$ ⁽⁷⁾. Worldwide, the percentage of breast cancer in females under the age of 40 years is 6.6% of total breast cancers.⁽³⁾, and in United States

and industrialized countries, the percentage of those under 50y is less than 27%. In Arabic studies, they found that 50% of breast cancer cases had impacted those less than 50 years⁽¹⁷⁾.

In the current study, 108 patients out of 342 (31.6%) were under the age 40 years, and 227 cases/342 (66.4%) were under the age 50 years and this is clearly greater than the global averages, the United States, industrialized countries and Arab countries referred to above.

In conclusion, the average age of breast cancer in Fallujah in this study is earlier than other Arab and developed countries and even certain areas of Iraq, and the same conclusion for incidence rate where the incidence rate of those under 50 years is also greater than the mentioned above areas.

Tumor Stage: A minority of cases i.e. only 14 cases out of 432 (4.68%) were discovered in early stage (pT0-pT, according to TNM system), while 321/432 (93%) were diagnosed beyond the early stages. In the United States, about 60% of cases were discovered at early stage⁽¹²⁾.

This result of late diagnosis of breast cancer in Fallujah is in agreement with other studies that conducted

in developing countries and concluded that most cases of breast cancer are discovered in advanced stage. ^(1,7,10,12).

Tumor Grades: 15.49% of the cases were grade-I, 47.08%, cases were grade-II, and 37.42 cases were grade-III.

These results are analogous to Nada Alwan's study that achieved in Iraq in 2014, where she found about 40% of the cases are of high-grade type, confirming the high incidence of a high grade tumor in this region. ⁽¹¹⁾.

Tumor types: The rates of mucinous carcinoma and medullary carcinoma in this study were comparable to Inhye P. *et al.* & Kelli Y. *et al.*'s studies ^(18,19), in a comparison to Laure D. and Patrick R. Benusiglio & S. E. Singletary *et al.* studies, current study reveals a lower rate of invasive lobular carcinoma ^(20,21), the reason for this low rate of this tumor may be explained by the fact that invasive lobular carcinoma is usually affected the old age with use of hormone replacement therapy (HRT). Therefore, the high incidence rate of cancer in the young ages that shown in this study as well as the lack of HRT, may be the cause of the low incidence rate of this tumor.

Tumor Side:

Left breast side preponderance and the rate bilateral cases of breast cancer in this study were in alignment with other studies ⁽²²⁻²⁶⁾.

Conclusion

In Fallujah and its sectors, cancer of breast is comparatively low, but unfortunately affects a young age group with later stage and higher grade.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

References

1. Lauby-Secretan B, Scoccianti C, Loomis D, Benbrahim-Tallaa L, Bouvard V, Bianchini F, et al. Breast-cancer screening—viewpoint of the IARC Working Group. *N Engl J Med.* 2015; 372(24):2353-8.
2. Simmons PS, Jayasinghe YL, Wold LE, Melton III LJ. Breast carcinoma in young women. *Obstet Gynecol.* 2011;118(3):529.
3. Assi HA, Khoury KE, Dbouk H, Khalil LE, Mouhieddine TH, El Saghir NS. Epidemiology and prognosis of breast cancer in young women. *J Thorac Dis.* 2013;5(Suppl 1):S2.
4. Karim SAM, Ghalib HHA, Mohammed SA, Fattah FHR. The incidence, age at diagnosis of breast cancer in the Iraqi Kurdish population and comparison to some other countries of Middle-East and West. *Int J Surg.* 2015;13:71-5.
5. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin.* 2011;61(2):69-90.
6. Torre LA, Islami F, Siegel RL, Ward EM, Jemal A. Global cancer in women: burden and trends. *AACR;* 2017.
7. Najjar H, Easson A. Age at diagnosis of breast cancer in Arab nations. *Int J Surg.* 2010; 8(6):448-52.
8. Tiwari V, Pande S, Verma K, Goel S. Is multiparity a protective mechanism in Iraqi females with breast cancer? Need for detailed analysis. *Clin Cancer Investig J.* 2015;4(2):292.
9. Al-Hashimi MM, Wang XJ. Breast cancer in Iraq, incidence trends from 2000-2009. *Asian Pacific J cancer Prev APJCP.* 2014;15(1):281-6.
10. Majid RA, Mohammed HA, Hassan HA, Abdulmahdi WA, Rashid RM, Hughson MD. A population-based study of Kurdish breast cancer in northern Iraq: hormone receptor and HER2 status. A comparison with Arabic women and United States SEER data. *BMC Womens Health.* 2012;12(1):16.
11. Alwan N. Iraqi initiative of a regional comparative breast cancer research project in the Middle East. *J Cancer Biol Res.* 2014;2(1):1016.
12. Majid RA, Mohammed HA, Saeed HM, Safar BM, Rashid RM, Hughson MD. Breast cancer in Kurdish women of northern Iraq: incidence, clinical stage, and case control analysis of parity and family risk. *BMC Womens Health.* 2009;9(1):33.
13. Al-Faluji AAR, Ali SH, Al-Esawi AAJ. Incidence of cancer in Fallujah above 10 years age with overview of common cancers in 2011. *Health (Irvine Calif).* 2012;4(09):591.
14. Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A. *AJCC cancer staging manual 7th edition.* NY Springer. 2010;

15. Brant MK, Ziegler KL, Kairon RS. California cancer reporting system standards: abstracting and coding procedures for hospitals vol. 1. Sacramento, CA Calif Cancer Regist. 2013;
16. Parikh DA, Chudasama R, Agarwal A, Rand A, Qureshi MM, Ngo T, et al. Race/ethnicity, primary language, and income are not demographic drivers of mortality in breast cancer patients at a diverse safety net academic medical center. *Int J Breast Cancer*. 2015;2015.
17. Makanjuola D, Alkushi A, Alzaid M, Abukhair O, Al Tahan F, Alhadab A. Breast cancer in women younger than 30 years: prevalence rate and imaging findings in a symptomatic population. *Pan Afr Med J*. 2014;19.
18. Park I, Kim J, Kim M, Bae SY, Lee SK, Kil WH, et al. Comparison of the characteristics of medullary breast carcinoma and invasive ductal carcinoma. *J Breast Cancer*. 2013;16(4):417–25.
19. Ha KY, DeLeon P, DeLeon W. Invasive mucinous carcinoma of the breast. In: Baylor University Medical Center Proceedings. Taylor & Francis; 2013. p. 295–7.
20. Dossus L, Benusiglio PR. Lobular breast cancer: incidence and genetic and non-genetic risk factors. *Breast Cancer Res*. 2015;17(1):37.
21. Singletary SE, Patel-Parekh L, Bland KI. Treatment trends in early-stage invasive lobular carcinoma: a report from the National Cancer Data Base. *Ann Surg*. 2005;242(2):281.
22. Khairy GA, Guraya SY, Ahmed ME, Ahmed MA. Bilateral breast cancer. Incidence, diagnosis and histological patterns. *Saudi Med J*. 2005; 26(4):612-5.
23. Gong SJ, Rha SY, Jeung HC, Roh JK, Yang WI, Chung HC. Bilateral breast cancer: differential diagnosis using histological and biological parameters. *Jpn J Clin Oncol*. 2007;37(7):487–92.
24. Nichol AM, Yerushalmi R, Tyldesley S, Lesperance M, Bajdik CD, Speers C, et al. A case-match study comparing unilateral with synchronous bilateral breast cancer outcomes. *J Clin Oncol*. 2011;29(36):4763–8.
25. Zeeneldin AA, Ramadan M, Elmashad N, Fakhri I, Diah A, Mosaad E. Breast cancer laterality among Egyptian patients and its association with treatments and survival. *J Egypt Natl Canc Inst*. 2013;25(4):199–207.
26. Dane S, Yildirim S, Koc M, Aktan M, Gundogdu C. Asymmetries in breast cancer lateralization and both axillary lymph node number and metastatic involvement. *Lymphology*. 2008;41(2):75–9.

Evaluation of the Role of miRNA-21 Levels as a Potential Diagnostic Biomarker for Colorectal Cancer Associated with Prognosis

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Abstract

Colorectal cancer one of the most common and aggressive tumor diagnosed in humans. The potential role has been suggested that circulating microRNAs assuring diagnostic markers for early detection of colorectal cancer. Hereabouts, this investigation intends to study the performance of miRNA-21 in CRC. Fifty blood samples were collected from individuals with colon cancer who enrolled in the Teaching Laboratories of the Medical City/Baghdad from June 2018 to September 2019. Taq Man microRNA Real-time PCR was utilized to recognize the expression of miRNA-21 in the patient's plasma. Representative in the expression of miRNA-21 by gender and pathological grading were not statistically important ($P>0.05$). Moreover, alterations in the expression of miRNA-21 amongst patients and control were significances statistically ($P<0.05$). While a higher risk of the disease was associated with high miRNA-21 and correlated with poor prognosis. The AUC for miRNA-21 was 0.657. The optimal cut-off value was 1.961-fold with sensitivity and specificity 64%, 68% respectively. In Conclusion, the high miRNA-21 expression might be a prognostic marker of colon cancer patient consequently; high expression of miRNA-21 was associated with poor prognosis of patients with colorectal cancer.

Keywords: Colorectal cancer, MiRNA-21, biomarker.

Introduction

Colorectal cancer (CRC) is the third most commonly diagnosed malignancy in both genders with approximately 1.2 million individual investigations and above 50% of deaths globally each year¹. The majority of CRC related fatalities can be prevented through early diagnosis and surgical removal of early-stage cancer². In addition, the available methodologies for early detection are based on traditional screening method, such as the fecal occult blood test (FOBT) as the primary screening tool, followed by colonoscopy for FOBT positive patients³. Colonoscopy, despite its specificity and sensitivity, is not suitable for the general population due to its high cost, invasiveness, requirement for bowel preparation and sedation, and association with medical complications. Therefore, the development of new markers is urgently required for the rapid, noninvasive, and highly sensitive screening of CRC patients⁴. MicroRNAs are near to 20 to 25 nucleotide non-coding RNAs that post-transcriptionally regulate gene expression and control

various cellular mechanisms⁵. There was increasing evidence that microRNAs were widely dysregulated in cancer and may have potential applications for cancer diagnosis, prognosis, and treatment⁶. The diagnostic value of circulating microRNAs for the early detection of cancer has been successfully investigated in numerous malignancies, including CRC. MicroRNA 21 is over expressed in various human tumors, particularly in the serum and tissue of CRC patients⁸. Diverse researches have investigated the diagnostic value of miRNA-21 in CRC and have raised interest concerns regarding the biomarker potential of miRNA-21^(9, 10). However, the findings of these studies were inconsistent. Therefore, this study is conveyed to assess the diagnostic value of miRNA-21 in CRC.

Materials and Method

Subjects: This study was performed during a period extended from March 2018 to February 2019 at the Teaching Laboratories of the Medical City/

Baghdad. Clinical data were collected from the hospital reports including age, sex, and grade of the tumor. The histological grading which was based on reviewing H & E stained representative slides was labeled as grade (G1) for well differentiated, (G2) for moderately differentiated, and (G3) was for poorly differentiated tumors. Ninety subjects participated in this study where included fifty subjects (40 males, 10 females) with age range from (31-85) years with histologically confirmed of CRC. Fourteen subjects (30 males and 10 females) with age range from (39-70) years who had no documented for cancer attended the same hospital. About five milliliters of venous blood samples were collected from patients and healthy persons in sterile tubes for serum and plasma isolation then stored at -70°C until use.

Molecular detection of miRNA-21: Molecular detection of miRNA-21 was carried out according to (Taq Man™ MicroRNA Assay, inventoried, SM, Applied Biosystems, USA) which occurred in three steps:

1. RNA extraction.
2. Reverse transcription step.
3. Real-time PCR for the detection of mature miRNA-21.

Statistical Analysis: Analysis of data was carried out using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). Data are presented as mean \pm SD, median, percentage and standard error. Qualitative relations were evaluated using the Chi-square test. A p-value of ≤ 0.05 was considered statistically significant. Cut-off values were estimated according to ROC¹².

Results

Demographic characteristics of the studied groups: The results of this study were based on the investigation of fifteen patients with CRC, compared with 40 apparently healthy persons considered as controls. Colorectal cancer patients whom ages were ranged from thirty one years to eighty five years. The mean age of these patients was (52.7 ± 14.2) years, whereas the mean age of their counterpart's apparently healthy control was (46.1 ± 11.9) years. There were no significant statistical differences ($p < 0.05$) between different groups according to age. It was found that 31 (62.3 %) of CRC were males, while the rest 19 cases (47.7%) were females. While the sex distribution in apparently healthy control was found that 20 (50%) were males and 20(50%) were females. The statistical analysis showed no significant difference ($P < 0.05$) between CRC and control groups according to gender.

Table 1: Distribution of patients and controls according to age intervals

Age Interval	Patients Group		Healthy Women Group		P-value
	No.	%	No.	%	
≤ 40 yrs.	10	20	20	50	
> 40 yrs.	40	80	20	50	
Total	50	100.0	40	100.0	
Mean age \pm SD	52.7 \pm 14.2		46.1 \pm 11.9		0.720 NS
Age range	(31-85) year		(30-70) year		
Gender	Male No. (%)	31 (62.3%)		20(50%)	P=0.655 NS
	Female No. (%)	19 (47.7%)		20(50%)	
Total No.	50		40		

NS: Non-Significant at $P > 0.05$.

Levels of miRNA-21 in the studied groups: The mean log fold change values of gene expression of miRNA-21 in plasma of CRC patient was higher as in

control group (1.306 vs 0.125 respectively), and revealed a statistically significant difference between them; the P-value was 0.012 as mentioned in table 2.

Table 2: MiRNA-21 plasma levels in studied groups.

MiRNA-21	Plasma CRC	Control
Mean	1.306	0.125
Standard Error of Mean	0.106	0.082
Median	0.872	0.098
CRC vs Control	0.012	

Relationship study between CRC grading and miRNA-21: In this investigation uncovered that well-

differentiated carcinomas were seen in 16 cases (32%) of the CRC group, while 31 cases (62%) have moderately differentiated grade. Poorly differentiated carcinomas were seen in 3 cases just as appeared table (3). There were no measurably critical contrasts ($P > 0.05$) among the CRC group according to the grade. The highly Folding 221 concentration reached (1.74 ± 0.621) in poor differentiation CRC patients comparison with 0.287 and 0.394 in Well and Moderate differentiation CRC grad respectively ($P = 0.38$).

Table 3 :Relationship study between CRC grading and miRNA-21

Marker		Well differentiation 16 (32%)	Moderate differentiation 31 (62%)	Poor differentiation 3(6)%	p- value
Folding MiRNA-21	Mean folding \pm SD	0.287 \pm 0.142	0.394 \pm 0.263	1.74 \pm 0.621	0.38

Estimation of cutoff value, sensitivity, specificity and AUROC of the miRNA-21 in CRC patient: The area under the curve (AUC) for miRNA-21 was 0.657, and P- value equal to 0.037. The optimal cut-off value

was 1.961-fold with sensitivity and specificity 64%, 68% respectively with 95% confidence interval as in table (4) figure (1).

Table 4: Estimation of cutoff points, sensitivity, specificity and AUROC of the miRNA-21 in CRC patient.

Parameters	Cut -off points	Sensitivity (%)	Specificity (%)	CI	AURO	P-values
MiRNA-21 Log fold change	1.961	64	68	95%	0.657	0.037

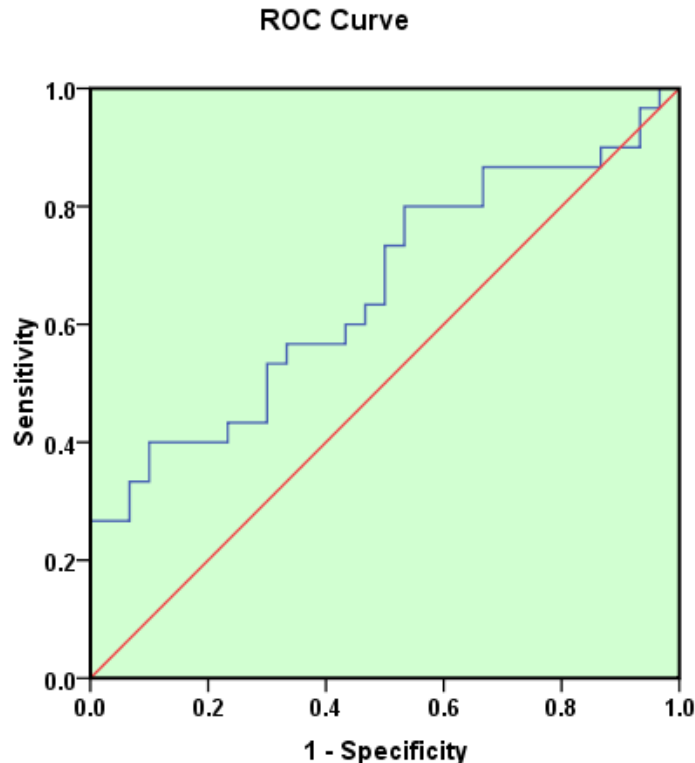


Figure (1): Receiver Operating Characteristic curve for miRNA-21 as a marker for CRC

Discussion

Colorectal cancer (CRC) was a major cause of cancer-related fatalities worldwide¹³. The reasonableness of colorectal cancer diagnosis rises after the age of 40 years, increases progressively from the age of 40 years, growing clearly after age 50 years¹⁴. Larger than 90% of colorectal cancer events occur in people aged fifty years or older¹⁵. According to, age match as exhibited in the present results harmonized with other studies from Iraq prepared by Al-Hummadi, 2009¹⁶ and Tahir, 2011¹⁷ found that the mean age of CRC was 50 years. A prior study by Abdul Ghafour, 2014 found that the mean age was about 53 years¹⁸. The investigation of miRNA-21 as a diagnostic biomarker contributed to colon cancer pathogenesis in current study revealed that the log folded of miRNA-21 in patients was significantly higher compared to healthy control similar to this result reported by^(19,20). A meta-analysis investigation conducted by Yu *et al.*, 2016 this study enlisted in the systemic review was carried in diverse countries such as China, Japan, Iran, Germany, and the USA. Amongst the nine studies involved, six of them were carried in Asian populations and three in Caucasian populations. Nine of these studies were written within 2012 and 2014, reviewed that the diagnostic value of miRNA-21 for CRC²¹. Earlier studies by Pan *et al.*, 2010 and Wang *et al.*, 2014 described that miRNA-21 is one of the most leading oncomiRNAs in CRC, and becomes expressed pro-tumorigenic features in various another hard tumor types^(22,23). In mouse design study through Shi *et al.*, 2015²⁴ summarized that MiRNA-21 seems to be fundamental to the inflammation recognized in colitis-associated colon cancer in a carcinogen-induced mouse model of CRC applying the mutagen azoxy methane (AOM) plus DSS, genetic inactivation of miRNA-21 decreased tumor burden and decreased levels of pro-inflammatory cytokines. Various studies were recording in miRNA-21 was raised in CRC tumors, with a step-wise increase in its expression as tumors progression to later grades^(25, 26). Nemours investigations illustrate that miRNA-21 in serum and stool indicates its levels in CRC tumors; this consequently might assist as both a diagnostic and prognostic biomarker via predicting the TNM stage, possible metastasis, and responsiveness to chemotherapy. Notwithstanding, enhanced miRNA-21 serum levels have also been described for pancreatic, lung and breast cancers recommending that stool analysis should be combined to enhance the specificity of CRC screening^(27,28,29,30). Besides, Mima *et al.*, 2016 *noticed* a close association between raised tumor

miRNA-21 expression and CRC is correlated with the poorer clinical issue and this association is stronger in carcinomas³¹. The meta-analysis published by Zhang *et al.*, 2014 and Du *et al.*, 2014 conducted on the diagnostic value of miRNA-21 for CRC. Zhang *et al.*, 2014³² reported a collected sensitivity of 76% and a collected specificity of 81% while; Du *et al.*, 2014³³ reported a pooled sensitivity of 76% and a pooled specificity of 82%; those events were comparable to the present result, but not identical, the AUC was 0.657 with sensitivity and specificity 64%, 68% respectively with 95% CI, indicating that the CRC patients have higher than a nine-fold possibility to express miRNA-21 in comparison to healthy individuals indicating that miRNA-21 can be used as a good marker for CRC diagnosis. Overall, miRNA-21 was not a special biomarker in CRC; it requires to be combined with another tool for enhanced specificity. However, current evidence indicates that circulating miRNA-21 has moderate sensitivity and good specificity as a diagnostic marker for CRC diagnosis. Large-scale prospective studies must be conducted in the future for verification. In addition, improving the diagnostic accuracy of circulating miRNA-21 and exploring new biomarkers with high diagnostic accuracy in CRC should still be considered in the future.

Conclusion

MicroRNA-21 is overexpressed in the serum of patients with colorectal cancer, submitting that miRNA-21 is a hopeful diagnostic biomarker for CRC. In distinction, a patient with a high expression of the miRNA-21 level was connected with a poorer prognosis.

Conclusion

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Collage of Health & Medical Technology and all experiments were carried out in accordance with approved guidelines.

References

1. Willett C G, Chang D T, Czito B G, Meyer J, Wo J. Cancer Genome Atlas Network. Comprehensive molecular characterization of human colon and rectal cancer. *Nature* 2012. 2013.
2. Uchi R, Takahashi Y, Niida A, Shimamura T,

- Hirata H, Sugimachi K, Iguchi T. Correction: Integrated Multiregional Analysis Proposing a New Model of Colorectal Cancer Evolution. *PLoS genetics*, 2017;13(5): e1006798]
3. Hundt S, Haug U, Brenner H . Blood markers for early detection of colorectal cancer: a systematic review. *Cancer Epidemiol Biomarkers Prev* 2007;16: 1935–53.
 4. Garofalo M, Quintavalle C, Romano G, M croce C, Condorelli G. miR221/222 in cancer: their role in tumor progression and response to therapy. *Current molecular medicine*, 2012;12(1):27-33]
 5. Bartel DP . MicroRNAs: genomics, biogenesis, mechanism, and function. *Cell* 2004;116: 281–97
 6. Tao S, Hundt S, Haug U, Brenner H .Sensitivity estimates of blood-based tests for colorectal cancer detection: impact of overrepresentation of advanced stage disease. *Am J Gastroenterol* 2011;106: 242–53
 7. Bartel DP . MicroRNAs: genomics, biogenesis, mechanism, and function. *Cell* 2004;116: 281–97.
 8. Garzon R, Marcucci G, Croce CM .Targeting microRNAs in cancer: rationale, strategies and challenges. *Nat Rev Drug Discov* 2010;9: 775–89
 9. Huang Z, Huang D, Ni S, Peng Z, Sheng W, et al. Plasma microRNAs are promising novel biomarkers for early detection of colorectal cancer. *Int J Cancer* 2010;127: 118–26.
 10. Zhang H, Li P, Ju H, Pesta M, Kulda V, Jin W, Cai M, Liu C, Wu H, Xu J, . Diagnostic and prognostic value of micro RNA-21 in colorectal cancer: An original study and individual participant data meta-analysis. *Cancer Epidemiol Biomarkers Prev* 2014;23: 2783-2792,.
 11. Du M, Liu S, Gu D, Wang Q, Zhu L, Kang M, Shi D, Chu H, Tong N, Chen J, et al. Clinical potential role of circulating microRNAs in early diagnosis of colorectal cancer patients. *Carcinogenesis* 2014;35: 2723-2730
 12. Singh G. Determination of cutoff score for a diagnostic test. *Internet J Lab Med*, 2006;2: 1-4]
 13. Jemal A, Bray F, Center MM, Ferlay J, Ward E and Forman D. Global cancer statistics. *CA Cancer J Clin* 2011;61: 69-90,.
 14. Siegel R, Naishadham D and Jemal A. Cancer statistics,. *CA Cancer J Clin* 2012;62: 10-29.
 15. Ries LA G, Melbert D, Krapcho M, Stinchcomb D G, Howlader N, Horner M J, Lewis D R. SEER Cancer Statistics Review, 1975–2005. Bethesda, MD: National Cancer Institute; 2008. Contract No.: Document Number]
 16. Al-Humadi A H. Epidemiology of colon & rectal cancer in Iraq. *World Journal of Colorectal Surgery*, 2009;1(1):15]
 17. Tahir Ava . A study of K-ras in colorectal carcinoma in Kurdistan region_Iraq. Ph.D thesis. college of medicine,Hawler medical university. 2011.
 18. AbdulGhafour KH. Immunohistochemical Expression of Her2/Neu Receptor in Human Colorectal Carcinoma (A Clinicopathological Study). *Iraqi Academic Scientific Journal*, 2014;13(3): 424-429]
 19. Toiyama Y, et al. .Serum miR-21 as a diagnostic and prognostic biomarker in colorectal cancer. *J. Natl. Cancer Inst.* 2013;105:849–859 .
 20. Xiong B, Cheng Y, Ma L, Zhang C. MiR-21 regulates biological behavior through the PTEN/PI-3 K/Akt signaling pathway in human colorectal cancer cells. *Int. J. Oncol.* 2013;42:219-228. 10.3892/ijo.2012.1707
 21. Yu W, Wang Z, Shen L I, Wei Q. Circulating microRNA-21 as a potential diagnostic marker for colorectal cancer: A meta-analysis. *Molecular and clinical oncology*, 2016;4(2):237-244]
 22. Pan X, Wang Z-X, Wang R. MicroRNA-21: a novel therapeutic target in human cancer. *Cancer Biol. Ther.* 2010;10:1224-1232. 10.4161/cbt.10.12.14252
 23. Wang W, Li J, Zhu W, Gao C, Jiang R J, Li W, Hu Q, Zhang B. MicroRNA-21 and the clinical outcomes of various carcinomas: a systematic review and meta analysis. *BMC Cancer* 14, 819 10.1186/1471-2014;2407-14-819
 24. Shi C, Yang Y, Xia Y, Okugawa Y, Yang J, Liang Y, Chen H, Zhang P, Wang F, Han H,et al. Novel evidence for an oncogenic role of microRNA-21 in colitis-associated colorectal cancer. *Gut.* 2015;65:1470-1481.
 25. Kjaer-Frifeldt S, Hansen TF, Nielsen BS, Joergensen S, Lindebjerg J, Soerensen FB, dePont Christensen R, Jakobsen A, Danish Colorectal Cancer G. The prognostic importance of miR-21 in stage II colon cancer: a population-based study. *Br. J. Cancer* 2012;107:1169-1174. 10.1038/bjc.2012.365
 26. Schee K, Boye K, Abrahamsen TW, Fodstad O,

- Flatmark K. Clinical relevance of microRNA miR-21, miR-31, miR-92a, miR-101, miR-106a and miR-145 in colorectal cancer. *BMC Cancer* 2012;12:505 10.1186/1471-2407-12-505
27. Toiyama Y, Takahashi M, Hur K, Nagasaka T, Tanaka K, Inoue Y, Kusunoki M, Boland C R, Goel A. Serum miR-21 as a diagnostic and prognostic biomarker in colorectal cancer. *J. Natl. Cancer Inst.* 2013;105:849-859. 10.1093/jnci/djt101
28. Volinia S, Calin GA, Liu C-G, Ambs S, Cimmino A, Petrocca F, Visone R, Iorio M, Roldo C, Ferracin M, et al. A microRNA expression signature of human solid tumors defines cancer gene targets. *Proc. Natl. Acad. Sci. USA* 2006;103: 2257-2261. 10.1073/pnas.0510565103
29. Yan L-X, Huang X-F, Shao Q, Huang M-Y, Deng L, Wu Q-L, Zeng Y-X, Shao J-Y. MicroRNA miR-21 overexpression in human breast cancer is associated with advanced clinical stage, lymph node metastasis and patient poor prognosis. *RNA* 2008;14:2348-2360. 10.1261/rna.1034808
30. Toiyama Y, Takahashi M, Hur K, Nagasaka T, Tanaka K, Inoue Y, Kusunoki M, Boland CR., Goel A. Serum miR-21 as a diagnostic and prognostic biomarker in colorectal cancer. *J. Natl. Cancer Inst.* 2013;105: 849-859. 10.1093/jnci/djt101
31. Mima K, et al. MicroRNA MIR21 (miR-21) and PTGS2 expression in colorectal cancer and patient survival. *Clin. Cancer Res.* 2016;22:3841–3848.
32. Zhang H, Li P, Ju H, Pesta M, Kulda V, Jin W, Cai M, Liu C, Wu H, Xu J, et al. Diagnostic and prognostic value of micro RNA-21 in colorectal cancer: An original study and individual participant data meta-analysis. *Cancer Epidemiol Biomarkers Prev.* 2014;23:2783–2792.
33. Du M, Liu S, Gu D, Wang Q, Zhu L, Kang M, Shi D, Chu H, Tong N, Chen J, et al. Clinical potential role of circulating microRNAs in early diagnosis of colorectal cancer patients. *Carcinogenesis.* 2014;35:2723–2730.

The Role of Rotavirus in Exacerbated Ulcerative Colitis

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Abstract

The Ulcerative colitis disease course is characterized by exacerbations and remissions. Studies of the role of viral composition within patients with changing disease activity are currently deficient. The rotavirus gastroenteritis is an important cause of morbidity and mortality worldwide. This study aimed to identify the associated role of Rotavirus during exacerbation of ulcerative colitis. A Fifteen (50) stool and biopsy samples from patients with exacerbated colitis were collected at different age groups and gender. These samples were taken from Morjan Hospital Consultant Gastroenterology and Liver Center, and the Imam Sadiq Hospital during the period from October to April 2019. The stool samples were screened for Rotavirus by using Rapid CERtest Rotavirus Kit,PCR The occurrences of UC and age revealed that the age group <25 year show ten with UC 83% followed by the age group (26-35) which give seven with UC 70%. The relation between existence of UC and gender shown that the positive among male were (20) of patients UC 71% while negative (8) among female the positive were 17 (77%)the results statistically non- significant. The frequency of rotavirus positivity during exacerbated UC as tested by Rapid CER test at different age group the results gives (23) positive samples for Rotavirus 46% and negative (27) 54%. The Rotavirus existence in stool of patients with positive biopsy for ulcerative colitis by using chromatography test revealed that the number of positive were 20 out of 50 at a rate of 40%. While the RT-PCR product analysis of VP4 gene in Rotavirus from in RNA extracted from stool patients samplethe positive were 24 out of 50 with rate of 48%.

Keywords: *Ulcerative colitis, Exacerbation, Rotavirus, Cer-test, PCR.*

Introduction

The Ulcerative colitis disease course is characterized by exacerbations and remissions. It is generally considered to arise from the interaction between host genetics, environmental factors, dysregulated immune responses and alterations in the intestinal microbiota composition. There are causative factors associated with the development of exacerbations. Many evidence suggests that gut microbe play a critical role in disease pathogenesis¹ while geographic² dietary and ethnic factors impact themicrobial composition. Most microbiota studies in UC have investigated the bacterial microbiota and alterations in fecal bacteria and fecal virome have been reported in patients with IBD. Patients with UC showed an expansion of *Caudovirales* bacteriophages and *Caudovirales* species richness in the stool. The gut microbial homeostasis between mucosa bacteria and viruses should be explored. Evidence of the prescence of some viruses like Epstein-Barr virus, HSV, Norovirus and CMV infections in the mucosal

inflammatory cells of ulcerative colitis patients suggests a possible role of these virus in the causation of inflammatory bowel disease (IBD). However,³ unclear. Limited studies have) any role for CMV in exacerbation of inflammatory bowel disease (IBD) remains examined the microbiota composition in ulcerative colitis patients developing an exacerbation. However⁴ the importance of rotavirus, as an exacerbating factor of UC, has been neglected by many clinicians. Therefore, the aim of the present study was to explore the role of rotavirus in UC patients during exacerbation.⁵ In the study of ⁶ On intestinal tissue, CMV genome was detected in 32.9% of patients with IBD and only in 2.4% of the controls; also a significant association was detected between CMV intestinal infection and either UC or CD, although the association was even stronger for patients with UC.⁷

Method

The current study was conducted in Marjan Teching Hospital Gastroentrology and liver Unite and Imam

Sadiq Hospital from October to April 2019 in which demographic, biopsy and feces samples were collected at outpatient visit and during an exacerbation. The diagnosis of UC was based on clinical and endoscopic examination by specialist physician. Fecal samples were collected at before endoscopy in each visit and stored at 4°C. Part was examined by Rapid Cer test for viral detection and the remaining part was stored for analyses by PCR. Exclusion criteria were pregnancy, use of rectal enemas, use of antibiotics. The study was approved by the Medical Ethics Committee of Iraqi MOH, and verbal consent was obtained from all subjects.

Results

Distribution of patients with UC during study period according to age. The association between occurrence of UC and age revealed that the age group <25 year show ten with UC 83% followed by the age group (26-35) which give seven with UC 70% .Other age group (36-45) UC were seven 77% and (46-55) were six 75% also the group (56-66) show four with UC 66% and the last age group show that (6) with UC% 66 (table-1).

Table 1: Age distribution of patients with UC during study period

Age	No.	With UC	%	Without UC	%	X ² 0.05
1-25year	12	10	83.33	2	16.66	5.32
26-35	10	7	70.00	3	30.00	1.6
36-45	9	7	77.77	2	22.22	2.76
46-55	8	6	75.00	2	25.00	2
56-66	6	4	66.66	2	33.33	0.66
<67	5	3	60.00	2	40.00	0.2
Total	50	37	100%	13	100%	

Distribution of Ulcerative Colitis according to gender. The results of relation between occurrence of UC and gender shown that the positive among male (20) of

patients UC 71% while negative (8) among female the positive were 17 (77%) and the negative (5) (table 2).

Table 2: Distribution of cases of ulcerative colitis according to gender.

Sex	No.	No. of Patients UC			%	X ² 0.05
		+ve	%	-ve		
Male	28	20	71.42	8	28.57	5.14
Female	22	17	77.27	5	22.72	6.54
Total	50	37	100%	13	100%	

Frequency of Rotavirus positivity in patients during exacerbation of ulcerative colitis according to age. The frequency of rotavirus positivity during exacerbated UC as tested by Rapid CER test at different age group the results gives (7)positive samples for Rotavirus 46% and negative(8) 53% at the age group (1-25). The other

group (26-35) show (6) positive 60% and the negative (4) 40%. A two positive 33% and four negative 66% in the group (36-45) followed by four positive 44% and five negative 55% at the (46-55) then positive(3)60% and negative(2)40% at (56-65) the last age group >66 show one positive 20% and negative(4) 80%

Table 3: The distribution of Rotavirus positivity in patients with exacerbation ulcerative colitis in relation to age of patients.

Age Group	No. of Tested Patients	No. of Positive		No. of Negative		X ² 0.05
		No	%	No	%	
1-25	15	7	46.66	8	53.33	0.06
26-35	10	6	60.00	4	40.00	0.04
36-45	6	2	33.33	4	66.66	0.66
46-55	9	4	44.44	5	55.55	0.55
56-65	5	3	60.00	2	40.00	0.2
<67	5	1	20.00	4	80.00	1.8
Total	50	23	100%	27	100%	

Rotavirus existence in stool of patients with positive biopsy for ulcerative colitis by using chromatography test. The existence of rotavirus in the stool samples of patient as examined by Rapid Certest according gender

revealed that the Biopsy positive for UC were 12 (40%) male while female was eight (40%). The rotavirus positive after endoscopic gives (13)% 43 positive male while female have seven positive 35%. (table-4).

Table 4: The Rotavirus existence in stool of patients with positive biopsy for ulcerative colitis by using chromatography test.

No of Patients Examine		Biopsy Positive for UC				Stool Examination Rota Positive after Endoscopic				X ² 0.05 Biopsy	X ² 0.05 Stool
Sex	NO	+ve	%	-ve	%	+ve	%	-ve	%		
Male	30	12	40.00	18	60.00	13	43.33	17	56.66	1.2	0.52
Female	20	8	40.00	12	60.00	7	35.00	13	65.00	0.8	1.8
Total	50	20	100%	30	100%	20	100%	30	100%		

PCR test for Rotavirus of examined patients with Biopsy positive and stool positive. The molecular method used PCR results display that the biopsy positive (10)

at 38.46% for male gender while in the stool examined positive after endoscopic(14) at 58.33% for female.

Table 5: The Rotavirus existence in stool sample of patients with positive biopsy for ulcerative colitis tested by PCR.

No of Patients Examined		Biopsy Positive				Stool Examined Positive after Endoscopic				X ² 0.05 Biopsy	X ² 0.05 Stool
Sex	NO	+ve	%	-ve	%	+ve	%	-ve	%		
Male	26	10	38.46	16	61.53	15	57.69	11	42.30	1.38	0.6
Female	24	14	58.33	10	41.66	11	45.83	13	54.16	0.66	0.166
Total	50	24	100%	26	100%	26	100%	24	100%		

RT-PCR results of stool samples from exacerbated ulcerative colitis

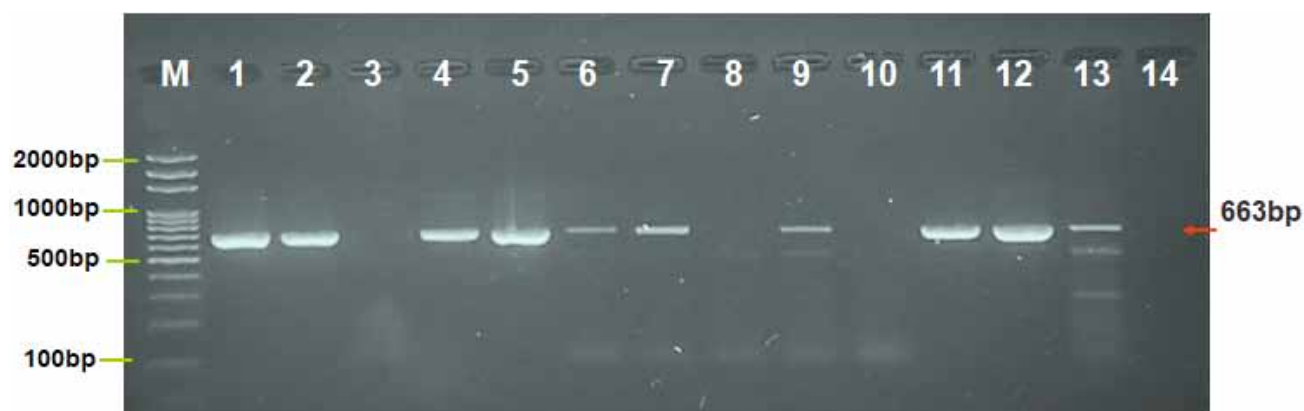


Figure 1: RT-PCR for the samples from exacerbated Ulcerative colitis.

Agarose gel electrophoresis image that showed the RT-PCR product analysis of VP4 gene in Rotavirus from in RNA extracted from stool patients samples, where ladder (2000-100bp), lane (1-14) some samples with positive VP4 gene in Rotavirus at (663bp) PCR product size.

Discussion

Although the pathogenesis of inflammatory bowel disease remains unclear, several studies have suggested that the onset and development of inflammatory bowel disease require the interaction between genetic susceptibility, stimulation by luminal bacterial antigens and adjuvants, and episodic environmental triggers which break the mucosal barrier. In therapy-refractory and fulminant cases of ulcerative colitis infectious causes have to be kept in mind. Numerous viral and bacterial agents have been associated with complicated or therapy-refractory course of ulcerative colitis especially in immunocompromised patients. Most of these viruses are bacteriophages, including those found in the gut, and insert genes into the bacterial DNA. The close relationship between gut bacteriophages and bacteria raises the possibility that there could also be a relationship between these resident viruses and UC, although this connection is only beginning to be explored.⁸ Viruses Complicating Ulcerative colitis Several viruses with a facultative intestinal organotropy such as cytomegalovirus human parvovirus B19, Epstein-Barr virus and herpes simplex virus have been reported. However, the absolute numbers have not been investigated thoroughly, comparative analyses are lacking so far.¹ The presence of norovirus in stool and/or rectal swab samples, as determined by an enzyme-linked

immunoassay, was assessed. In addition, sex, age, type of IBD, presence or absence of diarrhea, hematochezia, and the need for hospitalization were determined. The Khan *et al.* (2009) concluded that norovirus may be associated with exacerbations of IBD. The results of this study consistent with the observation of⁹ that up to 40% of the exacerbations were associated with symptoms of antecedent or concurrent infection, most commonly involving the respiratory tract. Rubella virus, Epstein-Barr virus, and adenovirus were associated with acute exacerbations. Till our knowledge no data available about the association of rotavirus with ulcerative colitis. The rotavirus may be associated with exacerbations and play a role in complicating ulcerative colitis.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science for Women and all experiments were carried out in accordance with approved guidelines.

References

1. Eckburg PB, Bik EM, Bernstein CN, Purdom E, Dethlefsen L, et al. Diversity of the human intestinal microbial flora. *Science* 2005;308: 1635–1638.
2. Sokol H, Seksik P, Rigottier-Gois L, Lay C, Lepage P, et al. Specificities of the fecal microbiota in inflammatory bowel disease. *Inflamm Bowel Dis* 2006;12: 106–111.
3. Cadwell K. The virome in host health and disease. *Immunity* 2015;42:805–13.

4. Virgin HW. The virome in mammalian physiology and disease. *Cell* 2014;157:142–50.
5. Kishore J, Ghoshal U, Ghoshal UC, Krishnani N, Kumar S, Singh M, et al. Infection with cytomegalovirus in patients with inflammatory bowel disease: prevalence, clinical significance and outcome. *J Med Microbiol.* 2004; 53 :1155 -60
6. Dimitroulia A, Dimitroulia E, Pitiriga VC, Piperaki ET, Spanakis NE, Tsakris A. Inflammatory bowel disease exacerbation associated with Epstein-Barr virus infection. *Dis Colon Rectum.* 2013; 56(3) : 322 -7
7. Hommes A, Hommes DW, Sterringa G, van Deventer SJ, Tytgat GN, Weel J. The pathogenicity of cytomegalovirus in inflammatory bowel disease: a systematic review and evidence-based recommendations for future research. *Inflamm Bowel Dis.* 2004; 10(3) : 245 -50
8. Sokol H, Seksik P, Furet JP, Firmesse O, Nion-Larmurier I. Low counts of *Faecalibacterium prausnitzii* in colitis microbiota. *Inflamm Bowel Dis* 2009;15: 1183–1189.
9. Kangro HO, Chong SK, Hardiman A, Heath RB, Walker-Smith JA.: A prospective study of viral and mycoplasma infections in chronic inflammatory bowel disease. *Gastroenterology* . 1990; 98 (3): 549-53 .

Impact of Internet Addiction Upon Educational Performance of Students Nursing Secondary Schools in Baghdad City

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Abstract

The study aimed to assess Impact of internet addiction upon educational performance of Students nursing Secondary schools in Baghdad city. A descriptive - analytic study used the assessment approach from 10 September 2017 to 30 November 2017 in order to study the impact of internet addiction upon educational performance of Students nursing Secondary schools was conducted in Baghdad city. Non probability (purposive) sample is selected for the study which includes (100) students .Data were gathered through the patients interviewed. Assessment questionnaire consist of two parts contains demographic characteristic, the other part concerning about assessment of internet addict. The validity and reliability of the instrument was determined by using through the panel of experts, and internal consistency through the computation of Alpha Correlation Coefficient. The data have been collected through the utilization of the interview. Data were analyzed through the application of descriptive statistical (frequencies and percentages).and inferential analysis chi by applying the Statistical Package for Social Science version 21.0(SPSS).The finding of the study showed that the highest percentage is located within the age group of twenties (46.8%) (130%) the of the sample was female and represents 84.8% aged 20-29 years. distribution of participants within the levels of Body Image Disorder and distributes as 29.9% having extremely severe level. 32.4% with face procedures have very high and high levels of self-esteem. The study concluded that Clients seeking cosmetic Surgery have moderate and severe level of Body Image and psychological Distress

Researcher recommended the first consultation should be with the psychiatric physician before cosmetic surgery done

Keywords: *Internet, education performance, Students, nursing.*

Introduction

The Internet was originally designed to facilitate communication and research activities. However, the dramatic increase in the use of the Internet in recent years has led to pathological use (Internet addiction) most people have experienced some of the various benefits of computer networks, with the rapid growth and prevalence of computer network technology¹. For example, on the Internet, people can find specific information, talk with others, and purchase almost any kind of merchandise. Young people are generally viewed as the majority of Internet users. However, recent studies^{1–5} revealed that some young people exhibit addictive behaviors, termed “Internet addiction” by researchers. However, few

studies on high school adolescents’ Internet addiction previously existed².

In the United States, despite a growing body of research, and treatment for the disorder available in out-patient and in-patient settings, there has been no formal governmental response to the issue of Internet addiction. While the debate goes on about whether or not the DSM-V should designate Internet addiction a mental disorder people currently suffering from Internet addiction are seeking treatment³. Because of our experience we support the development of uniform diagnostic criteria and the inclusion of IAD in the *DSM-V* in order to advance public education, diagnosis and treatment of this important disorder.

It is known that addictions activate a combination of sites in the brain associated with pleasure, known together as the “reward center” or “pleasure pathway” of the brain⁴. When activated, dopamine release is increased, along with opiates and other neurochemicals. Over time, the associated receptors may be affected, producing tolerance or the need for increasing stimulation of the reward center to produce a “high” and the subsequent characteristic behavior patterns needed to avoid withdrawal⁵. Internet use may also lead specifically to dopamine release in the nucleus accumbency, one of the reward structures of the brain specifically involved in other addictions⁶

Methodology

This study was a cross-sectional survey, the research was approved by many secondary School in Baghdad city . All participants gave written informed consent, and were ensured complete anonymity. Participation was voluntary, and students were given information about campus mental health resources upon completing the study.

Design of the study: A descriptive statistical analysis study using the techniques of assessment, was conducted on secondary nursing in the Baghdad city. The study was carried out to assess the Impact of internet addiction upon education levels of Students nursing Secondary schools of Baghdadcity Data was collected by using questionnaire format and filled out by students and who kindly accepted to participate in the study the data was collected from 18th of February to 7th of march. the administrative arrangement, the sitting of the study, sample of study, instrument construction and data analysis.

Data collection: Data was collected by using interview technique with the participants of students and who kindly accepted to participate in the study. Data was collected from

February 18th to March 7th (2018). Each interview session took approximately (20-25) minutes.

Instrument of the Study: Assessment questionnaire consists of two parts: Part I: Sample demographic characteristics which included two sections:

Section 1: Students demographic characteristics that included (age of students, many of hours use internet, the purpose of uses the internet.

Part II: This part consists of (20) items measuring the internet addiction of students. These items measured, scored and rated on a five level rating scale, (3) indicates the persistence of the status as (Always), (2) indicates presence of the status sometime and (1) indicates the absence of the status (never). Reliability and validity of this tool is determined through application of a pilot study and panel of 13 experts.

Statistical Method: Data were analyzed through the application of descriptive statistical (frequencies and percentages).and inferential analysis chi²

Result and Discussion

The results indicated that the sample of internet addiction consisted of 100 students. The majority of them were (60%), who were spend time(2-5hr)daily (48%) who used for purpose social media, (60%) students use internet at home. The table shows that higher mean of score is for the item No.(10) which is (2.9) while the lowest mean is for the item No.(2) which is (2.3). The total mean of all the items of this domain is (39.6) which is considered moderate level of internet addiction. Table 3 correlation between internet addiction and level of study. table 2 correlation between addiction internet and demographic This table shows that there is significant association between the internet addiction with place the use of internet,spend time with internet, and the purpose of use internet at p-value 0.01.

Figure 1. The distribution of students according to places in which internet are used.

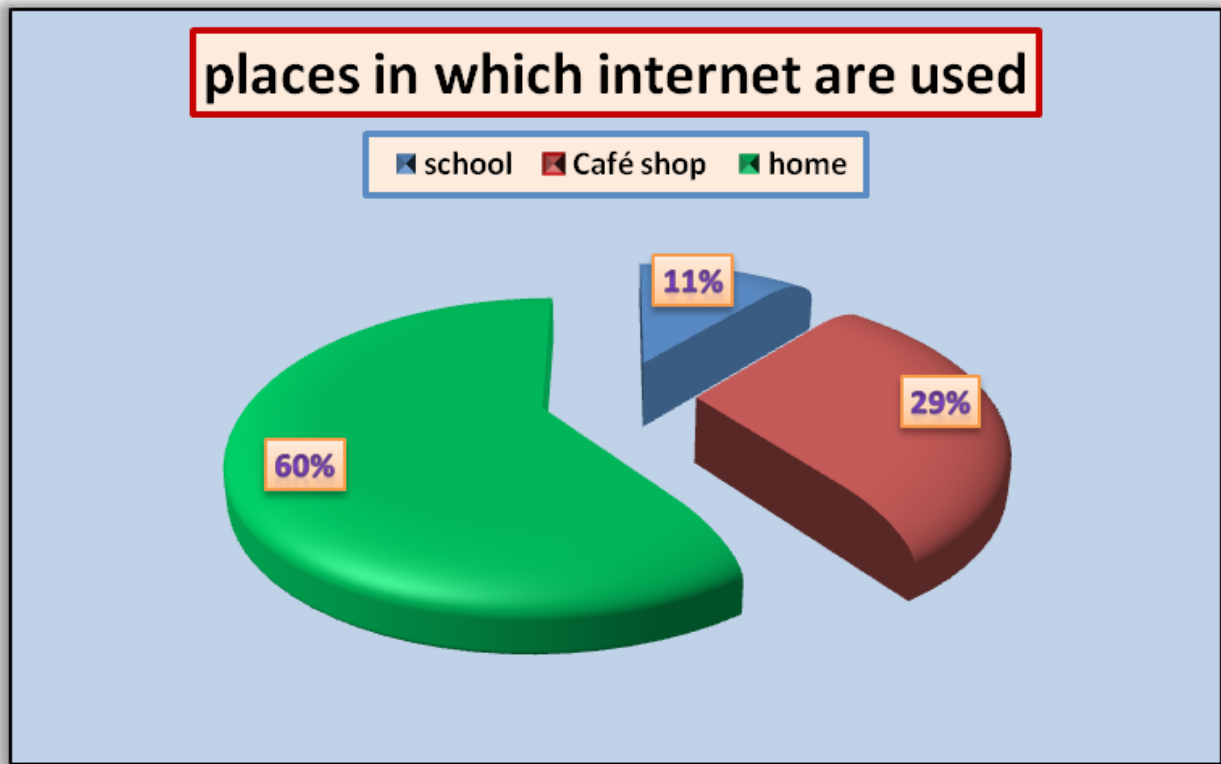


Fig. 1: Demographic characteristics of the students

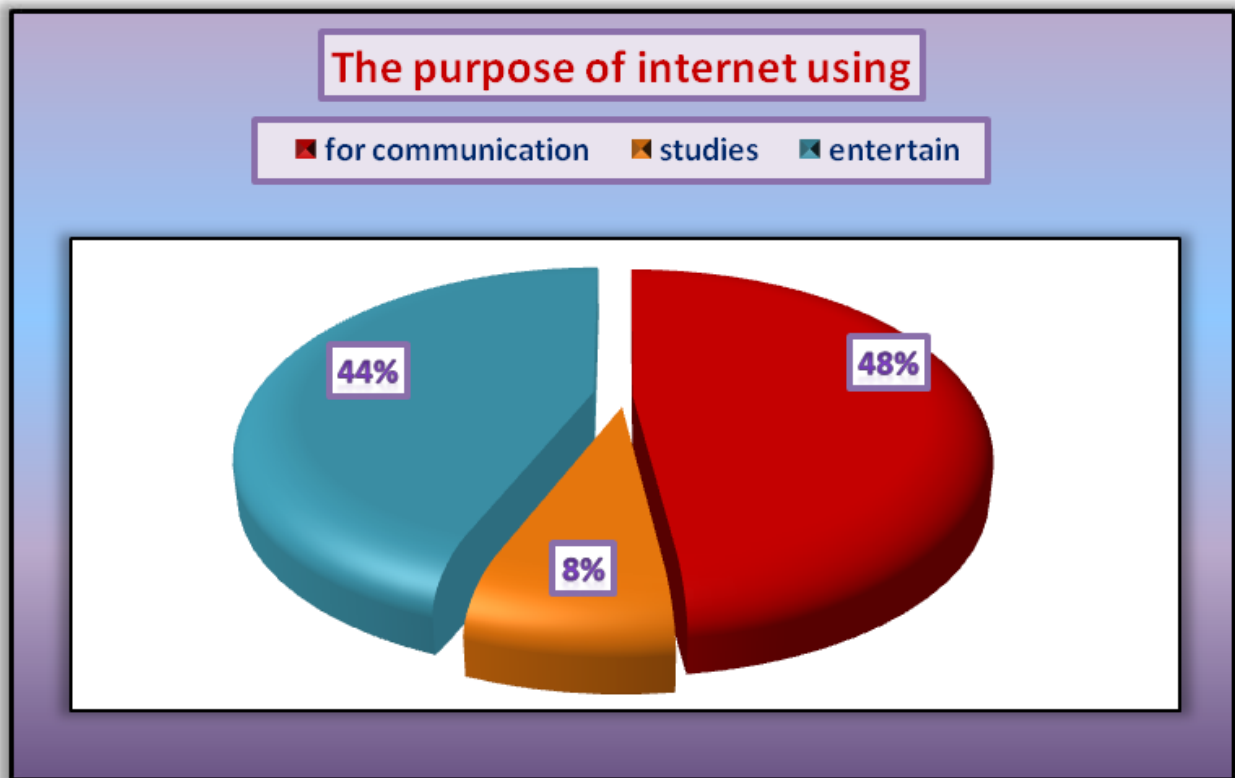


Fig. 2: Distribution according to the purpose of internet using

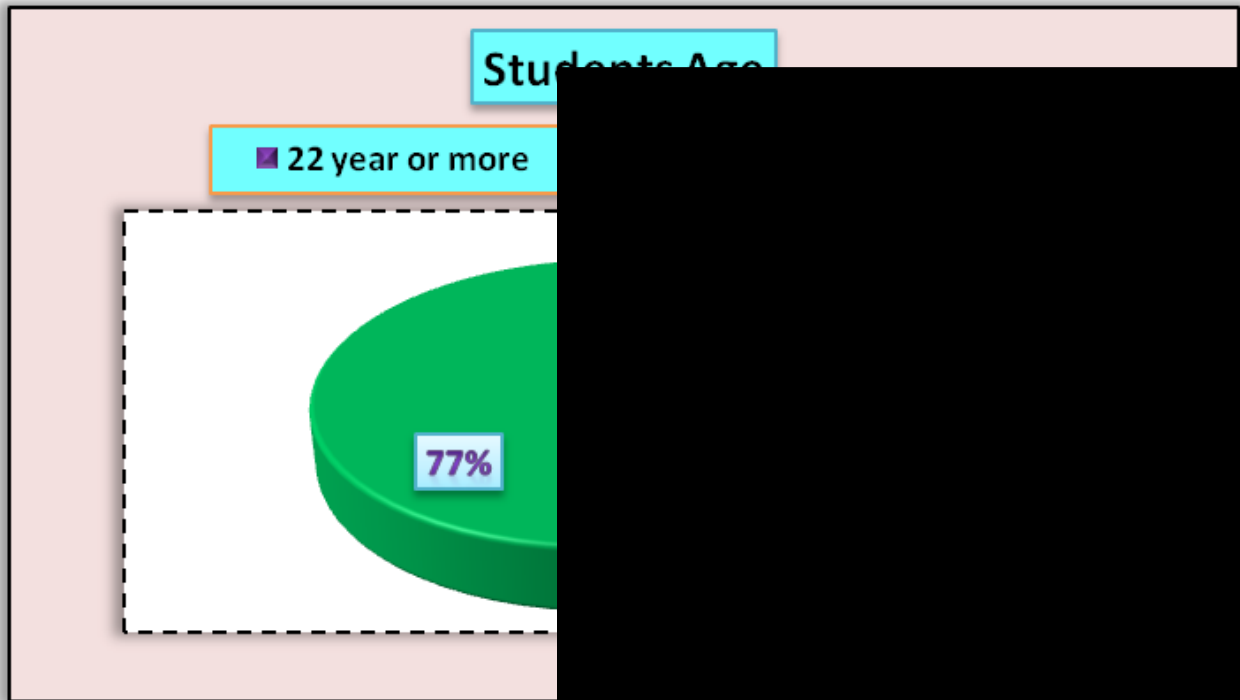


Fig. 3: Distributi

Table 1: Distribution internet a

No	Items
1	How often do you find that you stay on-line longer th
2	How often do you neglect household chores to spend
3	How often do you prefer the excitement of the Intern
4	How often do you form new relationships with fellow
5	How often do others in your life complain to you abo
6	How often do your grades or school work suffers bec
7	How often do you check your email before somethin
8	How often does your job performance or productivit
9	How often do you become defensive or secretive wh
10	How often do you block out disturbing thoughts abo Internet?
11	How often do you find yourself anticipating when yo
12	How often do you fear that life without the Internet v
13	How often do you snap, yell, or act annoyed if somee
14	How often do you lose sleep due to late-night log-ins
15	How often do you feel preoccupied with the Internet line?
16	How often do you find yourself saying "just a few
17	How often do you try to cut down the amount of tim
18	How often do you try to hide how long you've been

The table 1 shows that higher mean of score is the item No.(2) which is (2.3). The total mean of all level of internet addiction.

Table 2: Correlation between internet addiction and level of study

Items	Level of Studies	Correlations							
		s1	s2	s3	s4	S6	S7	S8	
Level of Studies	1								
s1	.119	1							
s2	.139	.162	1						
s3	.040	.220*	.462**	1					
s4	.124	.123	.505**	.422**	1				
s5	.335**	.084	.459**	.298**	.452**	1			
s6	.290**	.202	.557**	.288**	.601**	.546**	1		
s7	.097	-.110	.020	-.005	-.091	.128**	.069	1	
s8	.257**	.092	.467**	.504**	.400**	.470**	.465**	.216	1
Addiction	.394**	.119	.139	.040	.124	.335	.290**	.097	.570**

** . Correlation is significant at the 0.01 level (2-tailed)., * . Correlation is significant at the 0.05 level (2-tailed).

The findings indicate that there is a significant association between internet addiction and the students education with exception of age of students which was correlated significantly at p-value 0.05 respectively.

Table 3: Correlation between addiction internet and demographic

	Age of Student	Place the Use Internet	The Purpose for Using Net	The Number of Hours to Use the Net
Age of student	1			
Place the use of the net	.184	1		
The purpose for using the Internet	.070	.060		
The number of hours to use the net	.190	.406**	262**	1
Total	-.095	-.283	-155	-.379**

** . Correlation is significant at the 0.01 level (2-tailed).

This table shows that there is significant association between the internet addiction with place the use of internet, spend time with internet and the purpose of use internet at p-value 0.01.

Conclusion

This study concluded that the following:

1. Internet addiction is psychological and physiological case
2. Internet addiction affect on quality of life

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing/University

of Baghdad and all experiments were carried out in accordance with approved guidelines.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (5th ed.). Arlington, VA: American Psychiatric Publishing. 2013.
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. (4th ed., text rev.) Washington, DC: 2000. Author. [Google Scholar]
3. American Psychiatric Association. DSM-5 Publication Date Moved to May 2013. 2009 [cited 2011 August 21]; [Press release]. Available from: <http://www.psych.org/MainMenu/Newsroom/NewsReleases/2009NewsReleases/DSM-5-Publication-Date-Moved-.aspx> .

4. Greenfield D. Virtual Addiction: Help for Netheads, Cyberfreaks, and Those Who Love Them. CA: New Harbinger Publications; 1999.
5. Charlton JP, Danforth IDW. Distinguishing addiction and high engagement in the context of online game playing. *Computers in Human Behaviour*. 2007;23: 1531–1548.
6. Griffiths MD, Parke J. Adolescent gambling on the Internet: a review. *International Journal of Adolescent Medicine and Health*. 2010; 22: 59–75.

Human Health and Nutritional Value of Walnut and Evaluation of its Sensory, Peroxidase and Acid

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Abstract

Sensory evolution of walnut fruit sere testes by groups of assessors some lecturer in my department whom they have perfectly experience of this purpose. Acid value and Peroxidase value are tested to illustrate change in oiliness and changing in the taste, flavor, odor, texture and kernel color and to notice the differences among two storage condition in two different temperature (4°C, 25°C), in zero time after 18months of storage visual properties of kernel walnuts there were some properties evaluated in walnut (appearance of kernel, to assess its flavor, bitterness, astringency, texture, crispness and oiliness. Visual appearance of Kernel of walnuts was evaluated similarly by both groups of assessors. However, each group of assessors had quite different perceptions for tasting internal traits of the kernels. In the present study useful data of sensory characteristics of walnut fruits were obtained.

Keywords: Sensory evaluation, walnut, *Juglansregia L.*, storage temperature appearance of kernel, Peroxidase value a, Fungal cell.

Introduction

Walnuts edible nuts produced by walnut trees are well appreciated because they have many properties which became it importance in nutritional value enriched with unsaturated fat (linoleic, oleic acid). Vinson (2012)¹. They also contain other several beneficial components like plant protein (e.g. arginine, leucine), carbohydrates (e.g. dietary fiber), vitamins (e.g. vitamin A, E), important substances, minerals (magnesium, potassium, phosphorus, sulphur, copper, iron, plant sterols, phytochemicals (phenolic acids, flavonoids, etc.)². Especially pellicle substance a thin cover that surrounds kernel, was found as the most

important source of walnut phenolic, although it only represents 5% of the fruit weight³. Lipid oxidation is one important indicator for the walnut quality we can depend on in the evaluation of walnut that's mean when the quality of walnut deteriorate were the oil of it exposed to oxidation and its effect on changing in taste, flavor, odor has received a great deal of attention because its associations are undesirable for human health and it contributes to a decrease in the nutritional value of walnut. Lipid oxidation is well known as the main cause of quality deterioration during the processing or storage of lipid-rich food². The nut oil is used in several type meals of human consuming food, in the preparation of mayonnaises in salads and in several type of frying. However it is recommended not to use walnut oil in frying because high temperatures ought to make some toxic compounds and may lose its nutritional qualities of walnut. The oil-in- water (O/W) food emulsions are the basis of many food products walnut one of these product and their properties define food quality to a great extent. This study aims at determining the influence of various storage conditions on some properties in walnut (*Juglansregia L.*).

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Material & Method

Storage conditions for samples The samples of the walnuts (2000 g) used in this work were collected in September (2016-2017) from Tawella - Hawraman which located in –Kurdstanreiogn there are two according to (ACOC 2000) condition of storage at (4°C, 25°C after 18 months) at zero time also, walnuts are prepared for peroxidase value and acid value using standard method³, after extraction of oil by soxlet the testes walnut was evaluated for taste, rancidity, color, bitterness and flavor. Oil extraction was first step the oil of walnut was extracted after that determination of peroxidase value and H Value was determined. walnuts was preserved in 2-3 kg was and saved in a plastic Ziploc, kept in a fridge (4 °C) until used and another sample saved at room temperature at 25 °C, all tests of sensory evolution tests done in zero time also.

Chemical Analysis

Peroxide Value (PV).

Oil Extraction and Peroxide Analysis:

Extraction of oil is the first step in determination of Peroxidase and Acid value.

When free iodine released was titrated with a sodium thiosulfate solution until its yellow color disappeared. In this state, 0.5 ml starch solution (1% w/w) was added and titration was continued until the blue disappeared. The Peroxide value is expressed in mill equivalents of peroxide oxygen per kilogram of oil and calculated by the following equation:

$$\text{Peroxide value} = V \cdot N \cdot 1000 / W$$

Where: V is volume of applied sodium thiosulfate, N is the normality of thiosulfate and W is the oil weight. Peroxide value and Acid value was evaluated after, 4 °C and 25°C after 18 months also in zero time

Free fatty acid and acid value: This test is used as an index of freshness of walnut and quality of it, Acid value of fat is equal milligram of potassium hydroxide or sodium hydroxide required to neutralize 1gm of fat. A.V. is determined in one gram of fat samples of each treatments should be homogenized with 25 ml of absolute alcohol and 0.1 ml of phenolphthalein solution (%1) as an indicator and titrated to a pink end point (which persisted for 15 minutes) with 0.1N potassium hydroxide solution (KOH). Results were expressed

as gram of oleic acid/100 gm of fat according. Free fatty acid is the acid value was measured according to Modified (AOAC, 2000/940.28) Samples titrated with NaOH 0.1 N.

The FFA and Av was calculated according to the following formula (Eqs. 7 & 8)

$$\% \text{FFA as Oleic acid} = (\text{ml NaOH} \times \text{Normality}) / (\text{sample weight} / \text{g}) \times 100$$

$$\text{Acid value (mg KOH/G oil)} = \text{FFA} \times 1.99$$

Form for sensory evaluation:

Experimental design and statistical analysis:

The data were statistically analyzed using (ANOVA) test

$$\text{Iodine value (mg}^{-100}\text{g)}$$

The iodine value is the important method which indicated quality and stability of walnut during storage means after a period of storage in two different temperature it is define as a number of grams of iodine absorbed per 100 gram of the fat. Iodine value of the walnut kernels from experiment no. The experiment was determined according to Wij's method³. Wij's Iodine value was performed by Hannus method, according to STAS 145/19-67. The iodine value was calculated by subtracting the sample titre value from the blank titre values as per the given formula:

Iodine Value

$$= (\text{Blank titre} - \text{sample titre} \times \text{Normality of Na}_2\text{S}_2\text{O}_3 \times 12.69 \text{ (mg}^{-100}\text{)}) / \text{Weight of sample (g)}$$

Mechanical drying of kernel walnut at 40 and 45°C: Mechanical drying of whole walnuts was carried out in a cabinet dryer using hot air as drying medium. The dryer had the facility to regulate the air temperature (± 3 C). Two drying temperature.

Fungal Walnut content after storage and Drying in two different degrees: Walnut samples tested after storage and drying Fungal content for 18 months in two different temperature (4°C, 25 °C) to inspection of fungal cell which can grow or survive in storage walnut samples and observe these fungal cells ability to produce of Mycotoxins. after incubation samples in (Potato dextrose broth PDA) 20 g weight of each samples (shell, kernel) at 140 rpm, 28 °C for 48 hours

after making spore suspension of each samples after that inoculating 5µl of each samples on PDA Potato dextrose agar in striking method and incubated them in incubator for 7 days at 28 °C Result and Discussion:

Walnut oil is unstable during storage and exposed to some changing in physical and chemical properties this reason due to of its rich in mono and polyunsaturated acids. It is important to know the factors which determine its quality .Oil stability and quality depends on its chemical composition, one of the most important especially the content of unsaturated fatty acids, as well as the managing storage condition. During storage there are various physical, chemical and enzymatic changes that influence the quality of the walnut oil ⁴.

The results showed that the described model for peroxide index, weight loss, and color, sensory evaluation is significant (p < 0.001), so that increase of temperature causes the peroxide value, color, and weight loss to increase and it reduces the overall acceptability

of walnut kernels. increase and resulted in lower overall acceptability of the walnuts. Storage condition caused the peroxide value to decrease, but did not significantly affect other indices (p ≥ 0.05). Mold and yeast were not significantly found in any samples. walnuts include and temperature of 4 °C,25 °C.

Primary oxidative rancidity is a good indicator for the rancidity of walnut it defined as milli-equivalents of peroxide per kilo gram of oils (Buransompob et al,2003) there was no detection of peroxidase value for walnut during both condition of storage (4°C,25°C) it was in standard range due to the amount of antioxidant which available in walnuts poly –phenol,low temperature and absence of oxygen are another reason cause to remain oxidation in the standard range ⁵ mentioned that amount of tocopherol to USFA are important factors to oxidation of oil .On the study of ⁶ found conceders that strong temperature has more influence on oxidation than oxygen .

Sensory evaluation form:

Table (1): Sensory evaluation of Hawraman walnut in shell and kernel before and after storage for 18 months.

No.	Color 20	Taste 40 Mark			Texture 20 Mark			Odor & Flavor or Off Flavor	Total Score
		Sweetness	Bitterness	Assurgency	Chewing	Crispy	Oiliness		
1									

Table (1) Show sensory evolution of walnuts (Hawraman walnut (Kernel, shell+ kernel) of walnuts in (zero time, after 18 months of storage in both different temperature (4°C,25°C). This form for evaluating the properties of walnut after 18 months of storage in two difference temperature (4°C,25°C)

Means of 10 panelists Standard Error: 8.199.

* Means having the same letter in the same section are not significantly different at *p*>0.05 .

Table (2) illustrated the sensory evolution of walnut from Hawramman (Shell+kernel and kernel) before and after storage for both condition of storage the walnut kept good quality properties before storage in two temperature of storage after 18 months there were significant differences between both condition of storage

. Both of method kept quality properties, however their qualities reduced during 18 months of storage. There is some factors which affected of the very little difference among them before and after storage period due to the some reasons, first reason: high anti –oxidant capacity of walnut, second reason is low temperature of storage,last reason is lack of light in storage condition. Generally, Kernel color of walnuts have best quality properties there is no significant change than the whole walnut quality after storage they have beast quality in period of storage under both condition of temperature (4°C & 25°C) have best properties (Christopoulos and Tsantili, 2012) considered that respiration of kernel walnut is higher that in shell walnut at cool temperature shell is another protector for the walnuts is prevent the browning of kernel.

Table 2. Fisher (LSD) / Analysis of the differences between groups with a confidence range of 95.00 %:

Color	Taste	Texture	Flavor
18.1	35.3	16.6	17.1
16.2	34.9	16.2	14.3
18.1	35.3	16.6	17.1
15.4	34.1	15.6	15.7

LSD 1.62, * Means having the same letter in the same section are not significantly different at $p > 0.05$

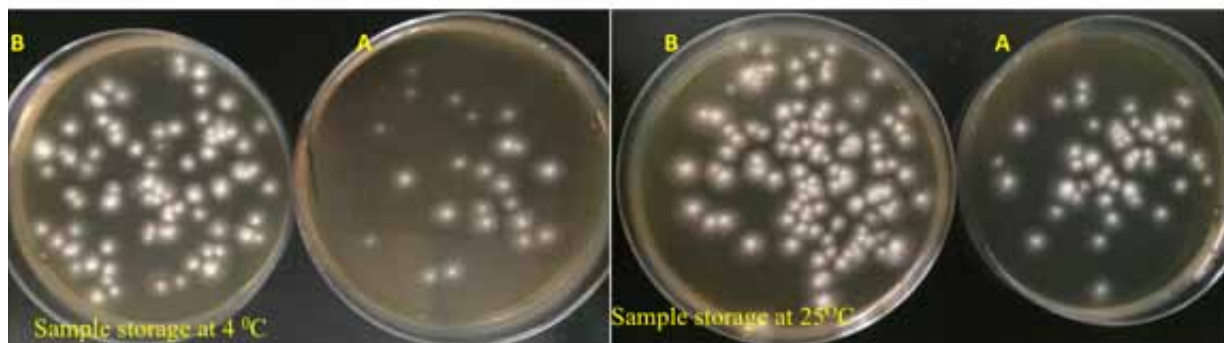
Changes in PV at 6 months of storage at +20°C - 22°C are shown in Figure 3.: After 18 months of storage, the walnut oil peroxide index values in temperature 4°C have raised more, as compared with the values registered in the 25°C.

The FFA (free fatty acid) is the common test usually judged for the Hydrolytic rancidity which it is caused by rancidity of walnuts

Iodine Value: The possible for development of and off-flavor in walnut products high in lipids is a function of the level of available unsaturated fatty acids. With a period of storage, degree of unsaturation in fatty acids

decline as a result of autoxidation. Therefore, a measure of unsaturation was a good indicator of probable to develop rancidity in walnuts. Therefore, an experiment to study influence of drying method, drying and storage conditions on iodine value was taken up in the present investigation. There was significant influence of drying administrations on mean iodine value of walnut samples. Drying method are aimed to relieve factors that may increase rancidity during storage. However, in the study their influence on degree of unsaturation in fatty acids appears to be limited. This is due to inferior levels of fatty acids available in the initial stages under drying and storage under two different degree of temperature.

Figure(1) Fungal cell content after storage at two different temperature (4,25 °C) after 18 months



A: after storage
B: before storage

Microbial content after drying and storage for 18 months: After storage for 18 months there were tested power plate method technique used after incubation samples (Shell +kernel and kernel)in PDB (Potato

dextrose broth) put samples in flasks and incubation them for 72 hours at 28°C at 150 rpm .after growth of Fungal cell I ml of liquid poured on PDA(Potato dextrose Agar or PDA Sabaroud dextrose agar) used striking

method Technique for power plating after that incubated at 28°C for 7 days in incubator next step inspection of plates to observe growths of colony on PDA agar. after inoculating fungal cell suspension 10^4 cell on Sabaroud dextrose agar and incubation for 5 days .this method is agree with (Tooraj Mehdizadeh et., al 2019).In Table (4) shows the effect of 18 months of storage at 4°C on the levels and mold and counts in the experimental Walnuts.

The mold counts in the walnuts ranged from 96×10 to 102×10 CFU. After 18 months of storage at 4°C, Storing Walnuts at a low temperature (refrigeration) reduces fungal cell growth levels and mold counts for 18 months. 18 months of storage at 4°C and could not be considered safe from any fungal growth although it better than storage at 25°C

Table (4): Fungal cell content after storage in two different temperature (4°C, 25°C) after 18 months of storage

Storage at 4°C 10^4 Before After	Storage at 4°C 10^5 Before After	Storage at 25°C 10^4 Before After	Storage at 25°C 10^5 Before After
111×10^4 110×10^4	114×10^5 96×10^5	102×10^4 98×10^4	122×10^5 102×10^5
138×10^4 126×10^4	107×10^5 95×10^5	109×10^4 96×10^4	118×10^5 104×10^5

This finding is in line with the results obtained by Amnah M.A, Alsuhaibani 2018., who reported that the length of storage time of nuts significantly affects the walnut properties .The results of the present study can be used to guide and educate consumers on the risks associated with nut consumption should they become contaminated. Based on this evaluation of fungal growth levels and mold and yeast counts, nut quality depends on both the storage period (3 or 6 months) and the temperature at which they are stored. The rates of aflatoxin contamination in different nuts should not be neglected. This study indicated that there is considerable variation in the change in properties which tested in this study including color taste appearance crispy, stringency and bitterness of the (shell+ kernel and kernel). This study showed that storing nuts at low temperature (refrigeration) can be beneficial for reducing the presence of the mold and yeast counts for 18 months, allowing the total aflatoxin levels in the samples to remain below the permissible limits of the EU, Iranian and Australian/ New Zealand food standard codes, which have set a maximum aflatoxin limit of 15 µg/kg for nuts.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Food science & Quality control College of Agriculture, University of Sulaimani, Kurdistan Region, Iraq, Iraq and all

experiments were carried out in accordance with approved guidelines.

References

1. Vinson JA, Cai Y. Nuts, especially walnuts, have both antioxidant quantity and efficacy and exhibit significant potential health benefits. *Food Funct.* 2012; 3 (2): 134-40.
2. Bo L, Lixia H, Rui L, Shaojin W. Thermal treatment and storage condition effects walnut paste quality associated with enzyme inactivation LWT - Food Science and Technology. 2014;59:786-793.
3. AOAC. Official Method of analysis of AOAC International, 16th edition. The United States of America- STAS 145/19-67. - STAS 145/67. - Standard EN ISO 66.1995.
4. Tatarov P, Sandulachi E, Ivanova R, Baerle A. Quality changes in oil of walnut (*Juglans regia* L.) during storage. *Lucrări Ştiinţifice. Editura "Ion Ionescu de la Brad.* 2017;187-190.
5. Ana L, M Oroian, Sorina R. the quality and stability of walnut. *Scientific Papers-Animal Science Series: Lucrări Ştiinţifice - Seria Zootehnie.* 2016; 65: 230-236.
6. Amnah M.A. Alsuhaibani Effects of Storage Periods and Temperature on Mold Prevalence and Aflatoxin Contamination in Nuts DOI: 10.3923/pjn. 2018.219-227.
7. Christopoulos MV, Tsantili E. storage of fresh

- walnuts(*Juglansregia L.*)-Low temperature and phenolic compound .Postharvest Biology and Technology. 2012; 73:80-88.
8. Janse PN, Sorensen G,Englesen S, Bertelsen G. Evaluation of quality of walnut kernel (*Juglansregia L.*) by vis/NIR spectroscopy,*J.Agric .food Chem.*2001; 49:5790-5796 .
 9. Bakkalbasi E, Ylmaz O. Effect of packaging materials .storage condition and variety of oxidative stability of shelled walnut .*LWT –Food science and Technology.* 2012; 46: 203-209.
 10. M Javanmard. Effect of Modified Atmosphere Packaging and Storage Temperatures on Quality of Shelled Raw Walnuts 2017 World Academy of Science, Engineering and Technology International Journal of Nutrition and Food Engineering. 2017; 11: 7.
 11. Mariod AA, Bertrand M, Maznah I. supercritical fluid and hexane extraction method in extracting kenaf (*Hibiscus cannabinus*) seed oil lipids. *Journal of the American Oil Chemists Society.*2011; 88: 931-935.
 12. Sen S. Walnut, cultivation, nutritional value, folklore (4th Ed.) (in Turkish). ICC Publication, Ankara, Turkey. 2011; 220.
 13. Tooraj M,Neda M. Effect of walnut kernel septum membranes hydro alcoholic extract on the shelf life of traditional butter. *Heliyon.*2019; 5: e01296.
 14. Martenes M, Barrionuevo G, Nepote V,Grosso N. Sensory characterization and oxidative stability of walnut oil international journal of food science and Technology. 2011; 46 :1276-1281.
 15. Negi A, Luqman S. Antiproliferative and antioxidant activities of *Juglansregia* fruit extracts. *Pharm. Biol.* 2011; 49(6): 669-673.

Knowledge and Psychological Factors Affecting on Skills Performance Enhancement and Developing Reading

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Abstract

The current research aims to building proposed standards to evaluate the performance of teachers of the Arabic language male and female teachers in according to the quality systems of modern education and according to the following areas: ((Planning, learning strategies, scientific material, assessment, teacher's profession)), The number of standards (16) criteria and the number of indicators (72) and I developed for each paragraph five alternatives (Excellence, very good, good, average, acceptable), and verified the validity of the tool and its stability, which has been applied by the researcher on a sample of teachers and teachers of the language in the center of the province numbered (193) male and female, the researcher found that the performance of teachers both gender was generally positive which calls for more attention to the preparation and training of teachers according to quality performance standards.

Keywords: *Psychological skills, educational program, performance, knowledge.*

Introduction

Many of our educational institutions suffer from several problems, the most important of which is the low level of evaluation of the performance of teachers and teachers according to the overall quality standards, and the low level of scientific and educational capabilities, their weakness for the movement of global development and progress, which adversely affects in the preparation of male and female teachers of the primary stage and low receiving educational information ¹ in addition, there was a weakness in the performance of some male and female teachers and teaching them to the Arabic language, this weakness in the outputs of educational services provided to teachers in general, male and female teachers of the Arabic language in particular, which negatively affected the level of performance of teachers and their possession of many of the required competencies that must be available in the teacher. ²In the light of the foregoing, the researcher believes that one of the reasons for the low level of the teacher of the Arabic language is twice the numbers during the course of his studies and during the service professional numbers, did not qualify them sufficient educational qualification to be able to transfer knowledge and information on the basis of good performance in the classroom and its interaction with

students in different educational situations, as the teacher of the Arabic language at the primary level requires continuous during his service and provide him with He received a change and development in the teaching method and Arabic language skills, As well as providing him with information and knowledge in the light of scientific, cognitive change, and the lack of training opportunities or the existence of formality led to poor performance of the teacher affects the level of students³. The education is an instrument for the advancement of the individuals and groups, mainly in the preservation of the entity of the nation and its civilized construction⁴, they are closely related to life, as well as the nerve of the civilizational building of the nation, and became a field for the investment of human resources, and preparation for what is required for construction and reconstruction. The wealth of nations is not appreciated by its population, but by the qualified human resources capable of production and labor⁵. And that education is an acquired component of the learner, therefore, they are twins inseparable, they complement each other and complement the human personality, because education and its priority remain more important than education, and the responsibility of modern education cannot be unique to one team or institution, whether a teacher or educational institution ⁶. The concept of performance in

teacher preparation and teaching is an important concept which have attracted the attention of those involved in education, the call for adoption of this trend has emerged on educational competencies as it leads to improving the effectiveness of teachers, and a positive change in their performance. The importance of this trend is confirmed by a strategy development of Arab education on the need to renew the preparation of teachers and training programs so as to improve their professionalism and performance⁷. The teacher's role in the learning process is no longer restricted to knowledge transfer to the learner and fill his mind with matter, the criterion of sufficient education is no longer the amount of material absorbed by its specialty and the amount of what can store it in the minds of learners, but became the role of enabling the learner to learn, the criterion of his performance ability to achieve and influence the cognitive structure of the learner, modifying the behavior of the learner and develop his personality comprehensive development dealing with the knowledge and values and skills (Atiya, Al Hashemi, 2007: 19) As performance is important in the educational process, performance assessment is one of the basic pillars that can be adopted in the development of teachers' work. Through which qualitative aspects of their performance can be improved. Moreover, the evaluation is a feedback used in the development of the educational process, including education. (Atiya, 2009: 24) The educational evaluation is one of the cornerstones of the educational process, It is the cornerstone of any educational development or renovation aimed at improving the learning and education process in any country. The educational evaluation is also viewed by all educational decision makers as the main motivation that leads the employees in the educational institution at different positions in the administrative ladder to work to improve their performance and practice and thus their outputs.⁸ Total quality in education means an integrated management system and a way to develop student quality as the product through quality goals and content processes and the quality of the personnel working in the educational institution of managers and teachers and to work on continuous improvement and development based on careful planning and the participation of all management, students and teachers in carrying out the responsibilities for achieving the overall quality. The current research aims at constructing proposed standards for evaluating the performance of teachers of Arabic language and their teachers in accordance with modern quality education systems. To achieve the research objective, the researcher

formulated the following questions: What are the proposed standards that require building according to the modern quality education systems? The movement of the evaluation emerged with the emergence of the educational process. Educators from the beginning felt that they needed to measure the progress and delay of their students and the need to identify their strengths and weaknesses. They also felt the need to measure and evaluate the success of their efforts and their teaching method. The concept of evaluation is one of the concepts that have received a great deal of controversy in the media and educational literature. This is due to the complexity of this concept, its flexibility and its overlap with other concepts referred to measurement and evaluation, accountability and inspection. The educational evaluation is an important and necessary dimension for management and educational leaders, it is a deliberate and required process of supervision and development to ascertain the quality and quality of the curriculum and the other aspects of the educational process, with a view to improvement and development, and the process of evaluation reveals to us how well the educational process, it also provides us with indicators of the extent to which this improvement is possible and then prepare the educational calendar and the development of method one of the main approaches to the development of education, it is the scientific method through which accurate diagnosis of the educational process and modify the course. Its importance in providing necessary information related to the learners, teachers, materials and educational programs and educational officials and administrators. Educational evaluation is an important and complementary part of the educational process and also contributes to judging the integrity of the procedures and practices in the teaching and learning process. The teacher has a special place in the educational process, but the success of the educational process is not only with the help of the teacher, the teacher is characterized by the competencies and the desire and inclination of education is what helps the student to learn and prepare to acquire the appropriate educational experiences. It is true that the student is the focus of the educational process and that everything must be adapted to his orientation, readiness, abilities and academic and educational level, but that the teacher is still the element that makes the process of learning and teaching successful and is still the person who helps the student to learn and success in his study however, He differed radically between past and present.

Methodology

The researcher followed the descriptive approach in conducting the research, because it is more appropriate and the nature of this research, which aims to build the proposed standards to evaluate the performance of teachers of Arabic language and its teachers according to the quality systems of modern education, and the importance of descriptive research as a cornerstone in scientific research and in the eyes of many researchers, In addition, it is the most appropriate method to study most humanitarian fields, as a result of the difficulty of using other approaches, especially the experimental method. The descriptive approach is one of the most common method used by researchers. It aims at determining the current state of a particular phenomenon and then describes it. Studying the phenomenon as it actually exists and takes care as strictly.

The research community and its sample: The researcher identified the research community with the teachers of the Arabic language in the center of the province of Babylon/primary schools all, the researcher visited the General Directorate of Education Babylon/Educational Planning Division accompanied by the book facilitation task issued by the Faculty of Basic Education/University of Babylon (Annex), and looked at the records of primary schools in (183) primary schools/

morning study only for the academic year (2018 - 2019). The research sample consisted of

A. Sample of Schools: The researcher chose a sample of the schools (50%) of the original society. The number of selected schools was (91) in the random sampling method as shown in Table (1).

Table showing the total number and sample of primary school boys, girls and mixed.

No.	Schools at the center of the province	Total Number	Number of schools Sample research by 50%
1	Primary schools for boys	86	43
2	Primary schools for girls	80	40
3	Mix schools	17	8
	Total schools	183	91

B. The sample teachers and teachers of Arabic language: The researcher selected a sample of teachers and teachers of Arabic language (20%) of the original society. The number of students selected was 233 teachers from the Arabic language and distributed to the schools of Babil Governorate. (The exploratory sample) to extract the stability, as shown in Table (2).

Table (2): Table showing the total number and sample of Arabic male and female teachers in primary schools for the morning study in the center of the governorate .

No.	Schools at Province Center	Total Number	No. of Male Teachers	No. of Female Teachers	Number of male and female in the research sample 20%
1.	Primary schools for boys	573	100	15	115
2.	Primary schools for girls	486	97	97
3.	Mix schools	108	6	15	21
	Total Schools	1167	106	127	233

It is clear from Table (2) that the number of teachers of the language and its teachers who were selected as a sample of the research (233) teachers and teachers (106) teachers, and (127) teachers and sample who will be applied to the search tool through the observation card designed to achieve the goal of research.

The Research Tool: In the opinion of the researcher that the observation card is the appropriate tool to achieve the goal of its search for information. The observation can be generally referred to as: systematic

organization control of certain elements or behavior that is codified according to a predefined precise system (Atwan, Yousef Matar, 2018: 107).

To achieve the goal of the research, the researcher relied on a set of foundations in building observation card:

1. See the references in the research method.
2. Review previous studies that adopted the descriptive approach.

3. Access to quality education systems.
4. Instructors of specialized professors.

The Tool Honesty: Honesty means that the tool is valid for measuring what has been set up. There is a correlation between the truthfulness of the instrument and its stability, each honest tool is fixed (Sadiq et al., 2018: 5). Virtual honesty is defined as testing itself belongs to the subject to be measured, and valid to measure that subject. It is ascertained by observing the measurement instrument paragraphs and the fact that each paragraph is concerned with measuring the objectives of the material to be measured. (Attia, 2008: 298). In order to achieve this kind of honesty, the researcher presented her tools to a group of experts and adopted 80% as a ratio of agreement among them, and each paragraph received a lower percentage of this percentage, the researcher excluded and amended Some according to expert opinions.

Results

The study showed that the performance of teachers of Arabic language and its parameters was generally positive. Attention to the preparation and training of teachers and teachers of Arabic language in accordance with quality standards of performance. Availability of quality standards in the performance of teachers of Arabic language and its parameters.

Conclusion

The number of standards (16) criteria and the number of indicators (72) and I developed for each paragraph five alternatives (Excellence, very good, good, average, acceptable), and verified the validity of the tool and its stability, which has been applied by the researcher on a sample of teachers and teachers of the Arabic language in the center of the province numbered (193) male and female, the researcher found that the performance of Arabic teachers both gender was generally positive which calls for more attention to the preparation and training of Arabic teachers according to quality performance standards.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon – college of

Basic Education, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Ismail BH. Strategies for Teaching Arabic Language, 1st printing, Al-Manhal Publishing and Distribution. 2011.
2. Al-Bahadli MI. Evaluation of the performance of primary school teachers in light of the overall quality standards, Center for Research and Studies, No. (6), Ministry of Education, Republic of Iraq. 2009.
3. Al-Hariri R. Educational Evaluation 1stprinting, Dar Al-Maagheh for Publishing and Distribution, Amman, Jordan. 2012.
4. Barber H. Method and method of education and recipes of the successful teacher, 3rd printing, House of Arab Renaissance, Beirut Lebanon. 2011.
5. Al-Khafaji MT. The Impact of the Aggregate Strategy on the Achievement of Middle School Students in Arabic Grammar, Indian Journal of Medical Research and Development, 2018; 9(10)
6. Da'as MN. Modern Educational Assessment Strategies and Tools, 1stprinting, Dar Ghaida Publishers and Distribution, Jordan Amman. 2008.
7. Saati FB. Mathematical Management: Curriculum of Scientific Research in Mathematical Management, 2014, 1st printing, Dar Al-Mawahah for Printing, Publishing and Distribution, Amman, Jordan
8. Atwan AH, Yousef KM. Scientific Research Method, 2018, 1stprinting, Dar al-Kuttab Al-Alami, Beirut, Lebanon.2000.
9. Attia MA. Total and New Quality in Teaching, 1st printing, Dar Safa, Amman, Jordan. 2009.
10. Attia MA. Evaluation of the performance of teachers of the Arabic language, 1st printing, House of curriculum for publication and distribution, Jordan.
11. Attia MA, Abdul-Rahman A. Practical Education and its Application in the Preparation of the Future Teacher.2000.
12. Attia MA. Modern Curriculum and Method of Teaching, 1st printing, Dar Al-Maaheqah for Publishing and Distribution, Amman, Jordan. 2009.
13. Allam SM. Educational and Psychological Measurement and Evaluation “Its Basics,

Applications and Contemporary Directions” Dar Al-Fikr Al-Arabi, 6th printing. 2015

14. Al-QaraG, Ali MA. Evaluation of the performance of geography teachers in the light of their educational competencies and proposing a program to improve performance, unpublished master thesis, college of Basic Education, Mustansiriya University, Baghdad. 2004.
15. Attree M. Analysis of the Concept Quality As It Relates to Contemporary Nursing Care in Schmele,” June Quality Management in Nursing and health care Albany New. 1996.
16. Gronlund E. Measurement and Evaluation in Teaching, Seven the Edition. New York, Mamillanco. 2000.

Improvement the Strength of a Dental Filling Restoration by Adding of NiTi alloy Powder to Galloy

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Abstract

Gallium has the second lowest melting point of all metals after mercury (29.8 °C) and has the ability to react with metals and alloys at room temperature to produce a workable plastic mass that hardens with time. As a result Gallium-based alloys have been introduced to the dental market as mercury-free amalgam substitutes. Filling material produced by mixing amalgam alloy powder with gallium liquid instead of mercury. This work involves addition of NiTi alloy powder to Galloy to improve some mechanical properties. These properties included compression, hardness, tensile strength and creep. The characterization of prepared NiTi/Galloy with five wt% of addition (1, 2, 3, 4, and 5 wt%) was done by XRD and SEM/EDS. The results showed that the hardness, compression and diametral tensile strength were increased with increasing wt% of added NiTi alloy powder and the creep percent was decreased where NiTi powder alloy disperses in the matrix of the alloy and prevents the dislocation movement, also the NiTi powder particles have unique properties of super elasticity that work to increase the creep strength.

Keywords: Galloy; Amalgam; Dental alloy; NiTi alloy.

Introduction

Amalgam is still a preferred material where strength is the requirement for material selection as restoration material in dentistry, but the toxic effect of Hg led to the development of gallium alloy¹. As a result, introduction of Gallium based alloys have been occurred as mercury free amalgam which was suggested by Puttkamer as long ago as 1928^(2,3). On the other hand, Ni-Ti alloy was developed by W. F. Buehler in 1960s. A shape memory effect of this intermetallic alloy was found from its thermodynamic properties which controlled heat treatment⁴. This alloy was named Nitinol, an acronym for the elements from which the material was composed; ni for nickel, ti for titanium and nol from the Naval Ordnance Laboratory. This alloy has a lower modulus of elasticity and greater strength compared with stainless steel, therefore the advantage of using NiTi instruments during the preparation of curved root canals has been introduced, because the files will not be permanently deformed as easily as would happen with traditional alloys⁵. Many authors highlighted on Ga alloy for dental

applications⁽⁶⁻¹¹⁾, but this alloy had some defects and many attempts have been done to improve this alloy.

The present work aims to improve some mechanical properties of Ga alloy by adding NiTi alloy powder with five percents (1, 2, 3, 4 and 5 wt%) to investigate the hardness, compression, tensile strength and creep.

Materials and Method

Materials: The elements and materials used in this work are gallium, indium, tin, and bismuth. Ga, In and Sn used for the preparation of the liquid alloy. A standard amalgam alloy used as powder alloy that mix with liquid alloy. All elements used in this work with high purity obtained from different origins.

Liquid alloy was prepared by alloying gallium, indium and tin together at 230°C until all the elements be liquid and let it cool down to room temperature, the weight percentages of Ga, In and Sn were (64, 24, and 12 wt.%) respectively and the melting point of this alloy is -19°C.

Preparation of Base Alloy: The preparation of specimens were done according to the ADA specification No.1¹² by trituration 1:0.5 g of powder alloy and liquid alloy respectively for preparation fills by amalgamator type (YDM-Pro), the trituration time is 8 seconds. Specimen dimensions were 6mm in diameter and 12mm in height as cylindrical shape. For specimen preparation, a Teflon mold was used and after the trituration, the fill paste was immediately put in the hole of the die by using a special instrument with the diameter 2.5mm called condenser, and then it was compressed into the die 14 MPa for 85 seconds.

The powder of NiTi with a weight percentage of (55% Ni + 45% Ti) has been wetly mixed by planetary automatic ball mill with five steel balls differ in diameter to mix and refine metal powder for three hours. Ethanol has been used as a mixing medium of wet mixing and then 5 g of NiTi powder mixture has been compacted by electric hydraulic press to produce a disc samples with dimension of 12.7 mm diameter and 8 mm thickness. The compacting pressure was 620 MPa for 1 minute. Graphite was used as a lubricant to reduce the friction during the pressing process.

The green compacted samples have been sintered in a vacuum tube furnace. The sintering system composed from the following parts: Tube furnace, Vacuum rotary, Quartz tube. The compacted samples were put in the quartz tube inside the tube furnace the samples were heated from room temperature to 850°C under vacuum condition. The heating rate was 30°C/min and the samples were kept for 6 hours at 850°C and then slowly cooled inside the furnace with preceding the vacuum circumstance at 10-3 torr. The prepared NiTi alloy converted to the powder form by crushing with ball mill of ceramic balls in planetary automatic ball mill (NΦM-O-O4). Then this powder was sieved with a 200 mesh sieve its normal aperture is 75 μm according to British standard-410.

Characterization: The characterization of prepared specimens was done by:

X - Ray Diffraction: The X - ray diffraction analysis was performed on amalgam powder, base Galloy, NiTi powder alloy and 5% NiTi/Galloy with X-ray machine (Shimadzu LabXXRD-6000, Japan) with copper K α radiation at $\lambda = 1.5406 \text{ \AA}$ and a nickel filter. The range of the diffraction angle $2\theta^\circ$ was (20-90°).

Scanning Electron Microscopy (SEM): SEM with high energy beam generated a verity of singles at the surface of solid specimen was used. This test was carried out using SEM type MIRA3 TESCAN/Czech Republic. This test was done for base alloy and 5% NiTi/Galloy.

Mechanical Properties

Hardness Test: Vickers microhardness test was done by a digital microhardness tester (Type TH715, Beijing, Time High Technology Ltd) with a static load of 200 g for 10 seconds at two different time intervals (1 day) and (7 days) after the trituration. Three recorders were measured at diagonal distribution across the specimen. The dimensions of the indentation are measured by the measuring microscope at 200 \times magnification.

Compressive Strength: The compressive strength was carried out using Instron machine, type Universal testing machine/WDW 200, China with the speed of 0.5 mm/min. The specimen was vertically put between the jaws. The test was done after (1 day) and (7 days) after the trituration at temperature of $37\pm 1 \text{ }^\circ\text{C}$. The compressive strength is calculated using the following formula:

$$\text{Compressive Strength} = \frac{\text{Max force}}{\text{Cross sectional area}} \quad \dots(1)$$

Diametral Tensile Strength: This test was done by the same machine of compression test at loading rate of (0.5 mm/min) after put the specimen at the lateral side and after (1 day) and (7 days) of trituration. The tensile strength was calculated by the following formula¹³:

$$\sigma_t = \frac{2P}{\pi DL} \quad \dots (2)$$

where: σ_t is a tensile strength (MPa), P is a load at fracture (N), D is a diameter of specimen (mm), and L is a length of the specimen (mm).

Creep: This test was done at $37\pm 1 \text{ }^\circ\text{C}$ after (2 hours) and (45 min.) of trituration. And then the specimen was subjected to a constant axial pressure of 10 MPa and maintained for 21 hours. After that the shortening was obtained after measuring the length with micrometer caliper to calculate the percentage of creep according to A.D.A. Specification No.1 which allows the maximum of 3% creep¹². The creep percent is calculated by the following formula¹²:

$$Creep (\%) = \frac{L_o - L}{L_o} \times 100 \quad \dots(3)$$

where: L_o is original length (mm) and L is final length (mm).

Results and Discussion

Characterization: Fig. (1) shows the XRD pattern of powder alloy which identify the phase exist in the base alloy. The Cu_3Sn phase which has peaks at 2θ (41.787, 43.472 and 76.807) and the Ag_3Sn phase at 2θ (34.656, 37.602, 39.515, 39.589 and 52.059).

Fig. (2) shows the XRD pattern for base alloy (Galloy) where the formed phase are β -Sn, $CuGa_2$, $Ag_{72}Ga_{28}$, In_4Ag_9 , Ag_3Sn and Cu_3Sn . The peaks of β -Sn are located at 2θ (30.644, 32.018 and 44.902), the peaks of $CuGa_2$ are located at 2θ (35.235, 44.576, 45.305, and

67.030), also the peak of In_4Ag_9 are located at 2θ (38.455) and for $Ag_{72}Ga_{28}$ are located at 2θ (38.922, 40.189, 41.245 and 57.20) and for Ag_3Sn phase are located at 2θ (34.656, 37.602, 39.515, 39.589 and 52.059).

Figure (3) shows the XRD pattern for NiTi alloy powder it can be observed the sintering temperature and time are enough to complete the phase transformation and all Ni and Ti transformed into monoclinic NiTi phase (M- NiTi), cubic NiTi phase (A-NiTi) and hexagonal Ni_3Ti phase).

Figure (4) shows the XRD pattern of 5% NiTi/ Galloy, where the phase in this alloy is the same as base alloy except the addition of NiTi peaks that are located at 2θ (42.803, 46.534, 61.982 and 78.153) and the essential phases in base alloy.

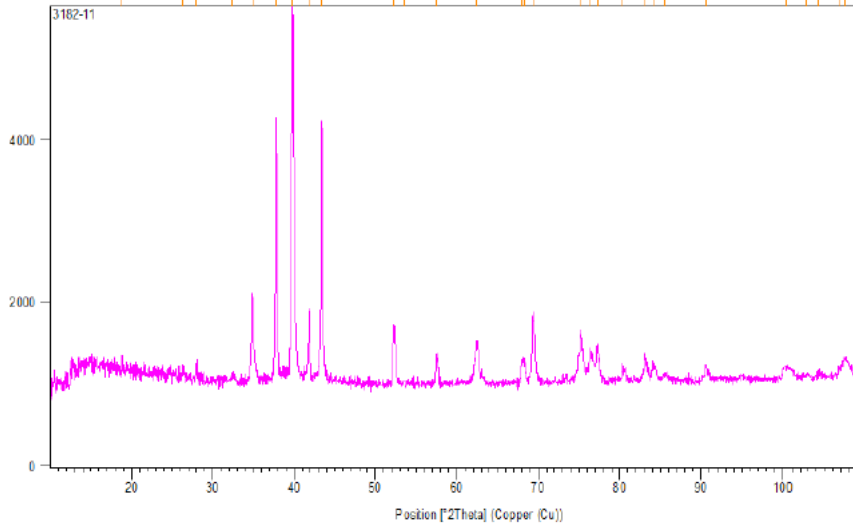


Fig. (1): XRD analysis of powder phase in Galloy.

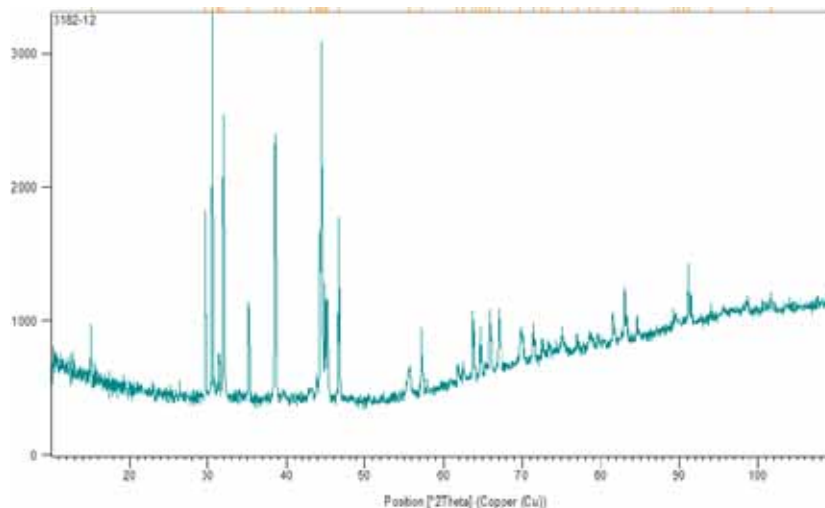


Fig. (2): XRD analysis of base Galloy.

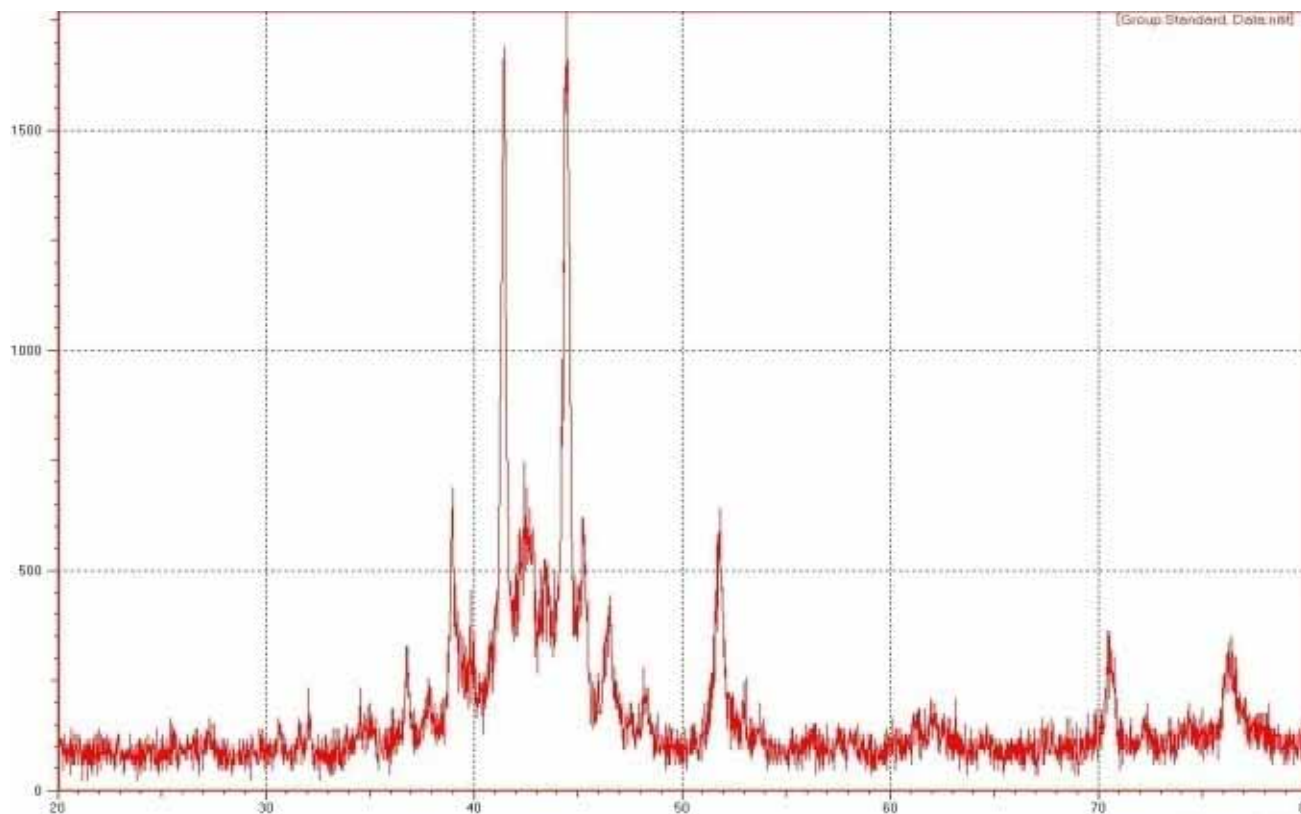


Fig. (3): XRD analysis of NiTi alloy powder.

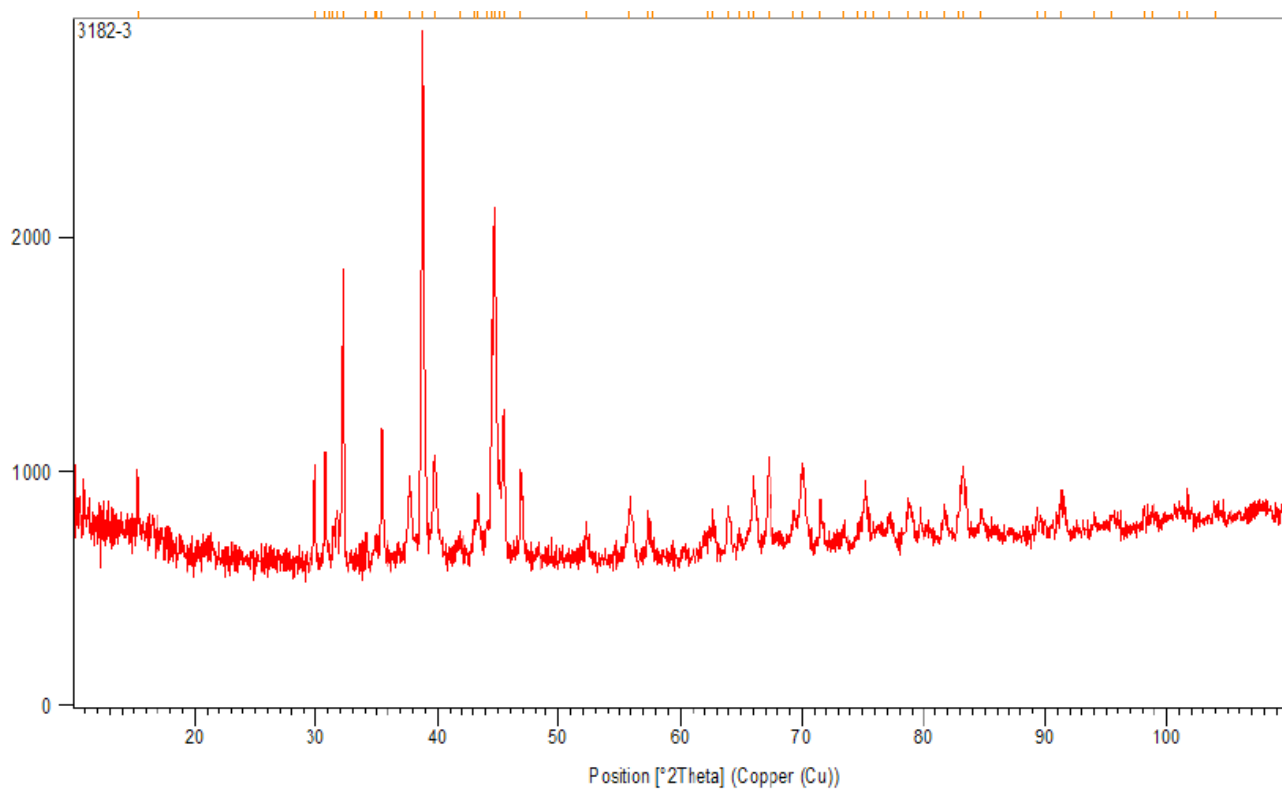
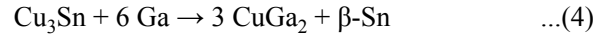


Fig. (4): XRD analysis of 5% NiTi/Galloy.

The microstructure of the base alloy is observed in the Fig. (5), the figure shows the unreacted cores of powder particles which consist of Cu + Sn + Ag surrounded by embedded zone within a complex matrix to produce CuGa₂. The core and the surrounding area denoted as A and C respectively and corresponding to the EDS test of the both region. The region B is referring to the matrix where it is consist of β-Sn and Ag₂Ga and

Ag₉In₄, and the formed β-Sn is due to the following equation:



While the D region is consist of CuGa₂ phase, all the regions (A, B, C and D) are analyzed by EDS (Fig. 6) which indicates the presented elements and their distribution in base alloy.

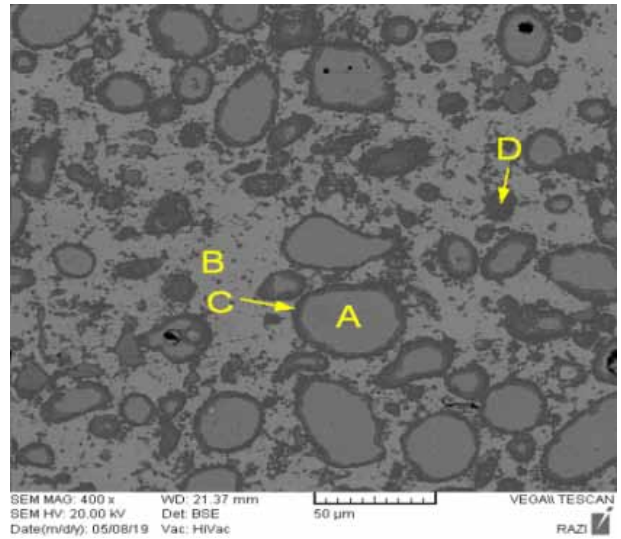
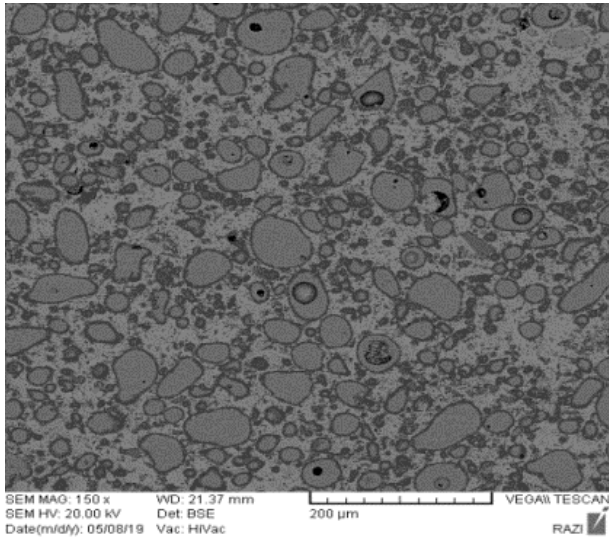


Fig. (5): SEM of base alloy (Ga alloy).

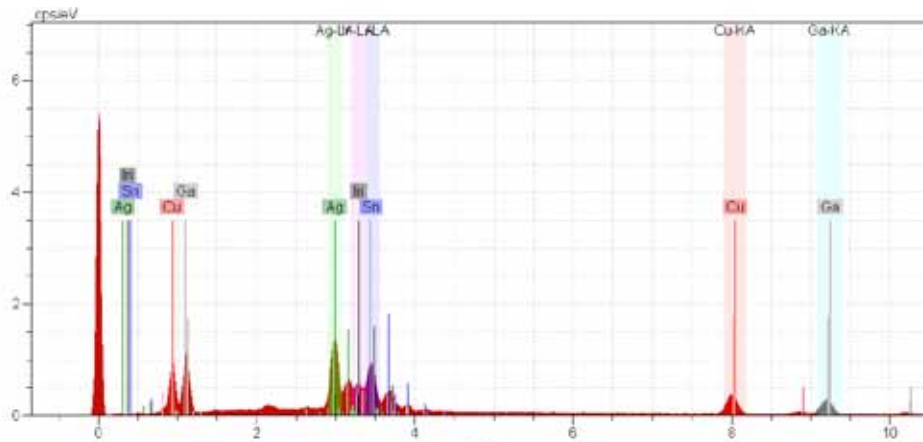
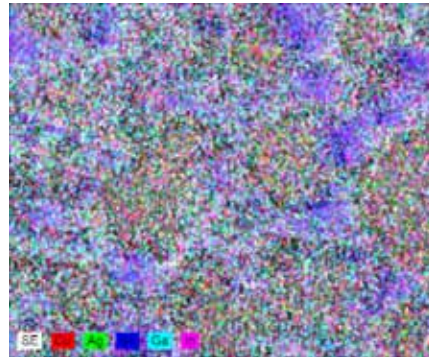


Fig. (6): EDS of base alloy (Ga alloy).

SEM of 5% NiTi/Galloy which indicates the main phases that presented in the base alloy. The phases are (β -Sn, CuGa₂, Ag₇₂Ga₂₈, In₄Ag₉, Ag₃Sn and Cu₃Sn) where the A region is consist of unreacted powders particles (Sn-Cu-Ag) surrounded by a reaction zone consist of β -Sn and CuGa₂ phase. While the B region is consist of NiTi alloy which confirmed by EDS analysis. The C region in SEM image is consisting of Cu, Ag, Ga, Sn elements and it may be CuGa₂ or AgGa phase. The D region is consisting of β -Sn which is the result of the reaction that is mention in eq. (1). EDS analysis confirms the presence of NiTi within base alloy phases with uniform distribution and no sign to aggregation.

Microhardness: The microhardness test has been done for prepared specimens of Galloy with addition of different percentages of NiTi powder. The microhardness was determined after 1 and 7 days. The behavior shown in this figure indicates that the microhardness increased with increasing weight percents of additive compared with the base alloy without addition. The data of microhardness indicate that the hardness increased after 7 days compared with the values after 1 day because of the setting reaction doesn't complete immediately and some liquid alloy found and that will weaken the alloy, so after 7 days the setting reaction is complete and the alloy reach to its final strength. The increment of microhardness in presence of NiTi alloy powder is attributed to the influence of NiTi alloy nano powder to the Galloy which it is works through the filling of vacancies in the base alloy and also due to the unique mechanical properties of NiTi powder alloy that inhibit the dislocation movement.

Compressive Strength: The strength of a dental filling restoration must be high enough to resist the biting force especially compressive force. The produced specimens were tested after (1 day) and (7 days) and there is a high increase in the compressive strength after 7 days in the comparison with 1 day because the setting reaction is not complete at 1 day. The role of NiTi nanoparticles powder to increase the compressive refer to disoperation in the matrix and work to prevent the dislocation movement, and also the NiTi shape memory alloy with unique properties which have super elasticity also work to increase the compressive strength, and the good interfacial bounding between NiTinano powder and the base alloy.

Dimetral Tensile Strength: The Dimetral Tensile strength was done after (1 day) and (7 day) of trituration.

the addition of NiTinano powder which led to increase the tensile strength with increasing of the NiTinano powder alloy percentage, and the tensile strength increase after 7 days more than the increasing after 1 day, because the setting reaction dose not complete after 1 day.

Creep Test: The creep for NiTi/Ga alloys with different percentages (1, 2, 3, 4, and 5 wt%). The addition of NiTinano powder alloy disperses in the matrix of the alloy and prevents the dislocation movement; also the NiTi powder particles have unique properties of super elasticity that work to increase the creep strength.

Conclusion

The addition of NiTi alloy powder to Galloy led to improve some mechanical properties of this alloy through the filling of vacancies in the base alloy and also due to the unique mechanical properties of NiTi powder alloy that inhibit the dislocation movement, this led to increasing the hardness, compression and tensile strength in addition to reduce the creep percent.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Materials Engineering – University of Technology, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. RSingh, STandon, MRakhee, "Comparative evaluation of clinical efficacy of gallium and amalgam alloys in primary molars", *J. Indian Soc. Pedo. Prev. Dent.*, 2004;22(2): 68 – 72.
2. FJShainia, F KWahaba, GPFlemingb, P MMarquisb, ACShortallb, "A palladium-free gallium-based alloy: analysis of composition and microstructure", Elsevier Ltd, 2003;19: 653–661.
3. SM Dunne, RAbraham, "A study into the performance of a gallium-based restorative material", *British Dental Journal*, 2000;189(6).
4. WHBuehler, J V. Gilfrich, RC Wiley RC, "Effect of low temperature phase changes on the mechanical properties of alloys near composition TiNi", *Journal of Applied Physics*, 1963;34:1475–7.
5. ESchäfer, "Root canal instruments for manual use:

- a review”, *Endodontics and Dental Traumatology*, 1997;13:51–64.
6. JC Taggart, “Handbook Of Dental Care: Diagnostic, Preventive and Restorative Services”, Nova Science Publishers, Inc., 2009.
 7. RM Waterstrat, RW Longton “Gallium-palladium alloys as dental filling material”, *Public Health Reports*, 1964;79(7): 638-642.
 8. MA Alher, “Ni ion release of TiO₂ and TiO₂/Hydroxylapatite composite coatings formed on NiTi shape memory alloy produced by powder metallurgy”, Ph.D. thesis, Production Engineering and Metallurgy Department, University of Technology, Baghdad-Iraq, 2013.
 9. DA Porter, “Phase transformations in metals and alloys” 2nd edition, Chapman & Hall, 2-6 Bowdoin Row, London SE11 1LX, 1992.
 10. H Hero, T Okabe, H Wie, “Trace elements in persons with dental amalgam”, *Journal of Materials Science*, 1997;8: 357-360.
 11. K Moharamzadeh, I M Brook, R V Noort, “Biocompatibility of Resin-based Dental Materials”, *Journal Materials*, 2009;2: 514-548.
 12. DA, “Guide to dental materials and devices”, 7th edition, 1974-1975.
 13. CP Ju, YH. Chen WF Ho, S Ching, WC Chen, DB Shieh, J Huey, “Effect of heat treatment on structure and properties of dispersed-type dental amalgam”, *Journal of Material Science*, 2008;19(1): 83–93.

Quality of Nursing Services for Heart Problems in Pediatric Hospital Intensive Care Unit

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Abstract

Background: Paediatric cardiac nurses should provide appropriate health information and guiding the parents to take care of their congenital heart diseases children effectively and family wellbeing. The aim of this study is to evaluate nursing management for admitted cardiac patients with congenital heart diseases in Sulaimani Pediatric intensive cardiac unit.

Method: Quantitative design with descriptive study was carried out with evaluation approach and it was conducted on nurses in pediatric intensive care unit of pediatric teaching hospital/Sulaimani city of Kurdistan region from 1st July 2017-1st May 2018. Non-probability sampling was performed, a purposive sample of (35) nurses who are working in Pediatric intensive cardiac unit of pediatric hospital and (105) convenience sample of the pediatric patient with congenital heart disease was involved in the study.

Results: Generally, the level of nurses' practice in total care management was 90.5% in fair level and only 9.5% in good level.

Conclusion: Nursing care management for child with congenital heart disease has been considered to be poor practiced in Kurdistan. More specifically, the nursing intervention to reduce child's heart load was poorly practice. The nurse's academic background and experience were not good qualified.

Keywords: Heart problems, Pediatric hospital, Nursing services.

Introduction

Congenital heart diseases (CHD) is structural or functional heart problems, which onset at birth. Some of these may be detect in later life. Cardiovascular disorders in children are divided into two major groups, congenital heart disease and acquired heart disorders. Congenital heart disease (CHD) includes primarily anatomic abnormalities present at birth that result in abnormal cardiac function. The clinical consequences of congenital heart defects fall into two broad categories, heart failure (HF) and hypoxemia. Congenital heart disease (CHD) is one of the master group of illness that, if treated, can get back health and promote quality of life. While the child admitted in the hospital, the most important role is that nurses have to perform dynamic clinical nursing care to this group of patient, specifically

the ones with complex situations e.g., congestive heart failure and anoxic spells. This role will result in survival and quality of life¹⁷. The nursing management for children with congenital heart diseases must be built up and carried out early, when the diagnosis of congenital heart disease is detected, in order to maintain the child in a stable or hemodynamically compensated state¹². Assessment of service delivery is an important aspect of nursing practice, service evaluation is being increasingly used and led by nurses, who are well placed to evaluate service and practice delivery. Evaluation in the healthcare context can be a complicated activity and some of the potential challenges of evaluation are described, alongside possible solutions. Further resources and guidance on evaluation activity to support nurses' ongoing development are identified¹⁴

Methodology

Design of the Study: Quantitative design with descriptive study was carried out with evaluation approach and it was conducted on nurses in Pediatric Intensive Care Unit of Pediatric Teaching Hospital/ Sulaimani city from 1st July 2017-1st May 2018. The study carried out to evaluate nursing management regarding children with congenital heart diseases.

Setting of the Study: Pediatric Intensive Care Unit has been established between 2011-2012. Most of serious pediatric patient admitting in this unit in order to performing better caring and services. The most critical cases includes: Congenital heart diseases, Pneumonia, Nephrotic syndrome, Severe dehydration, Bleeding, Sepsis, Convulsion, Croop, liver fail, and encephalitis.

The sample of the study: Non-probability sampling was performed, a purposive sample of (35) nurses and (105) convenience sample of the pediatric patient with CHD were recruit to the study.

The inclusion criteria for sample selection:

1. All nurses who work at PICU, university nurse, institute nurse, school nurse with both gender (male and female) and all nurses who work at both shifts (morning and evening).
2. Children who have congenital heart diseases either admitted to interventional purpose or clinical.

Tools: It is regarding patient socio-demographic data which are (age, gender, sequence child among sibling, residential area, type of CHD, Period and reason of hospitalization, and medication).

The observational check list scale includes (40) items concerning practice and activities that should be provided from the nurses to the children with CHD in Pediatric Intensive Care Unit. This scale consist of nursing Assessment (12 items), provide adequate nutritional intake to maintain growth and development (5 items), prevent infection (5 items), reduce the workload of the heart (5 items), manage respiratory distress (10 items), and provide health education to patient and family (3 items).

Method of data collection: The data were collected through the utilization of adopted and constructed questionnaire, interviewing technique, and observational

technique. Data were collected from (1st July 2017 - 1st April 2018).

Rating scales and scores: In this study using 3 types of rating scales:

Two points likert scale (Yes and NO): Three points likert scale (Always, Some time, and Never) is used in the section three of part one.

Five point likert scale: Poor (1), Fair (2), Good (3), Very good (4), Excellent (5)

Five is the highest score regarding nursing management in the (observational check list part) performed to the children with congenital heart disease in Pediatric Intensive Care Unit. To make understanding scoring system more clearly, mean of nursing care management were calculate for each subscale, then the score of each subscales have been unified in (0-100). And each item of the observational tools has been rated to three categories based on the mean of each distinct item, the category rated as Low practice (mean less than 1.65), Medium practice (mean lie between 1.65 to 3.3), High practice (mean greater than 3.3).

Descriptive Statistics: The P-value at 5% level indicates the degree of significance. Data were shown and tabled in frequencies and percentage, and mean of scores was calculated from ordinal data in five level (5, 4, 3, 2, 1). In the present study the highest mean of score indicates the highest level of practice regarding nursing management.

Inferential Statistics: Independent T- test and ANOVA have been utilized to find out the significant relationship of nursing care management with socio-demographic characteristics, and nurse's skill and experiences.

Results

The table 1 socio-demographic profile of participants presented. Out of 35 participants studied 21 (60%) were from age group 20 – 30 years, with mean age of 30.4 years. Majority of participants studied 77.1% were female and 62.9% of the participants were married whereas 37.1% were single. Total 21(60%) participants had experience of more than 10 years as a nurse, the experience of working in ICU was more than 5 years was 88.6%. Regarding education, majority of the nurses were graduated from institute 16 (45.7%).

Table 1: Distribution of the sample according to nurse's socio-demographic data

Characteristics	Frequency	Percentage
Age group		
20-30	21	60.0
31-40	10	28.6
More than 40	6	11.4
Total	35	100
Mean± SD for age: 30.4±8.2		
Gender		
Male	8	22.9
Female	27	77.1
Total	35	100
Years of experience as a nurse		
< 5	4	11.4
5-10	10	28.6
>10	21	60
Total	35	100
Years of experience in ICU		
1-5	4	11.4
> 5	31	88.6
Total	35	100
Level of education		
Graduate from primary nursing school	4	11.4
Graduate from secondary nursing school	5	14.3
Graduate from medical institute	16	45.7
Graduate from college of nursing	10	28.6
Total	35	100
Marital status		
Single	13	37.1
Married	22	62.9
Total	35	100

The socio-demographic profile and medical conditions of patients is given in Table 2 Out of 105 patients studied 51 (48.6%) were from infants age group, with mean age of 16.11 months. Patients studied 51% were female and total 67 (63.8%) patients were suffering from acyanotic congenital heart disease however.

Table 2: Distribution patient's socio-demographic data and medical conditions :

Characteristics	Frequency	Percentage
Age group		
Infant	51	48.6
Toddlers	32	30.5
Preschool	20	19.0
School	2	1.9
Total	105	100

Characteristics	Frequency	Percentage
Mean± SD for age :16.11±18.647		
Gender		
Male	51	48.6
Female	54	51.4
Total	105	100
Type of congenital heart disease		
Cyanotic	38	36.2
A cyanotic	67	63.8
Total	105	100
Reason of hospitalization		
Interventional	87	82.9
Clinical	18	17.1
Total	105	100

The Table 3 demonstrated the nurse's practices means for various steps of nursing management. Mean for practice was measured based on "observational check list score". The overall nursing management mean was 53.99. The mean for nursing assessment was 49.44. The mean for nurse's intervention for prevent

infections was highest with value 91.39. Furthermore, means for nurse's intervention for nutritional intake to promote children's growth and development was 55.62 and nurse's intervention reduce pulmonary distress was 49.60.

Table 3: Mean of nursing care management for each of assessment and intervention dimensions according to observational check list scale:

Variable	Mean	SD
Nurse's assessment for patients (12 items)	49.44	5.02
Nurse's intervention for nutritional intake to promote children's growth and development (5 items)	55.62	8.58
Nurse's intervention to prevent infections (5 items)	91.39	12.30
Nurse's intervention to reduce child's heart load (5 items)	37.48	9.06
Nurse's intervention to reduce pulmonary distress (10 items)	49.60	8.24
Nurse's intervention to providing education for child and family (3 items)	49.26	13.05
Intervention Total	55.93	6.23
Management Total	53.99	4.66

Table 4 gives the practice level of various nursing practices performed by participants during the study. It was found that the practice level of observation for clubbing fingers and chest deformities was low with mean value of (1.50) and (1.46) respectively. Meanwhile the mean for practice to assess respiratory patterns, records the vital sign and prepare the child for diagnostic and treatment procedures was high (3.31, 4.53) and (3.38) respectively.

However, practice of try to feed child was low with mean value (1.60). Socio-demographic profile of nurse's staff could have such relation on nursing care management. In this study mean age of nurses 30.4 years, 60% of nurses were from age group 20 – 30 years, (77.1%) were female and married (62.9%). (60%) participants had experience of more than 10 years as a nurse, and 88.6% of nurse's experience of working in ICU was more than 5 years. However, the

staff had much experiences while the staff education background was considerably less, since only few of them was college graduated nurse. Regarding to nursing degree and experience, the staff were not qualified well accordingly in this study. In US study revealed on that bachelor degree in nursing level or higher, and highly experienced nurse is required for PICU³. Same study has showed that a diploma nurse had made challenges to nursing care management in the PICU. Developed

countries have almost high workforce of qualified nurse in PICU. A study has shown that in PICU in the US hospitals, almost more than 95% of nurse are registered nurse with high mixed skill for deliver care to child with CHD⁷. And some other studies indicated that, seventy-one per cent of the nurses held a baccalaureate degree in nursing in the US, and nearly half of the nurses had more than 5 experience in PICU^{4, 18}.

Table 4: Assessment of means in respect to various nursing practices:

Nursing Assessment	Mean	Practice Level
The nurse obtain nursing history to become familiar with the child and his family to recognize normal and abnormal patterns	2.17±0.67	M
The nurse discuss with the physician about plan of medical care	2.73±0.69	M
The nurse observe and record information relevant to the child's growth and development	2.33±0.66	M
The nurse observe and record child's level of exercise tolerance	1.82±0.60	M
The nurse observe child's skin and mucous membranes for color and temperature changes	2.71±0.82	M
The nurse observe for clubbing fingers	1.50±0.65	L
The nurse observe chest deformities	1.46±0.60	L
The nurse assess respiratory patterns	3.31±0.96	H
The nurse palpate the child's pulses in all extremities	2.13±0.95	M
The nurse auscultate the child's heart	1.57±0.83	M
The nurse records the vital sign	4.53±0.94	H
The nurse prepare the child for diagnostic and treatment procedures	3.38±0.83	H

L= mean less than 1.65, M= mean lie between 1.65 to 3.3, H= mean greater than 3.3

Children with CHD are required to particular nursing care regarding to nutritional intake, prevention of infection, reduce child's heart load, reduce pulmonary distress, immunization, education for child and family and coordinate care⁹. For each of aspect of nursing care there is a specific nursing intervention and procedure that nurses have to implement them soundly. In this study, the only nursing intervention done for provision of adequate nutritional intake to maintain the growth and developmental which highly practice by nurses was "measure intake and output", meanwhile, nurses poor practice in involving try to feed the children. Since, these patient have limited ability for oral intake because of heart failure. potential complications such as gastro-esophageal reflux, aspiration risk, osmotic diarrhoea, constipation may develop in these children⁹. Poor nutrition status also may lead to stunting, underweight, and wasting in the CHD children¹⁵. Better nursing care management may protect child with CHD from death,

and reduce mortality rate^(4,5). Practice of nursing care management may be affected by the socio-demographic characteristic of nurse's, work experiences, skills about the PICU's materials. This study found among socio-demographic variables only nurse's educational background has significant relationship with nursing care management. Nursing care management was good practiced among nurse's high degree certificated. Some studies in the US have shown similar findings. According to the US studies, high certificated nurses and more experience nurse in PICU have significantly enhanced the quality of nursing care, and decrease the complications, and mortality in significant rate^(7,4,6). Furthermore, Bachelor of Science in Nursing education and Critical Care Registered Nurse certification have significant impact on paediatric patient outcomes⁵. A study has demonstrated that experienced nurse have significantly practice the resuscitation and protect child life⁶.

Conclusion and Recommendation

In this study, nursing intervention regarding prevent infections were practiced well and nutritional intake to promote children's growth and development in the average level, while the nursing intervention to reduce child's heart load was poorly practice. The most well done nursing intervention in this regarding were "measure intake and output" and "hand washing", This study found among sociodemographic variables, nurse's educational background was significantly associated with nursing care management. Nursing care management was good practiced among nurse's high degree certificated.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Sulaimani college of medicine, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Cameron JW. Malnutrition in hospitalized children with congenital heart disease. *Arch Pediatr Adolesc Med*, 1995;149(10):1098-1102.
2. Christian BJ. Translational Research—The Multidimensional Challenges of Pediatric Nursing and the Linkage With Improved Health Outcomes for Children and Families *Journal of Pediatric Nursing*, 2017;36:248–253.
3. Connor JA, Mott S, Green A. Measuremen of Quality of Nursing Practice in Congenital Cardiac Care. *Am J Crit Care*, 2016;25(2):128-135.
4. Hickey PA, Gauvreau K, Curley MA, Connor JA. The effect of critical care nursing and organizational characteristics on pediatric cardiac surgery mortality in the United States. *J Nurs Adm*, 2013;43(12): 637-644.
5. Hickey PA, Gauvreau K. The Impact of Critical Care Nursing Certification on Pediatric Patient Outcomes. *Pediatr Crit Care Med*, 2018;19(8):718-724.
6. Hickey PA, Pasquali SK, Gaynor JW, etal. Critical Care Nursing's Impact on Pediatric Patient Outcomes. *Ann Thorac Surg*, 2016;102(4):1375-1380. doi:10.1016/j.athoracsur.2016.03.019
7. Hickey P, Gauvreau K, Connor J, Sporing E, Jenkins K. The relationship of nurse staffing, skill mix, and Magnet recognition to institutional volume and mortality for congenital heart surgery. *J Nurs Adm*, 2010;40(5):226-232.
8. Lewis KD, Conway J, Cunningham C, Larsen BMK. Optimizing Nutrition in Pediatric Heart Failure: The Crisis Is Over and Now It's Time to Feed. *Nutr Clin Pract*, 2018;33(3):397-403.
9. MRegina Lantin-Hermoso, Stuart Berger, Julia E. Richerson, Robert Morrow, Michael DFreed, Beekman, RH. The Care of Children With Congenital Heart Disease in Their Primary Medical Home. *THE AMERICAN ACADEMY OF PEDIATRICS*, 2017;140(5).
10. MoynihanPJ, KingR. Caring for patients with lesions increasing pulmonary blood flow. *Crit Care Nurs Clin North Am*, 1989; 1(2):195-213.
11. MAGALHAES, Simone silveira; QUEIROZ, Maria Veraci Oliveira; CHAVES, CameloEM. Neonatal nursing care of the infant with congenital heart disease: an integrative review. *Online Brazilian Journal of Nursing*, 2019;15:724-734.
12. Marino BS, Lipkin PH, Newburger JW, etal. Neurodevelopmental outcomes in children with congenital heart disease: evaluation and management: a scientific statement from the American Heart Association. *Circulation*. 2012;126(9):1143-72.
13. PATRICIA AKANE, COLEEN ELIZABETH MILLER, JUDITH AASCENZI, etal. Nursing Care of the Child with Congenital Heart Disease. 2006;545-558.
14. Pam Moule, Julie Armoogum, Emma Douglass etal. Evaluationand its importance for nursing practice . *Nursing Standard*. 2016;31(35):55-63.
15. QinC, LiY, WangD, ShiZ. Maternal factors and preoperative nutrition in children with mild cases of congenital heart disease. *Jpn J Nurs Sci*, 2019;16(1): 37-46.
16. SilvaVG, PereiraJdMV, Figueiredo LdS, Guimarães TCF, Cavalcanti CD. Nursing diagnoses in children with congenital heart disease: cross mapping. *Acta Paul Enferm*, 2015;28(6):524-530.
17. Srisomboon Musiksukont. Nursing Management of the Child with Congenital Heart Disease: Principle and Practice . *J Nurs Sci* 2010;28(2):13 – 22 .

Evaluation of Total Antioxidant Capacity in Serum and Follicular Fluid of Women Undergoing ICSI and its Association with Implantation Failure

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Abstract

Purpose: Total antioxidant capacity (TAC) in women serum and follicular fluid (FF) which surrounding oocytes may be related to the implantation failure. Therefore, we herein examined the relationship between total antioxidant capacity status in serum and FF and its association with implantation failure.

Method: One hundred and seventeen of non-reproductive women who underwent intra-cytoplasmic sperm injection (ICSI) included in this study and conducted between March 2018 and April 2019 in Kamal AL-Samarrai Hospital, center of fertility and IVF. Serum and follicular fluid were collected from non-reproductive women aged ranged 20-45 years and BMI (ranged 21.9-36.3kg/m²), TAC were measured using sandwich ELISA in serum and follicular fluid specimen of 21 women of successful implantation compared to 96 experienced implantation failures.

Results: TAC was increased in serum of implantation failure compared to successful but not significant differences between two study groups. Whereas TAC levels were highly significant ($P=0.002$) in FF of women who had successful implantation (1.08 ± 0.64 mmol/L) whereas in failure were lower (0.55 ± 0.42 mmol/L). In addition to that, when evaluating the frequency of TAC category in FF revealed highly significant differences ($P=0.003$) between two groups, the majority of failure groups (84.4%) had low TAC compared with (40%) in successful groups, while a significant increase of sufficient TAC in successful than failure groups (50% versus 6.1% respectively), whereas the borderline TAC were (9.1% versus 10%) in failure and successful groups.

Conclusions: TAC in FF may be potential markers for implantation successful in ICSI cycle.

Keywords: Follicular fluid, antioxidant, implantation failure, intra-cytoplasmic sperm injection.

Introduction

In fact, despite advances in assisted reproduction treatment, poor oocyte quality remains a subtle problem for female infertility, and the investigation of factors that affect IVF/ICSI outcome may help to improve success rates. FF is a serum transudate, which contains metabolism products by granulosa and theca cells and provides the micro-environment of the grown oocyte, directly influences on the oocyte quality and implantation¹. Several studies have focused on the microenvironment surrounding the oocyte, such as ROS and antioxidants found in FF⁽¹⁻²⁾. Oxidation stress has

been suggested as one of the most important factors that negatively affect assisted reproduction outcome³, in order to protect the follicles from oxidative insult, follicular fluid is naturally provided with an efficient antioxidant system⁴. Total anti-oxidants status (TAS) is composed of antioxidant capacity of total protein (85%; mainly albumin), uric acid, bilirubin, carotenoids, tocopherol and ascorbic acid⁵. Indeed, an imbalance between ROS and the antioxidant defense system in the FF could be responsible for abnormal oocyte development, causing damage to the DNA, cytoskeleton and cell membrane, which would result in lower egg quality and lead to decreased fertilization potential

of the oocytes in ART cycles⁶. Most of losses of anti-oxidant in human reproduction take place even before the implantation as up to 50% of losses occur during that time. Also, the environment is influenced by endocrine signaling⁷ and by the type of gonadotrophin the follicle is exposed to during the follicular phase leading to reduced protection against oxidation⁸. Therefore, the objective of this study was to determine the association between total antioxidant capacity and implantation rate, both in serum and FF of women had successful implantation compared to those in women with implantation failure.

Materials and Method

Subjects

The study included 117 women (mean age 31.1 ± 5.7 years) admitted at Center of infertility diagnosis and assisted reproductive technology/Kamal AL-Samarai Hospital. This cross-sectional study of non-reproductive women who underwent intra-cytoplasmic sperm injection consisting of 21 women with successful implantation and 96 women with implantation failure were recruited. Patients with endometriosis, endometrial polyps, fibroid in uterus and diabetes mellitus and any systemic disease were excluded. Indication for ICSI in non-reproductive women was tubal obstruction or male factor infertility.

Ovarian Stimulation Protocol: All of the patients received gonadotropin releasing hormone antagonist (GnRH-ant) protocol for ovarian stimulation and were treated with recombinant follicle-stimulating hormone (rFSH) (Gonal-F, Merckserono, Switzerland) per day from the 2nd day of spontaneous or induced menstruation. The dose of gonadotropins was adjusted according to ovarian response, as detected by ultrasound examination. As soon as the dominant follicle reached 14 mm in diameter, (GnRH) antagonist cetrorelix at 0.25 mg (Cetrotide®, Serono, Switzerland) was administered daily, until the day of ovulation triggering which was obtained by hCG injection (Ovitrelle at 250 µg; Merck- Serono, Geneva: Switzerland), when at least three follicles of size >18 mm were present in the ovaries, oocyte puncture was performed at the 36th hour after hCG injection. After FF aspiration oocytes were separated and transferred into culture media, then, FF was located into a 15-ml plane tube and centrifuged at 300 g for 5 min and supernatant was stored at -80°C until further analysis; also for each patient, at the day of embryo transfer, blood serum samples for comparative

analysis was collected.

ICSI Producers: Oocyte denudation and ICSI were performed 3 hours after retrieval, and the *in vitro* culture was carried out in cleavage Gain medium (Fertipro/Belgium) under mineral oil until day 2 (2–5 cells stage) in automated incubators with 6% CO₂ at 37 °C, the growth of all the embryos from each patient (n=117) was continuously monitored. Embryo quality was assessed before embryo-transfer, and a maximum of three embryos transferred to all patients. Pregnancies were diagnosed by serum positive B-HCG levels (>100 mIU/ml) 14 days after embryo transfer.

Parameters Analyses: Age, duration of non-reproductive, body mass index (BMI), serum E2 were assessed as possible confounders. E2 were measured sandwich enzyme immunoassay ELISA method based on a human monoclonal antibody (Biomérieux/France) according to the manufacturer's instructions. TAC was measured in serum and FF using a test kit (Omnigostix GmbH & CoKH, Austria) by spectrophotometric quantification. Briefly, it is based on the reaction of peroxides with peroxidase followed by a color reaction of the chromogenic substrate tetra-methyl-benzidine in the presence of biological antioxidants. Its blue colour turns to yellow complex after addition of the stop solution which had a maximum absorbance at the wavelength of 450nm.

Statistical Analysis: Statistical analysis carried out by using Vassar Stats Web Site for Statistical Computation (Lowry, 2013). Qualitative data expressed as percentage values, whereas measurable data expressed as (M ± SE). However; the difference between two independent samples analyzed by t-test, while comparison of categorical data between the different groups carried-out by using Chi square test. The significance of differences estimated at two-tail P level less than 0.05.

Results

Demographic and clinical characteristic parameters of the subjects are presented in Table 1. The ICSI cycle characteristics of our patients are shown in Table 2. The total number of retrieved oocytes was 1094 (range 1-28), at the time of the ICSI procedure, the nuclear maturity of the intact oocytes revealed 801 oocytes in metaphase II and ranged from 1-23, embryo obtained was 537. The mean percentage of efficiency of fertilization rate was 69%, the mean ranged of embryo transfer was 1-5, regarding implantation status, only twenty one of women

has revealed successful implantation whereas ninety six women has implantation failure. The clinical ongoing implantation rate per transferred embryo was 17.9%. Table 3 shows the antioxidant profile in serum and FF of two groups of women's. TAC were higher in serum of women who had implantation failure than successful

but, did not show significant differences (2.24 ± 0.52 versus 1.96 ± 0.42 mmol/L, respectively, $P=0.051$). In contrast, TAC were decreased in FF of women who had implantation failure (0.55 ± 0.42 mmol/L) compared to women of successful implantation (1.08 ± 0.64 mmol/L) and show highly significant ($P=0.002$).

Table 1: Demographic and clinical characteristic of the patients.

Variables	Range	Mean \pm SD
No. of patients	117	
Age (years)	20-45	31.1 \pm 5.7
Infertility duration (Years)	2-24	7.8 \pm 4.3
Weight (kg)	48-108	73.1 \pm 10.5
Length (m)	1.43-1.78	1.59 \pm 0.06
BMI (kg/m ²)	21.9-36.3	28.6 \pm 3.6
E2 level (pg/ml)	255-4023	1583 \pm 895

BMI: body mass index; E2: estradiol.

Table 2: ICSI cycle characteristics of patients.

Variables Total	Range	Average
Retrieved oocyte 1094	1 - 28	9.3
MII801	1-23	6.8
Embryo obtained 537	0-18	4.6
Efficiency of fertilization 69%		
Embryo transferred ---	1-5	---
Implantation status		
Successful 21	---	---
Failure 96	---	---
Implantation rate 17.9%		

Table 3: Comparison of antioxidant status between successful and failure implantation groups

Total anti-oxidant capacity (mmol/L) (M \pm SD)	Implantation Group		P value
	Successful (n=21)	Failure (n=96)	
In serum	1.96 \pm 0.42	2.24 \pm 0.52	0.051
In follicular fluid	1.08 \pm 0.64	0.55 \pm 0.42	0.002
TAC < 1 (low); 1-1.3 (borderline); > 1.3 (sufficient)			

Values are mean \pm SD; TAC: Total antioxidant capacity.

In order to confirm these data, we evaluated the frequency of TAC category in FF as shown in Fig 1, and revealed highly significant differences ($P=0.003$). The majority of failure groups (84.4%) had low TAC compared with (40%) in successful groups, while a

significant increase of sufficient TAC in successful than failure groups (50% versus 6.1% respectively); in addition to that, the borderline TAC were (9.1% versus 10%) in failure and successful groups.

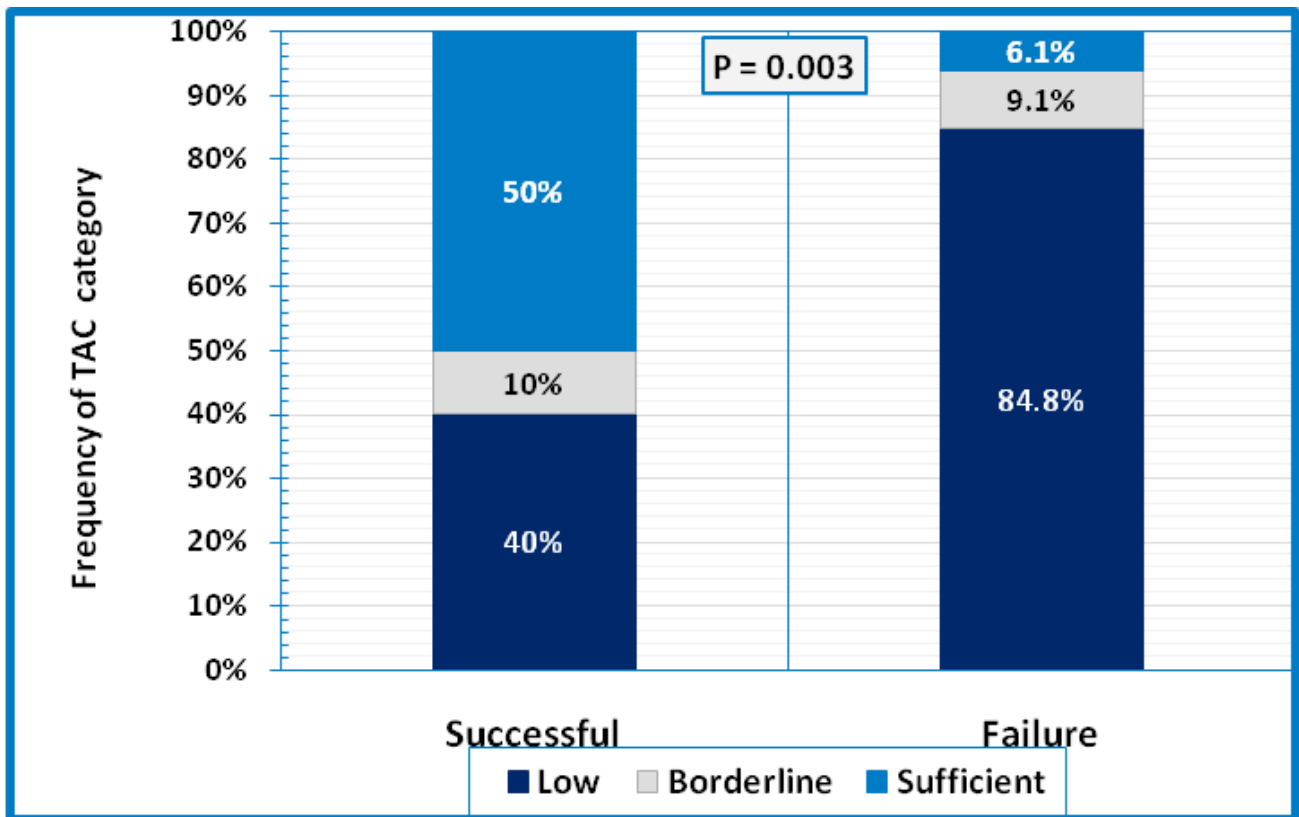


Figure 1. Frequency of TAC categories in follicular fluid of women with successful and failure implantation.

Discussion

In spite of the total number of oocyte retrieved and efficiency of fertilization was high, it appears that failure to achieve implantation with ICSI in this study was very high. Research about antioxidants status appears to be in strict relation with assisted reproduction outcome. In the present study, total TAC levels were lower in FF of patients who had implantation failure after ICSI. However, follicular fluid forms the biochemical micro-environment of the oocyte before ovulation and assists in estimating the developmental competence of female gametes¹. FF contains proteins, sugars, ROS, antioxidants, and hormones which have a direct impact on the maturation ability and the quality of oocytes, also rich in low molecular weight metabolites that are direct or indirect regulators of oxidative stress and antioxidant production⁹. Rupture of the follicular wall during ovulation can be modeled as a short inflammatory process. An increase in various substances in the follicle near the time of ovulation, which can induce oxidative stress. Free radical-generating agents include histamine, bradykinin, angiotensin, prostaglandins (PG), eicosanoids, proteolytic enzymes, nitric oxide, and

superoxide¹⁰. The ROS are produced within the follicle during the ovulation process¹⁰, imbalance between antioxidants factors and ROS production in ovarian FF could adversely influence on the quality of the oocyte, fertilization, and embryo development¹¹. Elevated ROS levels in patients with unexplained infertility imply reduced levels of antioxidants such as vitamin E and glutathione, resulting in a reduced ability to scavenge ROS and neutralize its toxic effects¹². On the other hand, ROS could induce inflammatory response accompanied by the releasing of pro-inflammatory cytokines¹³ such as, IL-6 decreases aromatase activity within follicles, which lead to reduction in intra-follicular estradiol concentration, fertility and fertilizing capacity⁶. Inflammation and oxidative stress have been implicated in the pathogenesis of several chronic disorders¹⁴. Although ovarian stimulation also induces ROS production, disrupts the oxidant- antioxidant balance and leads to oxidative stress¹⁵. Our observation is an agreement with the literature reports have shown that women who became pregnant after IVF therapy had a tendency toward higher levels of TAC in their follicular fluid compared to those who did not achieve pregnancy

¹⁶. Several research groups have concluded that the oxidant–antioxidant balance in the oocytes environment can have a significant impact on IVF outcome in women with endometriosis ¹⁷. On the other hand, obtained in a study by Attaran et al. ¹⁸ who investigated FF levels TAC in women undergoing IVF; but these authors did not observe a difference in TAC levels between patients who became pregnant and those who did not. In contrast, high TAC level has been reported as a marker for poor response to ovulation induction in women with polycystic ovarian syndrome ¹⁹. On the basis of the etiology of infertility, women with male factor infertility, which can be considered as healthy control subjects, presented the best follicular antioxidant profile in comparison to those with female or unexplained infertility, confirming the presence of oxidation stress and reduced antioxidant capacity in FF from women with reproductive diseases ²⁰. In accordance with this study, previous reports have shown that follicular total antioxidant capacity is positively correlated with pregnancy rate ²¹; at the same time, a previous study demonstrated that elevated blood plasma antioxidant status was favorable for achieving clinical pregnancy ²⁰. In short, both systemic and local antioxidant status appears to be in strict relation with assisted reproduction outcome. The results may help physicians on the treatment of IVF/ICSI, as well as scientists in clarifying the etiology of ICSI ²².

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Education and all experiments were carried out in accordance with approved guidelines.

References

1. Revelli A, DellePiane L, Casano S, Molinari E, Massobrio M, Rinaudo P. Follicular fluid content and oocyte quality: from single biochemical markers to metabolomics. *Reprod Biol Endocrinol*. 2009; 7:40.
2. Fujimoto VY, Bloom MS, Huddleston HG, Shelley WB, Ocque AJ, Browne RW. Correlations of follicular fluid oxidative stress biomarkers and enzyme activities with embryo morphology parameters during in vitro fertilization. *Fertil. Steril*. 2011; 96:1357–1361.
3. Agarwal A, Aponte-Mellado A, Premkumar BJ, Shaman A, Gupta S. The effects of oxidative stress on female reproduction: a review. *Reprod. Biol. Endocrinol*. 2012; 10:49.
4. Agarwal A, Gupta S, Sikka S. The role of free radicals and antioxidants in reproduction. *Curr Opin Obstet Gynecol* 2006; 18 (3):325–32.
5. Altindag O, Erel O, Soran N, Celik H, Selek S. Total oxidative/antioxidative status and relation to bone mineral density in osteoporosis. *RheumatolInt* 2008; 28:317–21.
6. Nunez-Calonge R, Cortes S, Gutierrez Gonzalez LM, et al. Oxidative stress in follicular fluid of young women with low response compared with fertile oocyte donors. *Reprod Biomed Online*. 2016; 32:446–56.
7. Bristol SK, Woodruff TK. Follicle-restricted compartmentalization of transforming growth factor beta superfamily ligands in the feline ovary. *Biol Reprod* 2004; 70:846–859.
8. Aurrekoetxea I, Ruiz-Sanz JI, del Agua AR, Navarro R, Hernandez ML, Matorras R, Prieto B, Ruiz-Larrea MB. Serumoxidizability and antioxidant status in patients undergoing in vitro fertilization. *Fertil. Steril*. 2010; 94:1279–1286.
9. Tamura H, Takasaki A, Miwa I, Taniguchi K, Maekawa R, Asada H, et al. Oxidative stress impairs oocyte quality and melatonin protects oocytes from free radical damage and improves fertilization rate. *J Pineal Res*. 2008; 44:280-7.
10. Sugino N. Reactive oxygen species in ovarian physiology. *Reprod Med Biol* 2005;4:31–44.
11. Yalcinkaya E, Cakiroglu Y, Doger E, et al. Effect of follicular fluid NO, MDA and GSH levels on in vitro fertilization outcomes. *J Turkish German Gynecol Assoc* 2013;14:136–41.
12. Wang Y, Sharma RK, Falcone T, Goldberg J, Agarwal A. Importance of reactive oxygen species in the peritoneal fluid of women with endometriosis or idiopathic infertility. *FertilSteril* 1997; 68(5):826–30.
13. Touyz RM. Molecular and cellular mechanisms in vascular injury in hypertension: role of angiotensin II – editorial review. *Curr Opin Nephrol Hypertens* 2005;14:125–31.
14. Biswas SK. Does the interdependence between oxidative stress and inflammation explain the antioxidant paradox?. *Oxidat Med Cell Longev*.

- 2016;2016:5698931.
15. Palini S, Benedetti S, Tagliamonte MC, et al. Influence of ovarian stimulation for IVF/ICSI on the antioxidant defence system and relationship to outcome. *Reprod Biomed Online* 2014; 29:65–71.
 16. Pasqualotto EB, Agarwal A, Sharma RK, Izzo VM, Pinotti JA, Joshi NJ and Rose BI. Effect of oxidative stress in follicular fluid on the outcome of assisted reproductive procedures. *Fertil Steril*.2004; 81(4):973–976.
 17. Prieto L, Quesada JF, Cambero O, Pacheco A, Pellicer A, Codoceo R, et al. Analysis of follicular fluid and serum markers of oxidative stress in women with infertility related to endometriosis. *FertilSteril*. 2012; 98:126-30.
 18. Attaran M, Pasqualotto E, Falcone T, Goldberg JM, Miller KF, Agarwal A and Sharma RK .The effect of follicular fluid reactive oxygen species on the outcome of in vitro fertilization. *Int J Fertil Womens Med*. 2000;45:314–320.
 19. FerdaVerit F, Erel O, Kocyigit A. Association of increased total antioxidant capacity and anovulation in nonobese infertile patients with clomiphene citrate-resistant polycystic ovary syndrome. *FertilSteril*. 2007;88:418-424.
 20. Velthut A, Zilmer M, Zilmer K, Kaart T, Karro H, Salumets A. Elevated blood plasma antioxidant status is favourable for achieving IVF/ICSI pregnancy. *Reprod Biomed Online*. 2013; 26:345-52
 21. Bedaiwy MA, Elnashar SA, Goldberg JM, Sharma R, Mascha EJ, Arrigain S, Agarwal A, Falcone T, Effect of follicular fluid oxidative stress parameters on intracytoplasmic sperm injection outcome. *Gynecol. Endocrinol*. 2012;28:51–55.
 22. Ozkaya MO, Naziroglu M, Barak C, Berkkanoglu M. Effects of multivitamin/mineral supplementation on trace element levels in serum and follicular fluid of women undergoing in vitro fertilization (IVF). *Biol Trace Elem Res*. 2011; 139:1-9.

Evaluation of Physically-Disabled Fighters' Quality of Life at Rehabilitation Military Center in Al-Basra City

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Abstract

Objective(s): The aim of the study is to evaluate the physically- disabled fighters' quality of life, and to identify the relationship between the physically-disabled fighters' quality of life and their socio-demographic characteristics.

Method: A quasi-experimental design is carried throughout the present study at the Rehabilitation Military Center in Al-Basra City, Iraq, for the period of January 7th 2019 to October 31st 2019. Non-probability "purposive" sample of (27) physically disabled fighters' is selected for the present study. The questionnaire is composed of two main parts (The Physically Disabled Socio-Demographic Characteristics, and Physically Disabled Fighters' Quality of Life Evaluation Tool). The data are collected through the utilization of a developed questionnaire (Arabic version) and the use of structured interview technique with each physically disabled fighter as means of data collection. Test-retest reliability of instrument was determined through the use of Pearson correlation coefficient and content validity of the instrument validity was determined through a panel of (18) experts. Data were analyzed through the use of descriptive statistical data analysis approach of frequency, percentage, mean, mean of scores, total of scores, range and standard deviation and inferential statistical data analysis approach T-test, multiple linear regressions, person correlation coefficient, Chi-Square test, and analysis of variance (ANOVA).

Results: The results of the study depict that the evaluation of physically-disabled fighters' quality of life is moderate on the physical health domain, psychological health domain, and social relationship domain environment domain and spiritual health domain, and low on the level of independence domain; physically disabled fighters' quality of life is significantly different relative to their age, residency, level of education, and chronic illness.

Conclusion: The study concluded that the overall evaluation of physically-disabled fighters' quality of life is moderate.

Keywords: *Quality of Life, Physical disability, Physically-disabled Fighters'.*

Introduction

Physical disability is defined as "the loss of motor function of varying degrees or limitation in movements or activities resulting from deformed limbs, body paralysis, or deformity caused by damage to the structure or function of body parts¹.

A physical disability is any type of physical condition that affects an individual's ability to carry out normal everyday living activities. It is substantial

and long term and may affect mobility; hearing or sight individuals may be physically disabled for a number or reasons, for example as result of an accident disease or a condition. Other causes may be a genetic condition, for example congenital abnormality². Physical disability is a complex phenomenon arising from interactions between one's physical health and functional status and the society in which one lives. It is result from impairments, activity limitations, participation restrictions. Physical disability term includes impairments, activity limitations

and participation restrictions. Physically disabled persons and their families' situation become doubly difficult due to general health problem and unique social stigma attached to various types of disability. It is multidimensional phenomenon resulting from the interaction between people and their physical and social environment^(3,4).

Disabled people experience various barriers due to restriction of participation and their lives are affected with poor health outcomes, low education, lack of social and economic participation, higher rates of poverty and increased dependency. Physically disabled people are unable to carry out normal social roles, and their daily life is affected by societal barriers^(1,5).

World Health Organization defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment⁶.

Quality of life is a complex experience influenced by objective conditions in which a person lives (social indicators), subjective response of the person to their life conditions (psychological indicators), the adjustment of expectations and needs of the person with their lifestyle (social policy) and external influences⁷. Physically disabled people experience more restrictions in social activities than healthy people, which are associated with poor level of quality of life^(8,9,10). Physical disability can decrease quality of life and limit the community participation. Significant and negative association was found between disability and quality of life^(11,12).

Method

A quasi-experimental design is carried out in order to achieve the objectives of the study through the use of the evaluation technique for the determination of physically- disabled fighters' quality of life in

Rehabilitation Military Center for the period of from of January 7th 2019 to October 31st 2019. The present study is conducted on physically disabled fighters' at the Rehabilitation Military Center in Al-Basra City. The Military Rehabilitation Center is established on May 7th 2018. It provides medical and rehabilitative services to physically disabled fighters' who have ratio from 60 to 80 percent. Non Probability "purposive" sample of (27) physically disabled fighters' has been selected for the present study. The data are collected through the utilization of a developed questionnaire (Arabic version) and the use of structured interview technique with each physically disabled fighter as means of data collection. The questionnaire is composed of two main parts as follows:

Part I: The Physically Disabled Socio-Demographic Characteristics: This part includes items of gender, age, residency, types of injury, marital status, level of education, chronic diseases, and socioeconomic status which are calculated through use for Socioeconomic Status Scale Low= (less than 59), Moderate= (60-80), and High= (81-100).

Part II: Physically Disabled Fighters' Quality of Life Evaluation Tool: This part is comprised of (69) item that measure physically disabled fighters' quality of life about physically disabled fighters'. It is measured as High= (2.34-3), Moderate= (1.67-2.33), and Low= (1-1.66).

Content validity and Pearson correlation coefficient reliability are determined through a pilot study. The data of the present study are analysed through the use of the Statistical Package of Social Sciences (SPSS) version 20. through descriptive statistics (frequency, percentage, mean, mean of scores, total of scores, range and standard deviation) and statistical inferential (T-test, multiple linear regressions, person correlation coefficient, Chi-Square test and analysis of variance ANOVA).

Results were determined as highly significant at ($P \leq 0.01$) significant at ($P \leq 0.05$) and non-significant at ($P > 0.05$).

Results

Table (1): Overall Evaluation of Physically Disabled Fighters' Quality of Life

Period	Level of Evaluation	Frequency	Percent
Pre-test	(1.00 - 1.66) Low	8	29.6
	(1.67 – 2.33) Moderate	18	66.7
	(2.34 – 3.00) High	1	3.7
	Total	27	100.0
	$\bar{x} \pm S.D.$	1.80 \pm 0.204	

$\bar{x} \pm S.D.$ = Arithmetic Mean (\bar{x}) and Std. Dev. (S.D.), Level of Evaluation: (1-1.66) = Low; (1.67-2.33) = Moderate; (2.34-3.00) = High

Analysis of evaluation of such domains of quality of life indicates that all of the physically disabled fighters' have moderate level of evaluation of physical health and low level of evaluation of level of independence of physically disabled fighters' quality of life (Table 2). This result is found to be consistent with that of others studies which found that most of the physically disabled fighters' have moderate level of quality of life (physical health domain) ^(15,12). And the finding is in an agreement with that of a study indicate that the physical disability effect on the independent level domain ¹³.

Analysis of such overall evaluation of physically disabled fighters' quality of life reveals that the majority of participants have moderate level of quality of life (Table 1). This result is in an agreement with the study that found adult patients with physical disability had moderate affected on quality of life domains ¹².

Conclusion

1. The study concluded that the overall evaluation of physically-disabled fighters' quality of life is moderate
2. Physically disabled fighters' quality of life is significantly different relative to their age, residency, level of education, and chronic illness.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Defense, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Rajati F, Ashtarian H, Salari N, Ghanbari M, Naghibifar Z, Hosseini S Y. Quality of life predictors in physically disabled people. Journal of education and health promotion, 2018;7
2. Disability Living Foundation (DLF). Key Facts/ People with Disabilities. available at: <http://www.dlf.org.uk/content/key-facts.2016>
3. Clark M. Population and Community Health Nursing, Sixth Edition, United States of America, 2015;793-812..
4. World Health Organization (WHO). World report on disability 2011. World Health Organization. 2011
5. Kuvalekar K, Kamath R, Ashok L, Shetty B., Mayya S, Chandrasekaran V. Quality of life among persons with physical disability in udupi taluk: A cross sectional study. Journal of family medicine and primary care, 2015;4(1): 69.
6. World Health Organization (WHO). Disabilities. Available from: <https://www.who.int/topics/disabilities/en/>. 2019.
7. Hasandokht T, Farajzadegan Z, Siadat ZD, Paknahad Z, Rajati F. Lifestyle interventions for hypertension treatment among Iranian women in primary health-care settings: Results of a randomized controlled trial. Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences, 2015;20(1):54.
8. Salehi R, Shakhi K, Khiavi FF. Association between disability and quality of life in multiple sclerosis patients in Ahvaz, Iran. Materia socio-medica, 2016;28(3):215.

9. Bakula M, kuafatish D, Sarilar M, Palijan T, kufatish M. Quality of Life in People with Physical Disabilities, *Collegium antropologicum* 35 Suppl 2011;2(2):247-53.
10. Duvdevany I. Self-esteem and perception of quality of life among Israeli women with and without physical disability. *Women & Health*, 2010;50(5): 443-458.
11. Holmgren M, Lindgren A, de Munter J, Rasmussen F, Ahlström G. Impacts of mobility disability and high and increasing body mass index on health-related quality of life and participation in society: a population-based cohort study from Sweden. *BMC public health*, 2014;14(1):381.
12. Atiyah H, Mohammed W . Determination of Quality of Life for Adult Patients with Limbs Loss, *Sci. J. Nursing.*, 2009; 22(1).
13. AliDKA, Tawfiq N B. Assessment of spinal cord injured persons, quality of life. *kufa Journal for Nursing sciences*, 2013;3(1):231-243.
14. Islam MS, Jahan H, Hossain MS, Patwary MF K. Quality of life among persons with paraplegic spinal cord injury. *Disability, CBR & Inclusive Development*, 2016;27(3):102-117.
15. Khlaif A, Mohammed Q. Quality of Life of Physically Disabled Adults at Thi Qar Rehabilitation Center in Al-Nasiriyah City, *International Journal of Science and Research (IJSR)*. 2015;78.96.
16. Belmont J. Combat wounds in Iraq and Afghanistan from 2005 to 2009. *Journal of trauma and acute care surgery*, 2012;73(1):3-12.

Impact of Fast Foods and Snacks Upon Adolescents' BMI at Secondary Schools in Baghdad City

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Abstract

Objective: The study aimed to identify the adolescents' fast foods and snacks, and find out the relationship between fast foods, snacks and adolescents' demographic data (gender and Body Mass Index).

Methodology: A descriptive (cross- section) study design was conducted impact of fast foods and snacks upon adolescents' Body Mass Index at secondary schools in Baghdad city, starting from 20th of April 2013 to the end of October 2014. Non- probability (purposive) systematically random sample of 1254 adolescents were chosen from secondary schools of both sides of Al-Karkh and Al-Russafa sectors. Data was collected through a specially constructed questionnaire format include (12) items multiple choice questions. The validity of the questionnaire was determined through a panel of experts related to the field of the study, and the reliability through a pilot study. The data were analyzed through the application of descriptive statistical analysis frequency & percentages, and inferential statistical analysis, chi-square test, are used.

Results: The study results revealed that one third and half of the sample daily take soft drink, sometimes eating cake and other crackers, chocolate or cocoa, ice cream, sweets, chips, artificial fruit juice, milk and dairy products, beans nuts, and drink tea or coffee respectively. The study sample have more than one third (37.4%) sometimes eat fast food in their home, and (38.1%) seldom eat fast food from out. Eat the snacks food highly significant association with adolescents' gender but eat the fast foods not significant association with their gender. There is highly significant association between eat the snacks and fast foods in home with their Body Mass Index but eat the fast foods out home not significant association with their Body Mass Index.

Conclusions: BMI mostly was at under and normal weight percentile while the other was overweight and obese. Adolescents' eating habits related to their gender and BMI have highly significance for snacks and fast food in home.

Recommendation: The study recommended that Ministry Of Health need to activate the healthy eating snacks and fast foods program within school health service programs, and Ministry of Education should be involved their teachers in the healthy eating programs & training them on the healthy eating strategies.

Keywords: *Fast Foods, Snacks and Body Mass Index.*

Introduction

Adolescence is the developmental stage between the onset of puberty and maturity, is important both biologically and socially.¹ It is during this time that an adolescent's body physically matures and the capacity for independent and abstract thought develops. Many adolescents have greater freedom to make choices which will affect their health and social well-being. One area of increased opportunity for independence is

in food selection.¹ Food provides both the energy and the materials needed to build and maintain all body cells. Nutrition is the process of taking in and using food nutrients for growth, repair and maintenance of the body. Fast foods intake is still increasing specially among younger generation.^(2,3) Fast foods intake has been associated with poor dietary intake and weight gain among young population. Fast foods restaurants are becoming widespread worldwide, both in developed

and even developing countries.⁽⁴⁻⁷⁾ Fast food contains higher levels of calorie and fat compared to the home-prepared meals.⁸ An important time for assessing and evaluating fast food intake and detecting the associated factors is from adolescents to younger adulthood, a high risk time for being overweight and obesity.^(9,10) Determining the factors influence on dietary intakes among adolescents, such as food preferences, family eating patterns and social norms, could be a guide for conducting interventions aimed to adopt healthy eating behaviors. The majority of people adults and children snack on a regular if not daily basis.⁽¹¹⁻¹⁴⁾ Adolescents snack frequently, and the snacks chosen are often high in fat, salt, sugar, and calories such as potato chips, cookies, and candy bars often provide a significant source of calories with few nutrients for this age group.¹⁵ According to several studies, the prevalence of snacking among adolescents ranges from 60-98 percent.^(16,17) Abnormal obesity is an accumulation of fat in the adipose tissue throughout the body. It is most common nutritional disorder in infants, children and adults in affluent societies. Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health.^(16,17) It is defined by Body Mass Index (BMI) and further evaluated in terms of fat distribution via the waist-hip ratio and

total cardiovascular risk factors.¹⁸ Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, breathing difficulties during sleep, certain types of cancer and osteoarthritis. Healthy eat fast foods and snacks are vital for teens' health and well-being. The nutritional needs of teens vary accordingly, but generally increased due to the rapid growth and changes in body during puberty.⁵

Methodology: Descriptive study to identify impact of fast foods and snacks upon adolescents' Body Mass Index at secondary schools in Baghdad city, starting from 20th of April 2013 to the end of October 2014. Non-probability (purposive) sample of 1254 adolescents were chosen systematically random from secondary schools of both sides Al-Karkh and Al-Russafa sectors. Data was collected through a specially constructed questionnaire that format includes (14) items multiple choice questions. The validity of the questionnaire was determined through a panel of experts related to the field of the study, and the reliability through a pilot study. Data were analyzed through descriptive statistical analysis application such as frequency & percentages, and inferential statistical analysis, chi-square test, is used to advice the objectives of the study.

Results

Table (1): Distribution of the Study Sample by their Personal Information

Variables	Gender									
	Male					Female				
Gender	*No.		%		*No.		%		%	
		611		48.7		643				51.3
Total	1254 (100%)									
Body Mass Index	Body Mass Index									
	Under Weight		Normal		Over Weight		Obese		Morbidly Obese	
	<50 th Percentile		50 th -84 th Percentile		85 th -94 th Percentile		=>95 th Percentile			
	*No.	%	*No.	%	*No.	%	*No.	%	*No.	%
	349	27.8	348	27.8	293	23.4	241	19.2	23	1.8

*No. = number, % = percentage

This table showed that more than half (51.3%) of adolescents were female, nearly one third at (27.8%) of them under and normal weight of the students' BMI.

Table (2): Distribution of the Study Sample by their Fast Food Eating Habits

Adolescents' Fast Food Eating Habits	Always		Sometimes		Seldom		No	
	*No.	%	*No.	%	*No.	%	*No.	%
Fast Food in Home	348	27.8	469	37.4	382	30.5	55	4.4
Fast Food from out	164	13.1	287	22.9	478	38.1	325	25.9
Total	(100%)1254							

*No. = number,% = percentage

This table showed that one third (37.4%) sometimes eating fast food in their home, and (38.1%) seldom eating fast food from out .

Table (3): Distribution of the Study Sample by their Eating Habits of Snacks after Meals

Snacks After Meals	More than One Per Day		Daily		Sometimes		Seldom		No	
	*No.	%	*No.	%	*No.	%	*No.	%	*No.	%
Cake and other Crackers	152	12.1	215	17.2	638	50.9	194	15.5	54	4.3
Chocolate or Cocoa	40	3.2	70	5.6	523	41.7	426	34.0	194	15.5
Ice Cream	16	1.3	42	3.4	424	33.8	546	43.6	225	18.0
Sweets (Sweetener)	193	15.4	438	35.0	506	40.4	89	7.1	27	2.2
Soft Drink like Cola....etc.	279	22.3	519	41.4	355	28.3	87	6.9	13	1.0
Chips	9	0.7	41	3.3	297	23.7	598	47.7	308	24.6
Artificial Fruit Juice	26	2.1	102	8.1	530	42.3	402	32.1	193	15.4
Milk and Dairy Products	45	3.6	200	16.0	506	40.4	222	17.7	280	22.3
Beans and Nuts	66	5.3	199	15.9	552	44.1	310	24.7	126	10.1
Tea or Coffee	174	13.9	248	19.8	360	28.7	192	15.3	279	22.3

*No. = number,% = percentage

This table showed that almost more than one third of the sample (41.4%) daily take soft drink, more than one third and half of the sample (50.9%, 41.7%, 33.8%,40.4%, 23.7%, 42.3%, 40.4%, 44.1%, and 28.7%) sometimes eating cake and other crackers, chocolate or cocoa, ice cream, sweets, chips, artificial fruit juice, milk and dairy products, beans nuts, and drink tea or coffee respectively.

Table (4): The Association between Eating Habits of the Study Sample and their Gender

Adolescents' Eating Habits		Gender		Total	*X ²
		Male	Female		
Eating the Snacks Unhealthy	Healthy	82	125	207	X ² =.004 **Sig.=.005*
	528	518	1046		
Total		610	643	1253	
Fast Food in Home	Healthy	207	230	437	X ² =.482 **Sig.=.520
	Unhealthy	404	413	817	
Total		611	643	1254	
Fast Food out Home	Healthy	389	415	804	X ² =.747 **Sig.=.792
	Unhealthy	222	228	450	
Total		611	643	1254	

*χ² = Chi- square, **sig. = significant, p-value ≤ 0.0

This table showed that adolescents' gender has highly significant association with unhealthy eating habits relating to the snacks, but eating fast food in and out home have no significant association.

Table (5): The Association between Eating Habits of the Study Sample and their BMI

Adolescents' Eating Habits		Body Mass Index					Total	*X ²
		Under Weight	Normal Weight	Over Weight	Obese	Morbidity Obese		
		<50 th Percentile	50 th -84 th Percentile	85 th -94 th Percentile	=>95 th Percentile			
Eating the Snacks	Healthy	63	59	54	25	6	207	X ² =.049 **Sig.=.038*
	Unhealthy	286	288	239	216	17	1046	
Total		349	347	293	241	23	1253	
Fast Food in Home	Healthy	104	139	90	99	5	437	X ² =.004 **Sig.=.003*
	Unhealthy	244	209	203	143	18	817	
Total		348	348	293	242	23	1254	
Fast Food out Home	Healthy	210	242	185	154	13	804	X ² =.120 **Sig.=.117
	Unhealthy	138	106	108	88	10	450	
Total		348	348	293	242	23	1254	

*χ² = Chi- square, **sig. = significant, p-value ≤ 0.05. This table shows that adolescents' Body Mass Index have highly significant the association with their eating habits items like eating the snacks and fast food in home, while eating fast food out home have no significant association at p-value ≤ 0.05.

Discussion

The sample of the study consists of 1254 students from 12 secondary schools chosen randomly for total 1171 schools in Baghdad city.

In the present study as shown in table (1) refers to statistically distribution of the observed frequencies, percentages of all studied sample personal characteristics variables. Regarding to the gender, the finding indicates that males and females (48.7, and 51.3%) respectively, were approximately equal ratio. This study was nearly the same ratio and agrees with Romanian high schools study sample (43.1%, and 56.9%) for male and female respectively.⁽¹⁹⁾ The study results found that more than one fourth BMI were almost equal in under and normal weight percentile (27.8%, and 27.8%) respectively, that indicate that they did not have good nutrients for developing their physically and psychologically performance. This result supported with Romanian study because most of the study results indicated that about under and normal weight for both genders (16.5% and 73.4%) respectively.

More than third of the study sample showed that sometimes eat fast food in or out their home as shown in table (2) therefore, the adolescents and their

family are interested in eating fast and unhealthy foods. This result disagrees with Malaysia study (2012) which shows that more than two third eating fast food form in and outside of home.²⁰

Regarding the study sample as shown in table (3) concerning eating the snacks after meals, almost more than one third and half of them daily and sometimes go to eating candies, sweets, ice cream, and chips and they are interesting in drinking fruit juice, and/or soft drink and tea or coffee after or within their meal; while also nearly one third of the study sample sometimes take healthy elements like milk and dairy products, and eat beans and nuts. A study conducted by Asia study (2007) in which almost one half and more than one third of the participants eat variety of snacks.²¹

The table (4) shows that adolescents' gender has highly significant association with unhealthy eating habits relating to the snacks, but eating fast food in and out home have no significant association, and the table (5) shows that adolescents' Body Mass Index have highly significant association with their eating habits items like eating the snacks and fast food in home, while eating fast food out home have no significant association at p-value ≤ 0.05. This result was disagreed with the study by French et al., that show highly significant association

fast food and snacks with gender, while overweight and obese have highly significant association with eat fast food and snacks.¹⁰

Conclusions: BMI mostly was at under and normal weight percentile while the other was overweight and obese. Adolescents' eating habits related to their gender and BMI have highly significance for snacks and fast food in home.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Collage of Nursing and all experiments were carried out in accordance with approved guidelines.

References

1. Wardlaw, Kessel M. *Perspectives in Nutrition*. 5th Edn., McGraw Hill Publisher, USA. 2002.
2. Hoelscher DM, Evans A, Parcel GS, Kelder SH. Designing Effective Nutrition Interventions for Adolescents. *Journal of the American Dietetic Association*, 2002.
3. Cross AT, Babicz D, Cushman LF, Snacking Patterns among 1,800 adults and children. *Journal of the American Dietetic Association*, 1994; 94(12):1398-1403.
4. Haslam DW, James WP, *Obesity Lancet*, 2005; 366: 1197-1209.
5. Olusanya JO. *Essentials of Food and Nutrition*, 1st Edn., Apex Books Limited, Lagos. 2008.
6. WHO. *Healthy Weight: Assessing Your Weight and BMI: About BMI for Children and Teens* Centre for disease control and prevention. <<http://www.cdc.gov/nccdphp/dnpa/healthyweight/assessing/bmi/c> 2000.
7. Sweeting HN, Measurement and definitions of obesity in childhood and adolescence: A field guide., for the uninitiated. *Nutr. J.*, 2007;; 6: 32.
8. Hastert TA, Babey SH, Diamant AL, Brown E R. "More California teens consume soda and fast food each day than five servings of fruits and vegetables," Policy Brief (UCLA Center for Health Policy Research), no. PB2005-8; 1-7, 2005.
9. Bowman SA, Gortmaker S L, Ebbeling CB, Pereira MA, Ludwig DS. "Effects of fast-food consumption on energy intake and diet quality among children in a national household survey," *Pediatrics*, vol. 2004; 113(1 I): 112-118.
10. French SA, Story M, Neumark-Sztainer D, Fulkerson JA, Hannan P. "Fast food restaurant use among adolescents: associations with nutrient intake, food choices and behavioral and psychosocial variables," *International Journal of Obesity*, 2001; 25(12): 1823-1833.
11. Niemeier HM, Raynor HA, Lloyd-Richardson EE, Rogers ML, Wing RR, "Fast food consumption and breakfast skipping: predictors of weight gain from adolescence to adulthood in a nationally representative sample," *Journal of Adolescent Health*, 2006; 39(6): 842-849.
12. Sadrzadeh Yeganeh H, Alavi AM, Dorostymotlagh AR, Mahmoodi M, Jarollahi N, Chamari M, "Relationship between obesity and nutritional behavior among high-school girls in Kerman," *Payesh*, 2007; 6(3): 193-199.
13. Bauer K, Larson NI, Nelson MC, Story M, Neumark-Sztainer D. "Socio-environmental, personal and behavioural predictors of fast-food intake among adolescents," *Public Health Nutrition*, 2009; 12(10): 1767-1774.
14. Guthrie J F, Lin B-H, Frazao E, "Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences," *Journal of Nutrition Education and Behavior*, 2002; 34(3): 140-150.
15. Kelishadi R, Sadry GH, Hashemi M, Pour, et al., "Lipid profile and fat intake of adolescents: Isfahan healthy heart program—heart health promotion from children," *Koomesh Journal of Semnan University of Medical Sciences*, 2003; 4(3-4): 176-167.
16. Rouhani MH, Mirseifinezhad M, Omrani N, Esmailzadeh A, Azadbakht L, "Fast food consumption, quality of diet, and obesity among Isfahanian adolescent girls," *Journal of Obesity*, vol. 2012, Article ID 597924, 2012; 8,.
17. Gordon-Larsen P, Adair LS, Nelson MC, Popkin BM. "Five-year obesity incidence in the transition period between adolescence and adulthood: The National Longitudinal Study of Adolescent Health," *American Journal of Clinical Nutrition*, 2004; 80(3): 569-575.

18. Harris KM, Gordon-Larsen P, Chantala K, Udry JR, "Longitudinal trends in race/ethnic disparities in leading health indicators from adolescence to young adulthood," *Archives of Pediatrics & Adolescent Medicine*, 2006;160(1): 74–81.
19. Vintila I. The impact of food behavior, lifestyle and social influences in the health and emotional status of a Romanian High School Population, 2012; 37: 130-143.
20. Ganasegeran K, Al-Dubai SAR, Qureshi AM, Al-Abed AAA, Rizal AM, Aljunid SM., Social and psychological factors affecting eating habits among university students in Malaysia medical school: A cross-sectional study : *Nutrition Journal* 2012;11:48.
21. MacFarlane A, Crawford D, Ball K, Savage G. Adolescent home food environments and socioeconomic position, *Asia Pac. J. Clin. Nutr.*, 2007;16(4): 748-756.

Association of Oxidative Stress and Disease Activity in Rheumatoid Arthritis Patients in Babylon Province

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Abstract

Background: Several lines of evidence suggest a role for oxidative stress in the pathogenesis of rheumatoid arthritis (RA). Both reactive oxygen species (ROS) and reactive nitrogen species (RNS) damage cartilage. Tissue injury in inflammation results in NO[•] production by articular chondrocytes and synovial fibroblasts and elevated levels of NO[•] are observed in the serum and synovial fluid of RA patients. The free radicals, particularly NO[•] and O₂^{•-}, inhibit the synthesis of matrix components like proteoglycans by chondrocytes and also damage the extracellular matrix through activation and up regulation of matrix metalloproteinases.

Aim of the Study: To study the possible association between oxidative stress and RA.

Patients and Method: The present case control study was conducted on sixty one patients (18 males and 43 females) with RA patients admitted to Rheumatoid Unit in Merjan Teaching Medical City, Babylon Province, Iraq, duration the period September 2018 to July 2019, as well as 127 apparently healthy control subjects (41 males, 86 females) as control group. Malondialdehyde (MDA) and total antioxidant capacity (TAC) using ELISA technique.

Results: The level of MDA was higher in patients with RA in comparison with control group, with median of 2.35 (1.93) versus 0.86 (0.52); the difference was highly significant ($P < 0.001$). On the other hand, the level of TAC was lower in patients with RA in comparison with control subjects, with median of 0.10 (0.21) versus 0.53 (1.02), respectively; the difference was highly significant ($P < 0.001$).

Conclusion: The current study documented that RA is significantly associated increased oxidative stress.

Keywords: Oxidative stress, Rheumatoid Arthritis, Babylon.

Introduction

Rheumatoid arthritis (RA) is a systemic autoimmune disease characterized by inflammatory arthritis and extra-articular involvement. RA with symptom duration of fewer than six months is defined as early, and when the

symptoms have been present for more than six months, it is defined as established¹⁻³. Several lines of evidence suggest a role for oxidative stress in the pathogenesis of RA. Both ROS and RNS damage cartilage. Tissue injury in inflammation results in NO[•] production by articular chondrocytes and synovial fibroblasts and elevated levels of NO[•] are observed in the serum and synovial fluid of RA patients. The free radicals, particularly NO[•] and O₂^{•-}, inhibit the synthesis of matrix components like proteoglycans by chondrocytes and also damage the extracellular matrix through activation and up regulation of matrix metalloproteinases. The HOCl, produced by myeloperoxidase (MPO) in neutrophils, chlorinate the tyrosine residues to form 3-chlorotyrosine and damage

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the collagen, thus implicated in arthritogenesis. RA patients have increased plasma MPO concentrations. Elevated levels of MDA, NO[•], protein carbonyls, oxidized hyaluronic acid and oxidized LDL have been reported in RA patients ⁴. Posttranslational protein oxidative modifications, in particular cysteine modifications, have been implicated in ischemic tolerance or preconditioning. Ischemic tolerance constitutes a positive stress that reprograms cellular defense systems to prevent subsequent lethal injuries ⁵. ROS can induce lipid peroxidation and disrupt the membrane lipid bilayer arrangement that may inactivate membrane-bound receptors and enzymes and increase tissue permeability. Products of lipid peroxidation, such as MDA and unsaturated aldehydes, are capable of inactivating many cellular proteins by forming protein cross-linkages ⁶. ROS can lead to DNA modifications in several ways, which involves degradation of bases, single- or double-stranded DNA breaks, purine, pyrimidine or sugar-bound modifications, mutations, deletions or translocations, and cross-linking with proteins ⁶. The current study, therefore, was aiming at assessing possible association between oxidative stress and RA.

Patients and Method

The present case control study was conducted in Department of Biochemistry, College of Medicine, University of Babylon, and Rheumatoid Unit, Merjan Teaching Medical City, Hilla City, Babylon Province, Iraq. The duration of current study was extended from September 2018 to July 2019. Sample size was determined according to sample size equation. Sixty one patients (18 male and 43 female) with RA clinically diagnosis by specialist physician attended to out clinic of Merjan Teaching Medical City, Hilla City with mean age of (47.43 ±11.34 years), as well as 127 apparently healthy control subjects (41 males, 86 females) with mean age of (48.94 ±12.36 years). Disease severity score of RA patients was determined by use DAS-28². Oxidative stress was evaluated by measuring MDA and TAC using ELISA technique according to providing company instructions.

Results

Clinical assessment of the severity of disease was made according to disease activity score (DAS-28) and the obtained results were demonstrated in Table 1. The mean DAS-28 score was 4.52 ± 1.42 with a range of 2 to 7.3. Cases with remission, a score of < 2.6, accounted to 6 (9.8%), cases with low disease activity, a score of 2.6 to 3.2, accounted to 9 (14.8%), cases with moderate disease activity, a score of > 3.2 – 5.1, accounted to 27 (44.3%) and cases with high disease activity accounted to 19 (31.1%), as shown in Table 1.

Table 1: Frequency distribution of patients with rheumatoid arthritis DAS-28

DAS-28 Score	Number of Cases	%
Remission (< 2.6)	6	9.8
Low activity (2.6 – 3.2)	9	14.8
Moderate activity (> 3.2 – 5.1)	27	44.3
High activity (> 5.1)	19	31.1
Mean ±SD	4.52±1.42	
Range	2–7.3	

SD: standard deviation

The oxidative stress status was assessed by measuring the serum level of the oxidative marker Malondialdehyde (MDA) and serum level of total anti-oxidant capacity (TAC). Actually, from statistical perspective, those two variables, namely MDA and TAC, are not normally distributed (non-parametric) according to kolmogorov-Smirnov test of normality distribution. For that reason, median is going to be used instead of mean as a measure of central tendency, and inter-quartile range (IQR), will be used instead of standard deviation as a measure of dispersion, as shown in Table 2.

The level of MDA was higher in patients with rheumatoid arthritis in comparison with control group, 2.35 (1.93) versus 0.86 (0.52); the difference was highly significant ($P < 0.001$), as shown in Table 2 and figure 1. On the other hand, the level of TAC was lower in patients with rheumatoid arthritis in comparison with control subjects, 0.10 (0.21) versus 0.53 (1.02), respectively; the difference was highly significant ($P < 0.001$), as shown in Table 2 and figure 1.

Table 2: Malondialdehyde (MDA) and total anti-oxidant capacity (TAC) levels in patients with rheumatoid arthritis and control group

Characteristic	Rheumatoid arthritis group n = 61	Control group n = 127	P
MDA			
Median (IQR)	2.35 (1.93)	0.86 (0.52)	< 0.001 †
Range	1.00 -3.90	0.50 -5.93	HS
TAC			
Median (IQR)	0.10 (0.21)	0.53 (1.02)	< 0.001 †
Range	0.01 -0.68	0.10 -1.90	HS

n: number of cases; IQR: inter-quartile range; MDA: malondialdehyde; TAC: total anti-oxidant capacity; †: Mann Whitney U test; HS: highly significant difference at $P \leq 0.01$

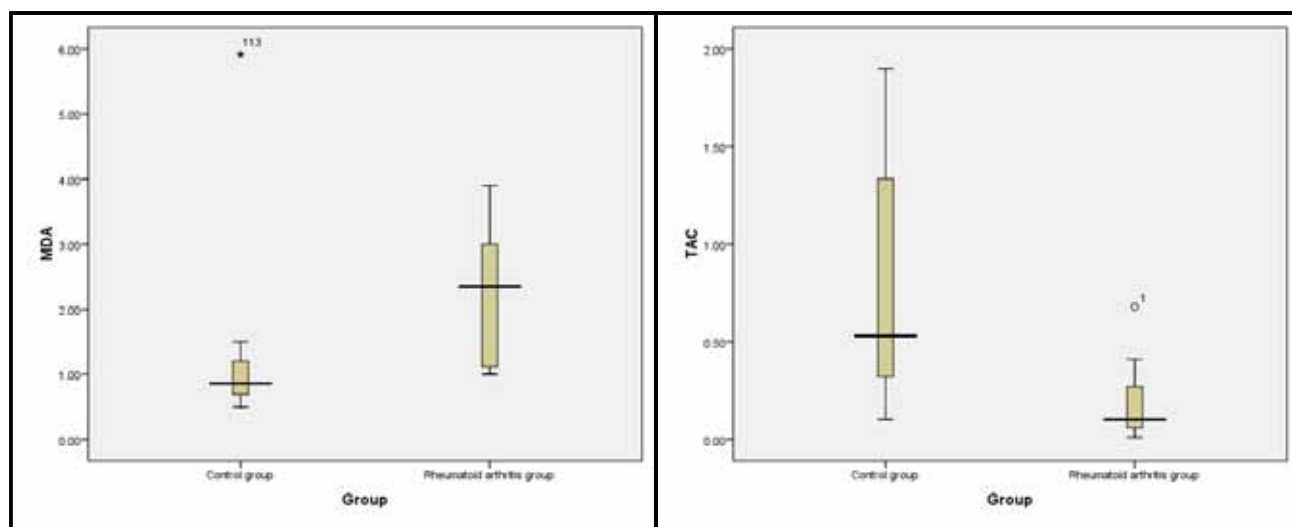


Figure 1: Box plot showing comparison of malondialdehyde (MDA) and total anti-oxidant capacity (TAC) levels in patients with rheumatoid arthritis and control group

Both serum MDA level and serum TAC level were correlated to characteristics of patients with rheumatoid arthritis and the results were presented in Table 3. Serum MDA was negatively correlated to age of patients ($r = - 0.013$); however, the correlation was statistically insignificant ($P = 0.919$). Serum MDA was correlated to male gender of patients ($r = - 0.008$); however, the correlation was statistically insignificant ($P = 0.950$), Table 3. Serum MDA was positively correlated to duration of disease ($r = 0.210$); however, the correlation was statistically insignificant ($P = 0.105$), Table 3. Serum MDA was positively correlated to disease activity ($r = 0.033$); however, the correlation was statistically insignificant ($P = 0.799$), Table 3.

Serum TAC was negatively correlated to age of patients ($r = - 0.160$); however, the correlation was statistically insignificant ($P = 0.217$), table 3. Serum TAC was correlated to male gender of patients ($r =$

$- 0.181$); however, the correlation was statistically insignificant ($P = 0.163$), table 3. Serum TAC was negatively correlated to duration of disease ($r = - 0.021$); however, the correlation was statistically insignificant ($P = 0.874$), table 3. Serum TAC was negatively correlated to disease activity ($r = - 0.123$); however, the correlation was statistically insignificant ($P = 0.345$), Table 3.

In the current study, the oxidative stress status was assessed by measuring the serum level of the oxidative marker Malondialdehyde (MDA) and serum level of total anti-oxidant capacity (TAC). It was found in this study that, the level of MDA was significantly higher in patients with rheumatoid arthritis in comparison with control group. On the other hand, the level of TAC was significantly lower in patients with rheumatoid arthritis in comparison with control subjects. These results indicate a principal role for oxidative stress in the pathogenesis of rheumatoid arthritis.

Table 3: Correlations of malondialdehyde (MDA) and total anti-oxidant capacity (TAC) levels to rheumatoid patients characteristics

Characteristics	MDA		TAC	
	r	P	r	P
Age	-0.013	0.919 NS	-0.160	0.217 NS
Gender	-0.008	0.950 NS	-0.181	0.163 NS
Duration of Disease	0.210	0.105 NS	-0.021	0.874 NS
DAS-28	0.033	0.799 NS	-0.123	0.345 NS

MDA: malondialdehyde; TAC: total anti-oxidant capacity; r: Spearman correlation coefficient; DAS: disease activity score; NS: not significant at $P > 0.05$

Discussion

A large number of studies have shown that reactive oxygen species (ROS) are implicated in the pathophysiology of many diseases including RA⁷. These are highly reactive chemical species that have the potential to damage lipids, proteins and DNA in joint tissues. Under normal conditions ROS production is controlled by a variety of antioxidant defence system present in the body. The non- enzymatic antioxidant defence includes vitamin A and C, reduced glutathione (GSH) while enzymatic antioxidant includes superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx), glutathione reductase (GR) and glutathione-S-transferase (GST). Imbalance between oxidants and antioxidants due to increased chemical reaction or insufficient antioxidant defence system results in oxidative stress. These ROS if not scavenged properly may damage biological macromolecules^{8,9}.

Previous reports suggest the role of oxidative stress in inflammation and destruction in the joints of arthritic animals and RA patients. ROS formation and markers of protein and lipid oxidation has been found to be raised in arthritic animals. The oxidative status has been found to be changed in the serum of RA patients and also in the brain, liver and vascular tissues of rats with experimental arthritis¹⁰. In the current study, MDA was elevated and this finding is in line with previous study. Lipid peroxidation was measured in terms of MDA present in blood plasma. The rise in lipid peroxidation product might be due to the increased formation of ROS which tends to increase abundantly during chronic inflammation and hence cause excessive damage to

tissues. This is in line with other studies where elevated level of MDA has been found in the serum, plasma and erythrocytes of RA patients^{11,12}. A significant increase in the lipid peroxidation has also been reported in the liver and brain of rats with adjuvant arthritis^{13,14}. In the current study, both serum MDA and TAC were not significantly correlated to age, gender, disease duration and disease activity of patients with rheumatoid arthritis. Similar results were obtained by Kardeset *al.*¹⁵ who stated that serum MDA was not significantly correlated to any of clinical parameters of patients with rheumatoid arthritis.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine and all experiments were carried out in accordance with approved guidelines.

References

1. Cai Q, Xin Z, Zuo L, Li F, Liu B. Alzheimer's Disease and Rheumatoid Arthritis: A Mendelian Randomization Study. *Front Neurosci.* 2018;12:627.
2. Sarah H. Edin, Abdulsamie H. Alta'ee, Sabah J. Al-Rubaie, Serum Interleukin-6 and Gene Polymorphisms in Rheumatoid Arthritis Patients in Babylon Province, Iraq, *International Journal of ChemTech Research*, 2017, 10, 2, 2017, 662-669.
3. Voigt A, Seipelt E, Bastian H, Juche A, Krause A. [Improved early diagnostics of rheumatic diseases : Monocentric experiences with an open rheumatological specialist consultation]. *Z Rheumatol.* 2018 Nov;77(9):844-849.
4. Abdulsamie H. Alta'ee, Mahmoud H. Hadwan, Lamia A. Almashhedy, The Balance Between Superoxide Dismutase and Catalase Activities in Sera of Obese Iraqi Men, *Euromediterranean Biomedical Journal* 2015, 10 (17):197-202.
5. Cai Z, Yan LJ. Protein Oxidative Modifications: Beneficial Roles in Disease and Health. *J Biochem Pharmacol Res.* 2013;1(1):15-26.
6. Mahmoud H. Hadwan, Abdulsami H. Alta'ee and Haider K. Zaidan, The Levels of Protein Oxidation and Lipid Peroxidation in Sera of Obese Men, *Journal of Babylon University*, 19, 1, 2011.

7. Ahmed K, Alanzy, Abdulsamie H, Alta'ee, Sabah J Alrubiae, Serum Tumor Necrosis Factor Alpha and Gene Polymorphisms in Rheumatoid Arthritis Patients in Babylon Province, Iraq, *Journal of Global Pharma Technology*, 10,3, 387-395.
8. Jaswal S, Mehta HC, Sood AK, Kaur J. Antioxidant status in rheumatoid arthritis and role of antioxidant therapy. *ClinChimActa*. 2003; 338:123–129.
9. Mahajan A, Tandon VR. Antioxidants and rheumatoid arthritis. *J Indian Rheumatol Assoc*. 2004; 12:139–142.
10. Bracht A, Silveira SS, Castro-Ghizoni CV, Sá-Nakanishi AB, Oliveira MRN, Amado CAB, et al. Oxidative changes in the blood and serum albumin differentiate rats with monoarthritis and polyarthritis. *SpringerPlus*. 2016; 5:36
11. Ali AM, Habeeb RA, El-Azizi NO, Khattab DA, Abo-Shady RA, Elkabarity RH. Higher nitric oxide levels are associated with disease activity in Egyptian rheumatoid arthritis patients. *Rev. Bras. Reumatol*. 2014; 54.
12. Veselinovic M, Barudzic N, Vuletic M, Zivkovic V, Tomic-Lucic A, Djuric D, et al. Oxidative stress in rheumatoid arthritis patients: relationship to diseases activity. *Mol Cell Biochem*. 2014; 391:225–232.
13. Abdulsamie Hassan Alta'ee, Mufeed J Ewadh and Zainab H. Kamil, Role of Some Trace Elements in Breast Cancer Receiving Chemotherapy, *International Journal of PharmTech Research*, 2016, 9, 5, 381-386.
14. Comar JF, Sá-Nakanishi AB, Oliveira AL, Wendt MMN, Bersani-Amado CA, Ishii-Iwamoto EL, et al. Oxidative state of the liver of rats with adjuvant-induced arthritis. *Free RadicBiol Med*. 2013; 58:144–153.
15. Kardes S, Karagulle M, Durak I, Avci A, Karagulle MZ. Association of oxidative stress with clinical characteristics in patients with rheumatoid arthritis. *Eur J Clin Invest*. 2018;48

Genotyping of *Echinococcus granulosus* Isolates from Human, Sheep and Cattles Hydatid Cysts in Some Central Euphrates Provinces, Iraq

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Abstract

A molecular study was conducted for the period from August 2018 till March 2019. This study included the collection of 60 samples of human and animal hydatid cysts (sheep and Cattles), human samples collected from Al-Diwaniyah hospital. Whereas the animal samples were collected from Al- Najaf and Al-Diwaniyah provinces abattoirs .DNA was extracted from the germinal layer of cysts (for humans, sheep and cows) as well as from the protoscolices of fertile cystic fluid. The PCR series reaction technique was performed using touch down for the multiplication of the Cox1 gene. Molecular examination showed that DNA extracted from protoscolices was better than DNA extracted from the germinal layer when PCR genes were amplified. The gene sequencer method and the phylogenetic tree analysis were conducted for nine PCR samples consisting of three samples for everyone humans, cows and sheep. The results showed that there are three strains in Iraq: sheep strain (G1), cattle strain (G3) and camel strain (G6). The current study reveals the cattle strain (G3) It was the most present and distributed by 66.6% and this proves that they are most closely related associated with human, sheep and cattle infections.

Keywords: *Echinococcus granulosus*, Genotyping, Human.

Introduction

Hydatid disease, known as hydatidosis or Echinococcosis, is a common human-zoonotic disease that arises as a result of the eggs of *Echinococcus granulosus* in feces of dogs (as final hosts) and delivered to the external environment where contaminated of water, vegetables, fruits, etc., it's endemic disease in all continents of the world except in Antarctica ¹ and ². Hydatid cysts have been known since ancient times, and are considered serious epidemic diseases that are harmful to human health and economically ³ and ⁴. According to the World Health Organization (WHO), the disease causes 19,300

deaths globally each year, more than one million people affected by the disease and livestock losses. ⁵ and ⁴. The disease is prevalent in livestock husbandry areas and carnivores in close contact with humans that help to complete the life cycle of the parasite causing the disease⁶. The parasite needs two hosts to complete its life cycle. The first host includes carnivores and represents the definitive host, the second host includes the herbivores and represents the intermediate host, the human is an accidental intermediate host does not contribute to the perpetuation of the life cycle of the parasite and infected in several ways, including food and drink contaminated with parasite eggs or direct contact with infected dogs⁷. The disease infected and affects many organs in the human body and the others intermediate host and the most vulnerable organs are liver and lung followed by spleen, kidney, heart, brain, spinal cord, urethra, uterus, fallopian tube, pancreas, mesenteric membrane, muscles and other organs, and brain infection is more common in children⁸. In Iraq, cystic echinococcosis one of the

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main health concerns⁹. It is an endemic disease and a major health problem in the country where it is known as Iraqi cancer¹⁰. Molecular detection techniques is a modern and sensitive method used to determine the type and strain of the *E. granulosus* parasite¹¹. Molecular studies indicated that there are 10 distinct genotypes of the parasite¹². Genotypes or strains were termed G (G1), based on the analysis of the sequence of mitochondrial cytochrome Cox1 genes. The *E. granulosus* strains were divided into several groups based on the sequence of mitochondrial genes, including the sheep strains *E. granulosus sensu stricto*, which includes genotypes (G1-G3), horse strains *Echinococcus equinus* (G4), the Camel strains *Echinococcus canadensis* (G6) and the pig strains G7 (G10-G6) and the elk strain G9 (G8 and G10), and the elk strain G9 is currently classified as G7¹³.

Materials and Method

Samples Collection and Preparation of Hydatid Cysts:

The present study included collection of 60 samples of human and animal hydatid cysts (sheep and cows), human samples collected from Al-Diwaniyah hospital. Whereas the animal samples were collected from Al- Najaf and Al-Diwaniya provinces abattoirs ..from August 2018 till March 2019. The hydatid cysts were isolated from slaughtered cattle and sheep and placed in an ice-cooled container and transferred to the Advanced Parasitology Laboratory at the College of Science for Women/University of Babylon, the samples had been washed directly with water to remove dirt and blood on them. Firstly the surface of the hydatid cyst is sterilized with 70% ethanol. Sterile medical syringes of 10 ml were used to remove the cyst fluid and the collection of protoscolices were performed under sterile conditions.

The cyst fluid was withdrawn with the protoscolices and placed in a beaker 250 ml. Germinal layer was extracted and placed in a sterile petridish containing a physiological saline solution (0.9%) and then washed with a washing bottle containing saline phosphate buffer solution (PBS) and several times to extract the largest number of protoscolices, and later collected in sterile test tubes and centrifuged three times Speed of 3000 rev/min for 15 minutes each time. 70% ethyl alcohol was added to these tubes for preservation with pieces of the germinal layer and subsequently used in polymerase chain reaction (PCR) and genetic sequencing to detect dominant parasite strains.

PCR Technique: PCR technique was performed for in detection and genotyping of *Echinococcus granulosus* hydatid cyst based on mitochondrial Cox1 gene in isolates. This technique was carried out according to method described by [14] as following steps:

Genomic DNA Extraction: Genomic DNA from hydatid cyst fluid samples were extracted by using gSYAN DNA Extraction Kit Geneaid.

Genomic DNA Examination: The extracted blood genomic DNA was checked by using Nanodrop spectrophotometer (THERMO. USA), which measured DNA concentration (ng/μL) and check the DNA purity by reading the absorbance at (260/280 nm) as following steps:

1. After opening up the Nanodrop software, chosen the appropriate application (Nucleic acid, DNA).
2. A dry wipe was taken and cleaned the measurement pedestals several times. Then carefully pipette 2μl of free nuclease water onto the surface of the lower measurement pedestals for blank the system.
3. The sampling arm was lowered and clicking OK to initialized the Nanodrop, then cleaning off the pedestals and 1μl of blood genomic DNA was added to measurement. PCR master mix was prepared by using (Maxime PCR PreMix Kit) and this master mix done according to company instructions. After that, these PCR master mix component that mentioned in table above placed in standard PCR PreMix Kit that containing all other components which needed to PCR reaction such as (Taq DNA polymerase, dNTPs, Tris-HCl pH: 9.0, KCl, MgCl₂, stabilizer, and tracking dye). Then, all the PCR tubes transferred into Exispin vortex centrifuge at 3000rpm for three minutes. Then placed in PCR Thermocycler (BioRad.USA).

PCR Product Analysis: The PCR products of mitochondrial genes were analyzed by agarose gel electrophoresis following steps:

1. 1% Agarose gel was prepared in using 1X TBE and dissolving in water bath at 100 °C for 15 minutes, after that, left to cool 50°C.
2. Then 3μl of ethidium bromide stain were added into agarose gel solution.
3. Agarose gel solution was poured in tray after fixed the comb in proper position after that, left to

solidified for 15 minutes at room temperature, then the comb was removed gently from the tray and 10µl of PCR product were added in to each comb well and 5ul of (100bp Ladder) in one well.

- The gel tray was fixed in electrophoresis chamber and fill by 1X TBE buffer. Then electric current was performed at 100 volt and 80 AM for 1hour.
- PCR products (450bp) *cox1* gene was visualized by using UV transilluminator.

DNA Sequencer Method: The process of DNA sequencing to identify strains of some positive *E.granulosus* isolates is carried out according to the following steps:

- The PCR product of the *cox1* genes was sent to Macrogenin South Korea in refrigerated container by DHL courier for DNA sequencing by AB DNA sequencing system.
- DNA sequence analysis (Phylogenetic tree analysis) using molecular genetic analysis, and Mega 6.0 software programmed and sequential alignment analysis based on convergence analysis.

Evolutionary distances were calculated using the maximum probability method and utilizing the UPGMA tool tree method.

- Analysis of strains identification by analysis of genetic trees between local *E.granulosus* isolates and known *E.granulosus* isolates at NCBI-Blast
- Finally, the *E.granulosus* isolates identified in NCBI-GenBank were provided for the GenBank registration number.

Results and Discussion

Results of the Polymerase Chain Reaction Technique for Cox1 Gene: The results of PCR technique showed the success of all amplification of extracted DNA from the protoscolices and the germinal layer of Cox(1) mitochondrial gene whereas the results were positive for all samples of human cysts (1, 2 and 3) and sheep (4, 5 and 6) and cows (7, 8 and 9) after conducting the gel agarose electrophoresis, which showed the presence of the diagnostic gene of the mitochondria Cox (1) of *E.granulosus* at a molecular weight of 450 bp as in Figure (4-1) and this is consistent with many studies such as [15] and [16].

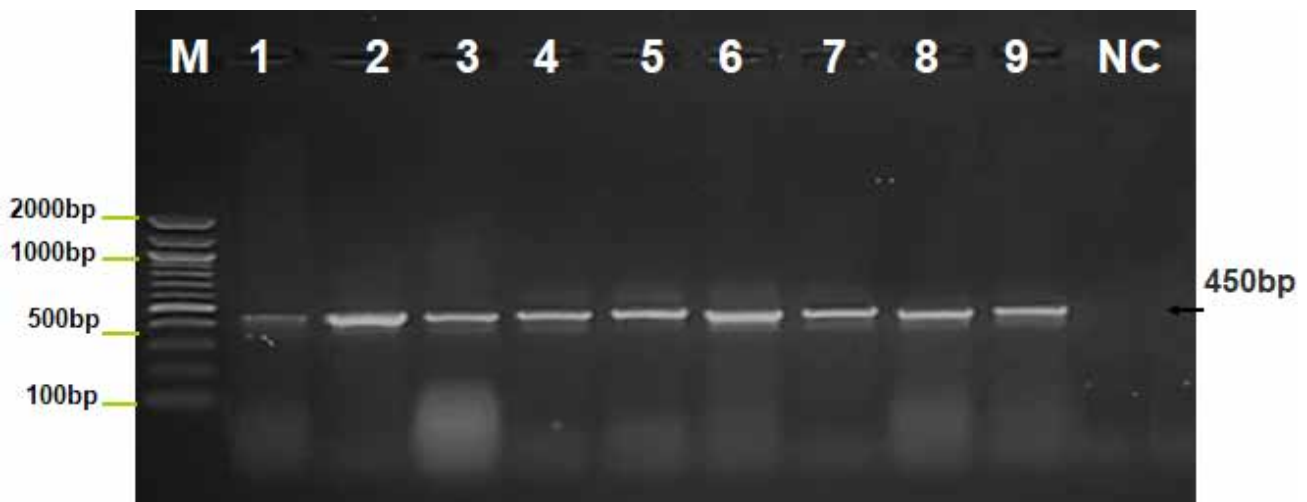


Figure 1: Agarose gel electrophoresis image that showed the PCR product analysis of mitochondrial cytochrome (COX1) gene in *Echinococcus granulosus* hydatid cysts isolated from Human, Sheep and Cattle.. Where M: marker (2000-100bp), lane (1-3) Human hydatid cysts isolates, lane (4-6) Sheep hydatid cysts isolates, and lane (1-3) cattle hydatid cysts isolates, positive *cox1* gene at (450bp) PCR product size. NC : non templet negative control.

Results of DNA Sequencing Technique and Genetic Tree Analysis

Result of *E. granulosus* Genotype: Three random samples were selected for humans, sheep and cows because of the high physical cost of DNA sequencing. The selected samples were sent to Macrogen company in South Korea for the purpose of determining the DNA sequence of the *cox1* mitochondrial gene, which was used to determine the position of *E. granulosus*. The phylogenetic tree was written using the evolution distance, which was measured using the Composite Likelihood Maximum method (UPGMA tree) in MEGA 6.0 version.

Human: The results of the DNA sequence of human cysts indicate that sheep (G1) and buffalo (G3) may be responsible for human infections in Al-Najaf and Al-Diwaniyah governorates, where the strain (G1) was found in 33.33% of samples and identical rates 96%. With the comparable sample in the genebank under the symbol KP161207.1 from Africa, and the cattle strain (G3) in 66.66% of the samples with an identical rates ranging from 99% to 100% when comparable sample in the genebank with accession number M84663.1. The isolates were recorded in GenBank with the following accession number: MN514880, MN514881 and MN514882

Sheep: The results of the PCR phylogenetic analysis of three samples of hydatid cysts of infected sheep indicate that sheep strain (G1) with a percentage of 96% with

the standard sample compared to them in the genebank, accession number M84663.1 from Turkey, and the cattle (G3) with identical rate 99% the standard specimen comparing them in the genebank with accession number KP161207.1 from Africa and the camel strain (G6) with identical rate 100%, the comparable specimens that were compared in the genebank with accession number JF964263 from Iran is responsible for infection in the isolates samples in the present study in genebank were recorded in accession number MN514883, MN514884 and MN514885

Cattle: The results of PCR phylogenetic analysis of three samples of hydatid cysts of infected cows, indicate that cattle (G3) strain may be responsible for cattle infections in Al-Najaf and Al-Diwaniyah governorates with a prevalence rates (100%) and identical rates (100%) and (99%) with the comparable sample. That have accession number in NCBI is M84663.1 for Turkey strains in the gene bank. The results of PCR phylogenetic analysis of three samples of hydatid cysts of infected cows, indicate that cattle (G3) strain may be responsible for cattle infections in Al-Najaf and Al-Diwaniyah governorates with a prevalence rates (100%) and identical rates (100%) and (99%) conformity with the comparable standard sample. That have accession number in the genebank under the code M8466.1 from Turkey, isolates samples in the present study were recorded in GenBank with the following numbers MN514886, MN514887, and MN514888, as shown in Table (1) and (2).



Figure 2: Multiple sequence alignment analysis of mitochondrial Cox1 gene partial sequence in local Echinococcus granulosus Human, Sheep, and cattle

Relation of the Current Study Strains to Some Other Strains in Iraq and Nearby Countries: The genetic tree of human, sheep and cattle isolates was written using the development distance, which

was measured using the Maximum Composite Likelihood method (UPGMA tree) in programmed software (Version 6.0 MEGA). Human, sheep and cattle isolates were compared with some other isolates

recorded in NCBI-BLAST. The isolates of humans (1) and sheep (3) showed the closest similarity to the isolates of African *E.granulosus* belonging to the strain (G1) numbered KP161207.1) recorded in NCBI-BLAST, and showed the isolates of humans (3,2) and sheep (1) and cattle (1,2,3). The closest similarity in the isolates of the

Turkish *E.granulosus* belonging to the cattle strain (G3) numbered M84663.1), and the isolation of sheep (2) showed the closest similarity to the isolates of Iranian *E.granulosus* belonging to the camels strain (G6 numbered Jf964263) recorded in NCBI-BLAST.

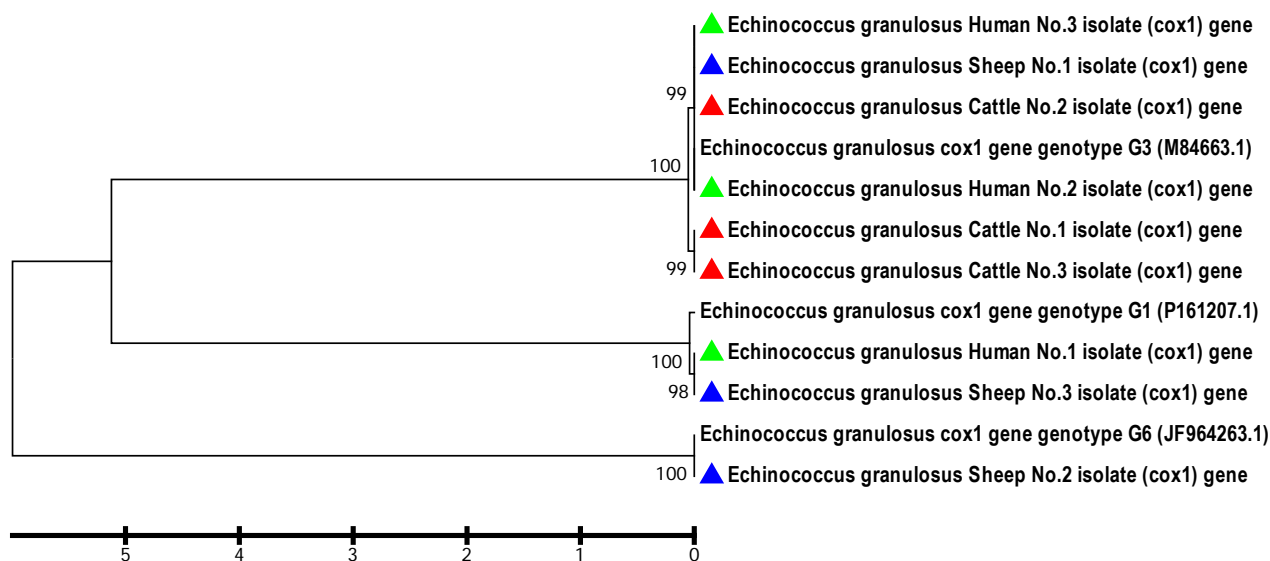


Figure 3: Phylogenetic tree analysis based on the mitochondrial Cox1 gene partial sequence that used for Echinococcusgranulosus typing detection.

Table 2: NCBI -BLAST Homology sequence identity between local Echinococcusgranulosus Human, Sheep, and cattle isolates with NCBI-BLAST Echinococcusgranulosus related Genotypes isolates.

Local isolate	Gene bank submission accession number	NCBI-BLAST Homology Sequence identity				
		NCBI BLAST identity isolate	Genotype	Accession Number	Country	Identity (100%)
local <i>E.granulosus</i> Human isolate No.1	Banklt2266832 Seq1 MN514880	Echinococcusgranulosus	Genotype 1	KP161207.1	Africa	96%
local <i>E.granulosus</i> Human isolate No.2	Banklt2266832 Seq2 MN514881	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	100%
local <i>E.granulosus</i> Human isolate No.3	Banklt2266832 Seq3 MN514882	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	99%
local <i>E.granulosus</i> Sheep isolate No.1	Banklt2266832 Seq4 MN514883	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	99%
local <i>E.granulosus</i> Sheep isolate No.2	Banklt2266832 Seq5 MN514884	Echinococcusgranulosus	Genotype 6	JF964263	Iran	100%
local <i>E.granulosus</i> Sheep isolate No.3	Banklt2266832 Seq6 MN514885	Echinococcusgranulosus	Genotype 1	KP161207.1	Africa	96%
local <i>E.granulosus</i> Cattle isolate No.1	Banklt2266832 Seq7 MN514886	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	99%
local <i>E.granulosus</i> Cattle isolate No.2	Banklt2266832 Seq8 MN514887	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	100%
local <i>E.granulosus</i> Cattle isolate No.3	Banklt2266832 Seq9 MN514888	Echinococcusgranulosus	Genotype 3	M84663.1	Turkey	99%

Table 2: Distribution and frequency of genotypes detected in the present study and their percentages from NCBI information.

Samples Type	Genotype 1 (G1)	(%)	Genotype 3 (G3)	(%)	Genotype 6 (G6)	(%)	Total
Human	1	11.1	2	22.2	0	0	3
Sheep	1	11.1	1	11.1	1	11.1	3
Cows	0	0	3	33.3	0	0	3
Total	2	22.2	6	66.6	1	11.1	9

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science for Women, Iraq and all experiments were carried out in accordance with approved guidelines.

References

- Paniker CJ, Ghosh, S. Paniker's textbook of medical parasitology. 7th Edn., Jaypee Brothers Medical Publishers (P) Ltd. New Delhi. 2013: 127-134.
- Otero-Abad B, Torgerson PR. A systematic review of the epidemiology of echinococcosis in domestic and wild animals. *PLoS neglected tropical diseases*. 2013; 7(6): e2249
- Thompson R. Biology and systematics of Echinococcus. In *Advances in parasitology*. Academic Press. 2017; 95 : 65-109 pp.
- Bogitsh B, Carter C, Oeltmann T. Human Parasitology 5Ed., General characteristics of the cestodea., Academic Press. 2019: 243-25
- Higueta N, Brunetti E, McCloskey C. Cystic echinococcosis. *Journal of clinical microbiology*. 2016; 54(3): 518523.
- Hayajneh, F.M.F.; Althomali A. Prevalence and characterization Hydatidosis in animals slaughtered at Al Taif abattoir, Kingdom of Saudi Arabia. *Open Journal of Animal Sciences*. 2014; 4(01): 38-41.
- Romig T, Deplazes P. Ecology and life cycle patterns of Echinococcus species. In *Advances in parasitology*. Academic Press. 2017; 95.; 213-314
- Khurana, M. Ruptured Hydatid cyst of lung. *Current Pediatric Research*. Scientific Publishers of India. 2012; 16(2):156-158.
- Cox F. *Modern Parasitology: A textbook of parasitology*. 2nd Edn., Blackwell Science Ltd. Oxford. 2004: 30252.
- Abdulhameed M. A retrospective study of human cystic echinococcosis in Basrah province, Iraq. *Acta Tropica*. 2019; 178: 130-133.
- Salih N. DNA Analysis of Echinococcus of Human and Sheep Origin in Ninevah Province, Iraq by PCR-RAPD Technique, *J. Rivista di Parassitol*. 2001; 17(3):221-232.
- Nakao M. A molecular phylogeny of the genus Echinococcus inferred from complete mitochondrial genomes. *Parasitology*. 2006; 134: 713-722.
- Rojas C. Echinococcus granulosus sensu lato genotypes infecting humans—review of current knowledge. *International Journal for Parasitology*. 2014; 44(1): 9-18.
- Nikmanesh B, Mirhendi H. Genotyping of Echinococcus granulosus Isolates from Human Clinical Samples Based on Sequencing of Mitochondrial Genes in Iran, Tehran. *Iranian J. Parasitol*. 2014; 9(1): 20-27.
- Ahmed B, Mero W, Salih A. Molecular Characterization of Echinococcus granulosus Isolated from Human Hydatid Cyst Using Mitochondrial Cox1 Gene Sequencing in Dohuk Province-Kurdistan Region, Iraq. *Science Journal of University of Zakho*. 2013; 1(1): 72-80.
- Ali M, Rahi A. A First DNA sequencing of hydatid agent isolated from human in Iraq. *Journal of Pure and Applied Microbiology*. 2016; 10(2): 1015-1020
- Agha A. Genotyping of Cystic Echinococcosis Isolates from Human and Animals Clinical Samples. M.Sc. thesis, Veterinary Medicine College. University of Al-Qadisiyah. Iraq. 2015: 48-87

Quality of Life of Patients with Ischemic Stroke Versus Hemorrhagic Stroke: Comparative Study

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Abstract

Quality of life (QOL) is an important aspect of a complete outcomes evaluation, to document the effects of rehabilitation for persons with disabilities, including those with stroke. A Comparative Descriptive Study is carried out in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate/Al-Forat Center for Neurological Sciences, from Nov. 6th, 2013, to April, 10th, in order to assess the quality of life for ischemic versus hemorrhagic stroke. A non-probability (Quota sample) of 200 patients (100 ischemic stroke patients, and 100 hemorrhagic stroke patients). The data are collected using semi-constructed questionnaire, which consists of three parts (1) Patients' Demographic data. (2) Patients' clinical data. (3) Patients' quality of life (WHOQOL). Validity of the questionnaire is determined through a five experts, who have more than 10 years of experience in nursing field. The data described statistically and analyzed through use of the descriptive and inferential statistical analysis procedures. The findings of the present study indicate that the ischemic stroke patients responses were failure at all the studied domains, except at the level of independency and environmental domain their responses were pass. While the hemorrhagic stroke patients responses were failure at all the studied domains. The study concludes that the ischemic stroke affect all the quality of life domains except the level of independence and environmental domains. While the hemorrhagic stroke affect all the quality of life domains without exceptions. While the study recommends that further studies conducted to involve a large sample size may be at a national level to obviously determine the quality of life for patients with ischemic versus hemorrhagic stroke.

Keywords: *Stroke, Quality Of Life, Hemorrhagic Stroke, Ischemic Stroke, Disabilities.*

Introduction

Cerebrovascular disorders are an umbrella term that refers to a functional abnormality of the central nervous system (CNS) ¹that occurs when the normal blood supply to the brain disrupted. Stroke is the primary cerebrovascular disorder in the United States, and it is the third leading cause of death after heart disease and cancer. Approximately 780,000 people experience a stroke each year in the United States. Approximately 600,000 of these are new strokes, and 180,000 are recurrent strokes ¹. About 5.6 million non-institutionalized stroke survivors are alive today; stroke is a leading cause of serious, long-term disability in the United States. The financial impact of stroke is profound, with estimated direct and indirect costs of \$65.5 billion in 2008 ¹. Strokes divided into two major

categories: ischemic (85%), in which vascular occlusion and significant hypoperfusion occur, and hemorrhagic (15%), in which there is extravasation of blood into the brain or subarachnoid space². Quality of life (QOL) is an important aspect of a complete outcomes evaluation, to document the effects of rehabilitation for persons with disabilities, including those with stroke ³. In addition, there are nine themes in QOL, these themes included, physical, function and independence, accessibility, emotional wellbeing, stigma, spontaneity, relationships and social function, occupation, financial stability, and physical wellbeing ⁴. Stroke can cause a wide variety of neurologic deficits that may affect the patients' quality of life. The patients may present with a group of signs or symptoms. These signs and symptoms may include numbness or weakness of the face, arm, or leg, especially

on one side of the body, Confusion or change in mental status, Trouble speaking or understanding speech, Visual disturbances, Difficulty walking, dizziness, or loss of balance or coordination, Motor Loss. In addition, the communication Loss, Perceptual Disturbances, Sensory Loss, Cognitive Impairment and Psychological Effects may involve.⁵ Living with disability has become a life-long process for many injured persons, with different set of problems presenting themselves at different stages throughout their lifetime. Extended life spans and the need for life-long follow-up make it important to expand the outcome parameters of medical care in order to better understand and promote physical, psychological, and social well-being after stroke. Thus, advances in medical and rehabilitative care have increased interest in studying how several factors may affect the QOL of individuals with stroke⁶. Quality of life has justifiably become both the ultimate goal of rehabilitation following stroke and key outcomes in determining the effectiveness of rehabilitation programs for people with disability⁷. Nursing care has a significant impact on the patient's recovery. Often, many body systems are impaired because of the stroke, and conscientious care and timely interventions can prevent debilitating complications as well as improving the patients' quality of life⁸.

Materials and Method

Design of the Study: A comparative study carried out in order to assess the quality of life for ischemic versus hemorrhagic stroke. The period of the study was from Nov. 6th, 2013, to April, 10th.

Setting of the Study: The study conducted in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate/Al-Forat Center for Neurological Sciences.

Sample of the Study: A non-probability (Quota sample) of (200) patients with stroke (100 ischemic stroke patients, and 100 hemorrhagic stroke patients); were included in the present study. The selection of sample size based on statistical power analysis with a statistical power more than 90%.

Criteria for Including the Sample within each Stratum (Ischemic and Hemorrhagic Stroke Patients):

1. All participants diagnosed as ischemic or hemorrhagic stroke.
2. The age of the all participants is 20 – 60 years old.
3. All participants are from Arabic Nationality.
4. Alert patients, free from any change in the level of consciousness.
5. Free from renal failure, or undergoing hemodialysis or peritoneal dialysis.
6. Free from cancer or undergoing chemotherapy.
7. Free from psychiatric disorders.

Study Instrument: An assessment tool (WHOQOL) used to assess the quality of life for patients with ischemic and hemorrhagic stroke. The final copy consists of the following parts:

Part I: Patients' Demographic Data.

Part II: Patients' Clinical Data.

Part III: Patients' Quality of Life Scale.

Data Collection: The data were collected through the utilization of the developed questionnaire, and by means of structured interview technique with the subjects who were individually interviewed, by using the Arabic version of the questionnaire and they interviewed in a similar way, by the same questionnaire for all those subjects who were included in the study sample.

Validity of the Instrument: A content validity of the study instrument conducted through a group of experts who have more than 10 years of experience in nursing field.

Statistical Analysis: The data were analyze through application of the descriptive and inferential data analysis method, included:

- Frequency, percentage, and cumulative percentage.
- Mean of scores.
- Chi-square.
- Independent sample t-test.

Study Results and Findings

Table 1: Distribution of the Study Subjects by their Demographic Data

Demographic Data	Rating	Ischemic Stroke		Hemorrhagic Stroke	
		Freq.	%	Freq.	%
Residency	Rural	20	20	20	20
	Urban	80	80	80	80
Gender	Male	80	80	80	80
	Female	20	20	20	20
Age/Years	<= 37.9	40	40	60	60
	38-38.9	0	0	38	38
	40+	60	60	2	2
		Mean/S.D. (38.6/1.517)		Mean/S.D. (37.2/1.720)	
Marital Status	Single	20	20	0	0
	Married	80	80	100	100
Levels of Education	Illiterate	0	0	40	40
	Able to Read and Right	20	20	30	30
	Intermediate School Graduated	40	40	20	20
	Secondary School Graduated	40	40	10	10
Occupational Status	Governmental Employee	20	20	20	20
	Private Worker	60	60	60	60
	Housewife	20	20	20	20
Socio-Economic Status	Satisfied	20	20	0	0
	Satisfied to Some Extent	40	40	40	40
	Unsatisfied	40	40	60	60

This table shows that the majority of the study subjects (80%) were from urban residential area in both ischemic and hemorrhagic groups. In regarding to the patients gender, the study results indicate that the majority of the study subjects were males in both ischemic and hemorrhagic stroke (80%). Also the study result indicate the 40 years old and more is the dominant age group for the patients with ischemic stroke, while for the patients with hemorrhagic stroke the dominant age group is about 37.9 years old (60%). In addition, the study results indicate that the majority of the study subjects were married in both groups. In concerning to the level of education, the study results indicate that the

study subjects distributed in many levels of education: intermediate and secondary schools for the ischemic stroke patients, while for the hemorrhagic stroke patients the (40%) of them were illiterate. Furthermore, the study results indicate that 60% of the ischemic and hemorrhagic stroke patients were private workers. Finally, in this table, the study results indicate that 80% of the study subjects with ischemic stroke were exhibit satisfied to some extent or unsatisfied socio-economic status, while for hemorrhagic stroke the majority of subjects are exhibit unsatisfied socio-economic status (60%).

Table 2: Distribution of the Study Subjects by their Clinical Data

Clinical Data	Rating	Ischemic Stroke		Rating	Hemorrhagic Stroke	
		Freq.	%		Freq.	%
Duration of Disease/Months	<= 1	20	20	1-9	60	60
	2 - 5	40	40	10-18	20	20
	6+	40	40	19+	20	20

Clinical Data	Rating	Ischemic Stroke		Rating	Hemorrhagic Stroke	
		Freq.	%		Freq.	%
Follow up Visits	Yes	80	80	Yes	80	80
	No	20	20	No	20	20
Physiotherapist Visits	Yes	80	80	Yes	80	80
	No	20	20	No	20	20
Use of Supportive Aids	yes	60	60	yes	40	40
	no	40	40	no	60	60
Musculo-Skeletal Complications	Hemiparesis	80	80	Hemiparesis	60	60
	Hemiplegia	20	20	Hemiplegia	40	40
Integumentary Complications (Pressure Sores)	yes	20	20	yes	40	40
	no	80	80	no	60	60

This table shows that the majority of the study subjects with ischemic stroke (80%) presented with more than (2 months) as a duration of disease, while for those with hemorrhagic stroke the (60%) of patients were complaining a stroke for (1-9 months). In regarding to the follow up and physiotherapist visits, the majority of the study subjects (80%) in both groups were adherence to these visits. In concerning the uses of supportive aids

such as crutches and wheel chairs, the study results indicate that (60%) of the patients with ischemic stroke were used these aids, while with the same percentage were for those patients they didn't use these aids. In addition, the common musculoskeletal complications in both groups is the hemiparesis. Moreover, in regarding to the integumentary complication, the more subjects mentioned that they have not a pressure sores.

Table 3: Distribution of the Study Subjects by their Responses to the Quality of Life Domains

Main Domains	Ischemic stroke		Hemorrhagic stroke	
	M.S.	Assessment	M.S.	Assessment
Physical	1.5	Failure	1.3	Failure
Psychological	1.7	Failure	1.5	Failure
Level of Independency	2.08	Pass	1.5	Failure
Social	1.9	Failure	1.6	Failure
Environmental	2.2	Pass	1.8	Failure
Spiritual	1.98	Failure	1.8	Failure
Overall Assessment	1.80	Failure	1.58	Failure

Based on the statistical mean of scores (2), the study results show that the ischemic stroke patients responses were failure at all the studied domains, except at the level of independency and environmental domain their responses were pass. While the hemorrhagic

stroke patients responses were failure at all the studied domains. Also the study results indicate in regarding to the overall assessment for the ischemic and hemorrhagic stroke patients quality of life, the results indicate that both groups overall responses were failure.

Table 4: Association between the Ischemic Stroke Patients Quality of Life and Their Demographic and Clinical Data

Demographic and Clinical Data	Sig. Value	D.F.	p-value	Report
Residency	$\chi^2 = 0.31$	1	0.576	NS
Gender	$\chi^2 = 0.31$	1	0.576	NS
Age	C.C.= 1.87	2	0.392	NS

Demographic and Clinical Data	Sig. Value	D.F.	p-value	Report
Level of education	$\chi^2 = 1.87$	2	0.392	NS
Occupational status	$\chi^2 = 0.83$	2	0.659	NS
Socio-economic status	$\chi^2 = 1.87$	2	0.392	NS
Duration of disease	C.C. = 5.00	4	0.287	NS
Follow up visits	$\chi^2 = 5.00$	1	0.025	S
Physiotherapist visits	$\chi^2 = 5.00$	1	0.025	S
Use of supportive aids	$\chi^2 = 1.87$	1	0.171	NS
Musculoskeletal complications (hemiparesis or hemiplegia)	$\chi^2 = 5.00$	1	0.025	S
Integumentary complications (pressure sores)	$\chi^2 = 0.31$	1	0.576	NS

This table shows that there is a non-significant association between the patients’ quality of life and their demographic and clinical data except with their follow up visits, physiotherapist visits, and musculoskeletal complication, at p-value equal or less than 0.05.

Table 5: Association between the Hemorrhagic Stroke Patients Quality of Life and Their Demographic and Clinical Data

Demographic and Clinical Data	Sig. Value	D.F.	Sig. (p-value)	Report
Residency	$\chi^2 = 0.31$	1	0.576	NS
Gender	$\chi^2 = 0.31$	1	0.576	NS
Age	C.C. = 0.83	2	0.659	NS
Level of education	$\chi^2 = 1.87$	3	0.599	NS
Occupational status	$\chi^2 = 0.83$	2	0.659	NS
Socio-economic status	$\chi^2 = 1.87$	1	0.171	NS
Duration of disease	C.C. = 5.00	1	0.025	S
Follow up visits	$\chi^2 = 5.00$	1	0.025	S
Physiotherapist visits	$\chi^2 = 5.00$	1	0.025	S
Use of supportive aids	$\chi^2 = 5.00$	1	0.025	S
Musculoskeletal complications (hemiparesis or hemiplegia)	$\chi^2 = 5.00$	1	0.025	S
Integumentary complications (pressure sores)	$\chi^2 = 0.83$	1	0.361	NS

Table (5) shows that there is a non-significant association between the patients quality of life and their demographic and clinical data except with their duration of disease, follow up and physiotherapist visits, use of supportive aids, and musculoskeletal complications, at p-value equal or less than 0.05.

Table 6: Differences Between the Studied Quality of life Domains between the Different Studied Groups (Ischemic and Hemorrhagic Stroke) according to the Means Differences

Main Domains	T- value	D.f.	Sig. (p – value)
Physical	4.000	8	0.004
Psychological	1.265	8	0.242
Level of Independence	1.265	8	0.242
Social	2.449	8	0.040
Environmental	0.632	8	0.545
Spiritual	1.265	8	0.242
Overall Assessment	2.121	8	0.067

This table shows that there is a significant difference at the physical and social domains between the ischemic and hemorrhagic stroke patients, at p-value less than 0.05. While there is a non-significant differences at the other studied domains, at p-value more than 0.05.

Discussion

American Heart Association reported that the advanced age will contributing in increased incidence of ischemic stroke, Specifically, high-risk groups include people over the age of 55, because the incidence of stroke more than doubles in each successive decade, and men, who have a higher rate of stroke than women ⁹. In addition, the cerebrovascular accident more common in population lived in a more popular, industrial, and overcrowded areas. In addition, ischemic stroke can affect all the human dimensions, as well as affect the quality of life. Also, the hemorrhagic stroke might occurs earlier than the ischemic stroke, and can affect all the human dimensions more than in ischemic stroke due to the fast progression of the hemorrhagic stroke. Furthermore, stroke can affect the quality of life in a variety of method. The stroke can affect the patients to communicate and activity of daily living, so it can affect the patients' quality of life. However, these effects can be vary according to the type of stroke. Because of the ischemic stroke affect, the body gradually so the body and the affected tissues can adopted and sometimes need a long time to destroy. But in case of hemorrhagic stroke affect the body suddenly, the affected tissues have no time to adapted, so the tissues will destroyed earlier ⁸.

Conclusion

Based on the study results the study concluded the following:

1. The patients in urban residential area are more vulnerable to get stroke than those in rural areas.
2. Male also more vulnerable to get stroke than female.
3. All the patients with stroke are adhere to follow up and physiotherapist visits.
4. Both ischemic and hemorrhagic stroke patients require to use a supportive aids as a result to hemiparesis or hemiplegia.
5. The ischemic stroke affect all the quality of life domains except the level of independence and environmental domains. While the hemorrhagic stroke affect all the quality of life domains without exceptions.
6. The follow up visits; physiotherapist visits, and musculoskeletal complications, affect the patients quality of life after ischemic stroke.

7. The duration of disease, follow up and physiotherapist visits, use of supportive aids and the musculoskeletal complications affect the quality of life for patients with hemorrhagic stroke
8. As the both types of stroke affect the patients quality of life, but the study result indicate that the hemorrhagic stroke affect the patients quality of life more than the ischemic stroke.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kufa and all experiments were carried out in accordance with approved guidelines.

References

1. Rosamond W, Flegal K, Furie K. for the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2008 update. A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*. 2008; 117, e25–e146.
2. Hinkle J, Guanci M. Acute ischemic stroke review. *Journal of Neuroscience Nursing*. 2007; 39(5), 285–293, 310.
3. May L, Warren S. Measuring Quality of Life of Persons with Spinal Cord Injury; External and Structural Validity, *Spinal Cord Journal*, University of Alberta, Department of Physical Therapy, 2002; (40)(7): 341 – 350 .
4. Manns P, Chad E. Component of Quality of Life for Persons with Quadriplegic and Paraplegic Spinal Cord Injury, *Ebsco Electronic Journal*, 2008; (11): 795-811,
5. Smeltzer S, Bare B, Hinkle J. *Brunner and suddarth Text Book of Medical Surgical Nursing*, 12th edition, Lippincott Williams and Wilkins Company, U.S., 2010; 1896-1900.
6. Ku HJ. Health Related Quality of Life in Patients with Spinal Cord Injury: Review of the Short Form 36-health Questionnaire Survey, *Yonsei Medical Journal*, 2007; (3): 360-370.

7. Hammell WK. Exploring Quality of Life Following High Spinal Cord Injury: A review and Critique, International Spinal Cord Society, 2004; (42): 491-502.
8. Smeltzer S, Bare B, Hinkle J. Brunner and suddarth Text Book of Medical Surgical Nursing, 12th edition, Lippincott Williams and Wilkins Company, U.S.2008; 1196.
9. American Heart Association. American Heart Association heart and stroke statistical update. Dallas.2000.

Retina Image and Bat-Inspired Algorithm for Artificial Key Generation

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Abstract

The process of key generation is utilized in different applications based on encryption techniques. The characteristics of the generated key should satisfy the required security as potential. The traditional techniques used for generating keys are based on various equations based on chaos maps or modulation for making these keys as one-time pads. Also, there are many techniques that utilized the block cipher or hash function for generating keys. In this paper, a retina image and bat-inspired algorithm are used for generating secure keys. Several processes have been applied to the input retina images like enhancement and edge detection processes. In the proposed technique, some parameters are adjusted for controlling the results and every output represents a bat solution and depending on the fitness function, the keys are generated. These generated keys are tested and evaluated using NIST tests. As a case study, some images are encrypted using the generated keys and the obtained encrypted images passed all the required security tests.

Keywords: Retina Image, Bat-Inspired Algorithm (BIA), Keys generation, images encryption.

Introduction

A stream cipher cryptography is widely utilized in the fields of communication and security. The attributes of this cryptography are based on the generation of the keys. Therefore, it is beneficial for generating accurate keys with a high degree of randomness since it is very significant for cybersecurity¹. Generally, there are two kinds of random number generators (RNGs); pseudorandom number generators (PRNGs) (or named deterministic RNGs), and true random number generators (TRNGs) (or named non-deterministic RNGs)². Usually, PRNGs are based on the cryptography algorithms and input seeds, whilst the TRNGs are based on the physical hardware and are capable of directly generating random numbers. The entropy of PRNGs output sequences is coming from the seeds, whilst the TRNGs entropy is coming from the physical signals³. This means the PRNGs are only capable of decreasing the entropy or remaining identical⁴. If the seeds of PRNGs are controlled or known via an attacker, then it is possible to predict the PRNGs output sequences, and this case represents the low entropy secret leakage⁵. Therefore, generally, the PRNGs designers assume

that the seeds have high entropy and the attacker is not capable of predicting the value of the seeds. Practically, there are lots of PRNGs applications that utilize multiple sources of entropy because more sources of entropy are mixed, therefore, the entropy is high, for instance, in the Android system, the seeds in Open SSL's PRNGs use nine sources. But, the output of these PRNGs remains predictable by an attacker⁶. Additionally, there are more instances such as the PRNGs output predictability in the Linux system⁷ and PRNGs recoverability in the Brillo operation systems, and PRNGs vulnerability in the implementations of Java⁸. The PRNGs are deterministic algorithms, therefore, formally, the PRNGs security can be proven. The loss of entropy in PRNGs was analyzed via the assistance of CBMC⁹ in¹⁰, in which the static analysis was used to check the PRNGs program codes. The PRNGs are not capable of increasing the input seeds entropy, while they should be capable of keeping it identical. Therefore, the loss of entropy refers to the PRNGs have several possible issues.

Keys Generation: In cryptography, the process of key generation works on generating keys. The key generator (keygen) is a program or device utilized for

generating keys. These keys are utilized for encrypting and decrypting different kinds of data. In modern cryptography systems, the generation of keys includes the algorithms of symmetric-key (utilize a single shared key), and the algorithms of public-key (utilize public & private keys)¹¹. In the algorithms of symmetric-key (like DES, and AES), the keys should be secret to keep the secrecy of data. While, in the algorithms of public-key (like RSA), the public keys are provided for anybody (usually via a digital certificate). The sender works on encrypting data with the public key of the receiver, but, only the private key holder is capable of decrypting these data¹². Because the algorithms of public-key are considerably slow compared with the algorithms of symmetric-key, modern systems like SSH and TLS utilize incorporation of public-key and symmetric-key algorithms, in which the recipient receives the sender's public key and encrypts a piece of data (generated using some data or symmetric key). The rest of the conversation utilizes the algorithm of symmetric-key which is typically faster for encryption. Computer cryptography utilizes the integers to the keys. In certain circumstances, the keys are generated randomly by utilizing PRNGs. PRNGs are computer algorithms works on producing random data under analysis. Generally, when the PRNGs utilize the system entropy for the seed data, then better results are produced because the initial conditions of the PRNGs become very tricky for guessing them by the attackers. One of the other ways of generating randomness is to use the information beyond the systems. The disk encryption software uses the movements of user mouse for generating exceptional seeds, Here, the users are worked on moving the mouse irregularly. Elsewhere, the keys are acquired deterministically utilizing passphrases and keys acquisition functions.

Bat-Inspired Algorithm: The bat-inspired algorithm (BIA) was founded depending on the process of bats echolocation. Within the process of echolocation, the bats will work on creating pulses that are alive from eight to ten milliseconds with a fixed frequency and identical wavelength. There are several bats features were prepared for developing BIA; Firstly, although with no vision, the bats are capable of sensing and estimating the distance between the food and the hindrances beyond them; Secondly, If the bats begin flying for finding the food, then they are related with the location, velocity, varying loudness, wavelength, and constant frequency; Thirdly, for changing the loudness values from a small constant to a higher positive values, different schemes are attributed¹⁶.

The BIA was founded in 2010 by X. S. Yang¹⁷. The basic mechanism for BIA is in^{18,19}. The initialization of the algorithm is started, at the moment $t = 0$, given the position of the bat, the number of bats, velocity, pulse frequency, pulse loudness, and pulse velocity. After that, the speed and position of the bat are updated at the time t based on the following equations:

$$V_a^{t+1} = V_a^t + (X_a^t - X') \times fr_a \quad \dots(1)$$

$$X_a^{t+1} = X_a^t + V_a^t \quad \dots(2)$$

$$fr_a = fr_{min} + (fr_{max} - fr_{min}) \times random \quad \dots(3)$$

Where indicated the bat velocity and indicated the bat position at t , and x' is the optimal position at t . To achieve that goal, fr_a is the bat ultrasonic frequency, fr_{min} represents the smallest pulse frequency and fr_{max} represents the highest pulse frequency, and denotes the new bat position and denotes the new bat velocity at $t+1$. At initial, for every bat, the value of pulse frequency is given randomly that is uniformly selected from $[fr_{max}, fr_{min}]$.

Generating a random number *random1*. When *random1* > pulse rate, then a random walk method is utilized to locally search about the bat for generating a new solution, as explained in the next equation:

$$X_{new} = X_{old} + \delta A^t \quad \dots(4)$$

Where denotes a random solution selected from the current optimal solutions, is a random vector which is selected from $[1, -1]$, and A^t denotes the loudness.

Generating a random number *random2*. When *random2* > and the new solution fitness is optimal than the old one, then, the old solution is replaced with the new one and updated it as in the next equations:

$$r_a^t = r_0 [1 - \exp(-\gamma * t)] \quad \dots(5)$$

$$A_a^t = \alpha \times A_a^{t-1} \quad \dots(6)$$

Where is the pulse frequency of the bat at t , and r_0 denotes a constant, denotes the bat pulse intensity at $t-1$, denotes the bat pulse intensity at t , and are coefficients.

After that, finding the preferable fitness bat after updating and recording it. Checking if the highest number of iterations is achieved or the search accuracy is achieved. When it is achieved, the iteration is finished, and the optimum position of the bat with the optimum level of fitness are output.

The Proposed Key Generation System: In this proposed key generation system, a retina image and bat-inspired algorithm (BIA) are used for generating secure keys. There are several steps are applied to the input retina images like retina image enhancement and edge detection processes. In the proposed system, some parameters are adjusted for controlling the results and every output represents a bat solution and depending on the fitness function, the keys are generated. After that, these generated keys are utilized for encrypting some grayscale images. The structure of the proposed key generation system

A. Retina Image Enhancement Step: The enhancement of the retina images is the initial step in the proposed key generation system. In this preprocessing step, the input color retina image is separated into three channels; Red, Green, and blue, after that, the contrast of these channels is adjusted

B. The Step of Edges Detection: In this step, the enhanced retina image obtained from the former step is converted to a grayscale image, then, the Gaussian filter is utilized on it. After that, the process of extracting the weak and strong edges is done and placed in isolated images. The final retina image is obtained based on the results of canny edge detector which are obtained from the isolated images.

C. Position Initialization in BIA: The process of initializing the points of BIA is depending on Bresenham’s Circle Drawing Algorithm and the detected edges from the former step. The circle is composed of eight equal Octets, therefore, only the coordinates are required to be found, octet-2 is taken, and “X and Y” will refer to the pixel. The points are selected from canny edges points that surrounded by two circles with different radius.


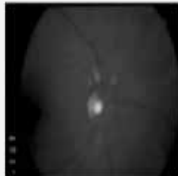
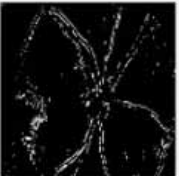
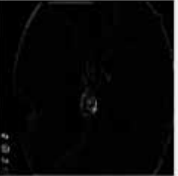


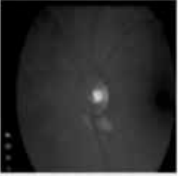




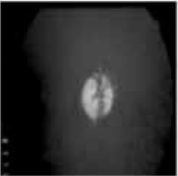

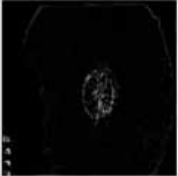
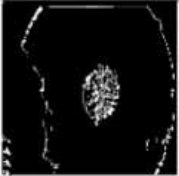

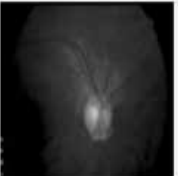
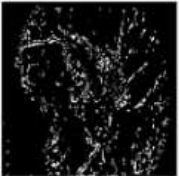



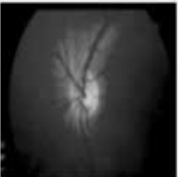

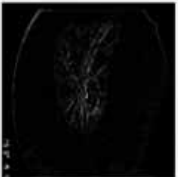
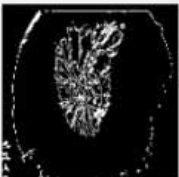
#	Image	Gaussian Filtered	Weak Edge	Strong Edges	Canny Edges
1					
2					
3					
4					
5					

Figure 1: Some image samples from the dataset and their output images.

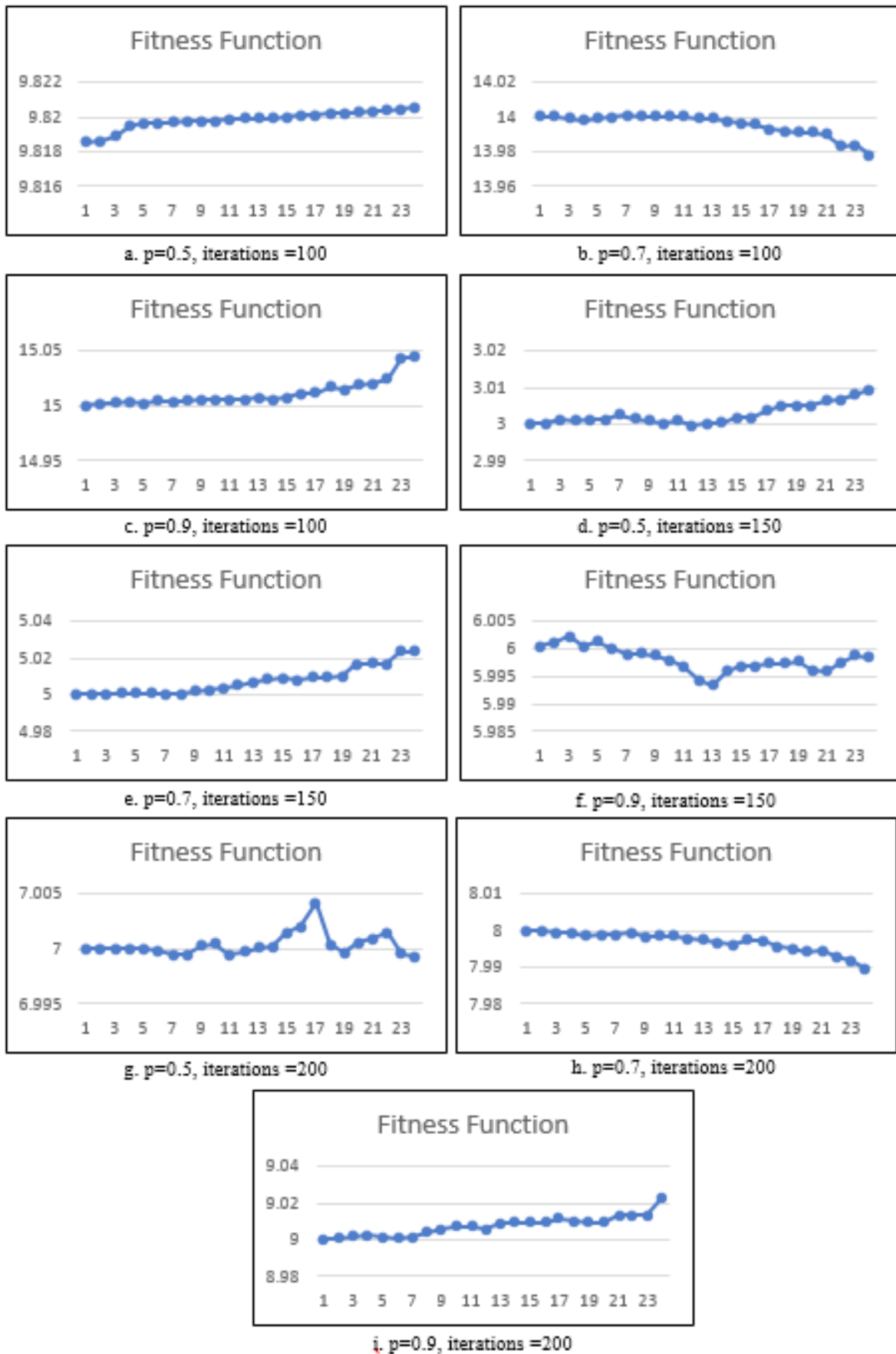


Figure 2: BIA Fitness function of various parameters.

- C. **BIA Optimization:** The resulted images from the former steps are utilized as input to the BIA (these images represent Bat solutions). Several parameters are specified for controlling the keys generation like loudness, pulse rate and frequency, and the number of iterations. With a constant number of iterations, and based on the specified parameters and applying some operations, the evaluation function is utilized in each iteration for generating the key.
- D. **The Step of Generating Keys:** All the numbers that are resulted from the former step are controlled by extracting a unique number. Then, these numbers are multiplied with a specified number for moving the floating-point and getting integer values. The whole numbers are gathered in series and every three digits are separated, after that, the modulation is applied to be considered as values of keys and the

carry are concatenated at the sequences end till all the needed keys are generated.

- E. **Encryption Step:** In the step of encryption, the generated key sequence should be equal to the size of information. An operation of exclusive or is applied on the binary representation of these two sequences for obtaining the encrypted text.

The Experiential Results: In the experiential results, several retina images are used for testing and evaluating the resulted sequences of keys. Every color retina image is utilized for producing multi-generation based on several parameters. The results of applying canny edges detection are illustrated in figure 1, where every retina image gives four images that are utilized as bat solutions.

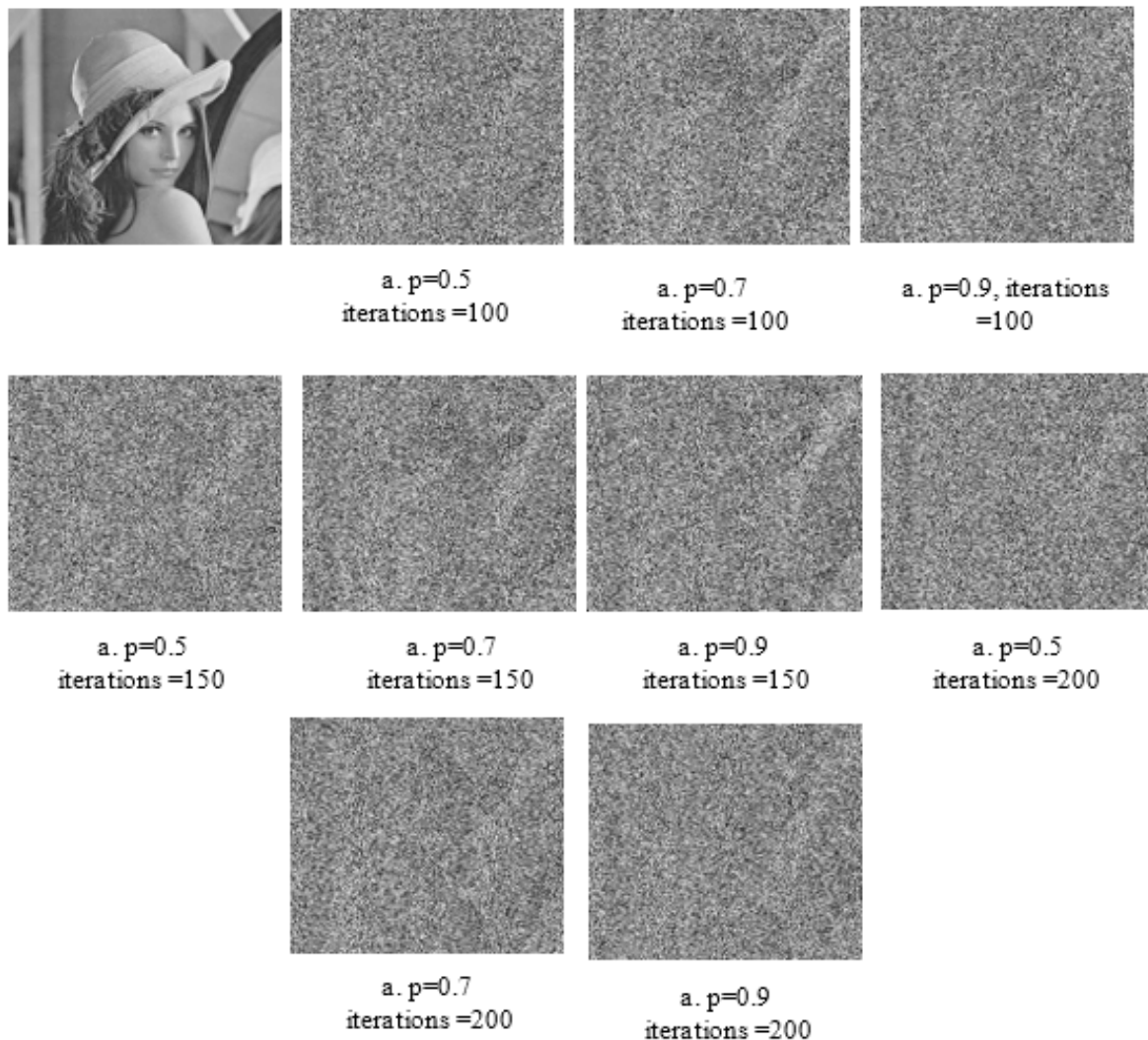


Figure 3: The results of Lena Image Encryption.

For each bat, the fitness function is works on obtaining a unique real number in various behavior even when selecting the same initial parameters. The number of iterations that are selected in this proposed system are; 100,150 and 200. And the selected pulse rates are; 0.5, 0.7 and 0.9, as illustrated in figure 7. The obtained numbers are processed and utilized for generating a key which is utilized later for encrypting the images.

The total size of the key that is needed for encrypting the grayscale image is calculated by multiplying the high and width of the image, i.e. when the size of the image is 256*256, then the total size of the key is equal to the

65536. In order to implement the stream cipher, the input grayscale image is converted into a vector of bits, after that, the exclusive or operation is applied on these two binary sequences (Key, and grayscale image), and the result is reshaped again into a 2D array for representing the cipher grayscale image, as illustrated in figure 3.

In this proposed system, the NIST tests (eleven tests) are utilized for testing the accuracy of nine samples of generated keys. Table 1 shows the results of the tests which demonstrate that the generated keys are accurate and successfully passed all these specific tests.

Table 1: The results of NIST tests.

#	Iteration	Pulse Rates	Block Frequencies	Approximated Entropy	FFTs	Cumulative Sum	Lempel-ZIV Compressions	Frequencies	Non-Periodic Template	Longest Run of Ones	Run Test	Overlap-Template Of All Ones T	Serial Tests
1	100	0.5	0.0280	1.000	0.9542	0.8920	0.78541	0.1116	0.5092	1.000	0.65853	1.000	0.6907
2		0.7	0.5843	1.000	0.4220	0.3997	0.78586	0.4795	0.9992	1.000	0.58028	1.000	0.4985
3		0.9	0.7843	1.000	0.5041	0.7745	0.37889	0.0509	0.988	1.000	0.62032	1.000	0.8422
4	150	0.5	0.1572	1.000	0.6463	0.3145	0.61074	0.1572	1.000	1.000	0.85748	1.000	0.4989
5		0.7	0.5958	1.000	0.4461	0.2995	0.67757	0.3475	0.0449	1.000	0.89413	1.000	0.7605
6		0.9	0.7236	1.000	0.2041	0.0244	0.68037	0.8509	0.0449	1.000	0.42032	1.000	0.8422
7	200	0.5	0.1572	1.000	0.6475	0.2995	0.67889	0.3475	0.9999	1.000	0.89413	1.000	0.7605
8		0.7	0.0215	1.000	0.2041	0.2656	0.68037	0.2341	0.0449	1.000	0.68620	1.000	0.2383
9		0.9	0.5000	1.000	0.6475	0.0291	0.67757	0.0145	0.9987	1.000	0.89413	1.000	0.238321

All the images utilized as a case study in the proposed system are tested for finding their efficiency. Figure 4 shows the histogram analysis test for the original and encrypted images which illustrates there are no relations between the images before and after

the encryption. Additionally, the quality measurements (Entropy, SSIM, PSNR, and MSE) are implemented on the resulted encrypted images as shown in table 2. All the obtained results are passed the security analysis and requirement.

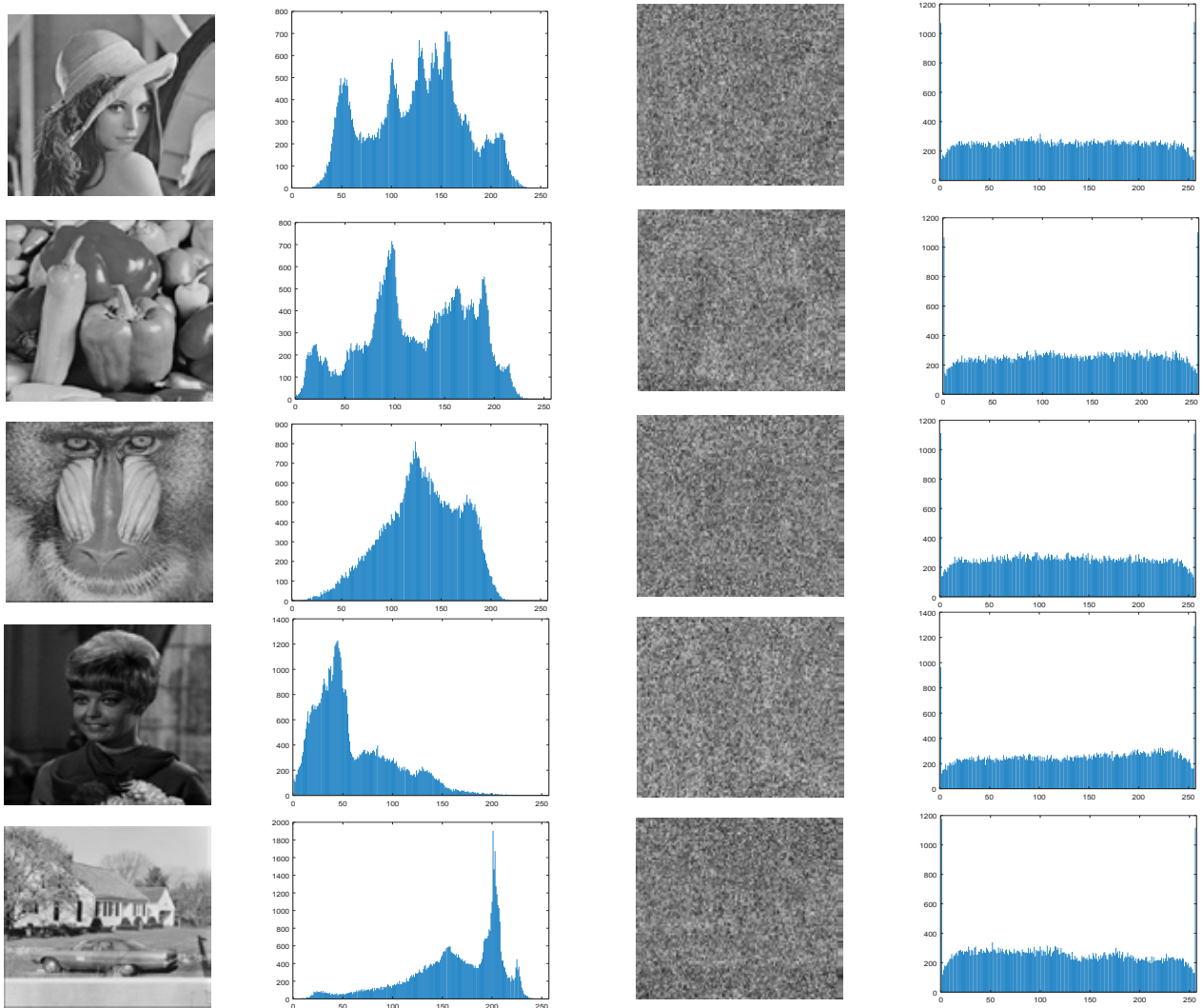


Figure 4: Histogram of original and encrypted images.

Table 2: The main objective measurements of encrypted images.

	Entropy				
	Before	After	SSIM	PSNR	MSE
Image#1	7.4683	7.9602	0.0010	9.0035	8179.5533
Image#2	7.6002	7.9570	-0.0060	8.4721	9244.2257
Image#3	7.2615	7.9556	-0.0081	9.5311	7243.8285
Image#4	7.0602	7.9512	0.0041	7.0031	12964.8288
Image#5	7.2820	7.9482	-0.0114	8.1602	9932.5331
Image#6	7.1098	7.9526	-0.0043	7.9811	10350.6837
Image#7	7.2844	7.9590	0.0026	8.8729	8429.2960
Image#8	7.1509	7.9479	0.0015	7.3750	11901.0401
Image#9	7.5004	7.9572	0.0039	9.0532	8086.5365

Conclusion

In this paper, an optimized keys generation system based on the main characteristics (unique features) of the retina image has been proposed. The major idea is to utilize retina images of persons for generating various sequences of keys, and in this way, the significant information concerning each person is kept in secure order. There are lots of steps that are implemented, especially utilizing the canny edge detector on the input retina images. The BIA was utilized as an instance of swarm intelligence to get the behavior of this inspired algorithm in generating keys. The strength of the generated keys is tested using randomness tests and through these tests, all the generated keys were passed successfully. Additionally, the quality measurements (Entropy before and after the encryption, SSIM, PSNR, and MSE) were implemented on the resulted encrypted images regarding the original images, and the obtained results were efficient.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of basic education and all experiments were carried out in accordance with approved guidelines.

References

1. J Wang, J Pan, X Wu. The entropy source of pseudo random number generators: from low entropy to high entropy,” 2019 IEEE International Conference on Intelligence and Security Informatics (ISI), Shenzhen, China, 2019: 161-163.
2. AAbusukhon, Z Mohammad, A. Al-Thaher. Efficient and Secure Key Exchange Protocol Based on Elliptic Curve and Security Models,” 2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), Amman, Jordan, 2019; 73-78.
3. H Boche, RF Schaefer. On the Algorithmic Computability of the Secret Key and Authentication Capacity Under Channel, Storage, and Privacy Leakage Constraints,” in IEEE Transactions on Signal Processing. 2019; 67: 4636-4648.
4. Q. Wang, X. Wang, QiuyunLv, Lin You, Wangke Y. Pre-process method for reducing initial bit mismatch rate in secret key generation based on wireless channel characteristics,” 2015 IEEE 16th International Conference on Communication Technology (ICCT), Hangzhou. 2015; 888-891.
5. Rizk-Allah RM, Hassanien AE. New binary bat algorithm for solving 0–1 knapsack problem”, *Complex & Intelligent Systems*.2017; 4: 31–53.
6. J Xie, D Wei. Multi-sensor Detection Network based on Improved Bat Algorithm,” 2018 IEEE 3rd Advanced Information Technology, Electronic and Automation Control Conference (IAEAC), Chongqing, 2018: 2061-2065.
7. Yang X. A New Metaheuristic Bat-Inspired Algorithm.2010. IEEE, *Studies in Computational Intelligence*.2010; 65–74 .
8. YechuangW, PenghongW, JiangjiangZ, ZhihuaC. A Novel Bat Algorithm with Multiple Strategies Coupling for Numerical Optimization”, *Mathematics*, 2019; 7: 135.
9. P Topno, G Murmu. An Improved Edge Detection Method based on Median Filter,” 2019 Devices for Integrated Circuit (DevIC), Kalyani, India, 2019; 378-381.
10. M Saya. Santhi, “Improved Edge Detection Method in OCT Images using a Hybrid Framework based on CGWO Algorithm,” 2019 International Conference on Communication and Signal Processing (ICCSP), Chennai, India, 2019; 0465-0469.
11. Panchal P, Bhojani R, Panchal T. An Algorithm for Retinal Feature Extraction Using Hybrid Approach. ELSEVER, *Procedia Computer Science*.2016; 79; 61–68.
12. JuliánG, Jose M. Hospital Miguel Servet, Mariano RincónZamorano, Margarita Bachiller and EnriqueJ. Carmona Suárez. DRIONS-DB, 2008. <http://www.ia.uned.es/~ejcarmona/DRIONS-DB.html>

Psychosocial Burdens of Hypertensive Patients

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Abstract

Hypertension is a major risk factor and antecedent of cardiovascular and end organ damage (myocardial infarction, chronic kidney disease, descriptive design was conducted in Babylon city outpatients and health centers to identify psycho-social burdens of patients with hypertension, A questionnaire including demographic information and two validated instruments assessing psychosocial burdens of hypertensive patients, Data were collected through self-administration of questionnaire regarding the study, Data were analyzed through applying descriptive analysis as frequency, percentage, The participants had 43-48 years aged (45.1%) and were married (88.0%) with Not educated (52.2%) and (71.7%) were Male, the physical indicators of sample weight 90 and more kg (50%) and height was 151-160 cm (38.6%) with normal BMI (38.0%).

Patients face stress and each day and the lack of enough time to relax and the lack of a holiday in the middle of the week, lead them to suffer various health problems such specially hypertension.

Keywords: *Psychosocial and Hypertensive.*

Introduction

Hypertension is a major risk factor and antecedent of cardiovascular and end organ damage (myocardial infarction, chronic kidney disease¹, ischaemic and haemorrhagic stroke, heart failure and premature death). It should not be treated alone, but include assessment of all cardiovascular risk factors in a holistic approach, incorporating patient-centred lifestyle modification.¹ Epidemiology of blood pressure Elevated blood pressure, known as hypertension, is an important and treatable cause of CVD morbidity and mortality. Hypertension is an independent risk factor for myocardial infarction, chronic kidney disease, ischaemic and haemorrhagic stroke, heart failure and premature death. Left untreated and/or uncontrolled, hypertension is associated with continuous increases in CVD risk, and the onset of vascular and renal damage. In 2012–13, 6 million Australians (34%) aged 18 years and over were hypertensive, as defined by blood pressure $\geq 140/90$ mmHg, or were taking antihypertensive medication. Of these, more than 4.1 million (68%) had uncontrolled or untreated hypertension. The proportion of Australians with untreated or uncontrolled hypertension was

greater in men than women (24.4% versus 21.7%), and was shown to increase with age peaking at 47% in individuals over 75 years of age. The incidence of untreated or uncontrolled hypertension was lowest in the Northern Territory (19.6%) and highest in Tasmania (28.6%).⁴ The prevalence of hypertension has also been associated with lower household income and residing within regional areas of Australia. (1) Global systematic reviews and meta-analyses suggest that the prevalence of dementia is lower in sub-Saharan Africa and higher in Latin America than in the rest of the world.^{3,4} According to Chaves et al,⁵ in Brazil the incidence of mild cognitive impairment (MCI) is 13.2 per 1000 person-years and for Alzheimer's disease (AD) is 14.8 per 1000 person-years. (2) In Brazil, despite the reduction in mortality from these diseases between 1996 and 2007, this group still represented the leading cause of death in the country in 2011. In 2000, hypertensive heart disease occupied the 16th rank regarding mortality worldwide, rising to 10th place in 2012. (3) Stress plays a pivotal role in an individual life in day to day life and the strain faced by the individual has been associated as an independent factor contributing to hypertension

in number of occupation, Factors like work-related stress, resulting in the imbalance between job demands, job control and domestic chores are the factors that plays a significant role in the etiology of hypertension in the modern era. Stress is difficult to analyze at the physiological and psychosocial levels due to its multi factorial causes.⁴

Whenever a women experience anger they try to keep it unknown or secretive of a fear that it will menace not only their femininity but also their surroundings and relationships, essential hypertension was found to be related with specific social ability insufficiencies that are apparent only during the self-assured expression of anger.

Socioeconomic status (SES) has long been identified as a risk factor for hypertension. A review by Spruill suggests a complex interaction of social, psychological, and behavioral factors contributing to unequal distribution of diseases. Compared to their high SES peers, individuals of low SES are more likely to lack socio-political power and economic resources thereby resulting occupancy of less health enhancing educational, occupational, residential and recreational environments. These factors lead to differential exposures to stressors (e.g., unemployment, crime and violence) and fewer resources (e.g., recreation and physical activity) to cope with accumulation of stressors that combine to contribute to greater risk of hypertension. In a recent meta-analysis, multiple indicators of SES (i.e., income, occupation, and education) were associated with an increased risk of hypertension⁵

This study aims to identify the psycho-social burdens of hypertensive patients in Babylon, assess the psychosocial burdens at each clinic visit can benefit health care providers by addressing challenges faced and facilitate subsequent referral to appropriate specialists.

Method

Design: A descriptive design was conducted in Babylon city outpatients and health centers to identify psycho-social burdens of patients with hypertension and their job in different cities of Babylon

Participants: None randomly selected patients between Jan 2016 and April 2017. When they attended outpatient clinics or health centers were handed covering letters explaining the purpose of the study, and assuring the confidentiality of information. Once in the target

number was (360) patients during the period of data collection, the sample of study was (184) patients.

Instruments: Instruments were developed and used in order to collect data. A questionnaire including demographic information and tow validated instruments assessing psychosocial burdens of hypertensive patients.

Data Collection: Data were collected through self-administration of questionnaire regarding the study. Participants provide self-report information across psychosocial burdens of teachers

Data analysis: Data were analyzed through applying descriptive analysis as frequency, percentage and mean score and the related data by using SPSS 23.0 software program. A level of P < 0.05 was considered statistically significant. Polite (1996).

Ethical Considerations: Ethical approval was obtained from a scientific research commute at the nursing college and governmental health department (2019/18).

Results

Table 1: Shows the demographic characteristics of the participants

Hypertensive Patients Age	Frequency	Percent
25-30	6	3.3
37-42	24	13.0
43-48	83	45.1
49 and more	71	38.6
Total	184	100.0
Patients Gender	Frequency	Percent
Female	52	28.3
Male	132	71.7
Total	184	100.0
Patients Marital Status	Frequency	Percent
Single	22	12.0
Married	162	88.0
Total	184	100.0
Patients Educational Status	Frequency	Percent
Not educated	96	52.2
Educated	88	47.8
Total	184	100.0

The participants had 43-48 years aged (45.1%) and were married (88.0%) with Not educated (52.2%) and (71.7%) were Male.

Table 2: Indicate the physical characteristics of hypertensive patients.

Hypertensive patients weight	Frequency	Percent
50-60	22	12.0
61-70	24	13.0
71-80	8	4.3
81-90	38	20.7
91 and more	92	50.0
Total	184	100.0
Hypertensive patients height	Frequency	Percent
140-150	50	27.2
151-160	71	38.6
161-170	57	31.0
171-180	6	3.3
Total	184	100.0
Hypertensive patients BMI	Frequency	Percent
Underweight	43	23.4
Normal	70	38.0
Overweight	53	28.8
Obese	18	9.8
Total	184	100.0

This table showed the physical indicators of sample weight 90 and more kg (50%) and height was 151-160 cm (38.6%) with normal BMI (38.0%)

Table 3: Shows the blood pressure measurement of the participants.

Blood Pressure	Frequency	Percent
No Hypertension	7	3.8
Risky for hypertension	55	29.9
Hypertension	122	66.3
Total	184	100.0

This table showed that (66.3%) of patients had hypertension during visiting the outpatients

Table 4: Shows the descriptive of blood pressure of the teachers

Descriptive Statistics					
B/P	N	Minimum	Maximum	Mean	Std. Deviation
BPSYS	60	100	180	141.67	17.866
BPDYS	60	60	120	90.83	12.391
Valid N (list-wise)	60				

The mean of systolic blood pressure was more the normal with St.d (17.866) (12.391)

Table 5: Shows the correlation between age of the patients and the blood pressure.

Blood Pressure	Age of the Patient/Years				Total
	25-30	37-42	43-48	49 and More	
No Hypertension	0	3	0	4	7
Risky for hypertension	3	6	24	22	55
Hypertension	3	15	59	45	122
Total	6	24	83	71	184

Discussion

Hypertension is regarded as a preventable public health problem. Despite increased prevalence of hypertension in many countries, treatment and control rates appear to improve as a result of effective public health strategies and changes in antihypertensive treatment

Iraq is one of the countries with a high prevalence of hypertension. According to study in Iraq (2016) showed that the prevalence of hypertension was 40.4%¹³. Ministry of Health, Directorate of public health and primary health care and Ministry of Planning and Development in collaboration with World Health Organization. Chronic non communicable diseases risk factors survey in Iraq.

In result of study (Prevalence of hypertension and Association of stress with Hypertension among teachers in primary School in - Hillah city) was proportion (66.7% - table 3) this proportion represent high prevalent of hypertension among teachers in Iraq compared to many studies in world countries was 25.2%. Al-Nozha et al.¹⁶ reported a prevalence rate of 26.1% among Saudis

Results of the Egyptian National Hypertension Project showed that the prevalence of HTN was 26.3%, (17) Ibrahim MM, Hypertension prevalence, awareness, treatment, and control in Egypt: Results From the Egyptian National Hypertension Project (NHP).

Many patients find that the disease has a significant restricting impact on their physical activity and impacts work and employment, household chores, social outings and travel, and their relationships.

In Canada, 85% of patients' activities of daily living are affected by their symptoms such as walking up a flight of stairs, having a telephone conversation, or walking a short distance (Pulmonary Hypertension Association of Canada, 2013). Caregivers similarly were impacted, as they expressed feeling exhausted from having to complete the extra tasks that patients were unable to complete. Caregivers often spent more than 50% of their time caring for the patient (Pulmonary Hypertension Association of Canada, 2013) Patients and caregivers reported that PAH affected their work, resulting in reduced household incomes. The sudden loss of a job and associated health insurance can cause a patient to feel a loss of independence and a loss of family contributions (Wryobeck, Lippo, McLaughlin, Riba & Rubenfire, 2017). In the Weber et al. (2017))

Conclusion

PAH is a devastating and progressive chronic illness with no known cure and carries with it a high mortality rate. Patients and their caregivers may experience many psychosocial burdens that are not often addressed at the time of clinic visits with their PAH health care providers. Left unaddressed, patients and caregivers suffer many forms of emotional distress. While many clinics do not have social workers or psychologist, a simple questionnaire assessing psychosocial burdens and maladaptive coping is suggested at each clinic visit in order to refer patients to appropriate services for assistance in their local community. Offering psychosocial support is best practice for PAH patients

Recommendations: If we believe that patients are indispensable for the success of life systems, must be care of this large segment of society that is struggling to raise the life reality in Iraq, we have to know the most important problems that suffer them, including psychological and social problems that pose a significant burden on teachers. Patients face stress and each day and the lack of enough time to relax and the lack of a holiday in the middle of the week, lead them to suffer various health problems such specially hypertension.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon Health directorate and all experiments were carried out in accordance with approved guidelines.

References

1. Anderson C, Amolda L, Cowley D, Dowden J. Guideline For The Diagnosis and Management of Hypertension In Adults. 2016.
2. Muela H, Costa-Hong V. Hypertension severity is associated with impaired cognitive performance. *Journal of the American Heart Association.* 2017; 6(1): 1–11.
3. Ribeiro T, Carvalho D. Prevalence of hypertension and its associated factors in contaminated areas of the Santos-São Vicente Estuarine region and Bertioga, Brazil: 2006-2009. *Environmental Science and Pollution Research.* 2016; 23(19): 19387–19396.
4. Cuffee Y, Ogedegbe C. Psychosocial Risk Factors for Hypertension : An Update of the Literature Psychosocial Risk Factors for Hypertension : an Update of the Literature. 2014.
5. Cuevas A, Prevention C. HHS Public Access. <https://doi.org/10.1016/j.ccl.2016.12.004>. *Psychosocial.* 2018; 35(2), 223–230.
6. Anderson C, Amolda L, Cowley D, Dowden J. Guideline For The Diagnosis and Management of Hypertension In Adults. 2016.
7. Bijnens E, Nawrot T, Loos R. Blood pressure in young adulthood and residential greenness in the early-life environment of twins. *Environmental Health: A Global Access Science Source.* 2017; 16(1): 1–8.

8. Dyal N, Dolovich L. Assessment of a hypertension screening and education intervention in Charlestown, Guyana: Hypertension Evaluation & Learning Program (HELP). *Canadian Pharmacists Journal*.2016; 149(1): 46–53.
9. Esler D, Raulli A, Pratt R, Fagan P. Hypertension: High prevalence and a positive association with obesity among Aboriginal and Torres Strait Islander youth in far north Queensland. *Australian and New Zealand Journal of Public Health*.2016; 40: S65–S69.
10. Lamptey P, Laar A, Adler A, Dirks R. Evaluation of a community-based hypertension improvement program (ComHIP) in Ghana: data from a baseline survey. *BMC Public Health*.2017; 17(1): 1–16.
11. Muela H, Costa-Hong V. Hypertension severity is associated with impaired cognitive performance. *Journal of the American Heart Association*.2017; 6(1): 1–11.
12. Ontario Centre of Excellence for Child and Youth Mental Health. Program evaluation toolkit - Tools for planning, doing and using evaluation. 2013.
13. Ribeiro T, Carvalho D, Guimarães M. Prevalence of hypertension and its associated factors in contaminated areas of the Santos-São Vicente Estuarine region and Bertioga, Brazil: 2006-2009. *Environmental Science and Pollution Research*.2016; 23(19): 19387–19396.
14. Rosendaal N, Hendriks M. Costs and cost-effectiveness of hypertension screening and treatment in adults with hypertension in rural Nigeria in the context of a health insurance program. *PLoS ONE*.2016; 11(6): 1–21.
15. Silva R, Barreto M. Evaluation of the care program implementation to people with high blood pressure. *Revista Brasileira de Enfermagem*.2016; 69(1): 71–78.
16. WHO. High blood pressure -Country experiences and effective interventions utilized across the European Region. World Health Organization.2013.

Association between Eating Disorders with Depression: A Descriptive Study

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Abstract

Background: Depression is the most prevalent mental health problem in the world, and it is considered more prevailing in women than in men. It is a recognized mental health problem that adversely impact upon the individual's ability to function and sufferer's daily life. Depression is common in people with eating disorders. It has a higher rate in patients with eating disorders than those without eating disorders.

Method: This is a descriptive study which included a sample of 50 patients diagnosed with major depressive disorder and having eating disorder behaviors visiting Ali Kamal consultation center for treatment and follow up. A questionnaire developed including Beck Depression Inventory and Garner-Eating Disorder Inventory. Data collected and analyzed using SPSS version 22.

Results: The result of this study indicated that there is statistical of interpersonal distrust, interoceptive awareness, and ineffectiveness of Garner-EDI-2 subscales with depression.

Keywords: *A descriptive study, eating disorders, depression.*

Introduction

Major depressive disorder is one of the public health problems¹, diagnosed as mental disorder (APA, 2013), with prevalence 3.6% of global population (WHO, 2012). The associations between depression and somatic and biological health have been recognized earlier¹, only recently there has been attention for the link between feeding and eating related behaviors and major depressive disorder². Depressed patients have been found to present eating disorder³, disturbances in dietary patterns⁴ and in eating styles⁵, Eating disorders

are somatic and mental health problems including anorexia nervosa, bulimia nervosa and binge eating, and subclinical forms are more frequent across all age groups, are classified in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (APA, 2013). Major depression in eating disordered patients varies from 30% to 70% in anorexia nervosa and about 40% in bulimia nervosa⁶. Anorexia nervosa is characterized by persistent behaviors that interfere with weight gain, disturbance in the way in which one's body weight or shape is experienced and lack of recognition of the seriousness of the current low body weight. Bulimia nervosa is characterized repetitive episodes of binge eating, followed by compensatory behaviors such as vomiting in an attempt to undo the excessive intake of food, as well as a disturbance in the perception of shape and weight, like in anorexia nervosa. In binge-eating disorder, patients do not generally have regular compensatory behaviors to combat excessive consumption of food and often present with overweight or obesity⁷.

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Methodology

Study Design: This is descriptive cross-sectional design that was conducted to assess the socio-economical and clinical background of the depressive patient. This study was carried out at the out-patient psychiatric clinic in Ali Kamal medical consultation center which is located in Sulaimani city from January 10th 2018 till October 1st 2019. The psychiatric clinic provides mental health treatment services to the community clients with psychiatric disorders. Most of the clients attending the clinic are already diagnosed previously by consultant psychiatrist.

Study Sample: A non-probability, purposive sample size of (50) patients with major depressive disorder were recruited from consecutive attendances to psychiatric clinic in Ali Kamal medical consultation center which were referred by consultant psychiatrist to the researcher of this study for data collection at the same setting.

Patients being older than 18 years old and above of both genders already diagnosed with major depressive disorder, and had drug adherence have been included in this study. Any patient was diagnosed with other mental disorders such as drug abuse, and pregnant women or puerperium was excluded from this study.

The Study Instrument:

A questionnaire was developed by the researcher which includes four parts:

The first, socio-demographic characteristics which include patient's age, gender, marital status, and level of education, occupation, residential area, income and anthropometric measurement {height, weight and body mass index (BMI)}. The second part is psychiatric history characteristics which include the duration of depression, number of hospitalizations, suicidal attempts and family history of mental illness. The third part is Beck Depression Inventory (BDI), which include minimal depression, mild depression, moderate depression and severe depression. It is one of the most widely used psychometric tests used for measuring the severity level of depression. It is a (21) multiple choice scale statements that evaluates key symptoms of depression. The fourth part is Garner Eating Disorder Inventory (G-EDI). This inventory used to assess eating behaviors. It comprises of 64 statements subdivided into eight subscales including behaviors concerning eating which are drive for thinness, bulimia, interpersonal distrust,

perfectionism, bulimia, maturity fears, interoceptive awareness, body dissatisfaction and ineffectiveness.

Measurement and Scoring: Beck depression inventory. This is (21) multiple choice scale statements, most widely used as psychometric test for measuring the severity levels of depression which includes minimal depression (17-20), mild depression (21-30), moderate depression (31-40), and severe depression (Over 40). Each item of Beck depression inventory is ranked in terms of severity of the symptoms, and scored four responses. Choices ranging from absence of a symptom (0) to an intense level (3).

Garner eating disorder inventory scale (G-EDI): A list of (64) items related to (8) subscales rated on six-point scale ranging from never to always. Items are scored as (never = 0, very rarely = 1, rarely = 2, occasionally = 3, frequently = 4, always = 5). For each sub-scale, item's score was added, and mean was calculated to find out the severity of the subscale. The higher the mean of score refers to the higher severity of eating disorder behaviors in each subscale.

Validity and Reliability: The face validity of the present study questionnaire was established through a panel of (13) experts of different specialists related to the field of the present study.

The internal consistency of the instrument was determined through the computation of Cronbach's Alpha test. The Cronbach Alpha test of the reliability of the questionnaire was (0.842).

Data Management: Data of the present study was analyzed through using application of statistical package for social sciences (SPSS) version (22). Frequency and percentage was used to show the sociodemographic attributes, psychiatric history and severity level of depression. Spearman's correlation coefficient was used to find out the association between depression and eating disorder behaviors and depression. The P-value of ≤ 0.05 was considered statistically significant.

Results

Table (1) shows that 50% of the sample are aged (30-39) years old with the mean 34.74 (± 8.32). The age range was 19 to 55 years. More than half (60%) of the sample were females. Regarding educational level, the table reveals that the highest percentage of the sample (40%) falls in read and writes level, followed by primary level

(32%). Most of the subjects were unemployed (64.0%), from urban area (82%), and insufficient monthly income were (56%), and (58%) falls in the normal range body mass index.

Table (2) appears that the duration of the current illness was less than five years in 36% of the total sample, 5-9 years in 26%, and ≥ 10 years in 38% of the sample. Around two thirds (64%) of the sample had no history of hospitalization and 26% had history of 1-2 admissions. Less than half (44%) of participant had history of suicidal attempt and 34% had family history of psychiatric illnesses.

Table (3) indicates that (40%) of the study sample has moderate level of depression, followed by (36%) mild depression, and (18%) severe depression.

Table 4 reveals the correlation of eating disorder behaviors among depressed patients. The result indicates that there is a significant correlation of some eating disorder behaviors with depression. This finding demonstrates that there is a significant relation of interpersonal distrust, interoceptive awareness and ineffectiveness associated with depression. Statistical values have shown that ($r= 0.39$, $p=0.005$) ($r= 0.333$, $p=0.018$) and ($r= 0.657$, $p=0.000$) respectively.

Table 1: Psychiatric history characteristics of the study sample.

Medical Background Characteristics	No.	%
Duration of current illness		
< 5	18	36.0
5-9	13	26.0
≥ 10	19	38.0
No. of hospitalization		
None	32	64.0
1-2	13	26.0
≥ 3	5	10.0
Suicidal attempt		
Yes	22	44.0
No	28	56.0
Family history of psychiatric illnesses		
Yes	17	34.0
No	33	66.0
Total	50	100.0

Table 2: Severity of depression of the study groups

Severity of Depression	No.	(%)
Minimal clinical depression	3	(6.0)
Mild depression	18	(36.0)
Moderate depression	20	(40.0)
Severe depression	9	(18.0)
Total	50	(100.0)

Table 3: Spearman's correlation of eating disorder behaviors with depression.

Eating Disorder Behaviors	Spearman's Correlation Coefficient	P-value
Drive for thinness	0.256	0.072
Interpersonal distrust	0.394**	0.005
Perfectionism	-0.023	0.874
Bulimia	-0.207	0.150
Maturity fears	0.245	0.087
Interoceptive awareness	0.333*	0.018
Body dissatisfaction	0.095	0.510
Ineffectiveness	0.657**	0.000

Discussion

In this study, results show that patients mean age was 34.7 (± 8.32) years, more than half were married, low educated level and most of them unemployed. These findings are similar to the result of the study done by Yousafzai and Siddiqi (2007) in Pakistan, who found that patients with major depressive disorder were in the middle of thirty years old, mostly married with low educational status. The findings of this study also confirmed by Fortinash and Warret (2012) who noted that, age of onset for major depressive disorder was between 25 to 44 years.

In regarding to gender, this study indicated that most of the cases 60% were female. Similar finding was found (2) in Netherlands. While this study is controversial with Ahmad et al (2016) in India and YousafZai and Siddiqi (2007) in Pakistan, who show that men are more predominance than women in major depressive disorder. However, some literatures noted that the lifetime prevalence of major depression more common in women than men. In this study most patients were insufficient with monthly income, and this finding was parallel with results of study by Ahmad (2017) in Sulaimani city. Previous studies widely acknowledged that the stressful social factors such as insufficiently economic status and unemployed contributed significantly to vulnerability

for depression. The mean BMI was 24.38 kg/(± 5.21). The BMI mean were almost similar to the finding in Paans et al, (2018) study in Netherlands. Some studies showed that depression may be related to disturbances in neurobiological appetite-related processes, and some of depressive patient would loss body weight (Boyd, 2008), while in this study the finding regarding to BMI was within normal.

The findings show that the higher percentage of duration of illness, 38%, was ≥ 10 year's history of depression and two thirds of the patients had no history of hospitalization. Similar finding was confirmed by Darwesh (2017) study in Sulaimani city. Currently, the psychiatric treatment is based on outpatient or community-based treatments, and the institutionalized patients are stay short in hospital. Many chronic patients will not require hospitalization unless for high risk patients with suicidal behaviors or sever psychotic symptoms.

The current study showed that suicidal attempts occurred among 44% among the subjects. This finding goes in the line of Kaviani et al (2011) study in Iran and Ribeiro et al (2018) study in USA. The American Psychiatric Association (2013) reported that the possibility of suicidal behavior exists at all times during depressive episodes. Ribeiro et al (2018) and Karasu et al (2009) confirmed the findings of this study and noted that the patients with major depressive disorder are at risk of suicidal behaviors.

This study demonstrated that 34% of patients had history of family mental illnesses. Similarly, Karasu et al (2009) reveal on that biological relationship have increased 1.5 to 3 times more risk of depression than general population. Moreover, the presence of family history of recurrent major depressive disorder increases the chances that patient's own illness will be recurrent.

In the term of symptomatic severity of depression, the results showed 40% of the total sample had moderate level of depression and 18% had severe level through the Beck Depression Inventory at baseline. The results of this study are similar to the findings of Salih (2016) study in Sulaimani and Paans et al (2018) study; they found that the severity of depressive symptoms was moderate level mostly among chronic disorder. In mild depression, usually causes symptoms that are detectable and impact upon daily activities; moderate depression can cause real difficulties; people with severe depression

may also suffer from delusion or hallucination, suicide is a distinct (APA, 2013). These findings are similar to the results of Calvert et al, (2018) study in Australia, Paans et al (2018) study in Netherland and Fairburn et al (2009) study in UK, who described the individuals with eating disorders have high levels of self-criticism, shame, dissociation, perfectionism and rigid thinking pattern.

The findings of this study confirmed by results of Penninx et al (2013) study who reported that depressed persons have been found to present disturbances in food-related behaviors including interpersonal distrust, interoceptive awareness and ineffectiveness.

A study depicted that both eating disorder and depression are interdependent on each other (3). The results indicate that there is a significant correlation of some eating disorder behaviors with the severity level of the depression. These findings demonstrate that there is a significant relationship of interpersonal distrust, interoceptive awareness and ineffectiveness with depression ($P \leq 0.05$). Another study has revealed that depression were associated with more emotional and uncontrolled eating and with less cognitive restrained eating (2).

Conclusion

The finding of this study indicates that the eating disorder behaviors which are interpersonal distrust, interoceptive awareness, and ineffectiveness are highly correlated with depression.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

References

1. Penninx B, Milaneschi Y, Lamers F. Understanding the somatic consequences of depression: biological mechanisms and the role of depression symptom profile. *BMC Med.* 2013; 11:129.
2. Paans N, Bot M, van Strien T, Brouwer I. Eating styles in major depressive disorder: Results from a large-scale study. *J Psychiatr Res.* 2018; 97:38-46.

3. Saleem M, Sattar S, Zafar M, Ismail R. Link between eating disorders and depression. *Pakistan Journal of Commerce and Social Sciences*. 2014; 8: 926-937.
4. Quirk SE, Williams LJ, O'Neil A. The association between diet quality, dietary patterns and depression in adults: a systematic review. *BMC Psychiatry*. 2013; 13: 175.
5. Goldschmidt AB, Crosby R, Engel S. Affect and eating behavior in obese adults with and without elevated depression symptoms. *Int J Eat Disord*. 2014; 47: 281-286.
6. Godart NT, Perdereau F. Comorbidity studies of eating disorders and mood disorders. Critical review of the literature. *J Affect Disord*. 2007; 97(1-3): 37-49.
7. Costa M, Menlik T. Effectiveness of psychosocial interventions in eating disorders: an overview of Cochrane systematic reviews. *Effectiveness of psychosocial interventions in eating disorders: an overview of Cochrane systematic reviews*. 2016; 14(2): 235-277.
8. Ahmad A., Altaf M, Jan K. Loneliness, self-esteem and depression among elderly people of Kashmir, *International Journal of Indian Psychology*. 2016; 3: 59.
9. Boyd M., (2008). *Psychiatric Nursing: Contemporary Practice*. Fifth edition, Wolters Kluwer Health/Lippincott Williams and Wilkins. P.P. 350-365.
10. Calvert F., Smith E., Brockman R., Simpson S. (2018). Group schema therapy for eating disorders: study protocol. *Journal of eating disorders*. 6: 1. PMID: 29344359.
11. Casañas R., Catalán R., del Val JL., Real J., Valero S., Casas M. (2012). Effectiveness of a psycho-educational group program for major depression in primary care: a randomized controlled trial. *BMC Psychiatry*. 2009; 18: 12:230.
12. Darweesh L. Assessment of quality of life among family caregivers of patients with depressive disorder attending Ali-Kamal psychiatric consultation clinic in Sulaimani city. University of Sulaimani. 2017.
13. Fairburn C, Cooper Z, Doll H. O'Connor ME. Transdiagnostic cognitive-behavioral therapy for patients with eating disorders: A two-site trial with 60-week follow-up. 2009; 166: 311-319.
14. Fernández-Aranda F, Álvarez-Moya EM. Predictors of early change in bulimia nervosa after a brief psychoeducational therapy. *Appetite*. 2009; 52(3): 805-808.
15. Garner D. *Eating Disorder Inventory-3. Professional Manual*. Lutz, FL: Psychological Assessment Resources, Inc. 2004.
16. Karazu C. *Suicide and attempted suicide, the medical basis of psychiatry*, 2nd edition, Philadelphia: W.B. Saunders. 2009.
17. Kaviani H, Rahim M, Darabad R. Overgeneral Memory Retrieval and Ineffective Problem Solving in Depressed Patients with Suicidal Ideation: Implications for Therapy *International Journal of Psychology and Psychological Therapy*. 2011; 11: 413-423.
18. Milaneschi Y, Sutin A. The association between leptin and depressive symptoms is modulated by abdominal adiposity. *Psychoneuroendocrinology*. 2014; 42: 1-10.
19. Morrison-Valfre M. *Foundations of mental health care*. Sixth edition. 3251 Riverport Lane. St. Louis, Missouri 63034. Elsevier Mosby. 2017; 237-242.
20. Pinto-Gouveia J, Carvalho SA, Palmeira L. BEfree: A new psychological program for binge eating that integrates psychoeducation, mindfulness, and compassion. *Clin Psychol Psychother*. 2017; 24(5): 1090-1098.
21. Salih. M. Assessment of coping strategies for stress in patients with major depressive disorder at mental health center in Sulaimani city, unpublished thesis, University of Sulaimani-Iraq. 2016.
22. World Health Organization. *Depression: a global crisis*. World Federation for Mental Health 20th Anniversary of World Mental Health Day: World Mental Health Day. 2012.
23. Yousafzai A, Siddiqi M. Association of lower self-esteem with depression: A case control study, *JPMI*. 2007; 21: 196-199.

Evaluation of Science Teachers' Knowledge towards Mumps Disease in Primary Schools

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Abstract

A descriptive study has been used the evaluating science teachers' knowledge towards mumps disease in primary schools. A probability (simple random sample) the sample consisted of 60 science teachers from 60 primary schools in Holy Kerbala city, during the period of January 2018 to the end of June 2019. The questionnaire involved two-part: the first, demographic data of teachers such as age, gender, and specialization, level of education, years of employment, participation in training course or workshop toward communicable diseases and second part, concerning teachers' knowledge about mumps in primary schools were comprised of (36) items divided to (6) items related to knowledge about anatomy and physiological of salivary glands, general knowledge about mumps (5) items, knowledge about signs and symptoms of mumps disease (7) items, knowledge about diagnosis and complications of mumps disease (6) items, knowledge about mode of transmission for mumps infection (6) items, knowledge about prevention and treatment of mumps disease. The data was collected by a questionnaire which consisted of two parts, the first part consists socio-demographic data, second part was about the knowledge of mumps disease which consist of (36) items scale of knowledge about mumps disease. In the present study, data were analyzed through the use of statistical package for social sciences (SPSS), version 24. The finding of the study indicated that most of the teachers who participated in the study were female, most of them graduated from institutes and they have an extremely low level of knowledge toward mumps ranges between poor and fair. The study recommends encouraging teachers' participation in the health education program, especially programs that deal with communicable diseases because the risk of spread these diseases among the school community.

Keywords: *Evaluation, Science Teachers, Knowledge, Mumps, Primary Schools.*

Introduction

Mumps virus can infect the children and adults at the same time. This virus is spread when an infected person talks, coughs or sneezes small droplets containing infectious agents into the air. The droplets in the air may be breathed in by those nearby. Infection may be spread by contact with hands, tissues and other articles soiled by the infected nose and throat discharges. Mumps virus is also spread by direct contact with the saliva of an infected person¹. The crowded places such as schools considered high risk to spreading mumps. Many schools was closed because lack of control on the spread of the disease. Mumps was most commonly reported among young school-age children². the schools consider a vital aspect of pupils' health because teachers who can spend time in

the classroom occasionally are more aware of the details of their child's day. When increasing the knowledge of primary school teachers toward the signs and symptoms of mumps, the complications of the disease and how to deal with infected children will help in the early diagnosis of the disease and transfer the infected patient to the hospital as soon as possible therefore decreasing the spread of the disease among the rest of the students. So, the teachers need to play a major role in the health aspect of school children³. School health is effective in helping students achieve their health literacy, enhance their health-related behaviors, and thereby improve their health status. However, in resource-limited countries, evidence is limited to show the impact of school health⁴. Health Promoting School (HPS) strives to make school a positive experience for pupils, staff, and visitors by

paying special attention to all aspects of health in every area of the school. The whole school community takes action and places priority on creating an environment that will have the best possible impact on the health and learning of pupils, staff, and parents⁵.

Methodology

A descriptive study has been used the evaluating science teachers' knowledge towards mumps disease in primary schools. A probability (simple random sample) the sample consisted of 60 science teachers from 60 primary schools in Holy Kerbala city, during the period of January 2018 to the end of June 2019. The questionnaire has been constructed according to the review of the related literature about mumps was used for data collection. The content validity has been determined through the panel of 17 experts their specialties fields are nursing and medicine. and its reliability was estimated through a pilot study conducted in (10) schools is excluded from the original sample which included (10) primary school teachers. Thereliability of the questionnaire is determined through the use of pre-posttest technique and computing of correlation coefficients ($r=0.93$). The questionnaire involved two-part: the first, demographic data of teachers such as age, gender, and specialization, level of education, years of employment, participation in training course or workshop toward communicable diseases and second part, concerning teachers' knowledge about mumps in primary schools were comprised of (36) items divided to (6) items related to knowledge about anatomy and physiological of salivary glands, general knowledge about mumps (5) items, knowledge about signs and symptoms of mumps disease (7) items, knowledge about diagnosis and complications of mumps disease (6) items, knowledge about mode of transmission for mumps infection (6) items, knowledge about prevention and treatment of mumps disease. The questionnaire was submitted to the teachers for the evaluating their knowledge about mumps disease. Ranging and scoring of study used the triple Likert scale was used for the purpose of items' rating which are scored as follows: yes= 1, uncertain= 2 and no= 3. The level of overall knowledge was estimated by calculating the mean of score and the cutoff point for the total score of knowledge as follow: poor knowledge (36 – 60), fair knowledge (61 – 84), and good knowledge (85 – 108). The level of knowledge for sub-domain was also estimated by calculating the mean of score and the cutoff point for the total score of sub-domain knowledge

as follow: the sub-domains of “anatomy and physiology, diagnosis and complications of mumps, mumps' mode of transmission, and prevention of mumps” were scored as follow: poor knowledge (1 – 1.66), fair knowledge (1.67 – 2.33), and good knowledge (2.34 – 3).the data of the study were analyzed through the use of Statistical Package for Social Science Program (IBM SPSS) version 24 24 through a statistical approach that includes (frequency, percentage, Mean of score (M.S.) and standard deviation (SD).

Results and Discussion

Table (1) indicates that the level of overall teachers' knowledge toward mumps (47.2%) for both level poor and fair that reflect a clear decreasing in levels of knowledge about mumps. The study used variables for the first time and there are no studies to support the findings. in the following paragraphs, the teachers' knowledge about mumps disease will be discussed for each of the following items, the anatomy and physiology, general information about mumps, symptoms and symptoms of mumps, diagnosis and complications of mumps, mode of transmission and finally the prevention and treatment of mumps. The evaluation of teachers' Knowledge toward mumps for each item of (table 2) which have six-part (A,B,C,D,E and F), A “ knowledge related to anatomy and physiology of salivary glands “ this part reveals that teachers among study group are showing fair level of knowledge regarding the item 1, 2, and poor level regarding remaining items of 3, 4, and 5 except item 6 the mean of score indicate good levels. B “ teachers' knowledge about general information of mumps “ this part depicts those teachers among the study group showing fair level of knowledge among all items of general knowledge domain except item 5 that show good level. C “ teachers' knowledge about symptoms and signs of mumps “ this part indicates that the mean of scores of all items were a poor so there are clear decrease in the level of knowledge regard signs and symptoms of mumps . D “ knowledge about diagnosis and complications of mumps “ this part indicates poor level among all items except item 4 which are fair. E “ knowledge about mode of transmission of mumps “ this part reveals among study group teachers are showing fair level of knowledge among all items except item 5 that reflects good level. F “ evaluation of teachers' knowledge about prevention and treatment of mumps” This part reveals fair level of knowledge in items 1, 2, 5, and poor level in items 3, 4, and 6.

Table (1): Overall Evaluation of Teachers’ Knowledge toward Mumps disease

No.	Levels of Knowledge	Frequency	Percent	Cumulative Percent	M.S	S.D
1	Poor	17	47.2	47.2	1.58	.604
2	Fair	17	47.2	94.4		
3	Good	2	5.6	100.0		
Total		30	100			

M.S: Mean of score, SD Standard deviation, Poor= 36 – 60, Fair= 61 – 84, Good= 85 – 108

Table (2): Evaluation of Teachers’ Knowledge toward Mumps disease

A	Knowledge related to Anatomy and Physiology	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	Salivary glands include two types of glands: parotid and subcutaneous glands only.	21	35	21	35	18	30	1.95	Fair
2	The parotid gland is the smallest salivary glands.	16	26.7	31	51.7	13	21.7	1.95	Fair
3	The parotid gland does not secrete saliva but has a key role in enhancing immunity.	45	75	12	20	3	5	1.3	Poor
4	The parotid gland is located under the lower jaw and under the tongue.	42	70	6	10	12	20	1.5	Poor
5	Some cases of mumps spread swelling to the chest and cause health problems.	31	51.7	20	33.3	9	15	1.63	Poor
6	In mumps, there is no possibility that the rest of the lymphatic system will be affected.	18	30	14	23.3	28	46.7	2.16	Good
B	General Knowledge about Mumps	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	A bacterial disease caused by bacteria called mumps.	34	56.7	11	18.3	15	25	1.68	Fair
2	Age is not considered a risk factor. All ages have the same chance of infection.	34	58.3	2	3.3	23	38.3	1.8	Fair
3	Taking some medications do not affect the rate of infection.	15	26.7	29	48.3	15	25	1.98	Fair
4	The particles of mumps live within particular organs (e.g. parotid glands), do not spread to other organs through blood circulation or lymphatic systems.	31	51.7	14	23.3	15	25	1.73	Fair
5	There is no need to isolate the patient with mumps.	6	10	6	10	48	80	2.7	Good
C	Knowledge about Symptoms and Signs	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	Mumps causes swelling and pains in the salivary glands that located at the upper side of the jaw in front of the ear.	56	93.3	2	3.3	2	3.3	1.1	Poor
2	All patients with mumps have symptoms of swelling in the parotid glands.	48	80	6	10	6	10	1.3	Poor
3	Initial signs and symptoms include painful swelling of one or both of the parotid glands.	55	91.7	4	6.7	1	1.7	1.1	Poor
4	The symptoms generally occur between the two days 5-7 days after exposure.	39	65	17	28.3	4	6.7	1.41	Poor
5	Symptoms disappear 7 to 10 days after infection.	34	56.7	16	26.7	10	16.7	1.6	Poor
6	The person becomes infectious after several days of onset of symptoms and not considered infectious before the onset of symptoms.	38	63.3	11	18.3	11	18.3	1.55	Poor
7	Symptoms are more severe in children than adults.	44	73.3	6	10	10	16.7	1.43	Poor

D	Knowledge about Diagnosis and Complications	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	One condition for the diagnosis of mumps is the presence of symptoms.	51	85	2	3.3	7	11.7	1.26	Poor
2	When there is swelling in the parotid gland, the diagnosis is mumps and can be confirmed by palpation the sublingual glands.	37	61.7	18	30	5	8.3	1.46	Poor
3	Blood test for antibodies (IgM) provides a final result of the diagnosis.	32	53.3	27	45	1	1.7	1.48	Poor
4	Meningitis of the brain is not considered a complication of mumps.	22	36.7	25	41.7	13	21.7	1.85	Fair
5	Possible to swelling in the ovarian or testicles in equal proportions.	32	53.3	23	38.3	5	8.3	1.55	Poor
6	The rate of infertility in female more than male.	24	40	18	30	18	30	1.9	Poor
E	Knowledge about Mode of Transmission	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	Mumps infection can be controlled because it is a slow spread among people.	32	53	9	15	19	31.7	1.78	Fair
2	Mumps infection spreads in winter; spring, autumn and summer alike.	30	50	9	15	21	35	1.85	Fair
3	Mumps is transmitted from person to person and can be transmitted from animal to human.	28	46.7	22	36.7	10	16.7	1.7	Fair
4	Human is not considered the only natural host to mumps.	20	33.3	28	46.7	12	20	1.86	Fair
5	Mumps infection is not transmitted through the saliva of an infected person that sprays in the air.	15	25	6	10	39	65	2.4	Good
6	Mumps virus cannot survive on surfaces, so contact with infected objects is not considered dangerous.	18	30	14	23.3	28	46.7	2.16	Fair
F	Knowledge about Prevention and Treatment	Yes		Not sure		No		M.S	Level
		F	%	F	%	F	%		
1	After the infected with mumps disease, the person has not acquired immunity against the disease for life.	23	38.3	7	11.7	30	50	2.11	Fair
2	There is a high probability of recurrent infection of mumps in a previously infected person.	18	30	12	20	30	50	2.2	Fair
3	Mumps can be prevented by taking four doses of mumps vaccine.	31	51.7	27	45	2	3.3	1.51	Poor
4	Mumps vaccine is often given alone and is not combined with another vaccine.	33	55	23	38.3	4	6.7	1.51	Poor
5	The availability of mumps vaccine is not an important factor that effects on rates of infection.	16	26.7	14	23.3	30	50	2.23	Fair
6	There is a specific treatment for mumps that can be given for cure from disease.	44	73	5	8.3	11	18.3	1.45	Poor

M.S: Mean of score, Poor= 1 – 1.66, Fair= 1.67 – 2.33, Good= 2.34 – 3

Conclusion

The finding of the study indicated that most of the teachers who participated in the study were female, most of them graduated from institutes and they have an extremely low level of knowledge toward mumps ranges between poor and fair level of knowledge. The study

recommends encouraging teachers' participation in the health education program, especially programs that deal with communicable diseases because of the risk of spreading these diseases among the school community. Emphasis on future studies could be done to evaluation teachers' knowledge relating to other communicable

diseases at the primary schools. Hence, increase the awareness of the school community's awareness about these diseases.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Nursing, University of Baghdad. Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Australia Ministry of Health. Notifiable conditions. the law requires doctors and laboratories to report some infections or diseases to SA Health. 2018; available in: <https://www.sahealth.sa.gov.au>.
2. Orenstein, W.A., Offit, P.A., Edwards, K.M. and Plotkin, S.A., (2018). Preface to the Seventh Edition. In Plotkin's Vaccines (Seventh Edition).2018; p:666.
3. Gowri, M. & Missiriya, S., Knowledge and practice of school teachers on health care of school children. *Int J Pharm Bio Sci.* 2017; 8(1), 227-231.
4. Shrestha, R. M., Miyaguchi, M., Shibamura, A., Khanal, A., Yasuoka, J. & Jimba, M.A School Health Project Can Uplift the Health Status of School Children in Nepal. *PloS one.*2016; 11(11), e0166001.
5. The Health Service Executive of Ireland. Schools for Health in Ireland. Publication Date: July 2013/Review Date: October 2015 available on: <https://www.healthpromotion.ie/hp-files/docs/HPM00841.pdf>. 2015; p:3.
6. Cheng, N.Y.I. and Wong, M.Y.E. Knowledge and Attitude of School Teachers towards Promoting Healthy Lifestyle to Students. *Health.* 2015. 7, 119-126.
7. Hussein, A., Sheren, N. A., Fatah, K. Knowledge and Attitude of Teachers about Communicable Diseases in some of Primary Schools in Erbil kufa *Journal for Nursing sciences.*2012.2(2), p: 135-141.
8. Faraj, R. K. & Khalifa, M. F. Assessment of Science Teachers' Awareness towards Communicable Diseases Control in Baghdad City Primary Schools. *nursing national Iraqi specility.* 2014. 27(2), 7-16.
9. Sahebihagh, M. H., Hosseini, S. Z., Hosseinzadeh, M., Shamshirgaran, S. M. Knowledge, Attitude, and Practice of Teachers in Tabriz(Iran) Elementry Schools Regarding Child Abuse (2015-2016). *International Journal of Medical Research & Health Sciences,* 2016, 5, 9S:336-343.
10. Htun, Y.M., Lwin, K.T., Nwe, N., Soe, K., Sein, T.T. Knowledge, attitude and reported practice of primary school teachers on specified school health activities in Danuphyu Township, Ayeyarwaddy Region, Myanmar. *South East Asia Journal of Public Health.*2013.3(1):24-29.
11. Ganpatrao, J. S. Knowledge and practices of school teacher regarding disaster management. *International Journal of Health System and Disaster Management.* 2014.Vol. 2,Issue 2. p:98-102.

Chromosomal Aberration and Histopathological Effect of Metronidazole-Induced Toxicity in Male Rat

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Abstract

One of the most world anti parasitic and antibacterial compound used is Metronidazole (MTZ), all Drug toxicity must be acceptable to relief patients and should cause less harm to human than infection itself. MTZ is potentially genotoxic to humans due to the following facts: it is a proven toxogenic to human cells as well as wide range of side effects including chromosomal aberration and reproductive toxicity. The study is designed to assess the cytotoxic and reproductive toxicity effects of two dose of MTZ (250 mg/kg b.wt group and 500 mg/kg b.wt group) orally by gavage for 30 days and compared with control group (given normal saline) and then examine chromosomes from bone marrow cells and testicular gametogenic activity of adult male albino rats.

Evident toxicity of both treatments of MTZ groups on chromosomal aberration (fragment, deletion and ring chromosome), with increased number of polyploid cells which were significantly increased ($P < 0.05$) by dose and time compared with control group. MTZ significant decrease in sperm activity and in deformed form ($P < 0.05$) as well as reduced testes weight, also MTZ stimulate injured in seminiferous tubules especially germinal epithelium.

Keywords: *Metronidazole Genotoxic Chromosomal aberration, Seminal Vesicle, Sperm, Testis.*

Introduction

Metronidazole, a nitroimidazole the trade name is flagyl or Nidagyl, involved in first option in the relief the inflammatory disorders of the digestive and vaginal infections, it is therapy to treated microaerophiles like *Helicobacter pylori*, protozoa infection including amoebiasis and giardiasis in addition to methanogenicarchaea^(1,2). are activated via its reduction through reducing nitro group when low oxygen, forming fragmentation of imidazole and cytotoxicity is related with the amount of metronidazole uptake. the Reduction happen by two routes, The inactivation reduction of metronidazole to non-toxic amino stable derivative is oxygen insensitive⁽³⁾. during reduction activation the drug MTZ uptake electrons leading to form ring division and produced cytotoxic derivatives, this lead to the MTZ action as electron acceptor and prevent the force of proton motion lead to decreasing ATP formation, at the beginning the MTZ produced free radical (nitroso) and derivative of hydroxylamine the high affinity of

oxygen for e⁻ than MTZ from generates oxygen radicals which stimulate DNA strand breaks^{1(4,5)}. This drug is highly metabolized in liver and excreted by kidney and less with feaces^[2], After absorbed by intestine canal and increased its concentration in tissues, will be metabolized highly in liver via oxidation and glucuronide formed and this highly water solubility than the Glucuronic acid is original substance and excreted via kidney and little amount with feaces⁽⁶⁾, significantly MTZ have capability in reduced the amount of colonic oxidative damage to proteins with no any effect on liver and on the glutathione levels along the bowel⁽⁷⁾. This drug advised by clinicians for long period about 4-8 weeks in special disease as Crohn's disease, Chagas disease, endocarditis, osteomyelitis infection of deep neck, joint and liver abscess caused health problems on male fertility when studied on laboratory rats⁽⁸⁾.

Objective(s): Aim of our study was to investigate the influenced of MTZ on cytogenetic and spermatogenesis

by observing the chromosomal aberration and histological changes of testes in adult male rats.

Material and Method

The drug we used ismetronidazole (flagyl) tablets 500 mg is produced by Novartis Pharma company Switzerland.

Experimental Animals: The types of rats in this experiments are 15 adult male (*Rattusnorvegicus*) weighting 200-250 gm in Faculty of Science, University of Kufa, in order to adapted rats to lab conditions we kept them in animal house at $24\pm 28^{\circ}\text{C}$ under 12:12 hr light and dark cycles (standard environment) for pellets food and water in the animal house. After 2 weeks of adaptation three groups, each one consist 5 rats, Group 1 depend on normal saline, group 2 received metronidazole 225mg/kg p.o. whereas groups 3, received 500mg/kg. of flagyl, prepared as homogenized suspension in normal saline, Animals were treated for 30-days

Bone marrow chromosome assay: After thirty days all animal injected with intrapretoneal colchicines (4mg/kg), to stop the division of cell. After two hours from given colchicines, animals were sacrificed and preparation of chromosomes from bone marrow according to Alder 1984^(9,10), which includes aspirated the bone marrow from femur bone with one milliter of 0.075M KCl. The harvest cell preserved at 37°C for 20 minutes and centrifuged at 1000 rpm (10 min.). Then cells fixed in Carnoy's fixative (methanol: acetic acid = 3:1) ratio and dropped from distance about 25 cm on

cool clean slides to facilitate the bursting of the cells. Then drying slides and stained with giemsa 10%, 6.8 pH for 5 min. examined any abnormalities of chromosomes at magnification of 1000 X (100 X 10).

Sperm abnormality assay: After animals sacrificed the epididymis excised, the sperms suspension was formed in 1ml saline. Then dropping suspension on clean slides and dried, fixed with absolute methanol, finally stained with hematoxylin (15 min.), the slides washed by the tap water, then using 1% Eosin for (5 min), after that slide washed by distilled water and drying slide⁽¹¹⁾.

Ethics: The collection of samples carry out within a specific barrier system in necropsy room in the animal house in science college of kufa university to minimize the suffering of animals.

Statics: Statistical analysis was done by using mega stat soft ware, Values are analysed at $p < 0.05$.

Results

The data obtained from bone marrow examination at metaphase stage are in table 1. the significant differences among groups. By presence of chromosomal aberration as control group. The deletion aberration was highest value in Flagyl dose 500mg/kg and Flagyl 250mg/kg were 11.4 ± 2.07 and 6.6 ± 1.34 respectively, then fragmented chromosome 7.2 ± 0.84 and 4.0 ± 0.71 respectively while ring aberrations record low value in treated groups.

Table 1: Chromosomal aberrations of bone marrow cells of experimental rats (mean \pm S.D).

Group	Chromatid Break	Fragmented Chromosome	Aneuploidy	Deletion	Dicentric Chromosome	Ring
Control	0.0 \pm 0.0	0.2 \pm 0.45	0.0 \pm 0.0	3.4 \pm 1.34	0.0 \pm 0.0	0.0 \pm 0.0
Flagyl 250mg/kg	1.8 \pm 1.10	4.0 \pm 0.71	0.0 \pm 0.0	6.6 \pm 1.34	0.4 \pm 0.84	0.2 \pm 0.45
Flagyl 500mg/kg	3.8 \pm 1.92	7.2 \pm 0.84	2.6 \pm 0.89	11.4 \pm 2.07	1 \pm 1.73	0.8 \pm 0.4

The figure 1(A-E) shows many types of structural chromosomal aberrations, the line pointed translocation, breaks, chromatid gap, chromosome gap, acentric, ring, aneuploidy with thickening chromosomes, chromosomal

association, chromatid gap and polyploidy respectively. The numerical aberrations appeared as polyploidy cells and an aneuploidy.

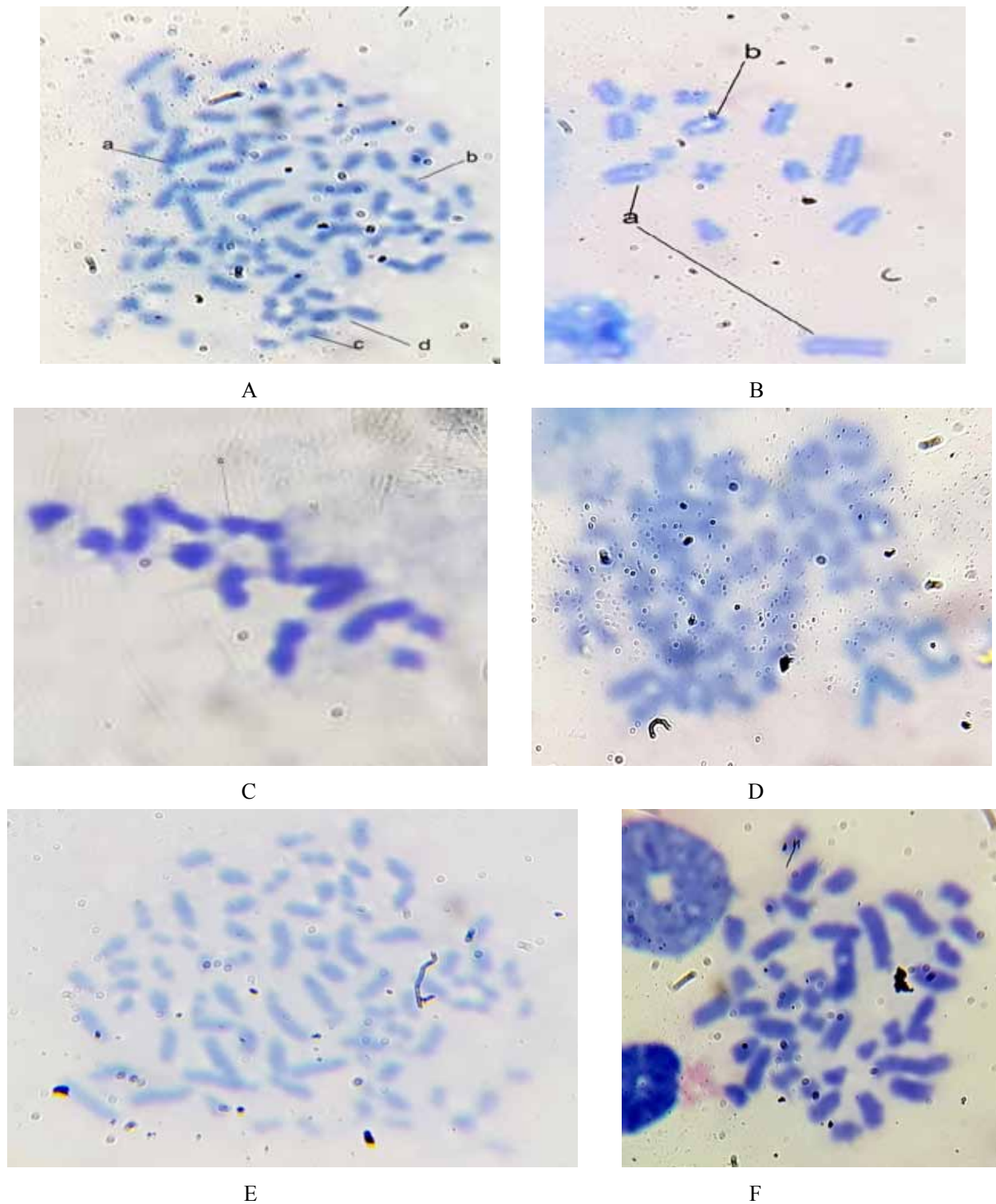


Figure (1): Metaphase stage of bone marrow treated rats with MTZ. A (a translocation b; chromatid break; c chromatid gap d; chromosome gap); B (a acentric b ring); C(aneuploidy with thickening chromosomes); D chromosomal association and chromatid gap); E polyploidy(chromosomal break); F (control group).

Sperm abnormality Assay: The results of the sperm abnormality are shown in the table 2. Show the most prominent deformations were folded or coiled filament, amorphous, flagellum with ansa, double head, double

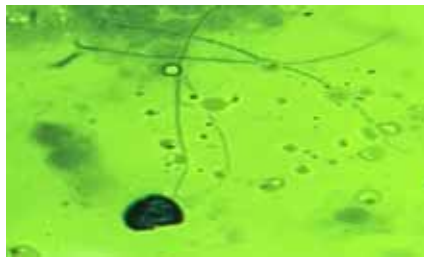
tail, coil with microcephaly, bent at cephalocaudal region, hookless flagella and multiple abnormalities as included in the Figure 2. The treatment with MTZ induced significant abnormalities than control ($P < 0.05$).

Table 2: Changes in some sperm abnormality of experimental rats (mean±S.D).

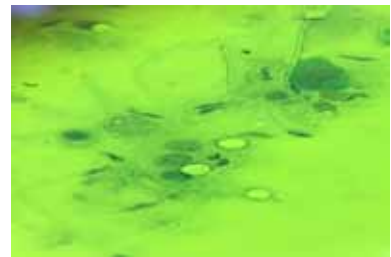
Sperm Abnormalities	Control	MTZ-250 mg/kg	MTZ-500 mg/kg	p
Normal	93.40±5.2	77.00±3.39	43±2.45	p<0.05
coiled/folded	5±0.7	6.2±1.30	14.20±3.1	<0.05
Bent at cephalocaudal	0	7.6±1.67	9.3±2.12	<0.05
Flagellum with ansa	1±0.7	5.8±1.3	7.8±1.3	<0.05
Amorphous	0.8±0.84	3.4±1.02	9.40±1.14	<0.05
Multiple abnormality	0	9.40±2.3	11.20±1.3	<0.05
Double tailed	0	5±1.4	8.4±0.89	<0.05
Coiled with	0	8.60±0.55	14.80±1.10	
Hookless flagellum	0	4.40±0.55	8.20±0.84	



A



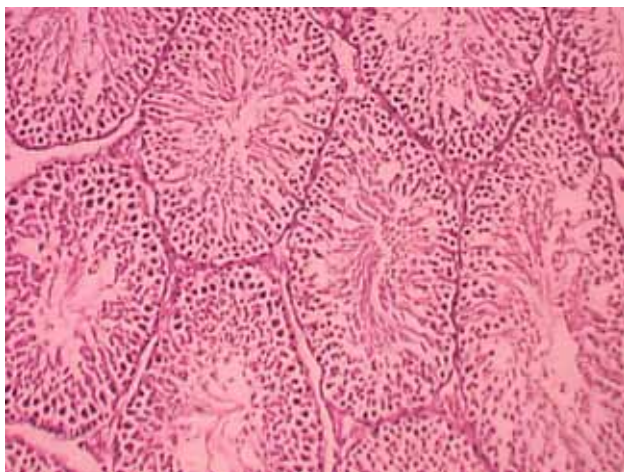
B



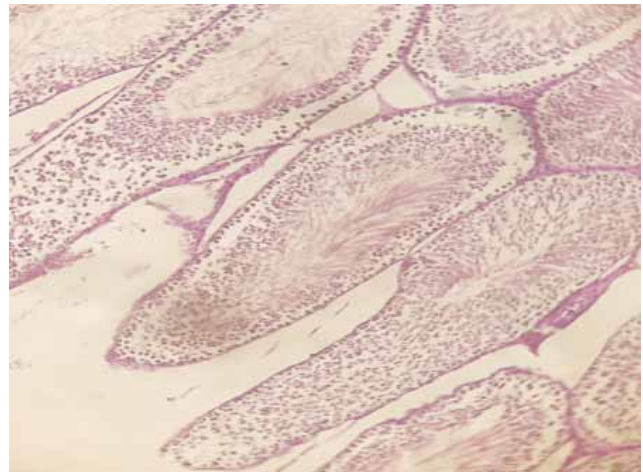
C

Figure (2): Deform shapes of sperms in treated rat with MTZ. A flagellum with ansa and folding; B abnormal sperm; C only head.

Histological Examination: Testes with seminiferous tubules of the control rats had normal appearance (A). but (B-D) of treated rats with MTZ (250, 500 mg/kg/day); (B) reveals the little effect of shrinkage at (250 mg/kg/day)dose, C-D MTZ500 mg/kg/day, show sloughing, depletion, vacuolization and disorganization of the cells like multinucleated giant cells in the seminiferous tubules.



A



B

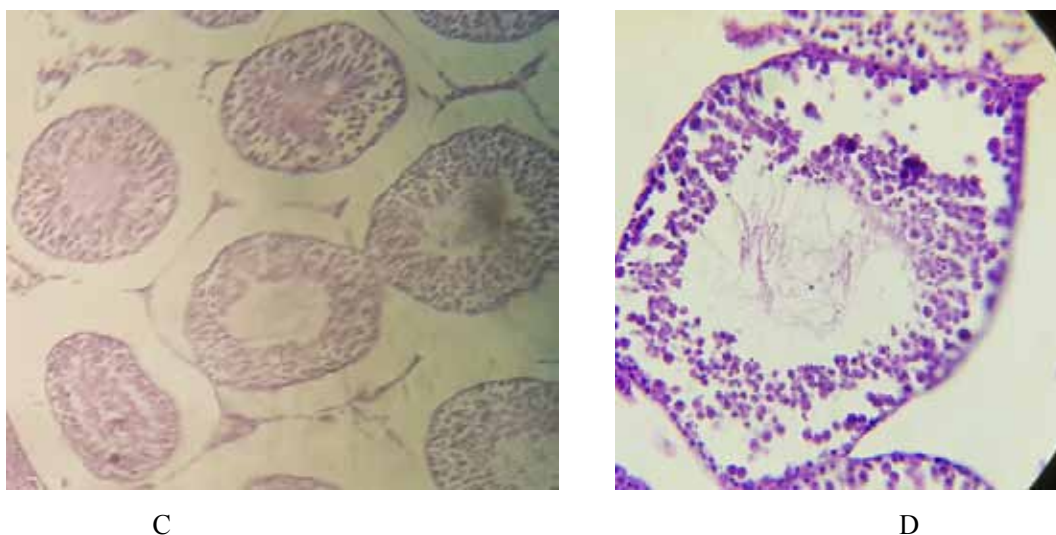


Figure (3): Show section in testis of control (A) was normal of seminiferous tubules. (B-D) MTZ (250, 500 mg/kg/day)-treated rats: (B) shows the little change of the seminiferous tubules and atrophy of leydic cell(250 mg/kg/day),C-D MTZ500 mg/kg/day, sloughing,depletion, vacuolization and disorganization of the cellsatrophy and little Leydig cells .

Discussion

Genotoxicity tests able to detect drugs that cause genetic damage by interaction with other cellular targets, such as enzymes and microtubules, are particularly interesting. This study assessed with toxicosis effect of MTZ on male rats based on chromosomal aberration, sperm abnormalities and histopathologic alterations in testes tissue depending on WHO International Agency for Research on Cancer the MTZ considered as a possible carcinogen.^[12] there was study denoted to chromosomal abnormalities in circulating lymphocytes in people with Crohn's disease treated with metronidazole.^[13]

Chromosomal abnormalities are usually diagnosed structural changes and rearrangement *in vivo* at metaphase^[14].

The mechanism explain the stimulation of chromosomes aberration include free radical production by two way first was auto-oxidation and second by enzyme-catalyzed oxidation of organic compounds, this caused peroxidation of lipids of membranes in tissues then induced damage in DNA bases via formation covalent binding between the product of lipid peroxidation and DNA^[15,16].

Our results show those genotoxic of receiving high dose of MTZ for long period about 30 days in

experimental group male rats were significant increasing of chromosomal abnormalities in treated rats as comparing to control group in agreement with previous study⁽¹⁷⁾, this drug depending on WHO International Agency for Research on Cancer the MTZ considered as a possible carcinogen.¹⁸ it s caused most chromosomal aberration like chromatid breaks due to change in chromosomal protein charge or DNA cross linking^[19, 20]. This increased aberrant metaphase percent⁽²¹⁾, A chromosome dicentric is one an aberrant chromosome having two centromeres, resulted in unusual behavior, a dicentric chromosome appear abnormal chromosome behavior during cells division lead to abnormal separation of chromosomes to daughter cells, both small breaks and a centric fragments (lacks centromere) couldn't survive to the next generation and the consequence of this lead to loss genetic material in these cells²². The ring shape of chromosome result from part of chromosome has broken off and then sticky end fused to form ring, Interchanged between chromosomal segments, These aberration lead to loss or mistakes in genetic material, All these abnormality belong to attack DNA by the free radicals, besides some spots in purine, lead to base substitution and breakage of DNA, or mutation^[23].

In present, MTZ the abnormal sperm significantly increased, the C3-chloro side-chain of the nitroimidazole ring^(24,25) is one of the metabolites of ornidazole can

formed 3-chloro-lactaldehydethe and α -chloro-hydrin, are prevent work of the glycolytic enzymes like glyceraldehydes-3- Phosphate dehydrogenase (GAPDH) and triosephospahteisomerase (TPI) in the spermatozoa⁽²⁶⁾.this reduce ability of spermatozoa to get ATP by the glycolytic pathway⁽²⁷⁾.and then Spermatogenic cells would be injured by the increased inhibition of α - glycosidase malondialdeyde (MDA), while the less activity of sperm belong to energetic transferase diminished⁽²⁸⁾.

Our observed agree with^[29] whom revealed in their experiments, after 700 mg/kg b.wt. as single dose of 2 thiazolyl-5- nitroimidazole caused infertility after 3 weeks in mice, then after 48 days return fertility maybe due to decreasing in circulating hormones LH,FSH and biosynthesis testosterone may affect the spermatogenesis lead to diminished in activity motion of sperms and highly abnormalities sperm shape⁽³⁰⁾.also there is signfigant differences in histological changing for testes of treated groups 250mg/kg and 500mg/kg than control group as figure 3,we found the little shrinkage of the seminiferous tubules(250 mg/kg/day),than MTZ500 mg/kg/day, as well as vacuolization, disorganization, depletion and sloughing of the germ cells and at high dose we found the evacuation of seminiferous convoluted tubules from sperms and limited number of Leydig cells at interstitial tissue between the seminiferous convoluted tubules,our study agree with⁽³¹⁾,the reason belongs to formation of free radical this increased direct and indirect oxidative stress leading to cells destruction and this appearance resulted in LH and FSH depletion which in turn on spermatogenesis⁽³⁰⁾

Conclusion

From this study we have come up with a serious toxicity MTZ for high dose and long term on chromosomes structure DNA,histopathological effect on testis tissues and sperms shape in addition to motion sperms defect.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology and all experiments were carried out in accordance with approved guidelines.

References

1. Dingsdag S.A. and Hunter N. Metronidazole: an update on metabolism, structure–cytotoxicity and resistance mechanisms J Antimicrob Chemother 2018; 73: 265–279
2. Frey. H.H and W. Loscher Lehrbuchderpharmakologie und Toxicologie fur die VeterinarMedizin. Enke Stuttgart, 502-503. International Journal of Pharmacology., 1996; (3): 252-256. Asian Network of Scientific Information.
3. Rolda'n MD, Pe' rez-Reinado E, Castillo F et al. Reduction of polynitroaromatic compounds: the bacterial nitroreductases. FEMS Microbiol Rev 2008; 32: 474–500.
4. Bola Mustapha1, Moji T Bakare-Odunola, Garba Magaji, Obiageri O. Obodozie-Ofoegbu1, David D Akumka, Pharmacokinetics of Chloroquine and Metronidazole in Rats Kudirat. Journal of Applied Pharmaceutical Science Vol. 5 (08), pp. 090-094, August, 2015
5. Church DL, Laishley EJ. Reduction of metronidazole by hydrogenase from Clostridia. Anaerobe 1995; 1: 81–92.
6. Yang G, Ge S, Singh R, Basu S, Shatzer K, Zen M., (May 2017). “Glucuronidation: driving factors and their impact on glucuronide disposition”. Drug Metabolism Reviews. 49 (2): 105–138.
7. Péliissier M. A. . Marteau P. Pochart; Antioxidant Effects of etronidazole in Colonic Tissue Digestive Diseases and Sciences January 2007, Volume 52, Issue 1, pp 40–44
8. Feller M Huwiler K SchoepferA Shang A Furrer H gger M 2010)Long-term antibiotic treatment for Crohn's disease: systematic review and meta-analysis of placebo-controlled trials Clin Infect Dis 50 473–480 .
9. Adler. Cytogenetic tests in mammals. Mutagenicity testing, a practical approach.(1984);212(1): 275-306.
10. Savage J. Classification and relationships of induced chromosomal structural changes. Journal of medical genetics.(1976);13(2): 103-22.
11. K. Narayana, U.J. D Souza, K.S. Rao. Effect of ribavirin on epididymal sperm count in rat. Indian journal of physiology and pharmacology. (2002);46(1): 97-101.

12. A. Wyrobek, J. Heddle, W. Bruce. Chromosomal abnormalities and the morphology of mouse spermheads. *Canadian Journal of Genetics and Cytology*.(1975);17(4): 675-81.
13. International Agency for Research on Cancer (IARC) (May 2010). "Agents Classified by the IARC Monographs, Volumes 1–100" (PHP). World Health Organization. Archived from the original on 2011-06-11. Retrieved 2010-06-0
14. Metrogyl Metronidazole Product Information" (PDF). TGA eBusiness Services. Alphapharm Pty Limited. 8 May 2013. Archived from the original on 9 September 2016. Retrieved 3 April 2014.
15. Wise JP, Wise SS and Little JE (2002) The cytotoxicity and genotoxicity of particulate and soluble hexavalent chromium in human lung cells. *Mutat Res* 517:221-229.
16. Karabay N.U., Oguz M.G., Cytogenetic and genotoxic effects of the insecticides, imidacloprid and methamidophos *Genet. Mol. Res.*, 2005, 4(4), 653-662.
17. Curtis JF, Hughes MF, Mason RP, Eling TE. Peroxidase catalase oxidation of (bi) sulphite:reaction of free radical metabolites of (bi) sulfite with 7, 8-dihydroxy-7, 8-dihydrobenzo (α)-pyrene. *Carcinogenesis*. 1988;9:2015–2021.
18. Adekunle A. Bakare, IModupe M. Ademeso, IOlusanmi A. Adetunji and 1,2Okunola A. Alabi Pharmaceutical effluent induced chromosome aberration in rat bone marrow cells *Arch. Appl. Sci. Res.*, 2011, 3 (2):345-352
19. Hudson EA, Fox LH, Luckett JCA and Manson MM.vivo cancer chemoprevention research possibilities. *Environmental Toxicology and pharmacology*. (2006); 21:204–14
20. Lambert B. Bromodeoxyuridine induced sister chromatid exchanges inhuman lymphocytes. *Hereditas*. (1997); 83, 163-174.
21. Martelli A. Comparison of the sensitivity of human and rat hepatocytes to the genotoxic effects of metronidazole. *Pharmacology and Toxicology*. 1990; 66, 329–334.
22. Menendez D, Bendesky A, Rojas E, Salamanca F & Ostrosky- Wegman P.Role of P53 functionality in the genotoxicity of metronidazole and its hydroxy metabolite. *Mutat. Res.* (2002); 501, 57– 67.
23. Mona Mohammed Zaid AL-SharifStudies on the Genotoxic Effects of Anticancer Drug Paclitaxel (Taxol) in Mice *World Applied Sciences Journal* 16 (7): 989-997, 2012
24. Meng ZQ, Sang N and Zhang B (2002) Effects of derivatives of sulfur dioxide on micronuclei formation in mouse bone marrow cells in vivo *Bull Environ Contam Toxicol* 69:257-264.
25. Jones AR, Cooper TG. Metabolism of ³⁶Cl-Ornidazole after oral application to the male rat in relation to its antifertility activity. *Xenobiotica* 1996; 27: 711-721.
26. Jones AR, Stevenson D, Hutton P, Dawson AG .The Antifertility action of alpha Chlorohydramin metabolism by rat and boar sperm. *Experientia* 1981; 37: 340-341
27. Oberlander G, Yeung CH, Cooper TG. Influence of oral administration of ornidazole on capacitationand the activity ofsome glycolytic enzymes of rat spermatozoa .*Reproduc Fertil* 1996; 106: 231-239
28. Bone W, Jones NG, Kamp G, Yeung CH, Cooper TG. Effect of ornidazole on fertility of male rats: Inhibition of glycolysis-related motility pattern and zona binding required for fertilization in vitro. *Reprod Fertil* 2000; 118:127-135.
29. Pang XB, Zhu Y, Lih G, Zhou H, Zhu JW, Liao AH, et al. Effect of ornidazole on sperm in rats and its mechanism of action. *Zhonghua Nan .KeXue* 2005; 11:26-28.
30. Sohrabi D., Alipour M., and Mellati A.; Effect of metronidazole on spermatogenesis, plasma gonadotrophins and testosterone in rats. *Iranian Journal of Reproductive Medicine* Vol5. No.2. pp:69-72, Spring 2007
31. Hamza A. Effects of Roselle and Ginger on cisplatin-induced reproductive toxicity in rats. *Asian J Androl*. 2006; 8: 607-612.
32. Rasheed S.T, Hasan I. and Khalaf M. T.; Study the effect of Metronidazole Drug (MTZ) and Rhuscoriaria (Sumac) on Testicular Tissues and sperms of Male White Mice, *Tikrit Journal of Pure Science*. 2018; 23 (1)

Effect of Garlic and Celery Extracts on Lead Toxicity in Male Mice

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Abstract

The present study aimed to use some plants extracts, such as celery and garlic in reducing the toxicity of dosed lead in white mice. The study included several experiments: the first included the progressive concentrations of lead in addition to control group (distilled water). The second and the third group were given only three progressive concentrations of plants, in addition to the control group which included a concentration of 6 mg/kg lead nitrate with DW. The results of statistical analysis at the p-value <0.05 showed a strong effect of the extracts used to reduce the toxicity of lead in male mice. Hence we can use the plants in the current study to improve the fertility of living organism, including humans because of their antioxidants.

Keywords: Lead, garlic, celery, male mice, sperm parameters.

Introduction

In spite of the fact that the general commitment of natural exposures to fruitlessness is obscure, the accessible writing proposes that introduction to different ecological elements, both in utero and neonatally, could drastically influence grown-up fertility¹. Investigations of different contaminant-uncovered untamed life populaces propose that numerous instruments add to changes in gonadal advancement, development of germ cells, preparation and pregnancy, specifically, the endocrine procedures supporting these occasions. Significant levels of fatherly lead presentation seem to lessen fruitfulness and to expand the dangers of unconstrained premature birth and diminished fetal development (preterm conveyance, low birth weight)². Lead may influence pituitary film capacity and cause adjustments in receptor official and secretory system (s) of pituitary hormones. This might be a significant factor in the pathogenesis of infertility³. Celery extraction has a defensive job in the testicles and intensifies the sperm parameters. This report is conflicting with the creator's report, on the grounds that Kerishchi et al. revealed that celery at certain portions has impact on sperm parameters and pituitary-gonadal axis⁴. In this regard, an exceptional consideration was paid to garlic extraction. This plant is utilized for quite a while both in cooking and as a restorative plant⁵. Broad contemplates have been completed on garlic (*Allium sativum* L.) have

revealed the nearness of two primary classes of cancer prevention agent segments, specifically flavonoids and sulfur-containing mixes (diallyl sulfide, trisulfide and allylcysteine). These are probably going to assume a significant job in the broadly exhibited organic impacts of garlic, which incorporate antitumor, hypolipidemic, antiatherosclerotic and cancer prevention agent⁶.

Materials and Method

Plant Material Collection: The leaves of celery and garlic plant were collected during April 2018, from Al-dewaniyah city from park. Plant has been diagnosed in the herbarium Faculty of Sciences/University of Babylon by the professor Dr. abdalkarim Khudair Albiermana.

Preparation of Aqueous Garlic Extract: Thirty gm of garlic added to 100 ml refined water were squashed and squeeze was acquired utilizing an organic product juice extricating machine. The resultant homogenized blend was sifted multiple times through a cheddar fabric. At that point, centrifuged at 200 g for 10 min, the reasonable supernatant was immediately gathered and kept in bottles until used⁷.

Preparation of hydro-alcoholic extraction of celery: The leaves were then dried in the shade and processed; before long. Powders were put away in a

fridge until extraction. So as to get ready 50 g of hydro-alcoholic concentrate, the orally administrable celery were broken down in 200 ml of 70% ethanol and the arrangement was kept at room temperature for three days. During these three days the arrangement was mixed a few times to isolate the concentrate, and following 72 hours, the blend separated with a channel paper. The concentrate arrangement was spread on a glass surface at room temperature to dissipate the dissolvable. The dried concentrate powder was acquired by scratching them from the glass surface, and afterward put away at 4°C until the utilization. fixations were set up from the powder of celery leaf extricate, utilizing refined water as a solvent⁷.

Animals and Housing: Forty five develop male mice (*Mus musculus*) matured 12-18 weeks were utilized in the present study. Male mice were permitted to adjust to the creature house condition before start of the test. Creatures were housed in polypropylene confines inside a well-ventilated room. Each enclosure comprise of five mice. they were benefited from the standard chow and drinking water not obligatory all through the analysis. Room temperature was kept up at 23±2°C, and the light-dim cycle was on a 12h light/dim cycle with light on at 06:00 a.m. what's more, off at 06:00 p.m. during the trial time frames.

Experimental Design:

Lead groups:

- Group 1: The animals were given DW as a control group for 30 days
- Group 2: The animals were given lead 2 mg/kg as single oral dose for 30 days.
- Group 3: The animals were given lead 4 mg/kg as single oral dose for 30 days.
- Group 4: The animals were given lead 6 mg/kg as single oral dose for 30 days.

After the statistical analysis we found the concentration of lead 6 mg/kg B.W its effect more than another concentration.

Celery Extraction Group s:

- Group 1: The animals were given 6 mg/kg of lead with DW for 30 days (control group).
- Group 2: The animals were given lead 6 mg/kg and 1000 mg/kg celery extraction as single oral dose for 30 days.

- Group 3: The animals were given lead 6 mg/kg and 2000 mg/kg celery extraction as single oral dose for 30 days.
- Group 4: The animals were given lead 6 mg/kg and 3000 mg/kg celery extraction as single oral dose for 30 days.

Garlic Extraction Group s:

- Group 1: The animals were given 6 mg/kg of lead with DW for 30 days (control group).
- Group 2: The animals were given lead 6 mg/kg and 60 mg/kg garlic extraction as single oral dose for 30 days.
- Group 3: The animals were given lead 6 mg/kg and 120 mg/kg garlic extraction as single oral dose for 30 days.
- Group 4: The animals were given lead 6 mg/kg and 180 mg/kg garlic extraction as single oral dose for 30 days.

Sperm Determination: The level of motile spermatozoa was evaluated by light microscopy at an amplification of 40× . At any rate 200 spermatozoa were evaluated per suspension bead. A drop of the sperm suspension was put on a glass slide and a smear was readied. The smear was fixed in ethanol for 1h, recolored with Giemsa recolor for 15–20min, washed, dried, and inspected with a light magnifying instrument at 100×magnification. In any event 500 spermatozoa were checked and the percent-period of irregular sperm decided. Morphologic variations from the norm of spermatozoa incorporate augmented, undersized, disfigured, or twofold heads, and curled, short, or twofold tails.

Statistical Analysis: Analysis of variance (ANOVA) was performed on all the data obtained in this study and Least Significant Differences (LSD) and Mean±SD (P<0.05) by using the SPSS program 2010.

Results

Lead Groups: The present study showed that there is effect of lead at different doses on sperm parameters by decreasing of [sperm (x 10⁶/ml), count motility (%), viability (%), abnormal head morphology (%) and abnormal tail morphology (%)] in male mice compared with control group. The highest significant toxicity of lead was in 6mg/kg followed by 4mg/kg and then least affected was 2mg/kg compared with the control group (table 1).

Table 1: Effect of lead on spermparameters of males mice.

Parameters	Lead concentration (mg/kg)				LSD
	Control (D.W)	2	4	6	
Sperm (x 10 ⁶ /ml)	14.974±0.02a	11.276±0.02b	9.738±0.03c	7.416±0.06d	0.125
Count motility (%)	57.964±0.04a	43.588±0.2b	35.452±0.2c	30.982±0.19d	0.321
Viability (%)	82.558±0.2a	70.144±0.04b	64.97±0.1c	51.4±0.19d	0.214
Abnormal head morphology (%)	6.76±0.05d	8.792±0.03c	9.344±0.009b	11.432±0.05a	0.251
Abnormal tail morphology (%)	1.328±0.008d	1.632±0.01c	1.948±0.01b	2.358±0.01a	0.321

The different letters denote to significant at P<0.05

Plant Groups: The results of the current study showed that there is a direct effect of extracted plant celery on sperm [sperm (x10⁶/ml), count motility (%), viability (%), abnormal head morphology (%) and abnormal tail morphology (%)]of male mice and in different doses given to animals compared with control group. The highest significant effect of celery plant extraction was in 3000 followed by 2000 and then least affected was 1000 compared with the control group(table 2). Also the present study showed that there is a direct effect of extracted plant garlic was significant differences on sperm (sperm (x 10⁶/ml), count motility (%), viability (%), abnormal head morphology (%) and abnormal tail morphology (%))in male mice and at different doses given to animals compared with control group. The highest significant effect of garlic plant extraction was in 180 mg/kg followed by 120 mg/kg and then least affected was 80mg/kg compared with the control group(table 3).

Table 2: Effect of celery on spermparameters of males mice.

Parameters	Celery concentration (mg/kg)				LSD
	Control (6 mg/kg lead)	1000	2000	3000	
Sperm (x 10 ⁶ /ml)	14.89±0.05d	16.306±0.01c	17.804±0.02b	18.516±0.1a	0.012
Count motility (%)	57.916±0.07d	61.784±0.06c	65.79±0.04b	70.94±0.2a	0.123
Viability (%)	82.566±0.1d	81.944±0.03c	84.956±0.2b	86.06±0.05a	0.21
Abnormal head morphology (%)	6.76±0.05a	5.804±0.02b	4.336±0.1c	3.474±0.04d	0.05
Abnormal tail morphology (%)	1.322±0.005a	1.12±0.04b	0.936±0.05c	0.74±0.008d	0.014

The different letters denote to significant at P<0.05

Table 3: Effect of garlison spermparameters of males mice.

Parameters	Garlic concentration(mg/kg)				LSD
	Control (6 mg/kg lead)	80	120	180	
Sperm (x 10 ⁶ /ml)	14.93± 0.04d	15.284±0.02c	16.816±0.1b	17.61±0.03a	0.025
Count motility (%)	57.892±0.05d	64.098±0.06b	60.226±0.2c	62.958±0.1a	0.03
Viability (%)	82.686±0.05b	81.686±0.2c	82.042±0.1b	83.148±0.02a	0.014
Abnormal head morphology (%)	6.764±0.10a	5.912±0.02b	4.922±0.05c	3.944±0.005d	0.024
Abnormal tail morphology (%)	1.33±0.01a	1.202±0.03b	0.97±0.001c	0.834± .005d	0.025

The different letters denote to significant at P<0.05

Discussion

Throughout the years, a few examinations have explored the impacts of lead introduction on different parts of wellbeing, specifically the conceptive system⁸. Frequently the outcomes from these investigations are clashing and opposing, due, partially, to the utilization

of various types of creature models^{9,10}. Our examination inspected the impacts of lead on various parts of the male conceptive framework in explicitly develop. Adding to the perplexity of the information is the finding that the seriousness of lead harmfulness has all the earmarks of being subject to the length of introduction

and the portion regulated. The information from our examination exhibit that the harmful impacts of lead are coordinated essentially on sperm inside the epididymis of the grown-up male mouse in a portion subordinate way. Organization of lead caused as light diminishing in the quantity of sperm inside the epididymis at low portion gathering and a critical decline in the quantity of sperm at high portion gathering. Different examines have additionally detailed a huge decline in sperm number inside the epididymis following introduction to lead utilizing distinctive creature models^{11,12,13}. The present investigation recommended that celery remove rolls out huge improvements in the trial bunches when contrasted and control gathering, with the goal that oral organization of 2, 4 and 6mg/kg of concentrate to male mice for 30 days. this concentrate might be successful by influencing the pituitary organ and expanding the sex hormones. Besides, given that the procedure of spermatogenesis and the capacity of regenerative organs are identified with sex hormone emission, the absorptive and secretory elements of the testicles and epididymis could be enhanced^{14,15}. This may clarify the expanded number of spermatozoids in the cauda epididymis and the expansion in epididymal weight at a high portion of the concentrate, notwithstanding increments in estimate and number of cells in the testicles.

Since the sperm check is impacted by any adjustment in the absorptive and secretory elements of the testis and epididymis, the expansion in this record is viewed as normal. In an investigation by¹⁶ hydroalcoholic concentrate of celery leaves, it was indicated that infusion of celery concentrate can lessen male regenerative hormones in mice. The present investigation was directed of the impacts of garlic on fruitfulness. When all is said in done, numerous examinations were audited. Thirteen examines were led on the impact of garlic on ripeness treatment. Because of the absence of reactions, just as containing flavonoids, nutrients, fructose and sulfur mixes, garlic can help with killing free radicals¹³. Sulfur mixes in garlic, with an immediate impact on the digestion of cytochrome P450 and glutathione-s-transferase, protectively affect spermatogenesis. Notwithstanding sulfur mixes, garlic has cancer prevention agent properties and can build richness by diminishing lipid peroxidation¹⁷. Given the previously mentioned components, garlic is suggested for the treatment of fruitlessness. In an investigation by Asadpour *et al*¹⁸; it was demonstrated that garlic has cancer prevention agent movement because of quality of

nutrient E, which averts oxygen peroxide. Additionally, the consequences of concentrate by Nasr indicated that garlic cancer prevention agent properties can lessen the lethality of unsafe medications on the testicles and increment the spermatogenesis and richness in men¹⁹.

Hammami and Abdelmalik²⁰ reasoned that garlic contains phytoestrogens, which directly affect estrogen. It is an antecedent to testosterone creation, so it is conceivable that garlic animates the sexual cells and sex hormones^{20,21}. The outcomes in the examination by Oi et al showed that garlic supplementation helps luteinizing hormone (LH) from the pituitary organ, and this invigorates testosterone discharge from the balls²¹. In any case, it was prescribed that the cooked garlic has better remedial impacts and, while influencing the multiplication of the sexual cells in testicles and epididymis, improves spermatogenesis.

Conclusion

Finally, we recommend from the present study that lead has a poisonous and lethal effect on animals and that the extracted plants are very important in terms of eliminating the toxicity of lead by acting as antioxidants, therefore we recommend to expand the following studies on these plants.

Conflict of Interest: The authors declares no conflict of interest.

Ethical Clearance: The protocol of this study was approved by the scientific committee the Department of Environmental Pollution Ethics at Al-Qasim Green University/College of Environmental Sciences.

References

1. Kerishchi P, Nasri S, Amin G, Tabibian M, editors. The effects of *Apium graveolens* extract on sperm parameters and H-G hormonal axis in mice. Proceedings of the 20th Iranian Congress of Physiology and Pharmacology; 2011 Sep; Hamedan, Iran.
2. Amagase H, Petesch B, Matsuura H, et al. Intake of garlic and its bioactive components. *J Nutr.* 2001;131(3S):955–996.
3. Bozin B, Dukic NM, Samojlik I, et al. Phenolics as antioxidants in garlic (*Allium sativum* L, Alliaceae) *Food Chem.* 2008;111:925–929.
4. Bruck R, Aeed H, Brazovsky E, et al. Allicin, the active component of garlic, prevents immune-

- mediated, concanavalin A-induced hepatic injury in mice. *Liver Int.* 2005;25(3):613–621.
5. Pinon-Lataillade, G., Thoreux-Manlay, A., Coffigny, H., Monchaux, G., Masse, R., and Soubir, J. C. 2006. Effect of ingestion and inhalation of lead on reproductive system and fertility of adult male rats and their progeny. *Exp. Toxicol.* 12:165–172.
 6. Ronis, M. J., Badger, T. M., Shema, S. J., Roberson, P. K., and Shaikh, F. 2006. Reproductive toxicity and growth effects in rats exposed to lead at different periods during development. *Toxicol. Appl. Pharmacol.* 136:361–371.
 7. Harborne, (1999). *Phytochemical dictionary: Handbook of bioactive compounds from plants 2nd (Edn.)*.
 8. Kempinas, W. G., Farvaretto, A. L. V., Melo, V. R., Lamano-Carvalho, T. L., Petenusci, S. O., and Oliveira-Filho, R. M. 2004. Time-dependent effects of lead on rat reproductive functions. *J. Appl. Toxicol.* 14:427–433.
 9. Sokol, R. Z., and Berman, N. 2055. The effect of age on exposure of lead-induced testicular toxicology. *Toxicology* 69:269–278.
 10. Barratt, C. L. R., Davies, A. G., Bansal, M. R., and Williams, M. E. 2009. The effect of lead on the male reproductive system. *Andrologia* 21:161–166.
 11. McLachlan R, O'Donnell L, Meachem S, Stanton P, De Kretser D, Pratis K, Robertson DM. 2002. Identification of specific sites of hormonal regulation in spermatogenesis in rats, monkeys, and man. *Recent Prog Horm Res*, 1: 149-179
 12. Parandin R, Sadeghipour Rodsari HR, Shamili S, Ghasempour HR. 2009. Effects of Aqueous Extract of *Boswellia Thurifera* on Fertility in Male Rats. *ZUMS J*, 65: 2330.
 13. Modaresi M, Ghalamkari G, jalalizand A. 2012. The Effect of Celery (*Apium graveolens*) Extract on the Reproductive Hormones in Male Mice. *APCBEE Procedia*, 4: 99-104.
 14. Mohammadi F, Nikzad H, Taherian A, Amini Mahabadi J, Salehi M. Effects of herbal medicine on male infertility. *Anat Sci J.* 2013;10(4):3-16.
 15. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med.* 2009;6(7).
 16. Asadpour R, Azari M, Hejazi M, Tayefi H, Zaboli N. Protective effects of garlic aqueous extract (*Allium sativum*), vitamin E, and N-acetylcysteine on reproductive quality of male rats exposed to lead. *Vet Res Forum.* 2013;4(4):251-7.
 17. Nasr AY. The impact of aged garlic extract on adriamycin-induced testicular changes in adult male Wistar rats. *Acta Histochem.* 2017;119(6).
 18. Abdelmalik SW. Histological and ultrastructural changes in the adult male albino rat testes following chronic crude garlic consumption. *Ann Anat.* 2011;193(2):134-41.
 19. Hammami I, Nahdi A, Atig F, Kouidhi W, Amri M, Mokni M, et al. Effects of garlic fractions consumption on male reproductive functions. *J Med Food.* 2013;16(1):82-7.
 20. Oi Y, Imafuku M, Shishido C, Kominato Y, Nishimura S, Iwai K. Garlic supplementation increases testicular testosterone and decreases plasma corticosterone in rats fed a high protein diet. *J Nutr.* 2001;131(8):2150-6.
 21. Bahrami KH, Mahjor AA, Johary H, Bahrami R, Bahrami A. Comparative study on histopathological and histomorphometric effect of raw and cooked garlic on spermatogenesis in testis and epididymis of rats. *J Fasa Univ Med Sci.* 2014;3(4):371-9.

Mood Disorder in Adolescents with Diabetes Mellitus in Kirkuk City

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Abstract

Objective: Assess the severity of mood disorders in adolescents with type 1 diabetes mellitus (T1DM), and identify the relationship between the mood disorder and some socio-demographic characteristics among Adolescents.

Methodology: A descriptive study was carried out at center of diabetics & endocrine disease in the Kirkuk city, from February, 10th, 2019 up to November 10th, 2019 in order to achieve the objectives of the present study. Non-Probability (Purposive) sample of (70) patients. Developed questionnaire was constructed for the purpose of the study which consisted of two parts: the demographic characteristics; and Child Depression Inventory (CDI) it is a Likert-type scale consisting of 27 items . The data were collected through the use of interview technique (face to face). The data was analyzed through the application of descriptive statistical analysis (Frequency, Percentage (%), Mean of Score) and inferential statistic (ANOVA & t. test).

Results: The findings of the study indicated that the majority of the sample (40%) of them with age group (16-17 years), (54%) of them were male, (71%) of them single, the most of the sample were graduated from intermediate school (47%), regarding to the occupation (42.9%) of the sample was student, and in relation to financial status the majority of the adolescent was in barely sufficient and constitute (77%).

Keywords: *Mood Disorder, Adolescents, T1DM, Depression, CDI, Anxiety, Anhedonia.*

Introduction

Depression is the most common and hurtful comorbidities, if untreated, depression becomes chronic, persistent, and increasingly destructive. There is greater psychiatric morbidity in T1DM patients than in the general population, with depression being the most common psychiatric disturbance followed by anxiety, and these disorders have a direct impact on metabolic control.⁽¹⁾

Adolescence is a transitional period characterized by significant physical; mental; and social alteration. For this reason, it is a duration of high risk for the increase of psychiatric disorders, especially anxiety disorders and depression. Type 1 diabetes mellitus (T1D), the juvenile form of diabetes, is a chronic endocrine disease that generally arise suddenly during childhood and adolescence. It follows that T1D would add up to major emotional sensitivity to the common disturbance of

adolescence, since these individuals must manifestation a series of significant revision in their lives and self-care routine to avoid medical complexity.⁽²⁾ Type 1 diabetes (T1DM) is one of the most frequent chronic metabolic diseases in childhood and adolescence.⁽³⁾ Thus, diabetes may composition the risk for psychological disorder in adolescents. Maternal depression was a risk factor for depression in youths with T1DM; this may be caused by a variety of biopsychosocial factors including genetics, family dynamics, and parental support or involvement in diabetes care.⁽⁴⁾ Studies particularly investigate the prevalence of mental disorders during adolescence are more uncommon, but an estimated prevalence of 11-18% for this age group has been reported.⁽⁵⁾

Ten percent of adolescent girls with type 1 diabetes meet criteria for eating disorders compared to 4% of their age-matched parallel without diabetes eating disordered with insulin limitation is also seen in boys with diabetes.⁽⁶⁾

Furthermore, eating disorders are correlating with poor metabolic control.⁽⁷⁾ Depression may affect commitment to diabetes treatment due to reduce interest, energy, and motivation which thereafter yields poor diabetic control, and may worsen symptoms of blame or hopelessness.⁽⁸⁾ There is a 27% raise in the probability of depression per unit high in HbA1c reports.⁽⁹⁾ Prospective research might recognize the relationship between depressed mood and rising HbA1c values. Parental and family conflict plays a role in depressive symptoms, family conflict may be diabetes-specific, correlating to responsibilities around glucose handling and insulin therapy. Depressed parents will often provide less physical and emotional upholding to their children, having minimal energy and motivation to help in the habit of diabetes management.⁽¹⁰⁾

A real excess in the rate of psychiatric diagnoses among adolescents has been observed in recent years. A meta-analysis of 41 studies from 27 different countries estimate the worldwide prevalence of psychiatric disorders among children and adolescents found a mean rate of 13.4% of individuals with a mental disease.⁽¹¹⁾

Methodology

1. **Participants:** A descriptive study was carried out at center of diabetics & endocrine disease in the Kirkuk city, from February, 10th, 2019 up to November 10th, 2019 in order to achieve the objectives of the present study. Non-Probability (Purposive) sample of (70) adolescent diagnose type 1 diabetes mellitus.
2. **Data Collection:** After informal consent was obtained from adolescents aged 12-19 years and

their parents using a screening tool (CDI). The data were collected through (face to face) interview.

3. **Instrumental:** Socio -demographic characteristics: Consists of the questions containing information related to adolescent with Diabetes Mellitus (age, gender, marital status, level of education, occupation and financial status).

Child Depression Inventory (CDI): It is a Likert-type scale, This scale was developed by Maria Kovacs⁽¹²⁾ consisting of (27 items) scored on a 3-point scale (0,1,2) as follows: No symptoms (0), Mild to moderate symptoms (1), Severe symptoms (2) and the scoring are = Normal (0 - 12), Mild to Moderate depression (13 - 19), Severe depression (more than 19) and subdivided into five subscales was used to investigate depression symptoms among adolescent with diabetics mellitus type 1, but is not used to diagnose depression. The CDI sub-scales measure negative mood in items (1,2,6,9,10,11,13,19,20); interpersonal problems in items (5,8,26,27); inefficiency in items (15,16,17,18,23); anhedonia in in items (4,12,21,22); and negative self-esteem in items (3,7,14,24,25). The total depressed array index derives from the sum of the five sub-scales of the CDI.

4. **Statistical Analysis:** The data were analyzed by using (SPSS) version (23) and through the use application of descriptive statistical analysis (Frequency, Percentage (%) & Mean of score) and inferential statistic (ANOVA & t. test).

Results

Table (1): Assessment of depression symptom among adolescent with Percentage & Mean of Score.

No.	Items	No symptoms		Mild symptoms		Definite symptoms		MS	Assess
		F	(%)	F	(%)	F	(%)		
1.	Sadness	26	37.1	40	57.1	4	5.7	0.69	M
2.	Pessimism	31	44.3	36	51.4	3	4.3	0.60	M
3.	Self-deprecation	33	47.1	35	50.0	2	2.9	0.56	M
4.	Anhedonia	26	37.1	32	45.7	12	17.1	0.80	M
5.	Misbehavior	40	57.1	26	37.1	4	5.7	0.49	L
6.	Pessimistic worry	46	65.7	20	28.6	4	5.7	0.40	L
7.	Self-hate	50	71.4	18	25.7	2	2.9	0.31	L
8.	Self-blame	38	54.3	28	40.0	4	5.7	0.51	M

No.	Items	No symptoms		Mild symptoms		Definite symptoms		MS	Assess
		F	(%)	F	(%)	F	(%)		
9.	Suicidal ideation	50	71.4	18	25.7	2	2.9	0.31	L
10.	Crying spells	38	54.3	28	40.0	4	5.7	0.51	M
11.	Irritability	22	31.4	37	52.9	11	15.7	0.84	M
12.	Less social interest	18	25.7	40	57.1	12	17.1	0.91	M
13.	Indecisiveness	19	27.1	37	52.9	14	20.0	0.93	M
14.	Negative self-image	12	17.1	38	54.3	20	28.6	1.11	M
15.	Schoolwork problems	10	14.3	37	52.9	23	32.9	1.19	M
16.	Sleep problems	14	20.0	41	58.6	15	21.4	1.01	M
17.	Fatigue	13	18.6	44	62.9	13	18.6	1.00	M
18.	Reduced appetite	19	27.1	38	54.3	13	18.6	0.91	M
19.	Somatic concerns	24	34.3	39	55.7	7	10.0	0.76	M
20.	Loneliness	24	34.3	40	57.1	6	8.6	0.74	M
21.	School dislike	31	44.3	35	50.0	4	5.7	0.61	M
22.	Few friends	32	45.7	31	44.3	7	10.0	0.64	M
23.	Academic decline	35	50.0	28	40.0	7	10.0	0.60	M
24.	Negative peer comparison	42	60.0	26	37.1	2	2.9	0.43	L
25.	Feels unloved	37	52.9	30	42.9	3	4.3	0.51	M
26.	Disobedience	45	64.3	24	34.3	1	1.4	0.37	L
27.	Fighting	47	67.1	23	32.9	0	0	0.33	L

GMS= 0.72

The table (1) show the mean of score out of this table was moderate significant depression symptoms amongadolescent with diabetes mellitus in most of the items, with grand mean of score (0.72).

Table (2) Frequency of Depression in adolescents with type 1 diabetes.

No.	Depression Symptoms	Frequency (f)	Percentage (%)
1.	Normal	5	7.1
2.	At Risk	49	70.0
3.	Clinical Range	16	22.9
Total		100	100.0

The table (2) show that the majority of sample were at risk severity level of depression symptoms among adolescent with DMT1 (70.0%).

Table (3) Distribution of depression and age of adolescents with diabetes type 1

Age \ Depression	Normal	At risk	Clinical range	Total
12-13	3	1	0	4
14-15	1	8	5	14
16-17	1	24	3	28
19-19	0	16	8	24
Total	5	49	16	70

The table (3) show that the majority of sample were at risk symptoms of depression in age group (16-17)years.

Table (4) Distribution of depression and gender of adolescents with diabetes type 1

Gender \ Depression	Normal	At risk	Clinical range	Total
Boy	3	26	9	38
Girl	2	23	7	32
Total	5	49	16	70

The table (4) show that the majority of sample were male who at risk symptoms of depression.

Items		Sum of Squares	DF	Mean Square	F	Sig.
Age	Between Groups	11.253	2	5.627	8.831	0.000 H.S
	Within Groups	42.690	67	.637		
	Total	53.943	69			
Marital status	Between Groups	.487	2	.243	1.006	0.371 NS
	Within Groups	16.213	67	.242		
	Total	16.700	69			
Level of Education	Between Groups	.883	2	.441	.756	0.473 NS
	Within Groups	39.117	67	.584		
	Total	40.000	69			
Occupation	Between Groups	1.758	2	.879	1.703	0.190 NS
	Within Groups	34.584	67	.516		
	Total	36.343	69			
Financial status	Between Groups	.158	2	.079	.356	0.702 NS
	Within Groups	14.927	67	.223		
	Total	15.086	69			

Table (5) Relation between (Age, Marital status, Level of Education, Occupation Financial status) and depression in adolescents with type 1 diabetes mellitus

SOV=Source of Variance, SS= Sum of Squares, MS=Mean of Score, F. Obs= Fisher Observation, DF= Degree of Freedom, S = Significant, NS= No Significant.

This table (5) show that there were no significant differences in most demographical characteristics of the study sample, but that there were highly significant relationship between a symptoms of depression and age of adolescent at P. value ≤ 0.05 .

Table (6) Relation between gender and depression in adolescents with type 1 diabetes mellitus

Items	Gender	No.	X	S.D	T. obs	P \leq 0.05
Depression	Male	38	2.05	0.567	0.517	N.S
	Female	32	2.28	0.457		
F. Critical = 0.424, DF= 68						

No.=number of sample, X=Mean, S.D= Standard deviation, DF= Degree of Freedom, N.S= No Significant.

The table (6) show that there were no significant differences between depression symptoms and gender of the study sample at P. Value ≤ 0.05 .

Discussion

The current study shows that 70% of adolescents with type 1 diabetes have depression with at risk rang, also

need to put in sight the different sociodemographic factors affecting adolescent. In regarding to gender relation to depression, the current study showed a no significant association between sex and degree of depression symptoms. The sex variance can be explained by genetics choose, the disorder of neurotransmittersystems and overbalance in reproductive hormones. Psychosocial risk factors might also be involved in explaining the sex variance.⁽¹³⁾

Study conducted by Grey., et al.⁽¹⁴⁾ found that the thorough prevalence of depressive symptoms was 17, depressive symptoms were more common in the earlier years post diagnosis, less common between 4-9 years after diagnosis and rose still after 10 years, else like studies reported variation frequencies; Lawrence., et al.⁽¹⁵⁾ declare 22.8% where Center for Epidemiological Studies-Depression Scale (CES-D) >16 (the clinical cutoff), Zdunczyk., et al.⁽¹⁶⁾ notify 39% had depressive symptoms (CDI > 13) (the clinical cutoff), The variations in the prevalence of depression in world with diabetes suggest international variations in prevalence, how symptoms of depression are reported.⁽¹⁷⁾ However Herzer and Hood⁽¹⁸⁾ reported 21% had CDI score > 13 (the clinical cutoff). Variation in the scoring system used and the clinical cutoff value, also Herzer and Hood⁽¹⁸⁾ establish that 13.4% and 17% of adolescents who had a diagnosis of type 1 diabetes reported condition and nearly 21% of adolescents had CDI (as a measure of depression) scores \geq 13 (the clinical cutoff). Intensive treatment with numerous insulin injections and frequent self-blood glucose monitoring especially with longer diabetes period be inverted the burden of treatment and progress disease that can excess negative emotions and maladaptive behaviors.⁽¹⁹⁾ Also, there are indicated shared predisposing and precipitating factors between diabetes and depression, both conditions show familial cohort proposition possible genetic influence or shared environments impact disease pathogenesis and progression.⁽²⁰⁾ Nouwen., et al.⁽²¹⁾ stated that diabetes manifest to be a risk factor for depression. About 25-50% of depressed youth have comorbid anxiety disorders. Results of the current study revealed no significant association between degree of depression gender, educational level or socioeconomic standard ($p > 0.05$). Other study came in concordance Hood., et al.⁽²²⁾ The age of onset of diabetes and diabetes duration were significantly correlated with degree of depression. These findings indicate that the degree of depression were likely a result of the difficulties happen in living

with Type 1 diabetes and its stressors, and amassed load of problems related to longstanding diabetes including; restriction of social life, physical disturbances, to some extent limitations in physical activity, daily discomfort in managing diabetes, emotional distress and concern about long-term complications.

Conclusion

The majority of study sample were suffered from depression symptoms have (at risk range) among adolescent with T1DM, also there were a significant relationship between a symptoms of depression and age of adolescent. Learning of early signs and symptoms of depression can help families and adolescent to expose them and ask for vocational staff to help and corroboration. Treatment of these psychological problems in diabetic adolescents should receive considerable attention, healthcare staff should schedule care in a way that psychosomatic enhanced, definite encouragement and compliance to medication could be promote.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Psychiatric & Mental Health Nursing and all experiments were carried out in accordance with approved guidelines.

References

1. Dantzer C. Anxiety and depression in juvenile diabetes: a critical review". *Clinical Psychology Review*. 2003; 23: 787-800.
2. Delamater AM, de Wit M, McDarby V, Malik J, Acerini CL; International Society for Pediatric and Adolescent Diabetes. ISPAD Clinical Practice Consensus Guidelines 2014. Psychological care of children and adolescents with type 1 diabetes. *Pediatr Diabetes*. 2014; 15:232-44.
3. Araujo MB and Mazza CS. Assessment of risk factors of poor metabolic control in type 1 diabetic children". *Pediatric Diabetes*. 2008; 9: 480-487.
4. De Wit M, Snoek FJ. Depressive symptoms and unmet psychological needs of Dutch youth with type 1 diabetes: results of a web survey. *Pediatr Diabetes*. 2011; 12: 172-176.

5. Anselmi L, Fleitlich-Bilyk B, Menezes AM, Araujo CL, Rohde LA. Prevalence of psychiatric disorders in a Brazilian birth cohort of 11-year-olds. *Soc Psychiatry Psychiatr Epidemiol.* 2010;45: 135-42.
6. Bachle C, Stahl-Pehe A, Rosenbauer J. Disordered eating and insulin restriction in youths receiving intensified insulin treatment: Results from a nationwide population-based study. *Int J Eat Disord* 2016;49:191-6.
7. Young V, Eiser C, Johnson B, et al. Eating problems in adolescents with type 1 diabetes: A systematic review with meta-analysis. *Diabet Med* 2013;30:189-98.
8. McGrady ME, Laffel L, Drotar D. Depressive symptoms and glycemic control in adolescents with type 1 diabetes. *Diabetes Care.*2009; 32: 804-806.
9. Hassan K, Loar R, Anderson B. the role of socioeconomic status, depression, quality of life, and glycemic control in type 1 diabetes. *J Pediatrics.*2006; 149: 526-531.
10. Hood KK, Huestis S, Maher A. Depressive Symptoms in Children and Adolescents with Type 1 Diabetes: Association with diabetes-specific characteristics. *Diabetes Care.*2006; 29: 1389-1391.
11. Polanczyk GV, Salum GA, Sugaya LS, Caye A, Rohde LA. Annual research review: a meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *J Child Psychol Psychiatry.* 2015;56:345-65.
12. Maria Kovacs. "The children's depression inventory: a self-rated depression scale for school-aged youngsters". University of Pittsburgh. School of Medicine. Western Psychiatric Institute and Clinic (Pittsburgh, Pa.) Publisher: Pittsburgh, PA: University of Pittsburgh School of Medicine, Department of Psychiatry, Western Psychiatric Institute and Clinic. 1983.
13. Leach LS. Gender differences in depression and anxiety across the adult lifespan: the role of psychosocial mediators". *Social Psychiatry and Psychiatric Epidemiology.* 2008; 43: 983-998.
14. Grey M., et al. "Depression in type 1 diabetes in children: Natural history and correlates". *Journal of Psychosomatic Research.* 2002; 53: 907-911.
15. Lawrence JM. Prevalence and correlates of depressed mood among youth with diabetes: the SEARCH for Diabetes in Youth study". *Pediatrics.* 2006; 117: 1348-1358.
16. Zduńczyk B. High prevalence of depressive symptoms in well-controlled adolescents with type 1 diabetes treated with continuous subcutaneous insulin infusion". *Diabetes/Metabolism Research and Reviews.* 2014; 30: 333-338.
17. Lloyd CE. Epidemiology of depression in diabetes: international and cross-cultural issues". *Journal of Affective Disorders.* 2012; 14: S22-S29.
18. Herzer M, Hood KK. "Anxiety symptoms in adolescents with type 1 diabetes: association with blood glucose monitoring and glycemic control". *Journal of Pediatric Psychology.*2010; 35: 415-425.
19. Fisher L. The confusing tale of depression and distress in patients with diabetes: a call for greater clarity and precision". *Diabetic Medicine.* 2014; 31: 764-772.
20. Dunkel-Schetter C, Tanner L. "Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice". *Current Opinion in Psychiatry.* 2012; 25: 141-148.
21. Nouwen A. Type 2 diabetes mellitus as a risk factor for the onset of depression: a systematic review and meta-analysis". *Diabetologia.* 2010;53: 2480-2486.
22. Hood KK. Depressive symptoms in children and adolescents with type 1 diabetes: Association with diabetes-specific characteristics". *Diabetes Care.* 2006; 29: 1389-1391.
23. Cho E. Psychological characteristics of Korean children and adolescents with type 1 diabetes mellitus". *Annals of Pediatric Endocrinology and Metabolism* 2013;18: 122-127.
24. Katon W. Behavioral and clinical factors associated with depression among individuals with diabetes". *Diabetes Care.* 2004; 27: 914-920.

Vitamin D Level Status and Hypertension among Elderly Iraqi People in Al Hillah City

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Abstract

Background: Vitamin D has different biological actions in the body . Vitamin D has the pleiotropic effects in multiple organ systems, and vitamin D deficiency was suggested to be associated with high blood pressure according to previous reports. Several interventional studies have examined the effect of vitamin D supplementation on high blood pressure patients

Objective: To identify Vitamin D level and its correlate with hypertension among old adult in Hilla city – Babylon province.

Keywords: ????

Introduction

Vitamin D, 25-hydroxyvitamin D (25(OH) D), is a dynamic fat-soluble vitamin that regulates calcium homeostasis and is important for bone and muscle health in people of all ages ¹. Vitamin D is logically present in some nutrients and dietary supplements and is formed endogenously when sunlight strikes the skin and motivates vitamin D synthesis. Serum concentration of 25-hydroxyvitamin D is the best indicator of vitamin D status in persons, with values of less than 30nmol/L (nmol/L = 0.4 ng/mL) measured to be insufficient for the universal health and wellbeing of adults ². A plethora of epidemiological and observational studies have established the correlation between vitamin D and general human wellbeing ⁽³⁻⁵⁾. Studies suggest that adequate serum vitamin D of more than 30 nmol/L is concerned in avoiding cardiovascular disease ⁶. An sufficient vitamin D serum level has also been informed to improve the immune system, avoid cancer, and limit

its development ⁷. Vitamin D is an essential part of nutrition. In association to the other vitamins, vitamin D has single metabolic and physiological special effects⁽³⁻⁷⁾ The deficiency of vitamin D is epidemically prevalent in the world; 20–25% of the population suffers from the deficiency of vitamin D in USA; Canada; Europe; Mexico; Asia; and Australia. ⁸ Surprisingly, the deficiency of vitamin D in the Persian Gulf nations is highly widespread, though there is adequate sunshine. The commonness of vitamin D (serum level of vitamin D) deficiency is upper among female adolescents and elderly in Iran and >80% in Saudi Arabia. Hypertension, also known as raised blood pressure, is a very common chronic disease and considered as a silent killer because it rarely causes symptoms(3). Generally, older age, lower incomes and higher body mass index are proposed as the associated factors with the risk of hypertension 46). Accordingly, people having high blood pressure would increase in the condition of population ageing and prevalent westernized diet in Korean society(16). Therefore, it is very important to look into the evidences and results about vitamin D in regards with its roles in controlling blood pressure at this point.

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Methodology

This was across sectional descriptive observational

study included a non-probability (convenient sample) of elderly in Hilla City.

Babylon province, the period of the study started from the first of January through August 2019, a pretested questionnaire was used to interview the participants after obtaining their verbal consents, the sample included old adult, serum level of Vitamin D that made by chemo immunoassay method (maglumi instrument),The data were analyzed statistically to assess the associations between variables.

Results

The study included 300 participants 83.0% of the study sample had either insufficiency or deficiency of Vitamin D level. The proportion of adults with hypertension were more common among participants with deficient and insufficient vitamin D, 42% and 7% respectively, the difference was significant $p < 0.05$.

Table (1) the mean age and number of participations.

Parameter	Number	Mean of the Age
65-69 Years	168	67 years
70 -74 Years	84	73 years
75-80 and More	48	78 years
Total	300	

This table shows distribution of study participants according to the mean age and number of participations.

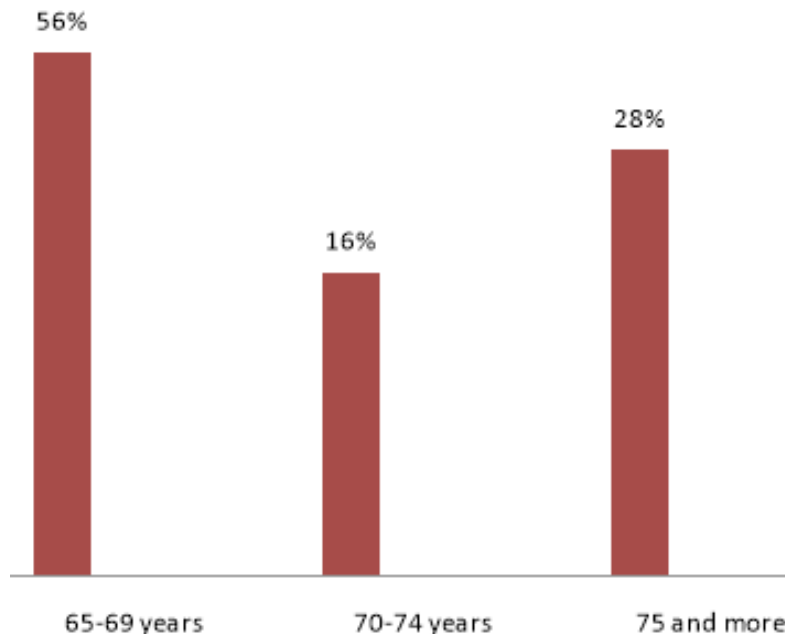


Figure (2) Frequency distribution of the study group by age.

Table (2) Means of vitamin D level by gender.

Female	19.5% ng/ml
Male	25.8% ng/ml
Male and Female	22.5% ng/ml

This table shows distribution of study participants according to the means of vitamin D level by gender.



Figure (2) Means of vitamin D level by gender.

Table (3) Frequency distribution of the study group of age.

Parameter	Frequency	Percentage
65-69	168	56.0%
70 -74	84	28.0%
75-80 and More	48	16.0%
Total	300	100%

This table shows distribution of study participants according to the age.

Table (4) Association between Vitamin D Hypertension) among males.

Study Variables	Vitamin D level among male					χ^2	P-value
	Deficiency (0-20 ng/ml)	Insufficiency (21-29 ng/ml)	Normal (30-100 ng/ml)	Total	Deficiency		
Hypertension						57.99	< 0.002*
Yes	37 (54.4%)	5 (26.3%)	2 (15.3%)	44	84.0%		
No	31 (45.6%)	14 (73.7%)	11 (84.7%)	56	55.3%		
Total	68 (100.0%)	19 (100.0%)	13 (100.0%)	99			

This Table shows Association between Vitamin D Hypertension) among males.

Table (5) Association between Vitamin D and Hypertension)among females.

Study variables	Vitamin D level among female					χ^2	P-value
	Deficiency (0-20 ng/ml)	Insufficiency (21-29 ng/ml)	Normal (30-100 ng/ml)	Total	Deficiency		
Hypertension						59.11	< 0.001*
Yes	90 (66.1%)	16 (72.7%)	5 (11.6%)	111	81.0%		
No	46 (33.9%)	6 (27.3%)	38 (88.4%)	90	51.1%		
Total	136 (100.0%)	22 (100.0%)	43 (100.0%)	201			

This table shows Association between Vitamin D and Hypertension)among females.

Discussion

In this study, the Vitamin D Level Status Among Iraqi Patients in Al Hillah City and the relation of these dependent variables to various epidemiological factors were assessed in 300 patents the most of sample are female 67% . The prevalence of vitamin D deficiency in those countries is higher in women than in men It seems that the skin complexion, poor sun exposure, vegetarian food habits and lack of vitamin D food fortification .

In this study most of patients are in the age group 65-69 years this result agree with (Heshmat et al 2008) who found that It was also indicated that vitamin D shortage is highest among individuals who are elderly, institutionalized, or hospitalized. It is recounted that 60% of the old adult in nursing homes were vitamin D deficient in the United States (Elliott et al. 2003).

Findings of relationship between level of vitamin D and hypertension for male and female sample male and female have deficiency in the level of vitamin D (84 %) (81%). This results are agree with (Songcang 2017) who found that vitamin D deficiency is highest among people who have hypertension .

Conclusion: Results of the current study showed a widespread, severe Vitamin D deficiency among participants of both sexes and in elderly people, urgent large scale public educational campaigns are needed to address this high priority public health problem in our society. We suggest that physicians should keep a check on the Vitamin D levels of elderly people in order to curb the ever-increasing incidence of hypertension.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon College of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Holick MF. Vitamin D deficiency. N Engl J Med 2007;357:266-81.
2. Esteghamati A, Gouya MM, Abbasi M, Delavari A, Alikhani S, Alaedini F, et al. Prevalence of

- diabetes and impaired fasting glucose in the adult population of Iran: National survey of risk factors for non-communicable diseases of Iran. *Diabetes Care* 2008;31:96-8.
3. Bringhurst FR, Demay MB, Krane SM, Kromenberg HM. Bone and mineral metabolism in health and disease. IKasper DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL, editors. *Harrison's principles of internal medicine*. 16th ed. New York: McGraw Hill; 2005; 2238-48.
 4. Holick MF Sunlight, vitamin D. for bone health and prevention of autoimmune diseases, cancer, and cardiovascular disease. *Am J Clin Nutr*. 2004;80:1678S-88S. Age Pearson 1 0.038 0.221 0.315 0.102 0.080
 5. Marriott BM, Vitamin D. supplementation: A word of caution. *Ann Int Med* 1997;127:231-3.
 6. Norman AW. Sunlight, season, skin pigmentation, vitamin D, and 25-Hydroxyvitamin D: Integral components of the vitamin D endocrine system. *Am J Clin Nutr* 1998;67:1108-10.
 7. Compston JE, Vitamin D .deficiency: Time for action. *BMJ* 1998;317:1466-7
 8. Holick MF, Vitamin D, deficiency *N Engl J Med* 2007;357:266-81.
 9. Mithal A, Wahl D, Bonjour JP, Burckhardt P, Dawson-Hughes B, Eisman J, et al. Global vitamin D status and determinants of hypovitaminosis D. *Osteoporosis Int.*, 2009;20:1807-20.
 10. Alvarez JA, Ashraf A. Role of vitamin d in insulin secretion and insulin sensitivity for glucose homeostasis. *Int J Endocrinol* 2010;2010:351-85.
 1. National Institute of Health, Vitamin D. Fact Sheet for Health Professionals, May 2016, <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>.
 2. Institute of Medicine, Food and Nutrition Board, Dietary Reference Intakes for Calcium, Vitamin D, National Academy Press, Washington, DC, 2010.
 3. MH Holick, Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis," *The American Journal of Clinical Nutrition*, 2004;79(3): 362–371.
 4. A Hossein-nezhad, MF Holick, Vitamin D .for health: a global perspective," In *Mayo Clinic Proceedings*, 2013; 88 (7): 720–755.
 5. MF Holick, Sunlight, vitamin D. for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease," *The American Journal of Clinical Nutrition*, 2004;80(6): 1678S–1688S.
 6. I Mozos, O Marginean, "Links between vitamin D deficiency and cardiovascular diseases," *BioMed Research International*, 2015;2015, Article ID 109275.
 7. A Chirumbolo, "Vitamin D3 in cancer prevention and therapy: the nutritional issue," *Hormone Molecular Biology and Clinical Investigation*, 2015; 23(5): 71–78.
 8. B Nikooyeh, T R Neyestani, M Farvid et al., "Daily consumption of vitamin D–or vitamin D+ calcium–fortified yogurt drink improved glycemic control in patients with type 2 diabetes: a randomized clinical trial," *The American Journal of Clinical Nutrition*, 2011;93(4): 764–771.
 9. C Gagnon, Z X Lu, D J Magliano, et al., "Serum 25-hydroxyvitamin D, calcium intake, and risk of type 2 diabetes after 5 years: results from a national, population-based prospective study (the Australian Diabetes, Obesity and Lifestyle study)," *Diabetes Care*, 2011; 34(5): 1133– 1138.
 10. RK Menon, A P Rickard, N Mannan, et al., "The effects of vitamin D2 or D3 supplementation on glycaemic control and related metabolic parameters in people at risk of type 2 diabetes: protocol of a randomised double-blind placebo-controlled trial," *BMC Public Health*, 2013;13(1): 999.
 11. Bde Courten, A Mousa, N Naderpoor, H Teede, M de Courten, R cragg, "Vitamin D supplementation for the prevention of type 2 diabetes in overweight adults: study protocol for a randomized controlled trial," *Trials*, 2015;16(1) : 335–346.
 12. S Shab-Bidar, T R Neyestani, A Djazayeri, "Vitamin D receptor Cdx-2-dependent response of central obesity to vitamin D intake in the subjects with type 2 diabetes: a randomized clinical trial," *The British Journal of Nutrition*, 2015;114(09): 1375–1384.
 13. C Annweiler, G Allali, P Allain et al, "Vitamin D and cognitive performance in adults: a systematic review," *European Journal of Neurology*, 2009;16(10): 1083–1089,.
 14. R E Anglin, Z Samaan, S D Walter, S D McDonald, "Vitamin D deficiency and depression in adults: systematic review and meta-analysis," *The British Journal of Psychiatry*, 2013;202(2): 100–107.

15. American College of Cardiology. Serum 25-hydroxy Vitamin D in Ng/ml accepted. American college of cardiology 2011;58:1547-56..
16. Jo I, Ahn Y, Lee J, et al. Prevalence, awareness, treatment, control and risk factors of hypertension in Korea: the Ansan study. *J Hypertens.* 2001;19: 1523–1532.
17. Lackland DT, Weber MA. Global burden of cardiovascular disease and stroke: hypertension at the core. *Can J Cardiol.* 2015;31:569–571.

Vitamin D Level Status and Diabetes Mellitus among Old Adult Iraqi People in Al Hillah City

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Abstract

Background: Vitamin D has different biological actions in the body . Vitamin D has the pleiotropic effects in multiple organ systems. Vitamin D (vit D) deficiency has been found to have an inverse relationship with the occurrence of type-2 diabetes mellitus (DM). The aim of this study was to assess the vit D level in type-2 diabetic patients.

Objective: To identify Vitamin D level and its correlate with type2 diabetes mellitus among old adults.

Methodology: This was across sectional descriptive observational study included a non-probability (convenient sample) of elders (>65 years both women and men) in Hilla City, Babylon province, the period of the study started from the first of January through August 2019, the sample size was calculated according to the sample size calculation equation with 95% confidence level, 300 elderly people were participated voluntarily in this study after explaining the objective of the study by the researcher, the response rate in this study 100%. This study was approved by the Ethics Committee of College of nursing - University of Babylon, a pretested questionnaire was used to interview the participants after obtaining their verbal consents, the sample included old adults, apparently healthy & not receiving vitamin D supplement, serum level of Vitamin D that made by chemo immunoassay method (maglumi instrument). Data about demographic characteristics, drug uses, number of chronic diseases, as well as measurement of mean blood sugar of each participant were done single handy by the researcher. Blood sugar was measured using electronic system, blood sugar more than 170mg/dl considered diabetes in this study or those who diagnosed previously as diabetes (type 2) and taking anti diabetic drugs. Vitamin D levels are divided into three categories .deficient < 20ng/ml, insufficient between 23-29ng/ml and normal level 30-100 ng/ml ²⁷ . Data were analyzed by using the (spss) package version 23. The chi-square test was used to test the associations between variables. The association considered statistically significant when the P-value is less than 0.05.

Results: The study included 300 participants, most of the study sample had either insufficiency or deficiency of Vitamin D level. Diabetic elders in this study had significant low serum Vitamin D level (both deficiency and insufficiency of vitamin) as compared to healthy group, this difference was statistically significant p<0.05.

Conclusion: There was a significant inverse relationship between vitamin D level and type 2 diabetes mellitus .

Keywords: *Vitamin D levels, Type 2 Diabetes Mellitus, Old adults, Iraq.*

Introduction

Vitamin D(VD) deficiency is globally very highly prevalent, about one billion people are affected⁽¹⁻⁶⁾. About 50% of population in developing countries lack VD⁷. Many factors increase the deficiency of VD

including less sunlight exposure, darkness skin, winter, elderly, use of clothes covering most of the body, female gender, and obesity⁸. Type 2 diabetes is one of the most common non communicable diseases among elders and has become a serious threat to older adults⁹ .

The public health impact of vitamin D deficiency has received attention due to the discovery of associations between low plasma concentrations of VD metabolites and higher risk of several chronic diseases including metabolic syndrome¹⁰. Previous studies have examined the association between vitamin D and type 2 diabetes risk.⁽¹¹⁻¹⁹⁾ However, the result remains controversial.

Several previous studies proved that VD deficiency is highly prevalent in Type Diabetes Mellitus, T2DM⁽²⁰⁻²²⁾. Correlation between VD serum levels and T2DM was studied by few local studies in Iraq, the results of these studies are also conflicting and controversial⁽²³⁻²⁶⁾.

Table (1) Frequency distribution of the mean age of the study group.

Parameter	Number	Mean of the Age
65-69 years	168	67 years
70 -74 years	84	73 years
75-80and more	48	78 years
Total	300	70.44+3.9

Table(1) shows the distribution of elders according to their age and mean age of the study groups, 65-69year

group is the dominant age group,the overall mean age and the standard deviation are 70.44+3.9

Table (2) Means of vitamin D level by gender.

Female	19.5 ng/ml
Male	25.8ng/ml
Male and female	22.5 ng/ml

Table(2) and figure (1) show the frequency distribution of the study participants according to the means of vitamin D level by gender the mean of vitamin D level among females is lower than vitamin D level among males.



Figure (1) Means of vitamin D level by gender.

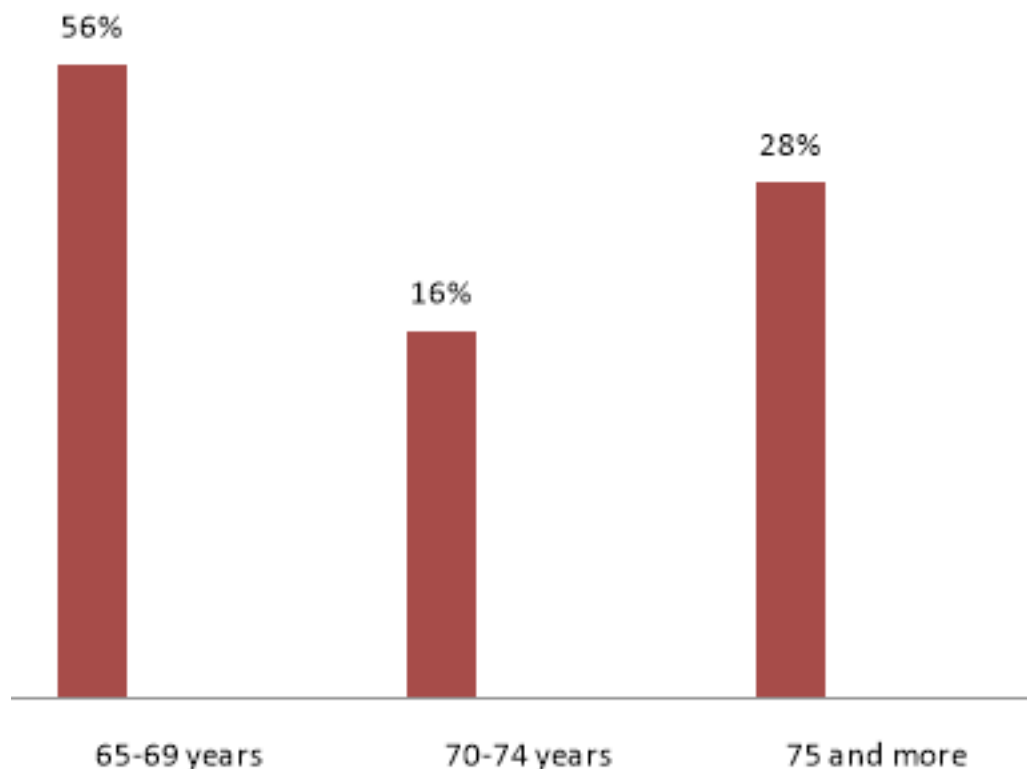


Figure (2): Shows the distribution of the elders according to age group, most of the participants in the age group 65-69years(56%).

Table (3) Association between Vitamin D and Diabetes mellitus among males

Study Variables	Vitamin D level among male					χ^2	P-value
	Deficiency (0-20 ng/ml) N (%)	Insufficiency (21-29 ng/ml) N (%)	Normal (30-100 ng/ml) N (%)	Total	Deficiency Proportion		
Diabetes Mellitus							
Yes	46 (83.6%)	9 (60%)	9 (31%)	55/64	85.9%	57.99	< 0.002*
No	9 (16.4%)	6 (40%)	20 (69.0%)	15/35	42.8%		
Total	55 (55.6%)	15 (15.1%)	29 (29.3%)	70/ 99 (70.7%)			

Table(3) shows that 70.7% of old males have low serum vitamin D level (less than 30ng/ml) most of them with deficient or insufficient level, this table also explains a positive highly significant association between low vitamin D and having high blood sugar (Diabetes) among elderly males chi square =57.99, df=2, p<0.002, there is an inverse relationship between the two variables.

Table(4) Association between Vitamin D and type 2 diabetes mellitus among females

Study Variables	Vitamin D level among females					χ^2	P-value
	Deficiency (0-20 ng/ml) N %	Insufficiency (21-29 ng/ml) N %	Normal (30-100 ng/ml) N %	Total	Deficiency Proportion		
Diabetes							
Yes	100 (83.3%)	21 (60%)	7 (15.2%)	121/128	94.5%	59.11	< 0.001*
No	20 (16.7%)	14 (40%)	39 (84.8%)	34/73	46.5%		
Total	120 (59.7%)	35 (17.3%)	46 (22.9%)	155/ 201=77.1%			

Table(4) shows that 77.1% of old females have low serum vitamin D level (less than 30ng/ml) most of them with deficient or insufficient level, this table also explains a positive highly significant association between low vitamin D and having high blood sugar (Diabetes) among elderly males chi square = 57.99, df = 2, p < 0.002, there is an inverse relationship between the two variables.

Discussion

To our best knowledge this study is the first study in our country that addresses the association between vitamin D status and type 2 diabetes among elderly people for both gender.

In this study, the Vitamin D level status among elders in Al Hillah City and its relation to type 2 diabetes mellitus are assessed among 301 old adults of both gender, females constitute about two third of the study group . The prevalence of low vitamin D serum level is higher among women than in men. the prevalence of Vitamin D Deficiency in the current study is about three quarter among the study group, this high prevalence is similar to that reported by a study conducted by Kara A

and Datta S in India who found that Vitamin D deficiency is significantly prevalent in otherwise healthy old aged population²⁸ .

The Korea National Health and Nutrition Examination Survey reported lower prevalence of vitamin D deficiency (<20 ng/mL) of 47.3% in males and 64.5% in females which is lower than our finding²⁹, but in a nationwide population-based study conducted in Thailand, only 5.7% of the population had a 25(OH)-D level <20 ng/mL³⁰, The prevalence of VD deficiency in this study is higher than that found in a local study conducted in Baghdad on 20 parkinsonism Iraqi patients with mean age 59 years (62.5%) the same study reported that the proportion of VD deficiency was much lower in the control group (27.5%)³¹.

Studies found that there is an increasing prevalence of vitamin D deficiency with age³². In general, elder people are more liable to VD deficiency due to many reasons, not only due to decrease skin production of Vitamin D but also due to decreased sunlight exposure, decreased dietary intake, impaired intestinal absorption, and diminished hydroxylation in the liver

and kidney^(33,34). Our study depicts a strong association between low serum concentration of vitamin D and type 2 diabetes mellitus in both in men and women this finding goes in line with findings of many other studies in different countries⁽³⁵⁻⁴²⁾. However, findings of other few studies disagree with our finding^(43,44).

Conclusion

Results of the current study showed a widespread, severe Vitamin D deficiency specially among women and high prevalence type 2 diabetes mellitus among elders, the study revealed a highly significant association between low vitamin D and having type 2 diabetes mellitus, a large scale public educational campaigns are needed to address this public health problem in our society. We suggest that physicians should keep an eye on the Vitamin D levels of elderly people in order to reduce and control the ever-increasing incidence of type 2 diabetes mellitus.

Acknowledgments: We would like to thank all participants who were enrolled voluntarily in this work for their full cooperation and patience during conducting this work. Thanks are due to the health care providers who support this study.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon College of Nursing and all experiments were carried out in accordance with approved guidelines.

References:

1. Long M, Wang C, Liu D. Glycated hemoglobin A1C and Vitamin D and their association with diabetic retinopathy severity. *Nutr Diabetes*. 2017;7:e281.
2. Alcubierre N, Valls J, Rubinat E, Cao G, Esquerda A, Traveset A, et al. Vitamin D deficiency is associated with the presence and severity of diabetic retinopathy in type 2 diabetes mellitus. *J Diabetes Res*. 2015;2015:374178.
3. Fanari Z, Hammami S, Hammami MB, Hammami S, Abdellatif A. Vitamin D deficiency plays an important role in cardiac disease and affects patient outcome: Still a myth or a fact that needs exploration? *J Saudi Heart Assoc*. 2015;27:264–71.
4. Joergensen C, Gall MA, Schmedes A, Tarnow L, Parving HH, Rossing P, et al. Vitamin D levels and mortality in type 2 diabetes. *Diabetes Care*. 2010;33:2238–43.
5. Lavie CJ, Lee JH, Milani RV. Vitamin D and cardiovascular disease will it live up to its hype? *J Am Coll Cardiol*. 2011;58:1547–56.
6. Nakashima A, Yokoyama K, Yokoo T, Urashima M. Role of Vitamin D in diabetes mellitus and chronic kidney disease. *World J Diabetes*. 2016;7:89–100.
7. Liefwaard MC, Ligthart S, Vitezova A, Hofman A, Uitterlinden AG, Kiefte-de Jong JC, et al. Vitamin D and C-reactive protein: A mendelian randomization study. *PLoS One*. 2015;10:e0131740.
8. Mandarino NR, Júnior FD, Salgado JV, Lages JS, Filho NS. Is Vitamin D deficiency a new risk factor for cardiovascular disease? *Open Cardiovasc Med J*. 2015;9:40–9.
9. Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes in older adults. *Diabetes Care* 2012;35:2650–64.
10. Grimnes G, Emaus N, Joakimsen RM, Figenschau Y, Jenssen T, Njolstad I, et al. Baseline serum 25-hydroxyvitamin D concentrations in the Tromso Study 1994–95 and risk of developing type 2 diabetes mellitus during 11 years of follow-up. *Diabet Med*. 2010;27(10):1107–15.
11. Bolland MJ, Bacon CJ, Horne AM, et al. Vitamin D insufficiency and health outcomes over 5 y in older women. *Am J Clin Nutr* 2010;91:82–9.
12. Kositsawat J, Kuchel GA, Tooz JA, et al. Vitamin D insufficiency and abnormal hemoglobin a1c in black and white older persons. *J Gerontol A Biol Sci Med Sci* 2015;70:525–31.
13. Napoli N, Schafer AL, Lui LY, et al. Serum 25-hydroxyvitamin D level and incident type 2 diabetes in older men, the Osteoporotic Fractures in Men (MrOS) study. *Bone* 2016;90:181–4.
14. Pilz S, van den Hurk K, Nijpels G, et al. Vitamin D status, incident diabetes and prospective changes in glucose metabolism in older subjects: the Hoorn study. *Nutr Metab Cardiovasc Dis* 2012;22:883–9.
15. Robinson JG, Manson JE, Larson J, et al. Lack of association between 25(OH)D levels and incident type 2 diabetes in older women. *Diabetes Care* 2011;34:628–34.
16. Schafer AL, Napoli N, Lui L, et al. Serum 25-hydroxyvitamin D concentration does not

- independently predict incident diabetes in older women. *Diabetic Med* 2014;31:564–9.
17. Schottker B, Herder C, Rothenbacher D, et al. Serum 25-hydroxyvitamin D levels and incident diabetes mellitus type 2: a competing risk analysis in a large population-based cohort of older adults. *Eur J Epidemiol* 2013;28:267–75.
 18. Thorand B, Zierer A, Huth C, et al. Effect of serum 25-hydroxyvitamin D on risk for type 2 diabetes may be partially mediated by subclinical inflammation: results from the MONICA/KORA Augsburg study. *Diabetes Care* 2011;34:2320–2.
 19. Veronese N, Sergi G, De Rui M, et al. Serum 25-hydroxyvitamin D and incidence of diabetes in elderly people: the PRO.V.A. study. *J Clin Endocrinol Metab* 2014;99:2351–8.
 20. Aljack HA, Abdalla MK, Idris OF, Ismail AM. Vitamin D deficiency increases risk of nephropathy and cardiovascular diseases in Type 2 diabetes mellitus patients. *J Res Med Sci.* 2019 May 22;24:47. doi: 10.4103/jrms.JRMS_303_18. PMID: 31160914; PMCID: PMC6540771.
 21. Yousif NM, Ismail AM. Alanine aminotransferase and gamma-glutamyltransferase activity as predictor markers for hepatocellular damage in Vitamin D deficient type 2 diabetes mellitus patients-cross-sectional study. *Am J Med Med Sci.* 2014;4:186–91.
 22. Mohammed MS, Ismail AM. Evaluation of lipid profile in Vitamin D deficiency diabetes mellitus type 2. *Eur Acad Res.* 2014;2:12074–84.
 23. AL-Najafi WK. Vitamin-D Status in Type 1 Diabetic Children and Teenagers Karbala J. *Med* 2018;11 (2):410-16
 24. Mustafa TI, Saleh BO, Thake AA. Association of Serum Levels of 25 Hydroxyvitamin D and Type 2 Diabetes Mellitus: Age and Gender Dependent Study. *IPGMJ* ;2017;16(2):138-145.
 25. Murtadha RM. Is There Any Association Between Type 2 Diabetes Mellitus and Biochemical Evidence of Vitamin D Deficiency?. *Kerbala Journal of Pharmaceutical Sciences*;2013;6:147
 26. Jabbar S, Jubair S Abdul AL-Kareem Z. New perspective actions of Vitamin D. *Kerbala journal of pharmaceutical sciences*;201;16:9
 27. Forrest KY, Stuhldreher WL. Prevalence and correlates of vitamin D deficiency in US adults. *Nutri Res (N Y, NY).* 2011;31(1):48–54
 28. Kar A, Datta S. A study of serum Vitamin D level and its association with hypertension. *J Family Med Prim Care.* 2018 May-Jun;7(3):546-550. doi: 10.4103/jfmpc.jfmpc_82_18.
 29. Choi HS, Oh HJ, Choi H, Choi WH, Kim JG, Kim KM, Kim KJ, Rhee Y, Lim SK. Vitamin D insufficiency in Korea--a greater threat to younger generation: the Korea National Health and nutrition examination survey (KNHANES) 2008. *J Clin Endocrinol Metab.* 2011;96(3):643–51.
 30. Chailurkit LO, Aekplakorn W, Ongphiphadhanakul B. Regional variation and determinants of vitamin D status in sunshine-abundant Thailand. *BMC Public Health.* 2011;11:853.
 31. Hatem AK, Lateef HF. The state of Vitamin D in Iraqi Patients With Parkinson Disease Al-Kindy College Medical Journal. 2017;13 (1):137-141.
 32. Daly RM, Gagnon C, Lu ZX, Magliano DJ, Dunstan DW, Sikaris KA, Zimmet PZ, Ebeling PR, Shaw JE. Prevalence of vitamin D deficiency and its determinants in Australian adults aged 25 years and older: a national, population-based study. *Clin Endocrinol.* 2012;77(1):26–35.
 33. Al-Horani H, Dayyih WA, Mallah E, Hamad M, Mima M, Awad R, et al. Nationality, Gender, Age, and Body Mass Index Influences on Vitamin D Concentration among Elderly Patients and Young Iraqi and Jordanian in Jordan Biochemistry Research International 2016;(2):1-8. Doi: <http://dx.doi.org/10.1155/2016/8920503>.
 34. Al-Mogbel ES. Vitamin D status among adult Saudi females visiting primary health care clinics. *Int J Health Sci (Qassim)* 2012;6:116-26.
 35. Song Y, Manson JE. Vitamin D, insulin resistance, and type 2 diabetes. *Curr Cardio Risk Rep*;2010; 4:40.
 36. Pittas AG, Chung M, Trikalinos T, et al. Systematic review: Vitamin D and cardio metabolic outcomes. *Ann Intern Med*;2010; 152: 307.
 37. Pittas AG, Nelson J, Mitri J, Hillmann W, Garganta C, Nathan DM, et al. Plasma 25-hydroxyvitamin D and progression to diabetes in patients at risk for diabetes: an ancillary analysis in the Diabetes Prevention Program. *Diabetes Care.* 2012;35(3):565–73.
 38. Tohidi M, Bozorgmanesh M, Mohebi R, Khalili D, Saadat N, Khorrami N, et al. Non-linear association between 25-hydroxyvitamin D and the incidence of

- type 2 diabetes: a community-based nested case-control study. *Diabet Med.* 2013;30(8):934–8.
39. Afzal S, Bojesen SE, Nordestgaard BG. Low 25-hydroxyvitamin D and risk of type 2 diabetes: a prospective cohort study and metaanalysis. *Clin Chem.* 2013;59(2):381–91.
 40. Tsur A, Feldman BS, Feldhammer I, Hoshen MB, Leibowitz G, Balicer RD. Decreased serum concentrations of 25-hydroxycholecalciferol are associated with increased risk of progression to impaired fasting glucose and diabetes. *Diabetes Care.* 2013;36(5):1361–7.
 41. Forouhi NG, Ye Z, Rickard AP, Khaw KT, Luben R, Langenberg C, et al. Circulating 25-hydroxyvitamin D concentration and the risk of type 2 diabetes: results from the European Prospective Investigation into Cancer (EPIC)-Norfolk cohort and updated meta-analysis of prospective studies. *Diabetologia.* 2012;55(8):2173–82.
 42. Gonzalez-Molero I, Rojo-Martinez G, Morcillo S, Gutierrez-Repiso C, Rubio-Martin E, Almaraz MC, et al. Vitamin D and incidence of diabetes: a prospective cohort study. *Clin Nutr.* 2012;31(4):571–3.
 43. Hidayat R, Setiati S, Soewondo P. The Association Between Vitamin D Deficiency and Type 2 Diabetes Mellitus in Elderly Patients. *Indones J Intern Med.* 2010; 42(3):123.
 44. Robinson JG, et al. Lack of Association Between 25(OH)D Levels and Incident Type 2 Diabetes in Older Women. *Diab Care* 2010; 34: 628.

Prevalence of Intestinal Parasites among Children in Khanaqin City East of Diyala/Iraq

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Abstract

The current study was carried out during the period between November/2018 and March/2019. The study was aiming to investigate the types and proportions of intestinal parasites among children who visited the primary health care center in the city of Khanaqin - Diyala governorate. The total number of specimens examined, during the course of study, was 805 stool specimens. These specimens were taken from children in the age range 1-10 years, and direct smear was the method used for the investigation of the intestinal parasites existence. The results showed that 156 children were infected with intestinal parasitic infections. These infections were categorized as four types of Protozoa and one type of intestinal Helminthes. The incidence ratio of intestinal parasitic infection was 19.373%, where the percentages of parasites considered in the current study have found to be 62.179% for the *Entamoebahistolytica* followed by 12.820% for the *Giardia lamblia*, 12.820 of *Entamoebacoli*, and 3.205% for the *Iodomoebabutschillii*. Moreover, the study has reported one type of Helminthes represented by the *Entrobisvermicularis* with occurrence ratio of 6.410%.

Keywords: Intestinal parasite, *Entamoebahistolytica*, Protozoa, Helminthes, *Giardia lamblia*.

Introduction

Intestinal parasite (IP) is one of the most widespread pathogens in the world, it infects around 3.5 billion persons a year, the majority of them are children¹. This type of infection represents an endemic disease worldwide, especially in the tropic and subtropical regions¹. It is mainly represented by Protozoa and Helminthes³, and they are transmitted by water and contaminated food⁴. However, the infection can also be transmitted from person to person by Oral-Fecal⁵. Apparently, all age groups are susceptible to IP infection, however the infection is likely to increase among children, especially those who are living in overcrowded, poor and rural communities that do not meet health care requirements^(6,7). For children, IP infections may cause many critical health issues. It results in iron deficiency, anemia, growth delay, weight loss, abdominal pain, dyspepsia and many health and physical issues⁸. Generally, literature review has revealed wide prevalence of IPs. In a study conducted by⁹ on a number of primary schools in Al-Khalis district/Diyala province, wide spread of many types of IPs, among children, was

reported, and the effect of some environmental factors on the infection was recorded. In another study, an increase in the incidence of IPs infection among families with low educational levels was reported¹⁰. In the same context, another study was indicated high incidence ratio of intestinal parasites infections among children in rural areas, and attributed the reason to the lack of services and scarcity of good drinking water¹¹. In the same way, several other studies conducted by^(12, 13) have indicated the spread of intestinal parasites among children in Baghdad. They have also pointed out some important aspects that could contribute to the spread of infections. Furthermore³, conducted a study in Dohuk – Kurdistan/Iraq and reported the types and extent of existence of IPs among children.

Material and Methods

During the period between November 2018 and March 2019, 805 stool samples were collected and inspected to investigate the types and prevalence of intestinal parasites among children in Khanaqin city. The samples were taken from children who visited

the primary health care sector due to suffering from gastrointestinal diseases, intestinal colic, and diarrhea cases. The samples were initially collected from the children's stools and kept in clean, perfectly sealed and dry plastic containers to keep the sample hydrous, as well as to prevent dryness. A questionnaire was then prepared to collect the required information from the children's parents. The collected information included child's sex, age, living area, number of family members, and the drinking water source (tap or filtered water). Collected stool samples were then subjected to laboratory test to investigate the presence of parasites (Trophozoites, Cyst, and Ova). 156 infected cases with intestinal parasites Protozoa and Metazoa were isolated.

The laboratory test consisted of two method:

a. Gross examination: Before conducting the microscopic test, the samples were examined with necked eyes. The purpose of this examination was to check the status of the stool samples in terms of the texture, color, and odor. Mostly, liquid stool contains trophozoites, while the cyst is predominantly found in the full-formed stool. Diarrhea caused by *Entamoedahistolytica* are normally recognized by its pong, and the existence of blood or mucus which are the evidence of the presence of amoebic infection. However, the existence of *Giardialambliia* in the stool is recognized by the yellowish-green color, oily texture, and the mucus. On the other hand, in case of infection with helminthes, the stool mostly be in its full-form unless co-infection.

b. Direct smear method: This method was implemented by preparing a clean slide, before a drop of the physiological solution (0.9%) table salt was placed on one side of the slide. Then, small amounts of the stool sample were taken from different places of the sample using a wood stick, and one of them was mixed with the physiological solution. On the other side of the slide, a drop of iodine solution was placed and thoroughly mixed with another small amount taken from the same stool sample. After that, the slide was covered with the slide cover.

Subsequently, the microscopic slides were examined using a microscope with magnification force of (40x, 10x).

Results

The results obtained from the present study showed that children in Khanaqin were infected by a number of IPs during the period between November 2018 and March 2019. A total of 805 stool samples were collected from children and tested in the primary health care sector in Khanaqin city. The children were suffering from gastrointestinal diseases and diarrheal diseases, they were clinically examined by specialist doctor before laboratory tests were made to investigate the presence of IPs infection. The results revealed that 156 children were infected, which represents total infection percentage of 19.378%. From the total number of infected cases, 70 infections were for females which represent 44.871%, and 86 infections were for males which represent 55.128% as shown in Table (1).

Table 1. Percentage of IPs infection between the studied samples for both sexes.

Infection percentage	Number of infected females	Infection percentage	Number of infected males	Infection percentage	Number of parasitic infections	The total Number of examinees
44.871%	70	55.128%	86	19.378%	156	805

The study, also, showed that children were infected with 5 types of the IPs. Out of these 5 types, 4 belong to protozoa which are *Entamoadahistolytica*, *Giardia lamblia*, *Entamoeba coli*, and *Iodoobabutchillii*. Table (2) shows that *E.histolytica* was in the first place with highest incidence of parasitic infection, it has infected 97 children which represent 62.179%. In the second place, the *Giardia lamblia* comes with total number of

infections of 59 that is 37.820%, followed by *E. coli* which infected 20 children with infection percentage of 12.820%, and then *Iodoobabutchillii* 5 infected cases which represents 3.205%. Moreover, the study showed some infections with helminthes, 10 children were diagnosed to be infected with *Entrobiousvermicularis* which is 6.410%.

Table 2. Types of IPs and the number and ratio of infections for each them during the study period.

Type of parasite	Number of infections	Percentage by the parasite
Entamoebahistolytica	97	62.179%
Giardia lamblia	59	37.820%
Entamoeba coli	20	12.820%
Entrobivirusvermicularis	10	6.410%
Iodomoebabutschillii	5	3.205%

The results given in Table 3 confirm the presence of some bilateral intestinal parasitic infections which means that the children were simultaneously infected with two different types of IPs. These infections were characterized as; *Giardia lamblia* with *E. coli* in 12 infected cases which is 7.629% of the total number of infections, followed by *Entamoebahistolytica* with

Entrobivirus vermicularis 10 cases representing 6.410% of the infections. Moreover, the *Entamoebahistolytica* with *Entamoeba coli* were found in 8 infections which is 5.128% of the total cases. The minimum recorded infection incidence ratio was 3.205% which represents 5 infections caused by *Giardia lamblia* with *Iodomoebabutschillii*.

Table 3. Co-infections with IPs among the investigated samples.

co-infection type	Number	Infection occurrence rate
E.histolytia + E.coli	8	5.128%
Giardia lamblia +E.coli	12	7.692%
E.histolytia + Entrobivirusvermicularis	10	6.410%
Giardia lamblia + Iodomoebabutschillii	5	3.205%

Table 4 shows the incidence ratio of IPs infection among the children categorized according to their sex and age group. It has been found that highest infection incidence ratio was among children in the aged between 5-10 years old which represents 47.435%. The infected cases were divided into 40 infected males (54.1%), and 34 infected females (45.94%). Infants' infections come in the second place with 48 infected cases representing

a percentage of 30.769%. Out of the 48 infections, 27 were for males and 21 for females which are respectively signify 56.3% and 43.8%. However, the lowest infection incidence ratio was in children under the age of 5 years. The total number of infections was 34 and the infection incidence ratio was 21.794%, 19 were males and 15 were females representing 55.9% and 44.11% respectively.

Table 4. Percentage of IPs infection according to age groups.

Age group	Number of infections	Infection percentage	Number of infected males	Infection percentage	Number of infected females	Infection percentage
Infants	48	30.769%	27	65.3%	21	43.8%
Below 5-years	34	21.794%	19	55.9%	15	44.11%
5-10 years	74	47.435%	40	54.1%	34	45.94%

Table (5) shows the incidence ratio of intestinal infection categorized according to living area (city center, district, and village). The results revealed that the highest ratio of infection was among the children

who live in villages. The whole number of infections were 87, (55.769%) split into 44 males (50.6%) and 43 females (49.7%). Districts come in the second place after the villages with total number of infections of 43 cases

(27.564%), the males share was 31 cases (72.1%) while the females share was 21 cases (27.9%). Finally, city center comes in the last place with minimum number of infections. The study recorded 26 infected case in the

city center, which signifies occurrence ratio of 16.666%. Out of these cases, the number of males were 11 and females were 15 which denote occurrence ratio of 42.3% and 57.7% respectively.

Table 5. Percentage of IPs infection according to living area.

Living area	Number of infections	Infection percentage	Number of infected males	Infection percentage	Number of infected females	Infection percentage
City center	26	16.666%	11	42.3%	15	57.7%
District	43	27.564%	31	72.1%	12	27.9%
Village	87	55.769%	44	50.6%	43	49.4%

The study has also investigated the relation and occurrence ratio of children's infection with intestinal parasites and the drinking water source. The study has observed increment in the number of infected children

who depend on tap water as a drinking water source. The number of infected children were found to be 92, (58.974%) compared to 64, (41.025%) for children who used to drink filtered water, as given in Table 6 below.

Table 6. The relationship and percentage of the infection with intestinal parasites and the source of drinking water.

Drinking Water Source	Number of Infections	Infection Percentage
Tap water	92	58.974%
Filtered water	64	41.025%

Discussion

This study has been conducted in the primary care sector in the city of Khanaqin-Diyala. The study was targeting children who visited the pediatric care department and were complaining from gastrointestinal diseases and diarrhea. The study considered children from different living areas, that relatively vary in the social environmental and economic conditions, to make it possible to relate the prevalence of the disease to the living conditions of those areas. Current study disclosed that the total incidence of the intestinal parasite infection was 19.778%. This is lower than what was reported by¹⁵ and³ who have reported infection incidences ratio of 24% and 22.27% respectively. However, the result presented here is higher than that of¹⁶ and¹⁷ who reported occurrence ratio of 14% and 17.4%, respectively. Current study revealed that the highest infection occurrence ratio was with *E. histolytica* (62.179%). This conforms with what was recorded¹⁹, who reported

increase in this parasite compared to the rest of Protozoa. The second was the *Giardia lamblia* which was the reason behind 37.820% of the infections. This result is very comparable with what has been reported by⁶ where the existence ration of *Entamoebahistolytica* and *Giardia lamblia* have been shown to be 66.8% and 36.8% respectively. The most common reason behind the wide spread of the of IPs infections is attributed to their direct transmittance to humans by taking food and water contaminated with contagious stages, and due to the superior ability of the Cyst to transmit the infection and to resist the environmental conditions²⁰. Though, flies play more significant role because they represent a *vector host* for the infection. The present study has also shown infections with *Entrobivirusvermicularis* (6.410%), which is relatively lower than what²¹, as he has pointed that the infection occurrence ratio as 24.9%. The *Entrobivirusvermicularis* was the most common intestinal worm among children. This was ascribed to the large

number of children within the same family, their participation in blankets, clothing and sleeping places, as well as the lack of health and social awareness, and the low educational level of the parents²². Further, the study has also recorded many cases of co-infections with IPs. 35 cases were recognized representing 22.43%. This finding conforms with number of studies found in the literatures that recorded many co-infections with IPs.

Conclusion

The results showed that 156 children were infected with intestinal parasitic infections. These infections were categorized as four types of Protozoa and one type of intestinal Helminthes. The incidence ratio of intestinal parasitic infection was 19.373%, where the percentages of parasites considered in the current study have found to be 62.179% for the *Entamoebahistolytica* followed by 12.820% for the *Giardia lamblia*, 12.820 of *Entamoebacoli*, and 3.205% for the *Iodomoebabutschillii*. Moreover, the study has reported one type of Helminthes represented by the *Entrobivirusvermicularis* with occurrence ratio of 6.410%.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Education for pure science, Iraq and all experiments were carried out in accordance with approved guidelines.

References

1. Fentahun AA , Asrat A ,Bitew A. Intestinal parasitic infection and associated factors among mentally disabled and non. disabled primary school students, Bahir Dar, Ahmara regional state, Ethiopia, 2018: a comparative cross – section study. BMC infectious Diseases, 2019;19 (1): 549-561.
2. Al-Mohammed HI , Amin TT , Abdulmagd E. Prevalence of intestinal parasitic infections and its relationship with soci-demographics and hygienic habits among male primary school children in Al-Ahsa, Saudi Arabia. Asian Pacific Journal of Tropical Medicine .2010;3 (11): 906-912.
3. Hussein JN , Abdullah A. The incidence of intestinal parasites among children in Hiri Pediatric hospital, Duhok, Iraq. Sience Journal of University of Zakoh, 2019;7 (1): 1-4.
4. AmerOSO, Al-Malki ES ,Waly IM. Prevalence of intestinal parasitic infections among patient of king Fahd Medical City in Riyadh Region, Saudi Arabia: A5 – year restrospective study. Journal of Parasitology Research,2018.
5. Ah hur YT ,Dakhil KM , KhalafHD. Study of intestinal parasites and its effect on blood parameters in children in Thi-Qar province. Journal of University of Thi-Qar, 2013;8 (3): 62-71.
6. Al-BayatiMHJ , Al-Hassany NA. Epidemiological and diagnostic study for some intestinal parasites that infected children in Diwaney Province. Journal of Al-qadisiya for pure science (quarterly), 2014;19(1):1-6.
7. Babakhani M , SafariR ,Rajati F. Prevalence and risk factors associated with intestinal parasitic infections among school children in Gashky, west of Iran. Intestinal Journal of pediatrics, 2017;5(7): 5263-5273.
8. Daryani A ,Hosseini- Teshnizi S ,Hosseini EA. Intestinal parasitic infections in Iranian preschool and school children: A systemactic review and meta – analysis. ActaTropica, 2017;169(69-83).
9. Al-BayatiNY. Intestinal parasitoses and pediculosis among pupils of some primary schools in Al-khalistwon center, Diyala province. M.Sc. thesis, College of Education (Ibn Al-Haitham) University of Baghdad, 2000;83.
10. Al-Kuraishi AH. The prevalence of Entamoedhistolyticacarries among children. Iraq Journal of Community Medicine, 2004;17(4):220-223.
11. Ftohe ZI, Al-Zako SS ,Mahoth N. Study on intestinal parasites as a costive of diarria and some effectors on them in children of Neinvah Governorate. Rafidin Journal of Science .2008;19(2):37-50.
12. Saiil YK. Prevalence of intestinal parasites in children in Baghdad city. Al-TAQANI Journal, 2009;22(2):32-37.
13. Shaker MJ , Hussein RA. Prevalence of intestinal parasitic infections among children in Baghdad city. Journal of College of Basic Education, 2011;17(71):21-30.
14. Garcia LS , Ash LR. Diagnostic phraseology: clinical laboratory manual. C.V. Mosby Co., Saint Louis: 1975;112.
15. Obaid HM. Malnutrition in relation to some intestinal parasitic infection in children of Kirkuk

- City – Iraq. Kirkuk University Journal/Scientific Studies (JUJSS),2015; 10(1): 191/206.
16. Abdi J ,FarhadiM , Aghaee S. Prevalence of intestinal parasites among children attending the daycare centers of Ilam, western Iran. *Journal of Medical Sciences*, 2014;14 (3): 143-146.
 17. Zemene T ,Shiferaw MB. Prevalence of intestinal parasitic infections in children under the age of 5 years attending the DebreBirhan referral hospital, North Shoa Ethiopia. *BMC Research Notes*, 2018;11(1):58 doi: 10.1186/s13104-018-3166-3.
 18. Gabbad AA ,Elawad MA. Prevalence of intestinal parasite infection in primary school children in Elengaz Are, Khartoum, Sudan. *Academic Research International* 2014;5(2): 86-91.
 19. Al-Kahfaji MSA. Prevalence of intestinal parasitic infection in children under five – year in Hilla, Babylon Province. *Medical Journal of Babylon*, 2014;11(3): 744-750.
 20. Al-WaridHS , Musa IS , Al-Qadhi BN. Iron deficiency and anthropometry in children infected with *Entamoebahistoltyca*. *International Journal of Recent Scientific Research*, 2013;4(6): 823-826.
 21. Kadir MA. Prevalence of entrobiasis (*Entrobivirusvermicularis*) and its impact on children in Kalar Town/Sulaimania – Iraq. *The Medical Journal of Tikrit*, 2011;2(172): 67-77.

Socio-Cultural Factors in Family Independence Prevent the Transmission of Leprosy in Sampang, Madura Island

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Abstract

Introduction: Leprosy is an infectious disease that causes various problems, not only in medical terms but also extends to social, economic, cultural, security and social security issues. Efforts made to break the chain of transmission of leprosy cases focus more on individuals who have not focused on families that have a high transmission chain.

Purpose: The research aims to explore the social factors of social and cultural factors in influencing family independence in preventing transmission of leprosy, describing the independence of the family in preventing transmission of leprosy, then compiled an example of a culture-based family independence program model for the prevention of leprosy transmission in Sampang with a theoretical approach used namely Family Centered Nursing and the theory of Transcultural Nursing in the form of modules.

Method: This study uses a qualitative research approach. Data saturation until five participants were obtained who carried out data retrieval in an in-depth interview. Data analysis using the Collaizi analysis method.

Results: Identification found four main themes: ((1) Religious; (2) Social Factors; (3) Economic Factors; and (4) Cultural Value. Conclusions: The description of the independence of families who care for lepers is still influenced by many factors, especially tradition and culture, efforts to break the chain of transmission are also closely related to care efforts that still do not reflect preventive values.

Keywords: *Family Independence, Prevention of Transmission, Transcultural Nursing, Leprosy, Phenomenology Study.*

Introduction

Leprosy is an infectious disease that causes various serious problems that are very complex¹. The efforts cut of transmission of leprosy focused more on individuals or people affected by leprosy. Although, other factors such as families had a high risk of contracting leprosy if they have not been treated optimally². The leprosy transmission risk is higher in one family, because family

members are direct contact with patients every day and last for a long time³.

According to World Health Organization (WHO) in 2014 there were 213,899 new cases with an Incidence Rate (IR) of 3.78 per 100,000 population⁴. Indonesia is country with the third largest number of leprosy cases in the world, is 17,202 new cases with Incidence Rate (IR) of 6.73 per 100,000 population in 2015⁵. East Java is province in Indonesia which has the highest burden of leprosy, the number of new cases in 2015 about 4,013 cases with IR of 10.33 per 100,000 population and 335 cases of new leprosy (8.35%). Sampang in Madura Island as one of the districts in East Java Province which has the second highest prevalence of leprosy cases in Indonesia. Based on the profile of the Sampang District

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Health Office, it was stated that the New Case Detection Rate (NCDR) from 2014 to 2016 showed an increasing trend in cases every year.

Based on the interviews results with 10 leprosy patients, it was found that the first appeared like phlegm or ringworm, so it does not need to be treated. As ordinary skin disease does not need treatment because they are thinking that more often taking medication can poison the body. After learning that the disease suffered is leprosy, they have a stigma from the surrounding community. The existence of a culture that is believed by surrounding community can influence the perception and selection of care undertaken by patients⁶.

Families have ethnic and cultural diversity and have different acceptance of health problems, so that a guideline is needed to intervene in order to avoid cultural shock⁷. Madura's philosophy of obedience, submission and submission to the four main figures in life shows the strong role of parents as role models in the family. While the teacher is a figure in the community including ulama or kyaisabagai figures who can provide family support in caring for family members who experience health problems in a faithful and spiritual way⁸.

Family involvement is needed in helping to prevent transmission, since the family acts as a decision maker to prevent health problems and maintain or improve the health status of family members⁹. The inadequate role of the family is a factor that influences the transmission of leprosy in addition to dropping out from taking medication¹⁰. So that a deeper exploration is needed related to the problems of families with leprosy in which there are socio-cultural influences that can affect family health problems.

Method

The method used in this study is a qualitative research method using a phenomenological approach to explore family-based social and cultural independence towards prevention of leprosy transmission in Sampang district in depth from the subjectivity of participants who are directly involved in providing care to leprosy patients¹¹.

The number of participants in this study was until data saturation was obtained with predetermined inclusion and exclusion criteria. The inclusion criteria are for the nuclear family who live in the same house as leprosy patients and permanent residents in Sampang

regency, while the exclusion criteria are those who are affected by leprosy referred to the hospital or those who move to other regencies. So that there were 15 respondents with a purposive sampling technique¹².

Instruments used in the collection process are using interview guidelines, field notes (recording data obtained during interviews): such as participant and other expressions and recorders or voice recorders in the form of MP3 voice recorders. The validity of the recording device is done by using a test recording the sound of the researcher.

The process of data analysis in this study was carried out using the nine step data interpretation method¹². The method was chosen because the steps of data analysis in Collaizi are quite simple, clear and detailed to be used in this study.

Results

Participants in this study amounted to 15 (fifteen) participants as the main subject, which number corresponds to the saturation results obtained in the field. Fifteen families were interviewed about the independence process carried out while caring for family members who have leprosy to prevent transmission to other family members.

Table 1: Demography Partisipants

Characteristics	Frequency	Percentage
Family Caregiver		
Gender		
Female	6	40
Male	9	60
Marital Status		
Single	3	20
Married	12	80
Age		
Less 45 years	4	27
More 45 tahun	11	73
Education		
No school	2	13
Elementary school	5	33
Junior high school	7	47
Senior high school	1	7

In this study the researchers wanted to explore family-based social and cultural independence in the prevention of leprosy transmission in Sampang district. This study found 4 themes and 10 sub-themes (table 2).

Table 2: Theme and subtheme

No.	Themes	Subthemes
1.	Religious	1. Spiritual
		2. Diseases Views
		3. Cause
2.	Social Factors	1. Medication adherence
		2. Support
		3. Openness related to disease
3.	Economy Factors	1. The cost of needs
		2. The difficulty of access to health services
4.	Cultural Value	1. Discipline of therapy
		2. Course of the disease

Religious: From the religious themes there are three themes were spiritual, disease views and causes. The participants’ spiritual sub-themes was described by participants:

“Used to swell up to five months, after prayers on friday in the mosque” (Participant (P1).

“Prayer of alone in the room” (P9).

The second sub-theme about the views of disease, along with the participant’s explanation regarding the theme:

“Infectious disease, but I am not clear”(P1-10).

The last sub-theme which was related to the causes of leprosy was presented by the participants :

“It’s like being used by people, cheating on the conditions said the shaman” (P12)

“Yes affected by the disease, he said he was exposed to a disease of the devil” (P7)

Social Factors: This social theme found three sub-themes were stigma, support and openness related to disease. The stigma sub-theme is presented by participants:

“Seeing it sad, every way out, people like not to get close” (P8)

The second sub-theme about support, along with participant’s explanation regarding the theme:

“His friends also comes, to encourage” (P5).

The third sub-theme regarding the openness of the disease is explained by participants:

“This is a disease that is routinely carried out by people, I don’t want all families to know”(P3).

Economic Factors: The theme of economic factors found two sub-themes were the cost of needs and the difficulty of access to health services. The cost of needs sub-theme was describe by participants:

“To meet daily needs just barely sir” (P10)

The next sub-theme about the difficulty of accessing health services was explained by participants as follows:

“I once took it to a health center, borrowed a neighbor’s bicycle. But it’s not good if you keep borrowing ”(P8).

Culturel Value: The theme of this cultural value found two sub themes were discipline of therapy and course of the disease. The discipline of therapy was described by participants :

“I was really tired, sir, but I want to get well. So that it continues to carry out this treatment” (P7).

The next sub-theme about course of the disease is explained by the participants:

“This is moving here now, first itchy continues to swell, so now it is like this. When Friday I bring it to prayer, once it is swollen pack, up to five month” (P13).

Discussion

This study similar with previous research has shown that 41% to 94% of patients want their doctors to deal with spiritual problems as a health solution¹³. The participants’ views regarding leprosy are also influenced by the religiosity they have. This is in line with previous research which stated that public knowledge about leprosy greatly influences perceptions, beliefs and attitudes¹⁴. Knowledge of leprosy also has a profound effect on the perceptions, beliefs and attitudes that participants will make to leprosy patients¹⁵. Religious patterns or beliefs about the mechanism of disease are closely related to knowledge, factors of experience and philosophy including religion¹⁶.

Beliefs held by individuals also play a role in choosing the right disease management¹⁶ Participants will believe treatment options according to what is considered right according to trust. Almost all participants chose non-medical treatment as the first treatment option. Most

individuals who have leprosy are advised by groups to undergo traditional medicine¹⁷. Traditional medicine is recognized as more affordable among livelihoods, more diverse and there is no partiality¹⁸. Traditional medicine is chosen because the cause of the disease is mostly due to curses and evil deeds or magic¹⁹. This explanation is similar of Visschedijk's research which states that leprosy control must be carried out more exclusively, especially related to mystical beliefs as one of the causes of leprosy²⁰.

Leprosy provides limitations in social relations. This research is in line with the previous study which stated that patients with leprosy experience an unsympathetic reaction, one of which is the rejection of the community regarding leprosy²¹. This distrust and rejection arises due to trigger stressors, namely the diagnosis of leprosy²². This situation causes the patient to experience social relations disorders in the form of a state of discrimination²³. So that continuous motivation and support for patients with leprosy is needed to have a positive impact on self-acceptance and constructiveness²⁴.

The next picture in the field of economics, which is often one of the crucial things. The existence of economic imbalances causes patients treated by participants to contribute to saving economic needs. This is one of the causes of the difficulty of access to health services. In line with the previous one which explains that health problems in population at risk one of them consists of risk factors that explain related economic problems²⁵.

The guidance of this research is on the concept of transcultural nursing, where the provision of nursing care with a cultural approach is competently carried out from infants to the elderly²⁶. Participants in this study are groups of people who have a strong cultural value in terms of organizing daily life. Culture has a central position related to social contact and spirituality. In the process of prevention, efforts to achieve the first cure need was continue therapy. Patients get the next rare diagnosis of leprosy that needs to be taken, namely undergoing treatment²⁴.

Leprosy is a disease that has a major impact on one's emotions^{27,28}. Previous studies related to leprosy also stated that patients with leprosy experience an unsympathetic reaction, one of them being rejection from the community²¹. This causes the emergence of feelings of sadness, worry, shame and resignation. Not infrequently also the patient becomes closed and chooses to remain silent at home.

Conclusion

Families as care giver who provide complete care still depend closely on the cultural values adopted. This tradition affects other factors such as social, economic and religious. Efforts to break the chain of transmission are also closely related to care efforts that still do not reflect preventive values.

Ethical Clearance: The present study was passed the ethical principal on the ethics committee of the Faculty of Nursing, Universitas Airlangga with certificate number: 1326-KEPK.

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Reference

1. Kementerian Kesehatan RI. Pedoman nasional program pengendalian penyakit kusta. Jakarta: Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia. 2012;(57):4.
2. Carvalho APM, Fabri A da COC, Oliveira RC, Lana FCF. Factors associated with anti-phenolic glycolipid-I seropositivity among the household contacts of leprosy cases. *BMC infectious diseases*. 2015; 15(1):219.
3. Barreto JG, Bisanzio D, de Souza Guimarães L, Spencer JS, Vazquez-Prokopec GM, Kitron U, et al. Spatial analysis spotlighting early childhood leprosy transmission in a hyperendemic municipality of the Brazilian Amazon region. *PLoS neglected tropical diseases*. 2014;8(2):e2665.
4. Organization WH. Global leprosy update, 2014: need for early case detection. *Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire*. 2015;90(36):461-74.
5. Indonesia KKRI, Penyakit P, Lingkungan P. Pedoman Nasional Program Pengendalian Penyakit Kusta. 2015.
6. Pradhan S, Kumar P. Cultural practice and beliefs hampering the treatment of leprosy- an area of concern. 2016;(April):124-8. Available from: <https://pdfs.semanticscholar.org/4a45/46b7f2597288344758309d07f44d4fdd0b27.pdf>
7. Leininger MM, Mcfarland MR. *Transcultural nursing: concepts, theories, research and practice*.

- Journal of Transcultural Nursing. 2002; 13(3):261.
8. Wiyata AL. Madura yang Patuh?; Kajian Antropologi Mengenai Budaya Madura. Jakarta: Ceric-Fisip UI; 2003.
 9. Friedman MM, Bowden VR, Jones E. Family nursing: Research, theory & practice. Pearson; 2003.
 10. Indanah I, Suwanto T, Wiyarni N. DUKUNGAN KELUARGA BERHUBUNGAN DENGAN KECACATAN PENDERITA KUSTA. Jurnal Ilmu Keperawatan dan Kebidanan. 2014;5(1).
 11. Creswell JW, Creswell JD. Research design: Qualitative, quantitative and mixed method approaches. Sage publications; 2017.
 12. Speziale HS, Streubert HJ, Carpenter DR. Qualitative research in nursing: Advancing the humanistic imperative. Lippincott Williams & Wilkins; 2011.
 13. Wachholtz AB, Pearce MJ. Does spirituality as a coping mechanism help or hinder coping with chronic pain? Current Pain and Headache Reports. 2009; 13(2):127–32.
 14. Singh S, Sinha AK, Banerjee B, Jaswal N. Knowledge, Beliefs and Perception of Leprosy. Disability, CBR & Inclusive Development. 2013;23(4):67–75.
 15. Van Brakel WH, Sihombing B, Djarir H, Beise K, Kusumawardhani L, Yulihane R, et al. Disability in people affected by leprosy: the role of impairment, activity, social participation, stigma and discrimination. Global health action. 2012;5:1–11.
 16. WILLIAMS A. Health beliefs surrounding leprosy induced foot ulceration; an exploratory qualitative study from South Nepal. Lepr Rev. 2015;86:254–64.
 17. Singh S, Sinha AK, Banerjee BG, Jaswal N. The Health-Seeking Behavior of Leprosy Patients: An explanatory model. Health, Culture and Society. 2013;4(1):52–65.
 18. Singh A, Madhavan H. Traditional vs. non-traditional healing for minor and major morbidities in India: Uses, cost and quality comparisons. Tropical Medicine and International Health. 2015;20(9):1223–38.
 19. Baccega M. Social Mobility and Social Stratification in Hartmann von Aue's Der Arme Heinrich. Quaderni di Palazzo Serra. 2013;22:1–10.
 20. Visschedijk J, van de Broek J, Eggen H, Lever P, van Beers S, Klatser P. Mycobacterium leprae—millennium resistant! Leprosy control on the threshold of a new era. Tropical Medicine & International Health. 2000;5(6):388–99.
 21. Wong ML, Subramaniam P. Socio-cultural issues in leprosy control and management. Asia Pacific Disability Rehabilitation Journal. 2002; 13(2):85–94.
 22. Susanti IA, Mahardita NGP, Alfianto R, Sujana IMIWC, Siswoyo, Susanto T. Social stigma, adherence to medication and motivation for healing: A cross-sectional study of leprosy patients at Jember Public Health Center, Indonesia. Journal of Taibah University Medical Sciences. 2018; 13(1):97–102.
 23. Sillo S, Lomax C, De Wildt G, Da M, Fonseca S, De Almeida Galan NG, et al. A temporal and sociocultural exploration of the stigma experiences of leprosy patients in Brazil. Lepr Rev. 2016;87:378–95.
 24. Susanto T, Dewi EI, Rahmawati I. The experiences of people affected by leprosy who participated in self-care groups in the community : A qualitative study in Indonesia. Lepr Rev. 2017;88:543–53.
 25. Stanhope M, Lancaster J. Community health nursing: promoting health of aggregates, families and individuals, 4th edition. 4th ed. St. Louis: Mosby Year Book Inc; 2000.
 26. Wechsler H, Devereaux RS, Davis M, Collins J. Using the School Environment to Promote Physical Activity and Healthy Eating. Preventive Medicine [Internet]. 2000;31(2):S121–37. Available from: <http://www.sciencedirect.com/science/article/pii/S0091743500906492>
 27. Charles-Damte M. The Lived Experiences of Women Living in a Leprosy Colony in Hyderabad, India : A Phenomenological Study Marjorie Charles-Damte A Dissertation Submitted to the Faculty of The Chicago School of Professional Psychology In Partial Fulfillment of the Require. ProQuest. Faculty of The Chicago School of Professional Psychology; 2016.
 28. Dako-Gyeke M, Asampong E, Oduro R. Stigmatisation and discrimination: Experiences of people affected by leprosy in Southern Ghana. Lepr Rev. 2017;88:58–74.

Head Posture and Functional Ability of Upper Extremity in Adolescents Use Smartphone

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Abstract

Objective: This study aimed to determine the impact of smartphone use in head posture and functional ability of upper extremity in adolescents and the correlation between them.

Design: Cross sectional design.

Method: Forty adolescents divided into two groups (group I and group II) based on the smartphone time use per day. They were assessed for neck pain by Visual analogue scale (VAS), the disability of the upper extremity by Upper Extremity Functional Index (UEFI) and the head posture angles by AutoCAD photographic analysis.

Results: The results of this study represented significant differences in all measurable variables in the group (II) as compared to the group (I). Also, the results of this study represent there were significant strong relationships between the measurable variables.

Conclusion: We could conclude that the prolonged duration of smartphone use had significant effects on the head posture and functional ability of adolescents.

Keywords: *Smartphone, head posture, pain, functional ability, adolescence.*

Introduction

The smartphone is one of the most information and communication technology used recently. It provides an attractive tool for internet connection, calling, games, photos, social media and music purposes⁽¹⁾. For these advantages, young people are highly ownerships for the smartphone as they represented 76% in adolescents and young adults⁽²⁾. Smartphone users assume the flexed neck position for long duration resulting in the development of physical problems e.g. forward head position, muscle

spasm and pain^(1,3,4). Researches demonstrated several studies related to the smartphone usage that investigated the range of motion and pain for the cervical spine. Also, the hand grip and conduction velocity for nerves were investigated⁽¹⁻⁴⁾.

So, this study aimed to determine the impact of smartphone use in head posture and functional ability of upper extremity in adolescents. Also, it aimed to determine the correlation between head posture, functional ability of upper extremity and the duration of smartphone use/day in adolescents.

Subject and Method:

Subjects: Forty adolescents participated in this study from both sexes (12 males and 28 females) with age ranged from 14 to 18 years. Their body mass index ranged from 18.5 to 24.9 kg/m². They were divided into two groups (group I and group II) based on the smartphone

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time use per day⁽¹²⁾. This study was conducted in the period from October 2018 to January 2019. They were recruited from several secondary schools at Cairo, Egypt, according to the following criteria:

- Group I: Twenty adolescents from both sexes (5 males and 15 females) used the smartphone for time less than 4 hours per day.
- Group II: Twenty adolescents from both sexes (7 males and 13 females) used the smartphone for time more than 4 hours per day.
- Subjects in both groups of late childhood (adolescence).
- Subjects in both groups did not have injuries in neck, back, upper or lower limb.
- Subjects in both groups did not have a history of inflammatory joint disease, surgical intervention for neck, back, upper or lower limb.
- Subjects in both groups did not have a history of neuropediatric or developmental disorders.
- Subjects in both groups were not athletes.

Adolescent's parents had signed a consent form about the purpose of the study, its benefits and inherent risks, their committee with regard to time and money and Agreement to participate.

Instrumentations:

Tape measurement: It was used to determine the height of the subject in centimeters (cm).

Weight Scale: It was used to determine the weight for every subject in kilograms (kg).

Visual analogue scale (VAS): It was used to measure the intensity of neck pain after the use of smartphone⁽⁵⁾.

Photos recording:

Digital Camera: Samsung PL20 camera (14.2 megapixels. 5X optical zoom lens, 1280 × 720 p resolution@24 fps, 27mm wide angle and digital image stabilization) was used to take photographs for the subjects. It was placed on tripods 134.5 cm high and at a distance of 2 meters lateral to the subject.

Sheer Spots: Sheer spots with extended sticks were used to define the anatomical land marks the tragus of the ear, the spinous process of C7 vertebra, the canthus

of the eye, the sternal notch of the manubrium and the center point of the chin and acromion.

Photographic Analysis: Auto CAD program (version 2013) used to determine the craniovertebral angle (CVA), head tilt angle (HTA: gaze angle), shoulder angle (FSA: forward shoulder angle) and head position angle (HPA),⁽⁶⁾. These angles were defined as:

- **Craniovertebral angle (CVA):** It is the angle between the true horizontal through the spinous process of C7, with a line connecting spinous process of C7 with the tragus.
- **Head tilt angle (HTA):** It is the angle between the line connecting the tragus of the ear to the canthus of the eye and the horizontal line passing through the tragus.
- **Forward shoulder angle (FSA):** It is the angle formed at the intersection of the line between the midpoint of the humerus and spinous process of C7 and the horizontal line through the midpoint of the humerus.
- **Head position angle (HPA):** It is the between the tragus manubrium line and the line extending from the center point of chin to the tragus.

The Upper Extremity Functional Index (UEFI):

It was used to determine the disability of the upper extremity⁽⁷⁾.

Procedures:

After parental permission, the subject conducted the following procedures:

- The tape measurement was installed on the wall by using pins. The stature was determined as the vertical distance between the floor and the top of the head and measured with the subject standing erect against the wall and looking straight ahead,⁽⁸⁾.
- The BMI was calculated as the ratio of the subject's height (in meter) and weight (in kilogram) i.e. weight/height²⁽⁹⁾. The subject was asked to mark on the visual analogue scale (VAS) and determine the degree of pain he/she felt. Then he/she was conducted to the Upper Extremity Functional Index (UEFI) questionnaire lists of 20 activities and the subject given a score to each based on the difficulty they have completing that activity⁽⁷⁾.
- Photographs were shot from the sagittal view and

while the subject was asked to assume the standing position in their relaxed normal posture at a mark on the floor, with the standardized instruction: “feet slightly apart, stand normally and relax, look straight ahead”. Two dimensional coordinates of each marker were used by Auto CAD to determine the spinal posture assessment including the distances and angles.⁽¹⁰⁾

Statistical Analysis: Unpaired t-test was calculated for variables measured during this study. We used level of significance 0.05. Pearson- a parametric test used to test the correlation between head posture and

functional ability of upper extremity in adolescents use the smartphone and their significance levels.

Results

Descriptive data of both groups: The mean values ± standard deviations of the age, height, weight, body mass index (BMI) and onset of smartphone use indicated no significant difference between both groups as P > 0.05, table (1). The distribution of males and females in the group (I) was 25% and 75%; respectively. Also, the distribution of males and females in the group (II) was 35% and 65%; respectively.

Table 1: The general characteristics of the subjects

Items	Group	N	Mean ± SD	t	Sig
Age	I	20	16.35 ± 0.988	0.295	0.772 (NS)
	II	20	16.25 ± 1.020		
Height (HT)	I	20	159.80 ± 3.381	1.131	0.272 (NS)
	II	20	160.65 ± 3.815		
Weight (WT)	I	20	54.67 ± 2.029	0.253	0.803 (NS)
	II	20	54.80 ± 2.122		
Body mass index (BMI)	I	20	21.25 ± 0.967	1.710	0.104 (NS)
	II	20	20.85 ± 1.226		
Onset of smartphone use (Years)	I	20	3.53 ± 0.224	0.643	0.528 (NS)
	II	20	3.33 ± 0.155		

SD: Standard deviation. NS: Non-significant.

Comparison between the duration of smartphone use/day, Visual analogue scale (VAS) and Upper Extremity Functional Index (UEFI) in both groups.

The mean values ± standard deviation of the duration of smartphone use/day, (VAS) and (UEFI) represented significant differences as P < 0.05, table (2).

Comparison between head posture angles in both groups: The mean values ± standard deviation of the head posture angles represented significant differences as P < 0.05, table (3).

Pearson bivariate correlation between the head posture angles, Visual analogue scale (VAS), Upper Extremity Functional Index (UEFI) and the duration of smartphone use/day: As shown in table (4), there were significant relationships between each of (VAS), (UEFI), Head posture angles and the duration of smartphone use/day which was found to have significant relationships at 5% significance level.

Table 2: Comparison between duration of smartphone use/day, Visual analogue scale (VAS) and Upper Extremity Functional Index (UEFI) in both groups

Items	Group	N	Mean ± SD	t	Sig
Duration of smartphone use/day (hrs.)	I	20	2.50 ± 0.114	12.350	0.000*
	II	20	5.90 ± 0.240		
Visual analogue scale (VAS)	I	20	1.95 ± 0.170	15.147	0.000*
	II	20	5.80 ± 0.172		
Upper Extremity Functional Index (UEFI)	I	20	67.20 ± 0.887	37.75	0.000*
	II	20	21.25 ± 0.502		

SD: Standard deviation. *: Significant.

Table 3: Comparison between head posture angles in both groups.

Items	Group	N	Mean ± SD	t	Sig
Craniovertebral angle (CVA)	I	20	52.40 ± 0.343	16.850	0.000*
	II	20	44.10 ± 0.289		
Head tilt angle (HTA: gaze angle)	I	20	14.70± 0.179	7.123	0.000*
	II	20	17.15 ± 0.327		
Shoulder angle (FSA: forward shoulder angle)	I	20	160.35 ± 0.488	26.45	0.000*
	II	20	145.80 ± 0.485		
Head position angle (HPA)	I	20	27.20 ± 0.258	24.64	0.000*
	II	20	34.10 ± .315		

SD: Standard deviation. *: Significant.

Table 4: Pearson bivariate correlation between the head posture angles, Visual analogue scale, Upper Extremity Functional Index and the duration of smartphone use/day

Item		VAS	UEFI	CVA	HTA	FSA	HPA
Duration of smartphone use/day (hrs.)	Pearson Correlation	0.854**	-0.896**	-0.836 **	0.589**	-0.839 **	0.840**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000

* Correlation is significant at the 0.05 level (2-tailed).**. Correlation is significant at the 0.01 level (2-tailed).

Visual analogue scale (VAS), Upper Extremity Functional Index (UEFI), craniovertebral angle (CVA), head tilt angle (HTA: gaze angle), shoulder angle (FSA: forward shoulder angle) and head position angle (HPA).

As shown in table (5), there were significant relationships between each of Head posture angles and (VAS). Also, there were significant relationships between each of Head posture angles and (UEFI) which was found to have significant relationships at 5% significance level. As shown in table (6), there was significant strong negative relationship between the Visual analogue scale and (UEFI) which was found to have significant relationships at 5% significance level.

Discussion

This study was conducted to determine the impact

of smartphone use in head posture and functional ability of upper extremity in adolescents and the correlation between head posture, functional ability of upper extremity and the duration of smartphone use/day in adolescents.

The age of the subjects participated in this study ranged from fourteen to eighteen years old because it was mentioned that smartphone users were 93% in the age ranged from sixteen to twenty four years old as mentioned by Ofcom on its website on 06 August 2015⁽¹¹⁾.

Table (5): Pearson bivariate correlation between the Visual analogue scale, Upper Extremity Functional Index and the head posture angles.

Item		CVA	HTA	FSA	HPA
Visual analogue scale (VAS)	Pearson Correlation	-0.869**	0.632**	-0.879**	0.918**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
Upper Extremity Functional Index (UEFI)	Pearson Correlation	0.919**	-0.723**	0.954**	-0.915**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).					
Visual analogue scale (VAS), Upper Extremity Functional Index (UEFI), craniovertebral angle (CVA), head tilt angle (HTA: gaze angle), shoulder angle (FSA: forward shoulder angle) and head position angle (HPA).					

Table (6): Pearson bivariate correlation between the Visual analogue scale and Upper Extremity Functional Index.

Item		Upper Extremity Functional Index (UEFI)
Visual analogue scale (VAS)	Pearson Correlation	-0.927**
	Sig. (2-tailed)	0.000
*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).		

All subjects in both groups were assessed for neck pain by Visual analogue scale which is a valid and reliable method⁽¹²⁾ and for the disability of the upper extremity by a valid and reliable questioner called Upper Extremity Functional Index⁽⁷⁾.

The head posture angles were measured for all subjects by AutoCAD photographic analysis which considered as a valid and reliable method for angles measurements⁽¹³⁾. The results of this study represented significant differences in the duration of smartphone use/day, Visual analogue scale, Upper Extremity Functional Index and the head posture angles in the group (II) as compared to the group (I). It was indicated that the neck pain and the disability of the upper extremity were increased by increasing the time use of smartphone/day.

The craniovertebral angle was decreased by 15.84% and head position angle was increased by 25.37% in group (II) as compared to the group (I) which indicated the subjects assume more forward head position by prolonged use of smartphone/day. Head tilt angle was increased by 16.67% in group (II) as compared to the group (I) which indicated the subjects assume more extension of the head relative to the cervical spine by prolonged use of smartphone/day^(6, 14).

Shoulder angle was decreased by 9.07% in group (II) as compared to the group (I) which indicated the subjects assume more forward shoulder in relation the seventh cervical vertebra by prolonged use of smartphone/day⁽⁶⁾.

Also, the results of this study represent there were significant strong relationships between the head posture angles, Visual analogue scale, Upper Extremity Functional Index and the duration of smartphone use/day. This finding indicates that the neck pain, disability of the upper extremity and forward head position were directly proportional to the time use of smartphone/day.

These findings can be referred to assuming the flexed neck position for long duration with smartphone use and maintain the head in a forward position. So the subjects extend the atlanto-occipital (C1 to C2) joints and flex the lower cervical spines (C4 to C7) while flatten the mid cervical lordosis⁽¹²⁾. Also, the cervical spine load is increase by 6 times as increase the head flexion. These demands may cause damage to the tissues support head and neck including muscles, ligaments and joints⁽¹⁵⁾. The pain in neck and shoulder leads to displacement of the acromion forward more than⁽⁶⁾. It may also refer to the reduction in the conduction velocity of the ulnar nerves after the prolonged use of smartphone⁽¹²⁾.

Conclusion

We could conclude that the prolonged duration of smartphone use had significant effects on the head posture and functional ability of adolescents.

Conflict of Interest: Author (s) have not declared any conflict of Interest.

Ethical Clearance: The ethical clearance was taken from by an Ethics Committee of the Cairo University.

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References

1. James. L. and Alagiathiruvevenkadam. I.: Analysis of the relationship between smartphone users and neck disability treatment programs: A quasiexperimental study. *International Journal of Applied Research*;2017; 3(6): 784-791.
2. Dayapoglu. N., Kavurmaci. M. and Karaman. S.: The Relationship between the Problematic Mobile Phone Use and Life Satisfaction, Loneliness and Academic Performance in Nursing Students. *International Journal of Caring Sciences*:2016; 9(2): 647-652.
3. Sang Yong Lee, Dae Hee Lee, Seul Ki Han.: The effect of posture on neck flexion angle while using a smartphone according to duration. : *J Korean Soc Phys Med*; 2016; 11(3):35-39.
4. Park. J, Kim. J, Jonggun. K., et al.: The effects of heavy smartphone use on the cervical angle, pain threshold of neck muscles and depression. *Advanced Science and Technology Letters*; 2015; 91:12-17.
5. Aun, C., Lam, Y. M., Collect, B.: Evaluation of the use of visual analogue scale in Chinese patients". *Pain*; 1986; 25:215-21.
6. Lee. HS., Chung. HK. and Park. SW.: The analysis of severity of forward head posture with observation and photographic method. *J Korean Soc Phys Med*, 2015; 10 (3): 227- 235.
7. Stratford. P, Binkley. J, Stratford. D.: Development and initial validation of the upper extremity functional index. *Physiotherapy Canada*; 2001; 53(4):259-67.
8. Castellucci. I, Gonçalves. M. A and Arezes. P. M.: Ergonomic Design of School Furniture: Challenges for the Portuguese Schools. *Applied human factors and ergonomics, 3rd international conference, USA*; 2010.
9. Sethi. J, Sandhu. J. S and Vijay. I. V.: Effect of Body Mass Index on work related musculoskeletal discomfort and occupational stress of computer workers in a developed ergonomic setup. *Sports Medicine, Arthroscopy, Rehabilitation, Therapy & Technology*; 2011; 3:22. Doi: 10.1186/1758-2555-3-22.
10. Perry. M, Smith. A, Straker. L, Coleman. J, O'Sullivan. P.: Reliability of sagittal photographic spinal posture assessment in Adolescents. *Advances in Physiotherapy*; 2008; 10: 66-75.
11. The UK Is Now a Smartphone Society (accessed on 28 August 2015). <http://media.ofcom.org.uk/news/2015/cmr-uk2015/>.
12. Samaan. M., Elnegmy. E.H., Elnahas. A. M. and Hendawy. A. S.: Effect of prolonged smartphone use on cervical spine and hand grip strength in adolescence. *International Journal of Multidisciplinary Research and Development*; 2018; (9): 49-53.
13. Nasser N, Hadian MR, Bagheri H, Talebian S, Olyaei G.: Reliability and accuracy of joint position sense measurement in the laboratory and clinic; utilising a new system. *Acta Medica Iranica*; 2007; 45(5):395-404.
14. Salahzadeh Z, Maroufi N, Ahmadi A, et al.: Assessment of forward head posture in females: observational and photogrammetry method. *J Back Musculoskelet Rehabil*; 2014; 27(2): 131-9.
15. Kee. IK., Byun. IS., Jung. JK and Choi JK.: The presence of altered craniocervical posture and mobility in smartphone addicted teenagers with temporomandibular disorders. *J. Phys. Ther. SCi*; 2016; 28: 339-346.

Neurological Spectrum Disorders Associated with Anti-MOG Antibody

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Abstract

Optic neuritis (ON) is an inflammatory disease of the optic nerve characterized by pain and visual loss and often associated with multiple sclerosis (MS) or neuromyelitis optica spectrum disorders (NMOSD). Autoantibodies against myelin oligodendrocyte glycoprotein (MOG-IgG) have been reported in patients with inflammatory central nervous system disorders including isolated optic neuritis (ON).

Objective: To investigate the differences of clinical features, cerebrospinal fluid (CSF), MRI findings and response to steroid therapies between patients with optic neuritis (ON) who have myelin oligodendrocyte glycoprotein (MOG) antibodies and seronegative group. This study was done in a period between June 2015 and July 2018, 65 patients were included in this study with ON who ophthalmologists had diagnosed as having or suspected to have ON with acute visual impairment and declined critical flicker frequency, abnormal findings of brain MRI, optical coherence tomography and fluorescein fundus angiography at their onset or recurrence. After exclusion of all patients who fulfilled the diagnostic criteria of neuromyelitis optica (NMO)/NMO spectrum disorders (NMOSD), MS McDonald's criteria, we defined 40 patients with idiopathic ON (12 males, 28 females, age range 15-60 years). Sera from patients were tested for antibodies to MOG and aquaporin-4 (AQP4) with a cell-based assay.

Results: 37.5% (15/40) were positive for MOG antibodies, 2.5% (1/40) were positive for AQP4 and 25 (62.5%) were seronegative. Among the 15 patients with MOG antibodies, four had optic pain ($p=0.007$) and five had prodromal infection ($p=0.05$). Two of the 15 MOG-positive patients showed significantly high CSF levels of myelin basic protein ($p=0.05$) and none were positive for oligoclonal band in CSF. On MRIs, five MOG-positive patients showed high signal intensity on optic nerve, four had a cerebral lesion and two had a spinal cord lesion. Six of the eight MOG-positive patients had a good response to steroid therapy.

Conclusions: The present results indicate that Patients with NMOSD and MOG positive antibodies have distinct clinical features, fewer attacks and better recovery than seronegative patients.

Keywords: *optic neuritis; myelin oligodendrocyte glycoprotein; autoantibodies; demyelinating diseases.*

Introduction

Optic neuritis (ON) is an inflammatory disease of the optic nerve characterized by pain and visual loss

and often associated with multiple sclerosis (MS) or neuromyelitis optica spectrum disorders (NMOSD). Recent evidence suggests that certain forms of ON are associated with anti-myelin oligodendrocyte glycoprotein (MOG) antibodies¹⁻⁴. A distinct clinical subset of ON is characterized by multiple episodes that involve one or both optic nerves, occur within months or weeks and do not involve any other associated clinical or radiologic findings. This entity, defined as either recurrent optic neuritis (rON) or chronic relapsing inflammatory optic neuritis (CRION)⁵, is typically corticosteroid-responsive and corticosteroid-

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dependent, often requiring immunosuppressive therapy for corticosteroid-sparing effect.

The MOG is a glycoprotein of 218 aminoacids expressed exclusively in the plasmatic membrane of the oligodendrocytes within the CNS. It is a minor compound of the myelin sheath but its localization on the outer surface made it accessible to reactive antibodies. It is believed that its extracellular domain induces cellular and humoral autoimmunity⁵. Antibodies directed against MOG (MOG-IgG) are mostly of the IgG1 subtype and are able to induce cytotoxicity and to fix complement⁵.

The MOG-IgG is observed in several clinical syndromes, such as NMOSD, idiopathic recurrent or bilateral optic neuritis (ON), isolated myelitis, acute demyelinating encephalomyelitis and in pediatric MS. Although, it is not clear if the variable phenotypes that have been linked to MOG-IgG are a result of the technical limitations and lack of a standard detection method⁵, or if they indicate certain heterogeneity in the immunological dysfunction that causes the production of these autoantibodies.

Patients and Method

Study Design: This is a cross-sectional study of patients with NMO or NMOSD that diagnosed according to revised criteria who visited the neurological department in Baghdad teaching hospital and AL yarmouk teaching hospital. The study extended from June 2015 and July 2018.

Study Sample: Sixty. five patients were enrolled in the study, from each a detailed medical history had been taken, thorough physical examination was done. We only included consecutive patients followed up in one of the 2 centers for whom information regarding the clinical attacks, brain and spinal cord MRIs and serum for antibody testing were available; 25 patients were excluded because of a lack of information. All patients seronegative for both AQP4 and MOG antibodies were fully investigated and alternative diagnoses were ruled out.

All serum samples were analyzed for AQP4 and MOG antibodies. The cell-based assay (CBA) for AQP4 antibody detected in living cells using HEK-293 cells. These samples were also analyzed for the presence of MOG antibodies using a CBA with live HEK-293 cells. The samples were tested for MOG antibodies at least twice at dilution of 1:100.

Statistical Analysis: This is descriptive study through which we determine the percentages of anti-NMO in blood and CSF and there relation to gender, relapse rate, EDSS and pattern of optic involvement. Statistical analysis was performed with the statistical package for social sciences (SPSS for windows version 16).

Results

Among the 40 patients with NMOSD, 37.5% (15/40) were positive for MOG antibodies and 2.5% (1/40) were positive for AQP4 antibodies. No patients were positive for both antibodies.

The mean age of patients with anti-MOG Ab was (23.9± 9) year old. Eleven (73.3%) were females and only four (26.7%) were male as shown in table (1)

None of the patients had encephalopathy or seizures. All 15 MOG-positive patients had at least one episode of ON and 9 of them fulfilled the criteria for rON/CRION (defined as ≥3 episodes of ON within a period of a few months to a year).

Table (1): The demographic characteristics of NMO positive patient

Patient Characteristic	Patients with anti-MOG+ve No.=15	Sero negative patients No.=25
Age/year (Mean±SD)	23.9±9	24.2±8
Sex Male	4 (26.7%)	8 (32%)
Female	11(73.3%)	17(68%)
Female to male ratio	2.7:1	2.1:1

Table (2): The clinical features of patients with anti-MOG Ab positive than seonegative group

Patients characteristic	Patients with anti-MOG+ve	Sero negative patients
Brain MRI at onset:		
Normal	11	5
Non specific lesion	4	4
CSF		
Cells, mean (SD)	3 (8)	44
Positive OGB	2	5
Chronic treatment	4	6
No. of relapse mean (range)	2(1-8)	3 (1-4)
Relapsing disease	11	6
No of total relapses	10	6
Titer of MOG-IgG (range)	100-600	

Anti-MOG +ve patients: eleven patients (73.3%) had a recurrent course and 2 of them (13.3%) presented features of corticosteroid-dependent chronic relapsing inflammatory ON. Bilateral simultaneous ON attack was observed in 8 patients (53.3%) and it was the presenting syndrome in three of the eight patients who had a monophasic course. In total, 10 patients (66.6%) were treated with chronic therapy. five patients (33.0%) had a severe visual disability and this outcome was associated with a relapsing course in patients with bilateral presentation.

Anti-MOG -ve patients: The female : male ratio 2.1:1.0 (17/25) in the seronegative group. The median (range) onset age was 24.2±8 (16–60) years ($p=0.004$). In this group 12 patients with a single attack who presented initially with ON and myelitis, thus fulfilling the definitive NMO criteria in the first attack. In the group of patients with only LETM, 4 patients (26.6%) had MOG antibodies and 72% (18/25) were seronegative. Among

the patients with bilateral simultaneous or recurrent ON, 6.5% (1/15) had MOG antibodies and 12% (3/25) were seronegative. In the group of patients with only LETM, 26.5% (4/15) had MOG antibodies and 38.5% (12/25) were seronegative. Among the patients with bilateral simultaneous or recurrent ON, 28% (7/15) had MOG antibodies and 52% (13/25) were seronegative. Painful tonic spasms were present in 6.6% (1/15) of the patients with MOG antibodies and 40% (10/25) of seronegative patients ($p=0.008$). Among patients with ON attacks, we found that 19.8% (3/15) of the MOG antibody group and 32% (8/25) of the seronegative group had a visual acuity <20/200 ($p=0.005$). One patient (6.6%) positive for MOG antibodies and 12.0% (3/25) of the seronegative patients had no light perception after an ON attack. Bilateral, simultaneous ON attacks were more common in patients with MOG antibodies than in those who were seronegative (60% (9/15) vs 24% (6/25), respectively; $p=0.001$).

Table (3): comparison of clinical features between patients with anti-MOG Ab positive and seronegative

Characteristics	MOG Ab +ve	Seronegative	p-value
Phenotype n (%)			
NMO	2 (8%)	12 (48%)	0.001
NMOSD-LETM	4 (%)	18 (72%)	0.005
NMOSD-ON	11 (%)	8 (%)	0.05
Simultaneous ON+myelitis attack n (%)	1	3 (%)	0.007
No. of attacks median (range)	2 (1-6)	3 (2-9)	0.005
EDSS median (range)	2 (1-5)	3 (1-7)	0.005

An abnormal brain MRI was present in 37.5% (6/16) of patients with MOG antibodies and 56.7% (34/60) of seronegative patients..

Spinal cord lesions on MRI were present in 37.5% (5/15) and 71.7% () of patients with MOG antibodies and seronegative patients, respectively (table 3, table e-2). Lesions in patients with MOG antibodies were distributed more frequently in the thoracolumbar region. By contrast, patients with seronegative patients had more lesions distributed in the cervicothoracic region. All patients with MOG antibodies (6/6), all patients who were seronegative (43/43) patients had lesions covering 3 or more vertebral segments in the sagittal spinal cord MRI.

Discussion

Our study results suggest that patients with MOG antibodies fulfilling the definitive NMO criteria as recently reported⁵ may actually be rare. The single NMO case in our study had a monophasic presentation with both ON and myelitis occurring during the same attack, similarly to the original description by Eugene Devic in 1894. In fact, some of these patients with MOG antibodies and single attack in the current studies may have a spatially limited form of acute demyelinating encephalomyelitis (ADEM) but without encephalopathy and typical brain lesions, which could mimic NMOSD. However, we also found recurrent patients with persistent MOG antibodies, which is not usually

observed in ADEM and precludes the generalization of this hypothesis to all patients.

The strong female predominance in patients with MOG antibodies was not found in the seronegative group and a lower female: male ratio was found in seronegative patients. A similar difference in the female: male ratio between the diseases (with MOG antibodies and seronegative group) was observed in previous smaller studies^{5,6}. We found a difference in the spatial distribution of spinal cord lesions on MRI between patients with MOG antibodies and seronegative group. Brainstem symptoms, such as persistent nausea/vomiting and hiccups, as previously reported in NMOSD^{9,10}, were more commonly found in the MOG antibody group than in seronegative groups.

Although MOG antibodies have been shown to be potentially pathogenic and to efficiently activate complement in vitro, these antibodies have been reported in a variety of demyelinating diseases such as ADEM and multiple sclerosis (MS)¹², especially in pediatric populations^{13,14} and also in NMOSD⁶. It is possible that differences in antibody assays or cohort ascertainment have a role to play in the apparent non-disease specificity of the MOG antibodies. One could argue that the presence of MOG antibodies in a number of distinct diseases may currently limit the use of the MOG antibody assay as a specific diagnostic biomarker and it is possible that other undiscovered autoantibodies may exist in the seronegative patients.

Because of the study design, patients with MOG antibodies who had received a diagnosis of ADEM and MS were not included in this study, so our study findings are currently limited to patients who received a diagnosis of NMOSD. MOG antibody-positive patients, regardless of whether they had a single attack or recurrent disease, had some distinct clinical presenting features, usually fewer attacks and a better recovery after an attack than seronegative patients. Further long-term prospective studies are required to investigate whether patients with a single attack and patients with recurrent MOG antibodies—with clinical diagnosis of ADEM, MS, or NMOSD—have a singular disease, but with some differences in the clinical phenotype, disease course and treatment response.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

1. Kitley J, Woodhall M, Waters P. Myelin-oligodendrocyte glycoprotein antibodies in adults with a neuromyelitis optica phenotype. *Neurology* 2012;79:1273-1277.
2. Wingerchuk DM, Banwell B, Bennett JL, Cabre P, Carroll W, Chitnis T. International consensus diagnostic criteria for neuromyelitis optica spectrum disorders. *Neurology*. 2015. 85(2):177-189.
3. Lennon VA, Wingerchuk DM, Kryzer TJ, Pittock SJ, Lucchinetti CF, Fujihara K. A serum autoantibody marker of neuromyelitis optica: distinction from multiple sclerosis. *Lancet*. 2004. 364:2106-21012.
4. Lennon VA, Kryzer TJ, Pittock SJ, Verkman AS, Hinson SR. IgG marker of optic-spinal multiple sclerosis binds to the aquaporin-4 water channel. *J Exp Med*. 2005. 202:473-477.
5. Mayer MC, Breithaupt C, Reindl M. Distinction and temporal stability of conformational epitopes on myelin oligodendrocyte glycoprotein recognized by patients with different inflammatory central nervous system diseases. *J Immunol*. 2013; 191:3594-3604.
6. Marignier R, Bernard-Valnet R, Giraudon P, Collongues N, Papeix C, Zéphir H. Aquaporin-4 antibody-negative neuromyelitis optica: distinct assay sensitivity-dependent entity. *Neurology*. 2013. 80:2194-2200.
7. Sato DK, Callegaro D, Lana-Peixoto MA, Nakashima I, Fujihara K. Seronegative neuromyelitis optica spectrum – the challenges on disease definition and pathogenesis. *Arq Neuropsiquiatr*. 2014. 72:445-450.
8. Zekeridou A, Lennon VA. Aquaporin-4 autoimmunity. *Neurol Neuroimmunol Neuroinflamm*. 2015.
9. Martinez-Hernandez E, Sepulveda M, Rostásy K. Antibodies to aquaporin 4, myelin-oligodendrocyte glycoprotein and the glycine receptor $\alpha 1$ subunit in patients with isolated optic neuritis. *JAMA Neurol*. 2015. 72:187–193.
10. Bernard-Valnet R, Liblau RS, Vukusic S, Marignier R. Neuromyelitis optica: a positive

- appraisal of seronegative cases. *Eur J Neurol.* 2015. 22(12):82-83.
11. Kitley J, Woodhall M, Waters P, Leite MI, Devenney E, Craig J. Myelin-oligodendrocyte glycoprotein antibodies in adults with a neuromyelitis optica phenotype. *Neurology.* 2012. 79:1273-1277.
 12. Mader S, Gredler V, Schanda K, Rostasy K, Dujmovic I, Pfaller K. Complement activating antibodies to myelin oligodendrocyte glycoprotein in neuromyelitis optica and related disorders. *J Neuroinflamm.* 2011. 8:184.
 13. Popescu BF, Lennon VA, Parisi JE. Neuromyelitis optica unique area postrema lesions: nausea, vomiting and pathogenic implications. *Neurology.* 2011. 76:1229-1237.
 14. Sepúlveda M, Armangue T, Martinez-Hernandez E, Arrambide G, Sola-Valls N, Sabater L. Clinical spectrum associated with MOG autoimmunity in adults: significance of sharing rodent MOG epitopes. *J Neurol.* 2016. 263:1349-1360.

Knowledge and Health Behavior Prevention Concerning Risk Factors for Coronary Heart Disease among Baghdad University Students

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Abstract

Background: Coronary heart disease, a gradual buildup of fatty deposits in the coronary arteries, occurs as a result of several risk factors with 75% attributable to lifestyle choices.

Objectives: To evaluate knowledge and behaviour of Baghdad University students concerning coronary heart disease and to identify the relationship between demographic characteristic data with student's knowledge and healthbehavior.

Methodology: A cross-sectional design study utilizing a stratified random sampling method. Students of all colleges of Baghdad University (BU) in Baghdad City were included. The respondents were randomly selected from each college. The sample size was 200. Knowledge, health behaviour questionnaire was developed and distributed to the respondents involved. The data collected was analyzed using SPSS version 20.0.

Results: The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class. The majority of students (76.5%) were single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

Conclusions: Findings of study shows that, undergraduate students have poor knowledge regarding risk factors for coronary heart diseases, as well as results demonstrate overall students have good behavior toward preventive measurement about risk factors of CHD.

Keywords: Knowledge, Health behavior, Students, Risk Factors, Coronary Heart Disease.

Introduction

Coronary heart disease (CHD) is a major public health problem worldwide. The coronary atherosclerosis is the major cause of coronary artery disease. However non atherosclerotic types of coronary heart disease are

also reported. The clinical presentation of coronary artery disease includes angina pectoris, myocardial infarction and chronic coronary heart disease ⁽¹⁾. According to the World Health Organization (WHO), there were 7.4 million deaths due to ischemic heart disease in 2012, with high-income countries and upper-middle-income countries accounting for 158 and 107 deaths per million, respectively^(2,3). Multiple risk factors are involved in the development and progression of CAD. In general, risk factors of CVD and CAD can be divided into two groups. The first group is non-adjusted risk factors such as age, sex, race and family history. The second group is adjustable risk factors such as hypertension,

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diabetes mellitus (DM), dyslipidaemia, overweight and smoking^(4,5).

Methodology and Materials

A cross-sectional descriptive and analytical study to assess the knowledge and health behaviour regarding coronary heart disease among students of Baghdad University. This study was conducted at Baghdad University between December 15th 2016 up to the end of 10th march 2017. A tool of knowledge, health behaviour questionnaire was developed and distributed to the participants in this study. The questionnaire was validated by conducting the pre-testing among 20 students in a pilot study. The content validity of the questionnaire was verified by expert of faculty of nursing. The questionnaires were distributed to the selected undergraduate students of all the four colleges in Baghdad University. The stratified random sampling method was utilized in selecting the participants. The

inclusion criteria for the participants were age of 18 years old and above of both genders, male and female, which include Year 1 to Year 4 from each faculty. The sample size calculated was 200, inclusive of the 10% non-response rate. Proportional allocation from all grade levels (1 to 5 in all colleges).

Results

The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class. High percentage of the students was single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

Table (1): The Mean of Score of Students Knowledge Concerning Risk Factors for Coronary Heart Disease.

No.	Items	True		False		MS	SD	A.D
		No	(%)	No	(%)			
1	Smoking	198	99.0	2	1.0	.99	.100	Pass
2	Alcohol	113	56.5	87	43.5	.56	.497	Good
3	High blood pressure is a risk factor	146	73.0	54	27.0	.73	.445	Good
4	High cholesterol	133	66.5	67	33.5	.66	.473	Good
5	Individuals who suffer DM are at more risk for CHD	114	57.0	86	43.0	.57	.496	Good
6	Being overweight increases a person's risk for CHD	91	45.5	109	54.5	.46	.499	Poor
7	BMI of more than 30 is considered as obese	107	53.5	93	46.5	.54	.500	Good
8	Diabetes is a risk factor for developing CHD	87	43.5	113	56.5	.44	.497	Poor
9	High blood sugar puts a strain on the heart disease	86	43.0	114	57.0	.43	.496	Poor
10	People with diabetes have high cholesterol	74	37.0	126	63.0	.37	.484	Poor
11	People with DM tend to have low HDL (good) cholesterol	87	43.5	113	56.5	.44	.497	Poor
12	Unhealthy diets	100	50.0	100	50.0	.50	.501	Good
13	High level of density lipoprotein	93	46.5	107	53.5	.46	.500	Poor
14	Physical inactivity	48	24.0	152	76.0	.24	.428	Poor
15	Stress	71	35.5	129	64.5	.36	.480	Poor
16	Men and women experience many of same symptoms of a heart attack	80	40.0	120	60.0	.40	.491	Poor
17	Walking is type of exercise to be a preventive of CHD	86	43.0	114	57.0	.43	.496	Poor
18	Daily exercise can prevent CHD	108	54.0	92	46.0	.54	.500	Good
19	Eating fruits or vegetable	104	52.0	96	48.0	.52	.501	Good
20	Avoid drinking alcohol	137	68.5	63	31.5	.68	.466	Good
21	Tobacco cessation	103	51.5	97	48.5	.52	.501	Good

No.	Items	True		False		MS	SD	A.D
		No	(%)	No	(%)			
22	Prayer	91	45.5	109	54.5	.46	.499	Poor
23	Prime wherefores of heart attacks is stress s	99	49.5	101	50.5	.50	.501	Good
24	Most cholesterol in eggs found in yellow part	53	26.5	147	73.5	.26	.442	Poor
25	Polyunsaturated fats are healthier for the heart than the saturated fats	59	29.5	141	70.5	.30	.457	Poor
26	Eating a lot of red meat increases heart disease risk	62	31.0	138	69.0	.31	.464	Poor
27	Taking an aspirin each day decreases the risk of getting heart disease	52	26.0	148	74.0	.26	.440	Poor
28	Dietary fiber lowers blood cholesterol	62	31.0	138	69.0	.31	.464	Poor
29	Most cholesterol in eggs found in yellow part	15	7.5	185	92.5	.08	.264	Poor
30	HDL refers to „good“ cholesterol and LDL refers to „bad“ cholesterol	36	18.0	164	82.0	.18	.385	Poor
	Total	2695		3305		0.45		

(A.D.): Assessment Degree, M.s=mean of score [(0 - .49) = fail (F); (0.5 –1) = Pass (P)]

Table (2) The Mean of Score of Health Behaviour Prevention Concerning Risk Factors for Coronary Heart Disease

No.	Items	Strong agree		Agree		Disagree		MS	A.D
		No	(%)	No	(%)	No	(%)		
1.	Doing exercise to maintain a healthy lifestyle	139	69.5	59	29.5	2	1.0	2.68	G
2.	Smoking is bad for health.	127	63.5	65	32.5	8	4.0	2.60	G
3	Maintain my weight according to my body mass index	136	68.0	60	30.0	4	2.0	2.66	G
4	Take less oily food	128	64.0	65	32.5	7	3.5	2.60	G
5	Taking a healthy diet	97	48.5	91	45.5	12	6.0	2.42	G
6	Exercising for 30 minutes most days	110	55.0	72	36.0	18	9.0	2.46	G
7	Control on blood pressure	110	55.0	72	36.0	18	9.0	2.49	G
8	Avoid eating fast food	93	46.5	97	48.5	10	5.0	2.42	G
9	Avoid stress	35	17.5	107	53.5	58	29.0	1.88	A
10	Avoid drinking carbonated drinks	53	26.5	98	49.0	49	24.5	2.02	A
11	Take fruit or vegetable in diet	88	44.0	93	46.5	19	9.5	2.34	G
12	Heart disease is severe	66	33.0	88	44.0	46	23.0	2.10	A
13	Choose a diet low in fat	106	53.0	65	32.5	29	14.5	2.38	G
14	Limits use of sugars	86	43.0	94	47.0	20	10.0	2.33	A
15	Get enough sleep	128	64.0	67	33.5	5	2.5	2.62	G
16	Take relaxation each day	120	60.0	67	33.5	13	6.5	2.54	G
17	Specific method to control stress.	123	61.5	59	29.5	18	9.0	2.52	G
18	Perform physical activity	133	66.5	62	31.0	5	2.5	2.64	G
19	prevent heart attacks my exercising	122	61.0	63	31.5	15	7.5	2.54	G
20	Exercise decreases stress.	113	56.5	72	36.0	15	7.5	2.49	G
	Total	2113		1516		371		2.44	G

(A.D.): Assessment Degree, M.s=mean of score [(1 – 1.66) = poor (p); (1.67 – 2.33)= Acceptance (F); [(2.34 – 3) = Good (G)]

Table (3): Association Between Students Knowledge & Demographic Characteristic

Demographic Variables		Sum of Squares	df*	Mean Square	F	Sig.
Age groups	Between Groups	.152	1	.152	.179	.673
	Within Groups	168.003	198	.849		
	Total	168.155	199			
Gender	Between Groups	.074	1	.074	.295	.588
	Within Groups	49.606	198	.251		
	Total	49.680	199			
Academic year	Between Groups	1.704	1	1.704	1.183	.278
	Within Groups	285.171	198	1.440		
	Total	286.875	199			
Marital status	Between Groups	.000	1	.000	.000	.993
	Within Groups	35.955	198	.182		
	Total	35.955	199			
	Within Groups					
	Total					

Sum of squares, Degree of freedom, Mean squares, Significant *: $P \leq 0.05$

Table (4): Association Between Health Behaviour Prevention Score & Demographic Characteristic).

Demographic Variables		Sum of Squares	df*	Mean Square	F	Sig.
Age groups	Between Groups	1.546	2	.773	.914	.403
	Within Groups	166.609	197	.846		
	Total	168.155	199			
Gender	Between Groups	.445	2	.222	.890	.412
	Within Groups	49.235	197	.250		
	Total	49.680	199			
Academic year	Between Groups	3.852	2	1.926	1.341	.264
	Within Groups	283.023	197	1.437		
	Total	286.875	199			
Marital status	Between Groups	.047	2	.023	.128	.880
	Within Groups	35.908	197	.182		
	Total	35.955	199			

Sum of squares, Degree of freedom, Mean squares, Significant *: $P \leq 0.05$

Discussion

Throughout the course of the data analysis of the current study indicated that students' knowledge concerning risk factors for coronary heart diseases. Thirteen questions to evaluate general knowledge related to risk factors of CHD. Only (45%) of the study sample answered correctly and (55%) responded incorrect "do not know". Knowledge questions were split to dietary pattern, medical and risk factors. Knowledge related to risk factors for CHD was answer correctly (Know) by (99%) majority of participation answer smoking main

causes for CHD, most of them stated 56.5% alcohol main risk factors for CHD, most of them reported (73%) hypertension risk factors for CHD, (66.5%) answer hypercholesterolemia one of causes CHD and most of them told (57%) diabetes mellitus all of them answer these main risk factors for cardio vascular disease, most of students (45.5%) told being overweight increase person risk for CHD, (43%) of them stated that high blood sugar puts strain on the heart disease, only (37%) of students answer correctly that individual with DM have high cholesterol.

The finding of the study agree with result obtained from other study who reported respondents' knowledge regarding the CHD risk factors who reported twenty five percent students graded smoking as the top most risk factor for CAD followed by hypertension high cholesterol, age, Family history and high cholesterol diet. Correct identification of risk factors in the form of positive responses was highest for cholesterol levels (91%)⁽⁶⁾.

Students' knowledge regarding risk factors for CHD. The most of the participants answered the danger factors questions items know like ambulation is type of exercise to be a preventive of CHD (43%), taken up fruits or vegetable is able to prevent from CHD (52%), avoid drinking alcohol reduced the risk of getting heart disease (68.5%), tobacco cessation prevent the risk of getting heart disease (51.5%) and body mass index of more than (30) is considered as obese (53.5). From all the risk factor questions, knowledge concerning physical inactivity (24%), stress (35.5%), both gender experience same symptoms of heart attacks world (40).

This findings is same line with result obtain from other study the researcher reported that the majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity blood pressure control and smoking cessation. However, fewer participants demonstrated correct knowledge of other CHD risk factors, including diabetes, stress .Fewer subjects were aware of (HDL) and (LDL) as risk factors ^(7,8).

Health behaviour prevention about risk factors coronary heart disease. Twenty questions exploring students health behaviour concerning of CHD.

This result of study are good agreements with other studies done by other researchers whose reported that the item with the highest proportion of positive health behavior was "smoking is bad for health" (93.7%) (149), "exercise to maintain a healthy lifestyle" (87.4%) (139), I maintain my weight according to my body mass index (BMI(74.8%)(119), take less oily food for healthy lifestyle (74.8), (119), I believe walking a lot can give benefits to my health (72.3), (115) and I should take fruit or vegetable in my diet for maintaining my health (77.4), (123)^(9,10).

Association between student's knowledge score and the demographic characteristics (age, gender, academic

year and marital status. The association between sociodemographic and students' knowledge score was explored. There are no significant relationship between gender and students knowledge (Chi-square = .526a), age (Chi-square = 2.118a) academic year (Chi-square = 3.507a) and marital status (Chi-square = .900a).

This result agrees with that of the other researcher who reported, The responses provided by the third year student nurses straight from school education and those mature students were found to be non-significant in relation to the twoage categories ($p > 0.05$). The HB however, was shown to differ significantly between males and females ($p = 0.04$), demonstrates the mean scores attained for both CHD knowledge and health behavior by both gender^(11,12).

The association between sociodemographic and Students attitudes Score was explored. There are no significant relationship between (age, gender, academic, marital status) and students' behaviour scores.

This finding Agree with results obtained from the study done by other researcher who reported. The present study identifies that there was no significant relationship between total CHD knowledge and HB of the third year student nurses ⁽¹³⁾.

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Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

Conclusions

This study demonstrate that, despite poor students knowledge regarding risk factors for CHD, as well as study indicated overall students have fair health behavior toward preventive measurement about risk factors of CHD. We recommend to health education programs about risk factors of coronary heart disease; seek to improve understand the trouble of heart disease and work cooperatively to reduce them. Should be transmitted through the mediums of radio and television, posters, pamphlets, social media like Facebook and Twitter to be beneficial to accessing to younger people.

References

1. Nusrata Z and Rabia FA, Survey of Female Undergraduate Medical students of an Arab Community, Regarding Coronary Heart Diseases and Its OF Association to Eating and Physical inactivity. *ISRA Medical Journal* 2015;7(2):110-108.
2. World Health Organization. Cardiovascular diseases (CVDs). From: www.who.int/mediacentre/factsheets/fs317/en/ Accessed: Nov 2015.
3. World Health Organization. The top 10 causes of death: The 10 leading causes of death by country income group (2012). From: www.who.int/mediacentre/factsheets/fs310/en/index1.html Accessed: Nov 2015.
4. Abdollahi AA., Hosseini SA, Salehi A, Vaghari GH and Behnam Pour N, The risk factors of coronary disorders in the elderly. *J Res Dev Nurs Midwifery* 2013; 11(2): 18-25.
5. Canto JG, Kiefe CI, Rogers WJ, Peterson, ED, Frederick PD, French WJ, et al.; Number of coronary heart disease risk factors and mortality in patients with first myocardial infarction. *JAMA* 2011; 306(19): 2120-7.
6. Aysha A, Aamir H, Fateh ATS, Knowledge of Coronary Artery Disease risk factors and Coronary Intervention among University Students, *J Pak Med Assoc.* 2008; 58(10): 556-553.
7. Ali A A, Ayman T, Chandrani, I., Joy K. K., Joshua M., Shreedevi, B.; Knowledge of Coronary Heart Disease Risk Factors among a Community Sample in Oman. *Clinical and Basic Research*, 2016; 16(2):196-190.
8. Abdelmoneim A, hala N, Public knowledge of cardiovascular disease and its risk factors in Kuwait: a cross-sectional survey. *BMC Public Health*, 2014(14):11-1.
9. Yuba RA, study of assessing knowledge and health beliefs about cardiovascular disease among selected undergraduate university students using Health Belief Mode, A Dissertation, Health Education In the Graduate School Southern Illinois University, Carbondale October 2012:174-1.
10. MardhiahMI, Nor AA, Nor IAR, Mainul, H.; Knowledge, Attitude and Practice of Malaysian Public University Students on Risk Factors for Cardiovascular Diseases, *Journal of Applied Pharmaceutical Science* 2016: 6 (2): 63-56.
11. Rosemary M, Coronary Heart Disease Knowledge and Health Behaviour in Student Nurses . A Dissertation, Master's degree in Cardiovascular Rehabilitation by the University of Chester, 2010; 152-1.
12. Winham DM, Jones KM, Knowledge of young African American adults about heart disease: a cross-sectional survey. *BMC Public Health*, 2011(11): 248.
13. MacInnesJD, The illness perceptions of women following acute myocardial infarction: implications for behaviour change and attendance at Cardiac Rehabilitation. *Women & Health* 2005;42(4): 105-121.

The Association of Lipoprotein-a Levels, Neutrophil Lymphocyte Ratio and Hypertension with the Clinical Severity Scale Measured by NIHSS Scale in Patients with Acute Thrombotic Stroke

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Abstract

Background: The correlation between levels of Lipoprotein-a, Neutrophil Lymphocyte Ratio and hypertension with clinical severity scale remains a controversial issue.

Objective: To determine the correlation of levels of Lipoprotein-a, Neutrophil Lymphocyte Ratio and hypertension with the severity scale measured by NIHSS scale in patients with acute thrombotic stroke.

Method: Lipoprotein-a levels, Neutrophil Lymphocyte ratio, blood pressure in patients with acute thrombotic stroke were measured and clinical severity scale was assessed by NIHSS scale. The levels of lipoprotein-a were grouped into normal and high levels of lipoprotein-a, Lymphocyte Neutrophil Ratios were grouped into low and high and hypertension were grouped into stage 1 and 2. The data was analyzed using logistic regression.

Results: There were 40 patients consisting of 29 (72.50%) male patients and 11 (27.50%) female patients. The demographic data included gender, age, LDL level, random blood sugar level, diabetes mellitus status and smoking status which were all homogeneous in both groups of lipoprotein-a, Neutrophil Lymphocyte ratio and hypertension stage. In the logistic regression analysis, the lipoprotein-a and neutrophil lymphocyte ratio were correlated with clinical severity scale ($p = 0.018$, RO 0.122 (CI 95% 0.022-0.696) vs $p = 0.041$, RO 0.068 (95% CI 0.005-0.895) while hypertension stage was not correlated with clinical severity scale ($p = 0.97$, RO 1.02 (95% CI 0.28-3.80)).

Conclusion: The levels of lipoprotein-a and lymphocyte neutrophil ratio were related to the clinical severity measured by NIHSS scale but not with hypertension.

Keywords: *Lipoprotein-a, Lymphocyte Neutrophil Ratio, Hypertension, NIHSS, Stroke.*

Introduction

Stroke is the fourth leading cause of death in the

United States. In addition, it is the main cause of disability in Indonesia, including in Dr. Soetomo General Hospital Surabaya with a fairly high mortality rate of 28.76%¹⁻³. Various risk factors of stroke have been known in which hypertension and elevated levels of Lipoprotein-a is one of the modifiable risk factors⁴. Increased levels of Lipoprotein-a (Lp-a) is one of the potential stroke risk factors that can be modified. Lipoprotein-a is a complex particle composed of LDL molecules as nuclei with apolipoprotein-b and apolipoprotein-a bound by a

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disulfide bridge⁵. High levels of lipoprotein-a result in the process of atherotrombosis by various mechanisms such as increasing ICAM expression, inhibiting TGF- β , increasing the production of IL-6 and IL-8⁶. In patients with hypertension and stroke, Lipoprotein-a levels have increased where the normal limit is 130 mg/dl. These levels are associated with the occurrence of carotid atherosclerotic. The greater the level of Lipoprotein-a, the greater the degree of atherosclerosis in the carotid artery in patients with ischemic stroke⁷. Levels of lipoprotein-a are not related to the severity scale and clinical outcomes in patients with acute ischemic stroke⁸. The levels of Lipoprotein-a, IL-6, albumin and ferritin are related to the degree of severity and clinical outcomes in patients with ischemic stroke.

Inflammation plays an important role in the pathophysiology of acute ischemic stroke. This inflammatory process results in endothelial damage and blood brain barrier, accumulation of inflammatory mediators, large leukocyte and platelet infiltration⁷. On the other hand, lymphocytes, primarily T lymphocytes, infiltrate around the ischemic zone from day 3 and increase on day 3 to day 7⁹. The role of lymphocytes in stroke is to decrease the proliferation and cytolytic activity of IL-2 and mitogen. The severity of neurological deficits in early stroke is associated with low T lymphocyte levels. This suggests a suppression of immune responses in patients with ischemic stroke¹⁰. Clinical studies show that neutrophil accumulation in cerebral infarction is associated with the severity of brain tissue damage and poor neurologic outcome after an ischemic stroke⁹. High neutrophil levels are associated with an increased NIHSS scale at the onset of stroke¹¹.

The Neutrophil Lymphocyte ratio (NLR) is a potential new biomarker for the risk of cardiovascular disease. NLR is an independent factor of the severity of coronary heart disease and decreased life expectancy in patients with coronary heart disease¹². Increased NLR values are a predictor factor of 30-day mortality in patients with acute coronary syndrome¹³. NLR has similar sensitivity and specificity to hs-CRP (sensitivity vs specificity of hs-CRP: 84% vs 83%)¹².

In acute ischemic stroke, NLR has not been widely studied and each study has different limitation values. NLR value ¹ 3.17 is associated with a risk of stroke in non valvular atrial fibrillation patients¹⁴. Another study

mentioned that the NLR value of 4.5 is associated with acute ischemic stroke¹⁵. For stroke output, the NLR value of ¹ 5.9 is associated with poor clinical outcomes and death within 90 days¹⁶. Another study showed that the NLR value of ≥ 5 is associated with clinical severity and short-term mortality within 60 days of non-lunar stroke patients compared to stroke lakunerv¹³.

Various observational data indicate that an increase in blood pressure during acute stroke is associated with a poor prognosis¹⁷. In lacuner stroke patients, an increase in systolic blood pressure between 140-220 mmHg and diastolic blood pressure between 70-110 has a better clinical severity scale compared with other stroke types¹⁸.

The aim of this study was to prove the association between lipoprotein-a, NLR and hypertension with clinical severity as measured by nihss scale in acute thrombotic stroke.

Method

This study is a cross-sectional study with consecutive sampling with primary data of patients with acute thrombotic stroke of first attack and onset <8 days. The subjects were collected from Dr. Soetomo General Hospital Surabaya, Indonesia without sepsis, haematological disorders, malignancy, corticosteroid and immunosuppressant, elevated liver enzyme levels, renal failure, cardiac arrhythmia, congestive heart failure and acute myocardial infarction. The total subjects in this study were 40 patients.

The levels of Lipoprotein-a, Neutrophil Lymphocyte Ratio and hypertension were examined at <8 days of onset and observed its associations among subjects with normal (≤ 18 mg/dl) and high Lp-a (> 18 mg/dl), low ($\leq 4, 5$) and high NLR (>4.5) and hypertension stage 1 (¹ 140-159/90-99) and Stage 2 (¹ 160/100) with clinical severity measured using NIHSS scale classified as mild (0- ≤ 4), moderate (5-15) and severe (>15) with logistic regression analysis using SPSS 21.0 program (SPSS, Inc., Chicago, IL).

Results

During the period of 3 (three) months, there were 40 research subjects who fulfilled inclusion criteria and no subjects who were excluded. It consisted of 29 males (72.5%) and 11 females (27.5%).

Table 1. The Bivariate Analysis of Research Variables with Clinical Severity Scales

Variables	Clinical severity		Total	p	RO	IK 95%
	Mild (n (%))	Moderate (n (%))	n (%)			
Lp-a level						
Normal	9 (64.29)	5 (35.71)	14 (100)	0.04	4.05	1.03-16.01
High	8 (30.77)	18 (68.23)	26 (100)			
NLR						
Low	16 (48.49)	17 (51.51)	33 (100)	0.21	5.63	0.61-52.22
High	1 (14.29)	6 (85.71)	7 (100)			
Hypertension						
Stage 1	6 (42.86)	8 (57.14)	14 (100)	0.97	1.02	0.28-3.08
Stage 2	11 (42.31)	15 (57.69)	26 (100)			
Random glucose level						
Normal	16 (44.44)	20 (55.56)	36 (100)	0.62	2.40	0.23-25.34
High	1 (25)	3 (75)	4 (100)			
Smoking status						
Non smoker	9 (42.86)	12 (57.14)	21 (100)	0.96	1.03	0.29-3.62
Smoker	8 (42.11)	11 (57.89)	19 (100)			
Age						
£ 55 years old	6 (46.15)	7 (53.85)	13 (100)	0.75	1.25	0.33-4.73
> 55 years old	11 (40.74)	16 (59.26)	27 (100)			
Gender						
Male	12 (41.38)	17 (58.62)	29 (100)	1.00	0.85	0.21-3.43
Female	5 (45.46)	6 (54.54)	11 (100)			

Bivariate analysis with Chi-Square between Lp-a levels, Neutrophil Lymphocyte Ratio and Hypertension and bivariate analysis of confounding factors (glucose levels, smoking status, age and gender) with clinical severity measured by NIHSS scales presented in table 2. The factors correlated to or affected the clinical severity

scale were Lp-a and NLR and can be incorporated into logistic regression analysis (p <0.25) whereas hypertension, hyperglycemia, smoking, age and gender did not affect the clinical severity and can not be incorporated into logistic regression analysis (p>0.25).

Table 2. The Logistic Regression Analysis of the Association between Lp-a Level and NLR with the Clinical Severity Scales

	Variable	Coefficient	p	RO (IK 95%)
Step 1	Lp-a level	2.100	0.018	0.122 (0.022-0.696)
	NLR value	2.692	0.041	0.068 (0.005-0.895)
	Constant	3.341	0.014	28.235

$$\text{NIHSS} = 3.341 + (2.100 \times \text{Lp-a}) + (2.692 \times \text{NLR})$$

Note = Ifnormal Lp-a = 0, high Lp-a = 1, Low NLR = 0, High NLR = 1

Table 2 shows a multivariate analysis of logistic regression to determine the association or effect of Lp-a levels and NLR with the clinical severity in acute thrombotic stroke patients. Lp-a levels and NLR correlated or affected the degree of clinical severity

and obtained a good calibration regression equation (p>0.05) (Hosmer and Lame show Test, p = 0.94) and low discrimination value (Area Under Curve (AUC) of 26.2%).

Discussion

We found an association between the levels of Lipoprotein-a and Neutrophil Lymphocyte Ratio with the clinical severity measured by NIHSS scale. However, there was no correlation between hypertension and the clinical severity measured by NIHSS scale in acute thrombotic stroke patients.

This study revealed that males had higher level of Lp-a than females. Previous research has shown that Lp-a levels in male patients with thrombotic stroke are higher than female patients¹⁹. Lp-a levels in normal individuals were 16.4 mg/dl and Lp-a levels in females were higher than in males (20.9 mg vs 11.3 mg/dl). Increased levels of Lp-a increase the risk of cerebro and cardiovascular disease²⁰. Lp-a levels are not affected by gender²¹. Neutrophil Lymphocytes Ratio of this study was not influenced by gender. This is supported by previous research which stated that the value of NLR did not obtain significant differences between male and female subjects¹³. Hypertension stage 1 and 2 occurred more in males than females, but there was no significant difference ($p = 0.47$). Researches in China and Bosnia reported that female patients with acute thrombotic stroke more suffer from hypertension than male patients. However, > 80 year-old male are more likely to suffer from hypertension than females²².

LDL levels affect Lp-a levels²¹⁻²². In this study, the LDL levels were evenly distributed (homogeneous) in both normal Lp-a and high Lp-a groups and there was no significant difference between the two groups. Likewise, LDL levels of NLR and hypertension did not cause any bias.

The random glucose levels in the normal and high Lp-a group, low and high NLR scores and stage 1 and 2 hypertension were not statistically significant. It implies that random glucose levels are homogeneously distributed in both groups. Hyperglycemia in patients with diabetes mellitus can primarily cause the formation of thrombus in the arteries, which can lead to abnormalities of cerebro and cardiovascular²³. Hyperglycemia occurs in 30-40% of stroke patients without previous diabetes mellitus and hyperglycemia history during hospitalization due to the poor outcome²⁴.

The characteristics of subjects based not on diabetes mellitus and on diabetes mellitus at both normal and high Lp-a levels, NLR values and hypertension stages were homogeneously distributed in both groups

marked with $p > 0.05$. Lp-a levels between people with diabetes mellitus and without diabetes mellitus showed no significant difference²⁵. Patients with acute ischemic stroke with diabetes mellitus are often accompanied by other risk factors of hypertension and there is a relationship between increased blood sugar levels in diabetes mellitus with hypertension²⁶.

Smoking is a risk factor of stroke. In this study, smoking status in normal and high Lp-groups, low and high NLR groups and hypertension stages were homogeneously distributed. Smoking and hypertension lead to intracranial stenosis²⁷. Smoking is not associated with Lp-a levels²⁸.

Multivariate analysis of logistic regression was performed to determine the relationship between Lp-a and NLR values with the clinical severity, whereas hypertension stage could not be included in multivariate analysis. In addition, an equation can be used to predict the clinical severity of acute thrombotic stroke. In the multivariate analysis, it was found that Lp-a and NLR values were correlated with the clinical severity with values of $p < 0.05$ and the obtained equation could predict the degree of clinical severity by entering Lp-a and NLR values due to the good calibration and discrimination. However, it was considered statistically very weak value of AUC. In this study, it was revealed that patients with acute thrombotic stroke had high Lp-a levels and NLR values for more severe severity of 26.2%. The normal Lp-a and low NLR levels were protective for more severe clinical severity.

Normal Lp-a levels are physiologically functioning in wound healing, angiogenesis and hemostasis. Lipoprotein-a is a source of cholesterol used for repair of tissue regeneration. In the angiogenesis process, lipoprotein-a is important for sprouting new blood vessels and in the process of hemostasis, competitively inhibiting plasminogen binding to fibrinogen and fibrin and inhibiting fibrinogen activation depending on fibrin through tissue plasminogen activator. In addition, lipoprotein-a binds platelet activating acetylhydrolase factor which is the strongest factor of platelet aggregation and hydrolyzes phospholipids during the lipid oxidation process and inhibits thromboxan secretion..

Conclusion

It can be concluded that there is an association between the levels of Lipoprotein-a and Neutrophil Lymphocyte Ratio with the clinical severity measured

by NIHSS scale. However, there is no correlation between hypertension and the clinical severity measured by NIHSS scale in acute thrombotic stroke patients.

Ethical Clearance: This study received an ethical test from Dr. Soetomo General Hospital and faculty of medicine Universitas Airlangga.

Source of Funding: This research was carried out through individual funding.

Conflict of Interest: There was no conflict of Interest from this study.

References

- Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Blaha MJ et al. Heart disease and stroke statistics--2014 update: a report from the American Heart Association. *Circulation*. 2014; 129(3):e28–292.
- Kementrian Kesehatan Republik Indonesia. Menkes Lakukan Soft Opening Rumah Sakit Pusat Otak Nasional. 2013.
- MS I. Acute Ischemic Stroke In Surabaya. In: Islam MS SA, Subadi I et al, (Eds) In : Postgraduate Course on Neurology and Rehabilitation Medicine, editor. 2013.
- Goldstein LB, Bushnell, C.D., Adams, R.J. et al. G. Guidelines for the primary prevention of stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke [Internet]*. 2011;42(2):517–84.
- Plow JH, Huang M. Lipoprotein (a) Metabolism : Potential site for Therapeutic Targets. 2013;62:479–91. *Metab Clin Exp*. 2013;62:479–91.
- Siekmeier R, Scharnagl, H., Kostner, G.M. et al. Lipoprotein (a)- Struktur, Epidemiology, Function and Diagnostic of Cardiovascular Marker. *Open Clin Chem J*. 2008; 1:79–91.
- Nasr N, Ruidavets, J.B., Farghali, A. et al. Lipoprotein (a) and Carotid Atherosclerosis in Young Patients With Stroke. *Stroke [Internet]*. 2011;42:3616–8.
- Kooten F, Krimpen, J., Dippel, D.W.J. et al. Lipoprotein (a) in Patients With Acute Cerebral Ischemia. *Stroke [Internet]*. 1996;27:1231–5.
- Jin R, Yang, G., Li G. Inflammatory Mechanisms in Ischemic Stroke: Role of Inflammatory Cells. *J Leukoc Biol*. 2010;87:779–89.
- Yilmaz G, Granger DN. Leukocyte Recruitment and Ischemic Brain Injury. *Neuromolecular Med*. 2010; 12:193–204.
- Kim J, Song, T.J., Park, J.H. et al. Different Prognostic Value of White Blood Cell subtypes in Patients with Acute Cerebral Infarction. *Atherosclerosis*. 2012;222:464–7.
- Akpek M, Kaya, M.G., Lam, Y.Y. et al. Relation of Neutrophil/Lymphocyte Ratio to Coronary Flow to in-Hospital Major Adverse Cardiac Events in Patients with ST-Elevated Myocardial Infarction Undergoing Primary Coronary Intervention. *Am J Cardiol*. 2012; 110:621–7.
- Tokgoz S, Kayrak, M., Akpınar, Z. et al. Neutrophil Lymphocyte Ratio as a Predictor of Stroke. *J stroke Cerebrovasc Dis*. 2013;20:1–6.
- Ertas G, Sonmez, O., Turfan, M. et al. Neutrophil/Lymphocyte Ratio is Associated with Thromboembolic Stroke in Patients with Non-valvular Atrial Fibrillation. *J Neurol Sci*. 2013;324:49–52.
- Gokhan S, Ozhasenekler, A., Durgun, H.M. et al. Neutrophil Lymphocyte Ratio in Stroke Subtype and Transient Ischemic Attack. *Eur Rev Med Pharmacological Sci*. 2013; 17:653–7.
- Brooks SD, Spears, C., Cummings, C. et al. Admission Neutrophil-Lymphocyte Ratio Predict 90 Day Outcome after Endovascular Stroke Therapy. *J Neurointerv Surg*. 2013; 10:11–36.
- Wityk RJ. Blood Pressure Augmentation in Acute Ischemic Stroke. *J Neurol Sci*. 2007;261:63–73.
- Semplecini A, Maresca, A., Boscolo, G. et al. Hypertension in Acute A Compensatoy Mechanism or an Additional Damaging Factor? *Arch Intern Med*. 2003; 163:211–6.
- Dhamija RK, Gaba, P., Arora, S. et al. Homocysteine and Lipoprotein (a) Correlation in Ischemic Stroke Patients. *J Neurol Sci*. 2009;281:64–8.
- Oliveira SHV, Miranda, M.R., Morais, C. A.S. et al. Serum Lipoprotein (a) Level in Healthy Subject Indicate a Lurking Cerebro-and Cardio-Vascular Risk in the Younger Populations. *Brain Res Bull*. 2013;97:48–52.
- Misirli H, Somay, G., Ozbal, N. et al. Relation of Lipid and Lipoprotein (a) to Ischaemic Stroke. *J Clin Neurosci*. 2002;9:127–32.
- Salihovic D, Smajlovic, D., Sinanovic, O. et al. Sex

- Differences in Patients with Acute Ischemic Stroke in Tuzla Region, Bosnia and Herzegovina. *Bosn J Basic Med Sci.* 2010; 10:116–21.
23. Hansen HR, Wolfs, J.L., Bruggemann, L. et al. Hyperglycemia accelerates arterial thrombus formation and attenuates the antithrombotic response to endotoxin in mice. *Blood Coagul fibrinolysis an Int J Haemost Thromb.* 2007; 18:627–36.
 24. Luitze MA, Biessels, G.J., Rutten, G. et al. Diabetes, Hyperglycemia and Acute Ischemic Stroke. *Lancet Neurol.* 2012; 11:261–71.
 25. Ohira T, Schreiner, P.J., Morrisett, J.D. et al. Lipoprotein (a) and Incident Ischemic Stroke : The Atherosclerosis Risk in Communities (ARIC) Study. *Stroke [Internet].* 2006;37:1407–12.
 26. AH A-K. The incidence of stress hyperglycemia in acute ischemic stroke patients (in Al-Yarmouk teaching hospital). *Mustansiriya Med J.* 2012; 11111111:46–51.
 27. Kim DE, Lee, K.B., Jang, I.M. et al. Associations of cigarette smoking with intracranial atherosclerosis in the patients with acute ischemic stroke. *Clin Neurol Neurosurg.* 2012; 114:1243–7.
 28. Erqou S, Kaptoge, S., Perry, P.L. et al. Lipoprotein (a) Concentration and the Risk of Coronary Heart Disease, Stroke and Nonvascular Mortality. *JAMA.* 2009;302:412–23.

Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India

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Abstract

Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India. The objectives were to assess the effect of perceived stress on menstruation among adolescent girls in a selected college, Correlate between perceived stress and blood flow during menstruation among adolescent girls, Associate between perceived stress on menstruation among adolescent girls with their selected demographic variables, Associate between blood flow during menstruation among adolescent girls with their selected demographic variables. The convenient sampling technique was used to select 50 samples. The data were collected by using perceived stress scale and pictorial blood assessment scale. The collected data were tabulated and analyzed. Descriptive and inferential statistics were used. The result showed that 12% of samples having low stress level, 80% of samples having moderate stress level and 8% of samples having severe stress level and 16% of samples had low bleeding, 30% of samples had normal flow and 54% of samples had severe flow. There was moderate positive correlation ($r = 0.84$) between perceived stress and blood flow among adolescent girls. The demographic variables like menstrual cycle periodicity ($X^2=1.78$) stress level, ($X^2=3.87$) blood flow and duration of menstrual flow ($X^2=4.32$) stress level, ($X^2=5.93$) blood flow had significant association with stress and blood flow during menstruation respectively.

Keywords: *Perceived stress, Menstruation, Adolescent girls.*

Introduction

Background of the Study: Menstruation, also known as a period or monthly, is the regular discharge of blood and mucosal tissue (known as menses) from the inner lining of the uterus through the vagina.^[1]

The first period usually begins between twelve and fifteen years of age, a point in time known as menarche. However, periods may occasionally start from eight years old children and still it is considered normal.^[1]

The average age of the first period is generally later in the developing world and earlier in the developed world.^[1]

Among women, it's very common to experience stress during the normal monthly cycling of ovulation. It is not uncommon and actually almost predictable to have subtle and not-so-subtle fluctuations in menstruation.^[2]

Many women notice erratic, unpredictable bleeding or a delay of menstruation when they encounter

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particularly difficult times such as deadlines at work or school, personal illness, or death of a loved one.^[2]

Need for Study:

Nazish Rafique and Mona H. Al-Sheikh (2018) conducted a cross sectional study on prevalence of menstrual problems and their association with psychological stress in young female student studying health science. Results showed that **Ninety-one percent of the students were suffering from some kind of menstrual problem. High perceived stress (HPS) was identified in 39% of the students.** A significant positive correlation was found between HPS and menstrual problems. Therefore, it was recommended that **health science students should be provided with early psychological and gynecological counselling to prevent future complications.**^[3]

Ziba Raisi Dehkordi (2017) conducted a cross-sectional study to evaluate the effect of perceived stress on dysmenorrhea among female students residing in dormitory in Shahrekord University of Medical Sciences in Shahrekord, Iran. Results showed that **66 students had a PSS score >20 High stress levels (PSS >20) was associated with only menstrual irregularities and not with duration, amount of flow or dysmenorrhea.**^[4]

Statement of the Problem: Effect of Perceived Stress on Menstruation among Adolescent Girls in a Selected College, Kanchipuram District, Tamil Nadu, India.

Objectives:

- Assess the effect of perceived stress on menstruation among adolescent girls in a selected college.
- Assess the blood flow during menstruation among adolescent girls in a selected college.
- Correlate between perceived stress and blood flow during menstruation among adolescent girls.
- Associate between perceived stress during menstruation among adolescent girls with their selected demographic variables.
- Associate between blood flow during menstruation among adolescent girls with their selected demographic variables.

Hypothesis:

H₀: There is no correlation between perceived stress and blood flow during menstruation.

H₀: There is no significant association between perceived stress on menstruation among adolescent girls with the selected demographic variables.

H₀: There is no significant association between blood flow during menstruation among adolescent girls with the selected demographic variables.

Operational Definitions:

Perceived stress: Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point (During menstruation) or over a given time period which will be assessed using **Perceived stress scale.**

Menstruation: Any amount of blood loss during first three days of girl's monthly cycle, which will be assessed using **Pictorial blood assessment scale.**

Adolescent girls: Girls in the age group of 18-20 years.

Research Methodology: A Quantitative approach with descriptive design was used in the study. The study was conducted among Adolescent girls in Allied Health Science, Chettinad Academy of Research and Education. A convenient sampling technique was used to select 50 samples with the following inclusion criteria. Adolescent girls who are: Studying 1st and 2nd year in Allied Health Science, Chettinad Academy of Research and Education, Age group between 18-20 years, Able to read and write in English. The data was analysed by using descriptive and inferential statistics.

Data Collection Procedure:

- The researcher got prior permission and consent from the study participant.
- The questionnaire was given to collect the data on demographic variables.
- PSS scale was given to assess the perceived stress during their menstrual period.
- PBAS scale was given to the sample and asked them to fill during menstruation.
- Duration of data collection was 1 week.

Ethical Consideration:

- UG Committee clearance was obtained.
- Human Ethics committee clearance was obtained.

- Prior permission from the head of the institution was obtained.
- Informed consent was obtained from the samples.
- Confidentiality was maintained.

Findings: Findings of the study were presented under the following headings based on the study objectives.

Objective 1: Assess the effect of perceived stress on menstruation among adolescent girls.

The finding of the present study revealed that,

12% of adolescent girls had Low stress level.

80% of adolescent girls had Moderate stress level.

8% of adolescent girls had Severe stress level.

Objective 2: Assess the amount of blood flow during menstruation among adolescent girls.

16% of adolescent girls had low bleeding.

30% of adolescent girls had normal blood flow.

54% of adolescent girls had severe bleeding.

Objective 3: Correlate between perceived stress and blood flow among adolescent girls.

The result showed that moderate positive correlation ($r = 0.84$) between perceived stress and blood flow among adolescent girls.

Objective 4: Associate between perceived stress during menstruation among adolescent girls with their selected demographic variables.

Result showed that the demographic characteristics like menstrual cycle periodicity ($X^2=1.78$) and duration of menstrual flow ($X^2=4.32$) have significant association

whereas the demographic characteristics like Age ($X^2=5.01$), Department ($X^2=6.22$), Age at menarche ($X^2=12.89$) and menstrual irregularities ($X^2=6.78$) have no significant association with perceived stress during menstruation.

Objective 5: Associate between blood flow during menstruation among adolescent girls with their selected demographic variables.

Result showed that the demographic characteristics like menstrual cycle periodicity ($X^2=3.87$) and duration of menstrual flow ($X^2=5.93$) have significant association whereas the demographic characteristics like Age ($X^2=2.13$), Department ($X^2=8.20$), Age at menarche ($X^2=15.51$) and menstrual irregularities ($X^2=2.58$) have no significant association with blood flow during menstruation.

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Conflict of Interest: Nil

Reference

1. Kerri Durnell. Women's Gynecologic Health, 2 ed. Burlington: Jones & Bartlett; 2011.
2. Dr. Christina Matera. Stress & how it affects your menstrual cycle. <http://tampax.com> (accessed 19 november 2018).
3. Nazish Rafique, Mona H. Al-Sheikh. Prevalence of menstrual problems and their association with psychological stress. Saudi. Med J 2018; 39(1).
4. Ziba Raisi Dehkordi. Evaluate the effect of perceived stress on dysmenorrhea. BMJ Open 2017; (015415).
5. Cohen .S, Kamark. T Etal. A global measures of perceived stress. Journal of health and social behavior 1983; 24(386-396).

The Roles of Parenting Style towards Mental Health of Early Childhood

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Abstract

Mental health of early childhood cannot be separated from parents' parenting. Mental health is strongly influenced by social-emotional conditions. Children's social development includes the child's ability to establish and form healthy relationships with others. Emotional development includes the ability to control and adjust one's feelings to others. The form of treatment and attitudes of parents greatly determine the social-emotional development of early childhood. When the social-emotional development of early childhood is impaired, it will indirectly have an impact on their mental health. For this reason, parents must determine the appropriate parenting style so that children's mental health develops well. Explorative qualitative method was used in this research. The researchers attempted to understand and examined the relationship between parenting style and early childhood mental health by understanding and analyzing the findings of previously published research. The results of this research indicated that parenting style has a very important role in the mental health of early childhood. Authoritative parents have a positive impact on children's mental health, whereas authoritarian parents have a negative impact on children's mental health. Authoritative care is characterized by warm treatment from parents and always concerned about the needs and development of children. Meanwhile, the authoritarian parenting is characterized by abuse by parents and being unresponsive to children.

Keywords: *parenting style, mental health, authoritative, authoritarian, social emotional, early childhood.*

Introduction

Studies of children's mental health are very important to discuss. Mental health is a problem that continues to develop in the community. Children's mental health problems continue to receive attention and to be studied in various countries. There are many ways to overcome mental health problems. For example, the development of early childhood's mental health consultation models in the United Kingdom⁽¹⁾. Development of a mental health service system in Korea⁽²⁾. And psychological support and various access to mental health services in Cambodia⁽³⁾. All of them indicate that mental health problems are a shared challenge that must be addressed since early childhood.

Mental health problems can occur from an early age. Throughout the prenatal period and into the first years of life, the child's brain and body develop rapidly, making the child very vulnerable to external influences⁽⁴⁾. Early

childhood is considered a very wide range of mental health disorders. The results show that the number of children diagnosed with mental health problems has increased significantly over the past three decades⁽⁵⁾. One of the factors in a child's mental health problem is the parenting style that is not in accordance with the child's development stage. If parenting is not done properly, it can disrupt the mental health of the child. The Iowa Association for Infant & Early Childhood Mental Health explains that the first years of life provide a foundation for children's mental health and social-emotional development⁽⁶⁾. The condition of young children who are still very young needs care from their parents and their nearest environment. Parenting during infancy and early life is very important for healthy physical, psychological and social development⁽⁴⁾. Proper care can provide positive experiences that are beneficial to children's social emotional development and mental health. Social experiences and opportunities

for young children to explore the world depend on the love and care they receive⁽⁶⁾.

Mental health problems in early childhood are mostly influenced by parenting styles. Various studies explain that parenting has a significant relationship to the mental health of children⁽⁵⁾. Parental interactions and treatment of children play an important role in children's mental health. This is because parents are the closest environment to the child. Whatever parents do and give will affect the child's development. When babies and toddlers are treated with kindness and encouragement, they develop a sense of security and emotional security⁽⁶⁾. Conversely, if a child is treated with bad things and threats, it can bring fear and pressure to the child so that it has a negative impact on the child's mental health. For this reason, parenting and the treatment of parents play an important role in the mental health of early childhood.

Method

Qualitative explorative method was used in this research. The researchers tried to understand and examine the relations between parenting style and early childhood mental health. Exploration method aimed to reveal new knowledge about forms of parenting style and their impacts on social emotional development and mental health of early childhood. Jacobsen explains that exploratory research questions aim to reveal new knowledge about a phenomenon that occurs⁽⁷⁾.

This research is based on various related literature that reveals the mental health of early childhood and various factors that influence it and studies related to parenting style, especially in relation to mental health of early childhood. The literatures used as a reference are books and reliable scientific articles, both published in journals and online media. They were then understood, studied and analyzed to obtain findings and conclusions.

Results and Discussion

Problems with mental health of early childhood can occur because of the attitudes and treatment of parents. Parents who are insensitive and care about the conditions of a child's emotional social development can have a negative impact on a child's mental health. In addition, parents who have mental health problems also influence children's mental health. For example, the results of a survey in Scotland in 2010 of more than 3000 mothers showed that children whose mothers

were emotionally good had better social, behavioral and emotional development than mothers who had mental health problems⁽⁸⁾. Thus, the behavior and conditions of parents have an important role in the mental health of their children.

Overview of Early Childhood Mental Health:

Early childhood is a child who is in the age range of birth to eight years⁽⁹⁾. It can also be interpreted as the age of birth to age 3 years, birth to 5 years, or birth to 8 years, or even including the prenatal period⁽¹⁰⁾. During these times, the child has tremendous growth and development where the development of children is strongly influenced by the environment and those around them⁽⁹⁾. Not to mention the mental health of early childhood.

Mental health plays an important role in the well-being of everyone, even for infants and young children⁽⁶⁾. Mental health of early childhood is an illustration of social-emotional abilities in everyday life⁽¹⁰⁾. Scientists define children's mental health as the development of social emotional competence and self-regulation and practically no psychological and pathological disorders⁽⁵⁾. Mental health is a term that refers to an individual's emotional, psychological and social well-being⁽¹¹⁾.

It must be understood that mental health with mental illness has different meanings. Mental health problems are not as severe as mental illness, but they can develop into mental illness if not handled effectively. Children's health and mental illness are shaped by complex interactions between individual children, biological characteristics, caregiver characteristics, a more general family environment and a broader socio-cultural and environmental context.

The concept of mental health according to WHO includes welfare, self-efficacy, autonomy, competence and the ability to realize one's intellectual and emotional potential⁽¹²⁾. Early childhood mental health is related to the development capacity of children from birth to three to experience, arrange and express emotions, form close and safe interpersonal relationships, both in the context of family, community and culture⁽¹⁰⁾. From this explanation, it can be illustrated that emotional social development is strongly related to the mental health of early childhood. The terms mental health and social-emotional development are used interchangeably⁽¹¹⁾. Any behavior that the child shows in his interactions with other people and his environment can illustrate

his mental health. One of the mentally healthy children can be identified through the ability and development of children psychologically, emotionally, intellectually and spiritually⁽¹³⁾. Anxious, tense and fearful feelings experienced by children make their mental health disturbed. Conversely, feeling happy, safe and comfortable makes children's mental health well developed.

The Role of Parenting Style for Mental Health:

Early Childhood Parents have a close relationship to social emotional development and mental health of early childhood. The parents' style of parenting greatly determines the future of the child. The attitude and treatment of parents is the basis for developing children's mental health. The experiences gained during parenting greatly affect the next mental health of the child. Positive experiences of early childhood enhance strong emotional health, whereas negative experiences can adversely affect brain development⁽¹⁴⁾. When the emotional development of early childhood deteriorates, their mental health experiences problems.

The style of parents' parenting has a very important role in the mental health of early childhood. Parenting style is defined as a form of parental control of children's behavior⁽¹⁵⁾. Children become responsible and contribute to community members⁽¹⁶⁾. Parenting is closely related to the process of action and interaction between parents and children⁽¹⁷⁾. Another opinion states that parenting styles can be described as specific behaviors that include the demands and responses of parents that are used to control and socialize children⁽¹⁸⁾. The form of demands and parents' responses to children's emotional development will determine their mental health.

As caregivers, parents play a role in maintaining, interpreting, educating and providing positive experiences for the development of children's abilities. The results showed that infants involved with caregivers who are responsive, consistent, care and live in a safe and comfortable environment are more likely to have strong emotional health⁽¹⁴⁾. This means that children's mental health can develop well. Social experiences and opportunities for young children to explore the world depend on the love and care they receive⁽⁶⁾. Relationships with parents and their environment are central to the mental health of early childhood.

Healthy emotional social development is very important for the life and future of the child. The

development of self-esteem, self-confidence and self-regulation are important features of social-emotional development⁽⁶⁾. The initial stage of social emotional development occurs in the family. Therefore, forming a family and caring for children is an important part of life⁽⁸⁾. Good relations between parents and children play an important role in the next development of the child.

Parenting Style that Supports and Inhibits Mental Health of Early Childhood:

The mental health of early childhood depends very much on the parenting style of their parents. There are times when parenting styles can support children's mental health, but there are also parenting styles that have a negative impact on children's mental health. Baumrind classifies parenting styles into three, namely: authoritative, authoritarian and permissive^(15,19,20). This classification is based on the form of demands and responses of parents to children's behavior. The demands refer to claims made by parents on children to be integrated into society through regulation of behavior, direct confrontation and demands for maturity and supervision of children's activities, whereas responses refer to the extent to which parents grow individuality and self-affirmation by supporting and approve child requests⁽²⁰⁾.

Two out of the three parenting styles raised by Baumrind, becoming the focus of this research are authoritative and authoritarian. Both of these parenting styles have relevance and the opposite effect on the mental health of early childhood. This is based on the characteristics of each of these parenting styles.

Authoritative is a parenting style that has high demands and high responses⁽²¹⁾. Authoritative parents give very strict control and provide leeway for children to make their own decisions⁽¹⁹⁾. Parents with this type play a role in directing and facilitating various behaviors and desires of children. Parents are very warm and accept communication of children⁽²²⁾. With this parenting style, children can grow up to be independent, confident and able to explore their world with pleasure and satisfaction. This condition is very positive for the mental health of early childhood. This is based on the results of a research that states that infants or children involved with caregivers who are responsive, consistent, care and live in a safe and comfortable environment are more likely to have strong emotional health⁽¹⁴⁾. This explanation can be seen through Figure 1.

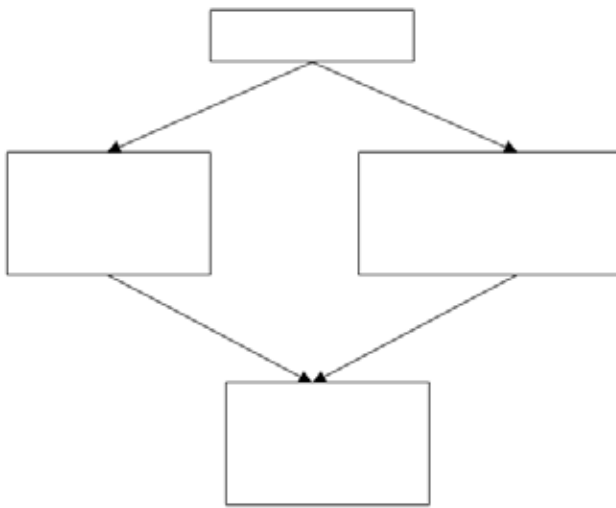


Figure 1: The Relation between Authoritative Types and Mental Health in Early Childhood

Responsive and warm parents are very good for children’s social emotional development, because it can help children develop their abilities optimally. Children can show feelings of being happy, satisfied, safe and comfortable. Such conditions are very supportive for the mental health of children and influence the subsequent development of children.

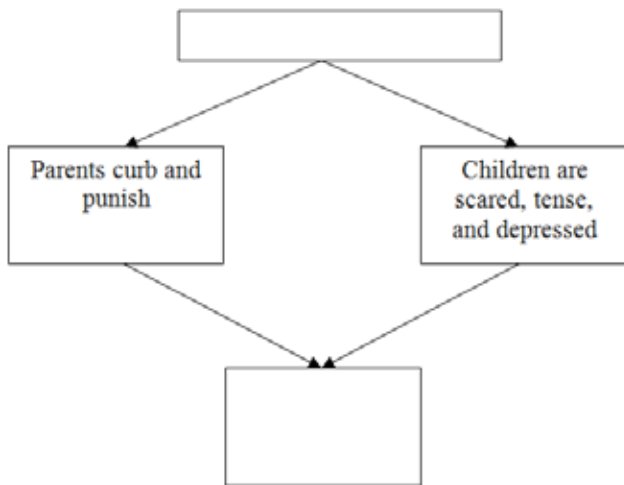


Figure 2: The relations of the authoritarian type to the mental health of early childhood

Authoritarian is a parenting style that has high demands but is not responsive⁽²¹⁾. Parents want and demand that their children obey, prefer punishment and much curb and limit children’s behavior. Authoritarian parents control children’s behavior arbitrarily and are accustomed to give severe physical punishment to their children⁽²³⁾. This style of parenting can interfere with children’s development, especially regarding its social

emotional. Children who are cared for authoritatively when dealing with other people, become unhappy, withdrawn, shy and unreliable⁽¹⁷⁾. Children become depressed, forced, scared and suspicious⁽¹⁶⁾. This situation greatly affects the emotional development of children. When the child always gets treatment and arbitrary punishment from parents, it can lead to a negative impact on his mental health. This explanation can be seen through Figure 2.

Severe punishments, unfair, not punctual and given by parents who do not love are very dangerous and ineffective in controlling children’s behavior. Arbitrary actions from parents make children afraid and feel insecure. The child’s emotions are disrupted and in a certain period of time can have a negative impact on the child’s mental health. Thus, it can be understood that authoritarian attitudes from parents have harmful side effects for emotions and mental health of early childhood. In addition, authoritarian behavior is an ineffective way to control children’s behavior and is very disturbing to the next child’s development.

Conclusions

Parenting style and mental health of early childhood are connected one another. Parents’ demands and responses to children’s behavior give rise to various effects on children’s social emotional development. This development is very influential on the mental health of early childhood. Good relations between parents and children in daily life are very positive for children’s mental health. Conversely, bad relations between parents and children are very bad for children’s mental health. Authoritative as an assertive style of parenting, caring and emphasizing warmth can encourage children to be independent, creative and confident. This parenting style makes children happy, satisfied, safe and comfortable so it is very good for their mental health. Authoritarian is a parenting style that is unresponsive, restrains and punishes children arbitrarily. This parenting style makes children afraid, tense, suspicious and depressed so that it has a negative impact on children’s mental health.

Additional Informations:

Conflict of Interest: No

Ethical Clearance: Yes

Source of Funding: Author

References

1. Upshur, C., Gross, M. W. & Reed G. A pilot study of early childhood mental health consultation for children with behavioral problems in preschool. *Early Child Res Q.* 2009;29:29–45.
2. Heo, Y. C., Kahng, Sang K., & Kim, S. Mental health system at the community level in Korea: development, recent reforms and challenges. *Int J Ment Health Syst.* 2019; 13(9):1–5.
3. Aberdein, C., & Zimmerman, C. Access to mental health and psychosocial service in Cambodia by survivors of trafficking and exploitation: a qualitative study. *Int J Ment Health Syst.* 2015;9(16):1–13.
4. Mental Health America. Prevention and early intervention B4stage4: The state of mental health in America [Internet]. Mental H. 2016. p. 38–9. Available from: [https://www.mentalhealthamerica.net/sites/default/files/2016 MH in America FINAL.pdf](https://www.mentalhealthamerica.net/sites/default/files/2016%20MH%20in%20America%20FINAL.pdf)
5. Taylor, N. K., & Mikulak A. Child mental health: A review of the scientific discourse [Internet]. 2009. Available from: https://www.frameworksinstitute.org/assets/files/PDF_childmentalhealth/childmentalhealthreview.pdf
6. IOWA. What is infant and early childhood mental health? [Internet]. Iowa Association for Infant & Early Childhood Mental Health. 2019. p. 1–8. Available from: <http://www.promotingmentalhealthiowa.org/pdf/WhatIsBro.pdf>
7. Vannebo, B.I. Gotvassli KÅ. The concept of strategy in the early childhood education and care sector. *Eur Early Child Educ Res J.* 2017;
8. Mental Health Foundation. Fundamental facts about mental health [Internet]. Mentalhealth.org. 2015. p. 1–94. Available from: <https://www.mentalhealth.org.uk/sites/default/files/fundamental-facts-15.pdf>
9. UNESCO. Early childhood care and education [Internet]. <https://en.unesco.org>. 2017 [cited 2018 Jan 25]. Available from: <https://en.unesco.org/themes/early-childhood-care-and-education>
10. Korfmacher, J. Infant, Toddler and Early Childhood Mental Health Competencies: A Comparison of systems [Internet]. Erikson Institute. 2014. p. 1–45. Available from: <https://www.erikson.edu/wp-content/uploads/ZTT-Infant-Mental-Health-report-v7.pdf>
11. Hughes, Mary-alaune., Spence, C. M., & Ostrosky M.M. Early Childhood Mental Health Consultation: Common Questions and Answers. *Young Except Child.* 2014; 18(3):37–8.
12. WHO. Investing in mental health [Internet]. Switzerland: Departement of Mental Health and Substance Dependence Noncommunicable and Mental Health, World Health Organization; 2003. 7-13 p. Available from: https://www.who.int/mental_health/media/investing_mnh.pdf
13. CAMHS. Promoting children’s mental health within early years and school setting [Internet]. Nottingham: DfEE Publications; 2001. 1-8 p. Available from: <http://www.mentalhealthpromotion.net/resources/promoting-childrens-mental-health-with-early-years-and-school-settings.pdf>
14. Zero To Three. The basics of infant and early childhood mental health: A briefing paper [Internet]. Zero To Three. 2017. p. 1–4. Available from: <https://www.zerotothree.org/resources/1951-the-basics-of-infant-and-early-childhood-mental-health-a-briefing-paper>
15. Baumrind, D. Effects of Authoritative Parental Control on Child Behavior. *Child Dev.* 1966;37(4):887.
16. Berns, R.M. Child, family, school, community: Socialization and support. Eighth Edi. USA: Wadsworth Cengage Learning; 2010. 143-144 p.
17. Brooks, J. The process of parenting. Eight edit. New York: Imprint of The McGraw-Hill, Inc; 2011. 10-11 p.
18. AlRub, M.F. A. Parenting styles used with preschool children among arab immigrant parents in a u.s. context. Colorado; 2013.
19. Baumrind, D. Reciprocal rights and responsibilities in parent-child relations. *J Soc Issues.* 1978;34(2): 179–196.
20. Baumrind, D. Patterns of parental authority and adolescent autonomy. *New Dir Child Adolesc Dev.* 2005; 108:61–9.
21. Baumrind, D. The influence of parenting style on adolescent competence and substance use. *J Early Adolesc.* 1991; 11(1):56–95.
22. Baumrind, D. Current patterns of parental authority. *Dev Psychol.* 1971;4(1 Pt.2):1–103.
23. Baumrind, D., Larzelere, R. E., & Owens E.B. Effects of Preschool Parents’ Power Assertive Patterns and Practices on Adolescent Development. *Parenting.* 2010; 10(3):157–201.

Factor Affecting the Success of Aged-Friendly Primary Health Care Program for Elderly in Surabaya City

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Abstract

Introduction: The elderly are human who experience various decreases in anatomical, physiological, social and economic aspects, this can cause some elderly aren't able to be independent in fulfilling their daily needs. One of efforts to improve the quality of life for the elderly, through the government issued a policy on the implementation of Aged-Friendly Primary Health Care Program for the elderly. Purpose: This study aimed to explore the factors that affect the success of Aged-Friendly Primary Health Care Program for the elderly.

Method: This study used qualitative study with a phenomenological approach. The saturation of data was obtained by 15 participants which were conducted the data collection by using indept interview. Data analysis used Collaizi analysis method.

Results: The identification found four main themes and eight sub themes: (1) characteristics of elderly (physiological and psychological factors), (2) Health workers (knowledge, services quality provided); (3) Health facilities (the availability of tools and technology, the distance of health care); (4) Family support (material supports, psychological supports).

Conclusion: Aged-Friendly Primary Health Care Program for the elderly was affected by several factors, all of the factors were interrelated so that it is needed a good coordination among the elderly, family and health workers to provide a quality of aged-friendly services for the elderly.

Keywords: *Aged-Friendly Primary Health Care Program, Elderly, Phenomenology Study.*

Introduction

The elderly are human over 60 years old who experiences various decreases in anatomical, physiological, social and economic aspects, this causes some elderly people unable to be independent in fulfilling their daily needs¹. One of the efforts in improving the quality of life of the elderly, through a policy of implementing of Primary Health Care program for the elderly which was issued by the government and it was implemented since 2005²

In addition, the population of the elderly in the world in 2015-2030 is expected to grow by 56%, projections for 2050 from 901 million to 1.4 billion people, thus accounting for twice of the amount in 2015³. Based on the Indonesian Ministry of Health's Data and Information

Center 2017, the elderly population in Asia in 2015-2030 is estimated to be from 11.6% to 17.1%. While the prediction of the number of elderly in Indonesia in 2020 (27.08 million), in 2025 (33.69 million), in 2030 (40.95 million) and in 2035 (48.19 million). East Java Province is one of three provinces in Indonesia with the largest percentage of elderly is 12.25%⁴

The increasing the number of elderly will affect the number of dependency burden. The Efforts conduct to reduce the burden of this dependency so that the elderly can live independently and remain productive through improving health services in accordance with the target of Regional Strategy For Healthy Aging 2013-2018 to realize healthy, independent, quality and productive elderly⁵ This can be implemented and starts from the

primary health care through Aged-Friendly Primary Health Care Program for the elderly.

Aged friendly primary health care is a health care system that aims to provide elderly with the best care possible, reduce health care related harms to elderly and optimize value of all, including patients, families, caregivers, health care providers and health systems⁶. Patients goals and preferences are valued, family caregivers are supported, included in the treatment plan and safe and better transitions of patients from different care settings are ensured. The systems will perhaps enhance the quality of care for elderly and optimize value for health systems in measurable ways⁷.

Method

The method used in this study was a qualitative research method by using a phenomenological approach to explore factor affecting the success of aged-friendly primary health care program for elderly in Surabaya City in depth from the subjectivity of participants who were directly involved in providing care to elderly patients⁸.

The number of participants in this study was found until data saturation could be obtained with predetermined inclusion and exclusion criteria. The inclusion criteria were elderly who visited to the aged-friendly primary health care and they were cooperative, good communication and hadn't hearing loss during the study process, while the exclusion criteria were those who were senile and had hearing loss. So that there were 15 respondents with a purposive sampling technique.

Instruments used in the collection process by using interview guidelines, field notes (recording data obtained during interviews): such as participant and other expressions and recorders or voice recorders in the form of MP3 voice recorders. The validity of the recording device was conducted by using a test recording of the researcher.

The process of data analysis in this study was conducted by using the nine step data interpretation method⁹. The method was chosen because the steps of data analysis in Collaizi which was quite simple, clear and detailed to be used for this study.

Results

Participants in this study were 15 participants as the main subject, which number corresponds to the saturation results obtained in the field. Fifteen families

were interviewed regarding factors affecting the success of aged-friendly primary health care program for elderly in Surabaya City.

Table 1. Demography of Participants

Characteristics	Frequency	Percentage
Elderies		
Gender		
Female	9	60%
Male	6	40%
Marital Status		
Married	5	33,3%
Widow	2	13,3%
Widower	8	53,4%
Age		
Less 65 years	4	26,6%
More 65 years	11	73,4%
Education		
No school	4	26,6%
Elementary school	6	40%
Junior high school	3	20%
Senior high school	2	13,4%
Profession		
Housewife	5	33,4%
Unemployment	3	20%
Retired	2	13,4%
Farmer	4	26,6%
Trader	1	6,6%

In this study the researchers wanted to explore factors affecting the success of aged-friendly primary health care program for elderly in Surabaya City. This study found 4 themes and 10 sub-themes (table 2).

Table 2: Themes and subthemes

No.	Themes	Subthemes
1.	Elderly Characteristics	1. Physiological Factors
		2. Psychological Factors
2.	Health Workers	1. Knowledge
		2. Service quality provided
3.	Health Facilities	1. The availability of tools and technology
		2. The distance of health care
4.	Family Supports	1. Materials Support
		2. Psychological Support

Elderly Characteristics: Based on the elderly characteristics theme, that consisted of physiological and psychological factors. The physiological sub-theme was

described by participants as following: “I come to poly alone, if I’m weak, my family will be helped me to check up at the elderly’s poly” (Participant (P1))

“I routinely check up my blood pressure at the elderly’s poly” (P5)

The second sub-theme about the psychological factors, the participant’s explanation regarding the sub-theme as following:

“I’m worried about my medical conditions so that I routinely check up at the elderly’s poly” (P9)

“I can join discussion properly and want to accept advice from nurses openly regarding my medical conditions” (P7)

Health Workers: The health workers theme consisted of two sub-themes, there were knowledge and service quality provided. The knowledge sub-theme was explained by participants: “Nurses who work at the elderly’s poly have had previous experiences and trainings, so they understand how to care for me well” (P11)

“Health workers at the elderly aged-friendly’s poly are very clear when giving services to me, I easily understand and I apply it at home” (P13)

The second sub-theme about the service quality provided, the participant’s explanation regarding the sub-theme was:

“I’m happy with the services that are provided by nurses at the elderly aged-friendly’s poly, the nurses are attentive and polite, I’m comfortable to check up my health there” (P6)

“I’m very satisfied with the services at the elderly aged-friendly’s poly, so I’m happy to check up at the elderly aged-friendly’s poly” (P8)

Health Facilities: Based on the health facilities theme that consisted of the availability of tools and technology and the distance of health care. The availability of tools and technology sub-theme was described by participants as following:

“Recently, registration to check up is easier with an online system, no need to queue”

“If I want to easily check up, I can register online at home, so when I come to the elderly aged-friendly’s

poly, I don’t have to queue for longtime” (P12)

The second sub-theme about the distance of health care, the participant’s explanation was:

“The distance from the primary health care to the house is close, so I’m easy to check up”

“I don’t routinely check up, because my house is far from the primary health care” (P14)

Family Supports: The family supports theme consisted of two sub-themes, there were materials and psychological supports. The materials supports sub-theme was described by participants as following: “If I come to the primary health care, I will be accompanied by my family, if there is a need that must be purchased, my family will buy it for my health needs” (P2)

“My child who gave me fees to check up to the primary health care” (P4)

The second sub-theme regarding psychological supports, the participant’s explanation as following:

“My family always supports and motivates me to come regularly to the primary health care, so I feel calm because my family has supported me.” (P10)

“I feel safe and calm because all of my families support me” (P3)

Discussion

This study was similar with previous study that physiological and psychological factors affected the elderly to check up. The study stated that the elderly who had good physical condition and spent time in outdoor activities could improve health care utilization.¹⁰ Besides, psychological needs also had to be paid attention by the community especially health workers through promote older people’s mental and physical health and strengthen their psychological self-adjustment so that the health care utilization can improve¹⁰. This study also was line in with the previous author that had studied the correlation between health care utilization and factors related to the patients’ sociodemographic characteristics included physical health and psychological health, as well as the health organization¹¹

The other factors which were knowledge of health workers and service quality provided of the health care. One of the previous studies stated that the high quality and type of healthcare greatly enabled elderly to use of

health service¹². The more professional health workers at the health care so the more utilization of health care that would be used by elderly. The support of a long-term policy of training for health workers would be one of efforts to improve the high quality of health care¹². Then, the clearly explanation of health workers that used common language regarding the treatment or medical conditions of elderly was also important to improve the utilization of health service for the elderly. This was similar with the previous study if there were language barriers it would decrease the utilization of health care included reduced the elderly's understanding and involvement in decision-making regarding their treatment options¹³

Health facilities included the availability of tools and technology and the distance of health care were factors affected the elderly to check up at the health service. The previous study indicated that a number of primary care visits decreased by 0.6% to 3.93 billion, so that sustaining the low utilization rates of lower level facilities¹⁴ This phenomenon was caused by the "three longs and one short" namely long waiting time for registration, long waiting time to prepay the charges, long waiting time for the appointment with a doctor, but a short appointment duration¹⁵. This situation was different with the study which there wasn't waiting time because of the primary health care used online system. Although, there were different situations, waiting time was one of problems that affected patient to check up in health care. Besides, the other study stated that longer travel times and greater distances to health care constituted barriers to repeated and distance is the most important factor that affected the utilization of health care¹²

Then, the family support was important thing for elderly, especially materials and psychological supports in order to access primary health care. This was in line with the previous study regarding Factors Affecting Healthcare Access for Older Immigrants states that the families of older immigrant and social worker participants played the most important role in assisting older immigrants to access healthcare¹². Moreover, the other study stated that the importance of family increased with advance age as elderly needed more support and help in their life especially during chronic illness¹⁶. Thus, family supports was the important factors that affected the elderly to access health care.

Therefore, factors that were mentioned above, could affected patient especially elderly to visit and check up

their medical conditions at the health care. As well as, the factors were interrelated and could be the success components of Aged-Friendly Primary Health Care Program for Elderly.

Conclusion

The elderly are human over 60 years old who experiences various decreases in anatomical, physiological, social and economic aspects, this causes some elderly people unable to be independent in fulfilling their daily needs, so that the government issued policy about Aged-Friendly Primary Health Care Program for the elderly in order to enhance the quality of care for elderly and optimize value for health systems. This program was affected by several factors, all of the factors were interrelated so that it is needed a good coordination among the elderly, family and health workers to provide a quality of aged-friendly service for the elderly.

Ethical Clearance: The present study was passed the ethical principal on the ethics committee of the Faculty of Nursing, Universitas Airlangga with certificate number: 1459-KEPK.

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Reference

1. Raquel B, Ornelas F, Jardim DH, Coordenadora P, Martins DM, Coordenadora P, et al. Prehabilitation and rehabilitation nursing : Balance and fall risk in community-dwelling older adults .
2. Ambariani. Pengaruh Kualitas Pelayanan Puskesmas Santun Lansia Pada Kepuasan Pasien Lanjut Usia Di Puskesmas Santun Lanjut Usia Kabupaten Bogor Jawa Barat. *Jurnal Keperawatan*, 2014; 1(1):59–68.
3. Bureau USC. An Aging World : 2015 International Population Reports. 2016;(March).
4. Dinas Kesehatan Kota Surabaya. Profil kesehatan. 2016; (31):5
5. Kementrian Kesehatan RI. Situasi lanjut usia (lansia).2017;(22):4.
6. Woo, Mak B, Yeung F. Age-Friendly Primary Health Care: An Assessment of Current Service Provision for Older Adults in Hong Kong. *Heal Serv Insights [Internet]*. 2013;69. Available from:

- <http://www.la-press.com/age-friendly-primary-health-care-an-assessment-of-current-service-prov-article-a3818>
7. Ma A, Ra G. Age-friendly primary care health centers why are they necessary ? 2018;2(4):180–3.
 8. Creswell JW, Creswell JD. Research design: Qualitative, quantitative and mixed method approaches. Sage publications; 2017.
 9. Speziale HS, Streubert HJ, Carpenter DR. Qualitative research in nursing: Advancing the humanistic imperative. Lippincott Williams & Wilkins; 2011.
 10. Jiang M, Yang G, Fang L, Wan J, Yang Y, Id YW. Factors associated with healthcare utilization among community-dwelling elderly in Shanghai, China. 2018; 1–22.
 11. Fern C. Factors associated with health care utilization by the elderly in a public health care system. 2006;75:131–9.
 12. Luo H, Proch K. Factors Affecting Healthcare Access for Older Immigrants : A Qualitative Study with Service Users and Healthcare Social Workers in a Central Canadian City. 2018;3:272–81.
 13. Garrett PW, Forero R, Dickson HG, Whelan AK. How are language barriers bridged in acute hospital care ? The tale of two method of data collection. 2008;32(4):1–2.
 14. Li C, Xu X, Zhou G, He K, Qi T, Zhang W. Implementation of National Health Informatization in China : Survey About the Status Quo Corresponding Author : 7.
 15. Chao J, Lu B, Zhang H, Zhu L, Jin H, Liu P. Healthcare system responsiveness in Jiangsu Province, China. BMC Health Serv Res [Internet]. 2017; 1–7. Available from: <http://dx.doi.org/10.1186/s12913-017-1980-2>
 16. Morgan & Suzanne. Aging, Society and the life course. Springer Publishing Company. 2016(35)5.

The Relation between Hyperlipidemia and Intracranial Bleeding Prospective Study

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Abstract

Cholesterol levels are inconsistently associated with the risk of hemorrhagic stroke. Total 24 patients were included in the study with severe headache at hospital ward of AL-Hussein teaching hospital in AL-Muthana from 1st July 2018 to 15th December 2018. Blood Samples were taken by using sterile syringe and tube sent to biochemical laboratory. Prospective studies were included, totaling 24 patient, the summary relative risk of ICH was increased level of total cholesterol (5.18), (0.3) for high-density lipoprotein cholesterol, (1.40) for low-density lipoprotein cholesterol and (1.4) for triglyceride. Total cholesterol level is inversely associated with risk of ICH. Higher level of high-density lipoprotein cholesterol seems to be associated with lower risk of ICH. Cholesterol level seems to be positively associated with risk of intracerebral hemorrhage.

Keywords: Intracerebral hemorrhage, low-density lipoprotein cholesterol, sub arachnoid hemorrhage.

Introduction

Stroke is one of the leading causes of death and adult disability in the world. Intracerebral hemorrhage (ICH), an important subtype of the stroke, is characterized by high mortality and morbidity, which contains symptomatic intracerebral hemorrhage (sICH)^[1] and cerebral micro bleed (CMB)^[2]. In ICH patients, per hematoma inflammation where the region becomes infiltrated with neutrophils and activated microglia after the activation of Toll-like receptor 4^[3] and the release of inflammatory mediators such as tumor necrosis factor- α (TNF- α) and interleukin-1 β (IL-1 β)^[4] contributes to neuronal injury and functional disability. Meanwhile, ICH results in the change of the cerebral blood flow and the increasing permeability of blood-brain barrier (BBB)^[5]. These pathological changes could aggravate nerve damage and dysfunction. The data from World

Health Organization (WHO) showed that ICH accounts for approximately 25–50% of stroke and the reduction of morbidity Hyperlipidemia has been proven to be a risk factor of ischemic stroke^[6]. Studies found that patients with lower serum lipid had an increasing risk of ICH^[11–13]. Therefore, it is necessary to further clarify the association of serum lipid levels.

Intracranial Hemorrhage: Intracranial hemorrhage (ICH), also known as intracranial bleed, is bleeding within the skull^[7]. Subtypes are intracerebral bleeds (intraventricular bleeds and intraparenchymal bleeds), subarachnoid bleeds, epidural bleeds and subdural bleeds^[8]. Intracranial hemorrhage is a serious medical emergency because the buildup of blood within the skull can lead to increases in intracranial pressure, which can crush delicate brain tissue or limit its blood supply. Severe increases in intracranial pressure (ICP) can cause brain herniation, in which parts of the brain are squeezed past structures in the skull. Intracranial bleeding occurs when a blood vessel within the skull is ruptured or leaks. It can result from physical trauma (as occurs in head injury) or non-traumatic causes (as occurs in hemorrhagic stroke) such as a ruptured aneurysm. Anticoagulant therapy, as well as disorders with blood clotting can heighten the risk that an intracranial hemorrhage will occur^[9]. Types of intracranial hemorrhage are roughly grouped into intra-axial and

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extra-axial. The hemorrhage is considered a focal brain injury; that is, it occurs in a localized spot rather than causing diffuse damage over a wider area. Intra-axial bleed Intra-axial hemorrhage is bleeding within the brain itself, or cerebral hemorrhage. This category includes intraparenchymal hemorrhage, or bleeding within the brain tissue and intraventricular hemorrhage, bleeding within the brain's ventricles (particularly of premature infants). Intra-axial hemorrhages are more dangerous and harder to treat than extra-axial bleeds^[10]. Extra-axial hemorrhage, bleeding that occurs within the skull but outside of the brain tissue, falls into three subtypes.

Epidural hemorrhage (extradural hemorrhage) which occurs between the dura mater and the skull is caused by trauma. It may result from laceration of an artery, most commonly the middle meningeal artery. This is a very dangerous type of injury because the bleed is from a high-pressure system and deadly increases in intracranial pressure can result rapidly. However, it is the least common type of meningeal bleeding and is seen in 1% to 3% cases of head injury. Patients have a loss of consciousness (LOC), then a lucid interval, then sudden deterioration (vomiting, restlessness, LOC). Head CT shows lenticular (convex) deformity. Subdural hemorrhage results from tearing of the bridging veins in the subdural space between the dura and arachnoid mater. Head CT shows crescent-shaped deformity. Subarachnoid hemorrhage, which occurs between the arachnoid and pia meningeal layers, like intra parenchymal hemorrhage, can result either from trauma or from ruptures of aneurysms or arteriovenous malformations. Blood is seen layering into the brain along sulci and fissures, or filling sub arachnoid cisterns (most often the chiasmatic cistern because of the presence of the anterior cerebral arteries of the circle of Willis and their branch points within that space). The classic presentation of subarachnoid hemorrhage is the sudden onset of a severe headache (a thunderclap headache). This can be a very dangerous entity and requires emergent neurosurgical evaluation and sometimes urgent intervention. Subarachnoid hemorrhage A subarachnoid hemorrhage is bleeding into the subarachnoid space—the area between the arachnoid membrane and the pia mater surrounding the brain. Besides from head injury, it may occur spontaneously, usually from a ruptured cerebral aneurysm. Symptoms of SAH include a severe headache with a rapid onset (thunderclap headache), vomiting, confusion or a lowered level of consciousness and sometimes seizures^[6]. The diagnosis is generally

confirmed with a CT scan of the head, or occasionally by lumbar puncture. Treatment is by prompt neurosurgery or radiologically guided interventions with medications and other treatments to help prevent recurrence of the bleeding and complications. Since the 1990s, many aneurysms are treated by a minimal invasive procedure known as endovascular coiling, which is carried out by instrumentation through large blood vessels. However, this procedure has higher recurrence rates than the more invasive craniotomy with clipping^[11].

Method

Prospective studies of 24 patients in AL-Hussein teaching hospital in AL-Samawa city-Iraq.

Examining the association between cholesterol and the risk of hemorrhagic stroke. Three main categories of cholesterol, including TC, high-density lipoprotein cholesterol (HDL-C) and LDL, were investigated, respectively. Hemorrhagic stroke mainly included ICH and SAH. The search was limited to studies published from July 2018 to January 2019.

Results

During the 5 months study period there had been 24 patients admitted for intracranial hemorrhage for which samples had been sent for analysis lipid profile. Males (66.6%) were more commonly affected than females (33.3%) and the sex ratio male : female was 2:1 (see Figure 1). The mean age was 69 yrs. (age range from 40 to 75 yrs.). Relative risk factor for hyperlipidemia to cause intracranial hemorrhage show in (Table 1). Fond relative risk of ICH was (58.3%) for total cholesterol, (8.3%) for high-density lipoprotein cholesterol, (16.6%) for low-density lipoprotein cholesterol and (16.6%) for triglyceride.

Figur 1. gender distirbution of study sample.



Figure 2. Relative risk factor of intracranial hemorrhage in hyperlipidemia



Table 1. No. of patients related to the different lipid profile.

Lipid profile	No. of Patient	% of Intracranial hg
Triglyceride	4	16.6%
Cholesterol	14	58.3%
HLD	2	8.3%
LDL	4	16.6%

Discussion

In this prospective population-based cohort study among people aged 40 years or older who were free from stroke at baseline, we confirmed that serum total cholesterol levels were associated with the risk of intracerebral hemorrhage. When investigating the various lipid fractions, we found that the association was due to a strong relationship between cholesterol levels and risk of intracerebral hemorrhage and not due to HDL-cholesterol or LDL cholesterol levels. Similarly, we found an inverse association between triglyceride levels and the presence of cerebral micro bleeds in the deep or infratentorial brain regions. Furthermore, we were able to study lipid levels in association with both asymptomatic micro bleeds and symptomatic intracerebral hemorrhage. We include 24 patients in the analysis. These participants were older (median age 69), more often male (66.6% versus 33.3%) and more likely to have intracranial hemorrhage risk. Another issue is that 36% of intracranial hemorrhage were classified as “unspecified” because neuroimaging had not been performed, which is similar to unspecified intracranial hemorrhage rates reported in other population-based or even hospital-based studies^[12,14]. Therefore it is likely that an unknown number of intracerebral hemorrhages were misclassified as unspecified. Apart from conventional intracranial hemorrhage risk factors, major determinants of unspecified intracranial hemorrhage risk are older age. However, because we observed very similar patterns between lipid levels and cerebral micro bleeds, we think that misclassification, if any, has not importantly influenced our results. However, previous studies have shown that, once present, cerebral micro bleeds rarely disappear.^[15] We found that high cholesterol levels are associated with an increased risk of intracerebral hemorrhage. This finding is in agreement with results from the research Study, which reported a reversed inverse association between low triglyceride levels and intracerebral hemorrhage^[16] and with results from a pooled cohort study among Atherosclerosis Risk in Communities Study participants and Cardiovascular

Health Study participants^[17]. However, three other studies did not detect an association between triglyceride levels and intracerebral hemorrhage^[18–19]. Analyses of the Copenhagen Heart Study and Oslo Study were based on non-fasting triglyceride levels and included only few events^[20–15]. Furthermore, results of the Oslo Study were based on 21 years of follow-up, which may have diluted the effect^[20]. The lack of an association observed by the Japan Lipid Intervention Trial could be due to the fact that they only included hypercholesterolemia patients with relatively high triglyceride levels^[23]. Although the mechanism of the association between triglyceride levels and intracerebral hemorrhage is unknown, there are some possible explanations. Several studies have suggested that high triglyceride levels favor a pro thrombotic state because they are positively correlated with the vitamin K-dependent coagulation factors VII and IX and with plasminogen activator inhibitor and blood viscosity^[22]. Likewise, one could hypothesize that low triglyceride levels may result in a pro hemorrhagic state. Another possible explanation is that low triglyceride levels may contribute to weakness of the vascular endothelium. Cholesterol and fatty acids are essential elements of all cell membranes. In vitro studies have shown that low cholesterol levels result in increased permeability of erythrocyte membranes^[4] and animal studies reported that low cholesterol levels cause smooth muscle degeneration and endothelial weakness in small intracerebral arteries^[23]. Therefore it has been hypothesized that very low cholesterol levels may contribute to the development of a fragile endothelium, prone to leakage and rupture^[5]. However, whether any of these perspectives explain the observed association between high cholesterol levels and the risk of intracerebral hemorrhage remains uncertain and requires further investigation. We also cannot exclude the possibility of residual confounding by unmeasured determinants, for example diet or physical activity, or due to the fact that lipid levels and confounders were measured only once. Therefore, studies using time-varying analyses are needed to explore whether intra individual fluctuations in lipid levels and confounders influence the results. We further found a comparable inverse association between cholesterol levels and presence of cerebral micro bleeds, which provides accumulating support for a parallel between asymptomatic micro bleeds and symptomatic intracerebral hemorrhage^[19,25]. However, although not significant, associations of triglyceride-cholesterol and LDL-cholesterol with cerebral micro bleeds seemed somewhat different from the associations

with intracerebral hemorrhage. This may indicate that intracerebral hemorrhage and cerebral micro bleeds are reflections of a different stage of arteriolosclerosis. Moreover, we cannot fully rule out the possibility that intracerebral hemorrhage and micro bleeds do not completely share the same underlying pathology. Our finding that cholesterol are related to deep or infratentorial micro bleeds rather than lobar micro bleeds may provide etiologic clues for the association between cholesterol and intracerebral hemorrhage. In a previous study, we showed that lobar micro bleeds are indicative of underlying amyloid angiopathy, whereas deep or infratentorial micro bleeds are associated with known risk factors for arteriolosclerosis^[24]. The association between cholesterol and deep or infratentorial micro bleeds but not lobar micro bleeds underscores these differences in underlying pathology and is suggestive for a role of triglyceride levels through development of arteriosclerotic micro angiopathy. To conclude, in this large population-based cohort study among elderly people we found that high serum cholesterol levels were associated both with an increased risk of intracerebral hemorrhage as well as with the presence of deep or infratentorial cerebral micro bleeds. This finding provides novel insights into the role of lipid metabolism in the etiology of intracerebral hemorrhage. Though the exact mechanism of the association remains unclear, cholesterol levels may aid in the identification of people at risk for intracerebral hemorrhage.

Conclusion

Higher level of high-density lipoprotein cholesterol seems to be associated with lower risk of ICH. Cholesterol level seems to be positively associated with risk of intracerebral hemorrhage. Low serum cholesterol levels were associated with an increased risk of intracerebral hemorrhage and with. The presence of deep or infratentorial cerebral micro bleeds. This provides novel insights into the role of lipid. Fractions, particularly cholesterol, in the etiology of intracerebral hemorrhage.

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References

- Scheitz JF, Seiffge DJ, Tutuncu S, Gensicke H, Audebert HJ, Bonati LH. Dose-related effects of statins on symptomatic intracerebral hemorrhage and outcome after thrombolysis for ischemic stroke. *Stroke*. 2014;45(2):509-14.
- Romero JR, Preis SR, Beiser A, DeCarli C, Viswanathan A, Martinez-Ramirez S. Risk factors, stroke prevention treatments and prevalence of cerebral microbleeds in the Framingham Heart Study. *Stroke*. 2014;45(5):1492-1494.
- Sansing LH, Harris TH, Welsh FA, Kasner SE, Hunter CA, Kariko K. Toll-like receptor 4 contributes to poor outcome after intracerebral hemorrhage. *Ann Neurol*. 2011;70(4):646-656.
- Churchward MA, Todd KG. Statin treatment affects cytokine release and phagocytic activity in primary cultured microglia through two separable mechanisms. *Mol Brain*. 2014;7:85.
- Ye X, Chopp M, Cui X, Zacharek A, Cui Y, Yan T. Niaspan enhances vascular remodeling after stroke in type 1 diabetic rats. *Exp Neurol*. 2011; 232(2):299-308.
- Tsai CF, Anderson N, Thomas B, Sudlow CL. Risk factors for ischemic stroke and its subtypes in Chinese vs. Caucasians: Systematic review and metaanalysis. *Int J Stroke*. 2015; 10(4):485-493.
- JN (August 2012). "Intracranial hemorrhage". *Emergency medicine clinics of North America*. 30(3):771-794.
- Naidich, Thomas P.; Castillo, Mauricio; Cha, Soonmee; Smirniotopoulos, James G. (2012). *Imaging of the Brain, Expert Radiology Series, 1: Imaging of the Brain*. Elsevier Health Sciences. p. 387. ISBN 1416050094.
- Kushner D. "Mild Traumatic Brain Injury: Toward Understanding Manifestations and Treatment". *Archives of Internal Medicine*. 1998; 158(15):1617-1624.
- Seidenwurm DI. "Introduction to brain imaging". In Brant WE, Helms CA. *Fundamentals of Diagnostic Radiology*. Philadelphia: Lippincott, Williams & Wilkins. 2007; p. 53. ISBN 0-7817-6135-2. Retrieved 2008-11-17.
- Van Gijn J, Kerr RS, Rinkel GJ. "Subarachnoid haemorrhage". *Lancet*. 2007; 369(9558): 306-18.
- Coull BM, Brockschmidt JK, Howard G, Becker C, Yatsu FM, Toole JF, McLeroy KR, Feibel J. Community hospital-based stroke programs in North Carolina, Oregon and New York. IV. *Stroke*

- diagnosis and its relation to demographics, risk factors and clinical status after stroke. *Stroke*. 1990;21:867-873.
13. O'Donnell MJ, Xavier D, Liu L, Zhang H, Chin SL, Rao-Melacini P, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *Lancet*. 2010; 376(9735):112-23.
 14. Jood K, Jern C, Wilhelmsen L, Rosengren A. Body mass index in mid-life is associated with a first stroke in men: a prospective population study over 28 years. *Stroke*. 2004;35:2764-2769.
 15. Poels MM, Ikram MA, van der Lugt A, Hofman A, Krestin GP, Breteler MM, Vernooij MW. Incidence of cerebral microbleeds in the general population: the Rotterdam Scan Study. *Stroke*. 2011;42:656-661.
 16. Bonaventure A, Kurth T, Pico F, Barberger-Gateau P, Ritchie K, Stapf C, Tzourio C. Triglycerides and risk of hemorrhagic stroke vs. ischemic vascular events: The Three-City Study. *Atherosclerosis*. 2010;210: 243-248.
 17. Zia E, Pessah-Rasmussen H, Khan FA, Norrving B, Janzon L, Berglund G. Risk factors for primary intracerebral hemorrhage: a population-based nested case-control study. *Cerebrovasc Dis*. 2006;21(1-2):18-25.
 18. Nakaya N, Kita T, Mabuchi H, Matsuzaki M, Matsuzawa Y, Oikawa S, Saito Y, Sasaki J, Shimamoto K, Itakura H. Large-scale cohort study on the relationship between serum lipid concentrations and risk of cerebrovascular disease under low-dose simvastatin in Japanese patients with hypercholesterolemia: sub-analysis of the Japan Lipid Intervention Trial (J-LIT). *Circ J*. 2005;69:1016-1021.
 19. Lund Haheim L, Holme I, Hjermmann I, Tonstad S. Risk-factor profile for the incidence of subarachnoid and intracerebral haemorrhage, cerebral infarction and unspecified stroke during 21 years' follow-up in men. *Scand J Public Health*. 2006;34:589-597.
 20. Suzuki K, Izumi M, Sakamoto T, Hayashi M. Blood pressure and total cholesterol level are critical risks especially for hemorrhagic stroke in Akita, Japan. *Cerebrovasc Dis*. 2011;31(1):100-106.
 21. Nakaya N, Kita T, Mabuchi H, Matsuzaki M, Matsuzawa Y, Oikawa S, Saito Y, Sasaki J, Shimamoto K, Itakura H. Large-scale cohort study on the relationship between serum lipid concentrations and risk of cerebrovascular disease under low-dose simvastatin in Japanese patients with hypercholesterolemia: sub-analysis of the Japan Lipid Intervention Trial (J-LIT). *Circ J*. 2005;69:1016-1021.
 22. Rosenson RS, Lowe GD. Effects of lipids and lipoproteins on thrombosis and rheology. *Atherosclerosis*. 1998; 140:271-280. control study. *Cerebrovasc Dis*. 2006;21(1-2):18-25.
 23. Zhou JF, Wang JY, Luo YE, Chen HH. Influence of hypertension, lipometabolism disorders, obesity and other lifestyles on spontaneous intracerebral hemorrhage. *Biomed Environ Sci*. 2003; 16(3):295-303.
 24. Poels MM, Vernooij MW, Ikram MA, Hofman A, Krestin GP, van der Lugt A, Breteler MM. Prevalence and risk factors of cerebral microbleeds: an update of the Rotterdam scan study. *Stroke*. 2010;41:103-106.
 25. Woo D, Sauerbeck LR, Kissela BM, Khoury JC, Szaffarski JP, Gebel J, Shukla R, Pancioli AM, Jauch EC, Menon AG, Deka R, Carrozzella JA, Moomaw CJ, Fontaine RN, Broderick JP. Genetic and environmental risk factors for intracerebral hemorrhage: preliminary results of a population-based study. *Stroke*. 2002;33:1190-1195.

Overall Equipment Effectiveness (OEE) to Determine the Effectiveness of Dental Chair Unit in Mother and Child Hospital at Surabaya

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Abstract

Investing in a Dental Chair Unit is an investment that requires a large amount of funds for the hospital, therefore the utilization of a Dental Chair Unit tool is a concern for hospitals. The importance of Dental Chair Unit utilization leads hospital to calculate the effectiveness of Dental Chair Unit devices using the Overall Effectiveness Equipment (OEE) method. OEE measures the effectiveness of the tool based on the availability ratio, performance ratio and quality ratio. The aimed of this study was to analyze the effectiveness of Dental Chair Unit in Mother and Child Hospital using the OEE method. This research was conducted at the dental clinic of Mother and Child Hospital on February 2019. This study was a descriptive study that was to calculate the OEE from a Dental Chair Unit then analyze the causes of the effectiveness of the tools obtained. The results of the calculation of OEE Dental Chair Unit device in aMother and Child Hospital at Surabaya are 18,7%, far below the standard of 85%. The cause of the low OEE value is the low value of the Performance ratio that is far below the standard 85%. The low performance ratio of Dental Chair Unit tools in mother and child hospital is caused by the small number of patients who come to the dental clinic, so a little also uses the Dental Chair Unit. It is because of the competition with general hospital that surround this hospital. Another factor that cause of low OEE ratio is patient's didn't know the importance of dental health for mother and children.

Keywords: OEE, Dental Chair Unit, Effectiveness of Tools, Hospital.

Introduction

The hospital business now faces very high demands. With increasing competition, hospitals are forced to increase effectiveness and cost efficiency to survive in competition. While the high value of buying medical devices need an increase in tool effectiveness so as not to experience losses in investing. Overall Equipment Effectiveness or abbreviated as OEE is a way to measure the performance of a production machine.

Measuring Performance with OEE (Overall Equipment Effectiveness) consists of three main components in the tool, namely Availability (Engine Availability Time), Performance (Number of units produced) and Quality (Quality produced). The OEE calculation results are in the form of Percentage (%).¹OEE value measurement is the efforts to improve manufacturing processes on production lines². The initial stages of measuring OEE are carried out in several stages, including; availability measurement, performance measurement and quality measurement³. This OEE stage can be explained as follows:

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Measuring Availability Ratio: Availability ratio is a ratio that describes the use of time available for the operation of machinery or equipment. Comparison of operating time with loading time, where the operating time is obtained from a reduction in loading time with the time of equipment downtime. Operating time is the

length of time the equipment is operating. Loading time is the time available for production (per period)⁴. The formula used for measuring the Availability ratio is:

$$A = \frac{\text{operating time}}{\text{loading time}} \times 100\%$$

$$A = \frac{\text{loading time} - \text{downtime}}{\text{loading time}} \times 100\%$$

Measuring Performance Ratio: Engine performance is a ratio that describes the ability of the engine and equipment to produce the product. This ratio is the result of the net operating rate and operating speed rate. The net operating rate is the product that is produced during the operating time. operating speed rate is the ideal cycle time per actual cycle time⁵. formula used for measuring this ratio are as follows:

Performance Efficiency = Net Operating Rate x Operating Speed Rate

$$P = \frac{\text{process amount} \times \text{actual cycle time}}{\text{operation time}} \times \frac{\text{ideal cycle time}}{\text{actual cycle time}} \times 100\%$$

$$P = \frac{\text{process amount} \times \text{ideal cycle time}}{\text{operation time}} \times 100\%$$

Measuring Quality Ratio: Product quality is a ratio that describes the ability of equipment to produce products that comply with quality standards. The formula used for measuring this ratio is as follows:

$$Q = \frac{\text{process product} - \text{defect product}}{\text{process product}} \times 100\%$$

Measuring Overall Equipment Effectiveness (OEE): Overall Equipment Effectiveness (OEE) is obtained by multiplying the main ratio, this is done to determine the effectiveness of machine use⁶. The OEE value can be known by the formula.

OEE (%) = Availability Ratio (%) x Performance Ratio (%) x Quality Ratio (%)

OEE analysis obtained from the calculation of availability, production effectiveness and level of quality compared to the ideal index standard, are:

1. Availability ≥ 90%
2. Performance Effectiveness ≥ 95%
3. Quality Level ≥ 99%
4. Overall effectiveness of equipment and machinery (OEE) ≥ 85%

(OEE Ideal: (0.90 x 0.95 x 0.99) x 100% = 85%)

Method

The study was conducted on Mother and Child Hospital at Surabaya using a descriptive method approach. Descriptive method aims to describe something — usually a characteristic or a function. The data used in this study are primary and secondary data. Primary data in this study was obtained through discussion and observation of the production process in Mother and Child Hospital at Surabaya during January 2019. Secondary data is data obtained from the radiology unit. Secondary data used to obtain an overview of the process of each stage of the process. This secondary data is needed in addition to analyzing the model.

Result

Measurement

Availability Ratio (A)

Total running time: 10 hours x 6 days x 4 weeks = 240 Hours

Downtime of equipment: 20 Hours

Availability (A) = (240-20)/240 x 100%= 91,7%

Performance Ratio (P) calculation:

Ideal cycle time per patient: 0.5 hours.

Number of patients treated : 98

Operation Time : 240 hours

Performance Rate (PE) = 0.5 x 98/240 x 100% = 20,4%

Quality Ratio (Q)

Number of good patient treated at Dental Chair unit = 98

Number of patient treated at Dental Chair Unit = 98

Quality ratio = 98/98 x 100% = 100%

OEE = A X PE X Q = 91,7% x 20,4% x 100% = 18,7%

The result of dental chair unit OEE is 18,7%.

Discussion

Based on the results of calculations that have been made, the average OEE value for January 2019 is 18.7%. This value is still far from the value of the ideal standard of OEE, which is 85%⁷. In the OEE category, the OEE value below 65% is not acceptable, because it causes significant economic losses and very low competitiveness of the company⁸. The value that greatly affects the low OEE is the value of the efficiency of

the performance ratio, because the value does not meet the standards of Japan Institute of Plant Maintenance (JIPM).

Judging from the performance efficiency, the OEE value does not meet the standard because the usage target is not achieved. The low use of Dental Chair Unit tools in mother and child hospital is caused by the small number of patients who come to the dental clinic, so a little also uses the Dental Chair Unit. The low number of patient visits is caused by the position of the maternal and child hospital which is adjacent to a public hospital that has been existing longer. This makes the market share of competition come to the dental clinic. Another reason is that this hospital has not joined BPJS (Universal coverage governance insurance at Indonesia), thus limiting the segment of patients who come to the hospital.

Another reason for the low rate of performance ratio is the patient's low knowledge about the importance of maintaining dental health for mothers and children. There are still many patients who come to the dentist only when they have a toothache. And there are still many parents who consider children's dental health not important because the child's milk teeth will be replaced by permanent teeth. Not only patient knowledge, knowledge of Obsgyn doctors and pediatricians is also still low about the importance of maintaining dental health in pregnant women and children. So the number of referrals from obstetric clinics and children's clinics is still very low.

Conclusions and Recommendations

The results of OEE's calculation of the Dental Chair Unit in a Mother and Child Surabaya are still low at 18.7% far below the standard of 85%. The cause of the low number of OEE tools for Dental Chair Units is a performance ratio of only 20.4%. The cause of the low performance ratio of the Dental Chair Unit is the low number of patients who come to the dental clinic so that the use of a dental chair unit is low. The advice given to this problem is to increase marketing to potential patients. Providing education to Surabaya residents about the importance of maintaining dental health for mothers and children, to increase the number of patient visits to the dental clinic. Education was also given by other specialist doctors to increase the internal referral rate to the dental clinic. Strengthen collaboration with clinics around hospitals to provide patient referrals to hospitals.

Ethical Clearance: Taken from ethic committee of a Mother and Child Hospital at Surabaya.

Source of Funding: Self Funding

Conflict of Interest: There aren't any relevant conflict of Interest

References

1. Betrianis R. Pengukuran nilai Overall Equipment Effectiveness Sebagai Dasar Usaha Proses Manufaktur. *Jurnal Teknik Industri*. 2005. 7(2), pp. 91-100.
2. Habib AS, Supriyanto HH. Measurement of Overall Equipment Effectiveness (OEE) value as guidance to improve the effectiveness of CNC cutting machine. *Journal of Engineering Pomits*, 2012; Vol. 1, No. 1: pp 1-6
3. Syarif, Syafrizal. Pengukuran Overall Equipment Effectiveness Dengan Labview 8.5 Sebagai Pengendalimaintenance". 2010. Depok
4. Mach P. Introduction to Overall Equipment Effectiveness : A Primer. s.l.:Pro Mac & ei3 corporation. 2015.
5. A. J. DE RON, J. E. R. OEE and equipment Effectiveness: an evaluation. *International Journal of Production Research*, 2006. Volume 44.
6. Industries Vorne. The Fast Guide to OEE. 2008. itasca, USA: Vorne Industries Inc.
7. Nakajima S. TPM Tenkai. JIPM Tokyo. 1982
8. Hansen R. C. Overall Equipment Effectiveness. 1ed. English: Industrial Press, Inc. 2011.
9. Rahmad, Pratikto, Slamet Wahyudi. Penerapan Overall Equipment Effectiveness (Oee) Dalam Implementasi Total Productive Maintenance (TPM) (Studi Kasus di Pabrik Gula PT. "Y"). *Jurnal Rekayasa Mesin* Vol. 3, No. 3 Tahun 2012 : 431-437
10. Rivai Y, Fauzi AM. Overall Equipment Effectiveness Dalam peningkatan Kinerja Produksi Ban PT Goodyear Indonesia. *Journal IPB*. Nomor DOI: 10.17358/JABM.2.2.148
11. Alvira D, Helianty Y, Prasetyo H. Usulan Peningkatan Overall Equipment Effectiveness (OEE) Pada Mesin Tapipin Manual Dengan Meminimumkan Six Big Losses. *Jurusan Teknik Industri Itenas*. No.03. Vol.03 Juli 2015
12. Little JDC. Operations management models and

- principles. J. Springer Science Business Media. 2008. 10(3): 81–100. Doi: 10.1007/978-0-387-73699-0.
13. Parikshit S. Poka yoke: the revolutionary idea in total productive management. *Journal of Engineering And Sciene*. 2003.(2)4: 19–24.
 14. Raguram R. Implementation of overall equipment effectiveness. *Journal Middle-East Journal odScientific Research*. 2014.20(5): 567–576.
 15. Rahmadani DF, Taroepratjeka H, Fitria L. Usulan peningkatan efektivitas mesin cetak manual menggunakan metode overall equipment effectiveness (OEE) (studi kasus di perusahaan kerupuk TTN). *Jurnal Online Institut Teknologi Nasional* .2014. 2(4): 156–165.
 16. Rahul RJ. Reduction in setup time by SMED a literature review. *Journal of Modern Engineering Research* .2012. 2(1): 442–444.
 17. Samat A, Kamaruddin S, Azid IA. Integration of overall equipment effectiveness (OEE) and reliability method for measuring machine effectiveness. *South African Journal of Industrial Engineering* .2012. 23(1): 92–113.

Knowledge on Warning Symptoms of High Risk Pregnancy as Perceived by the Antenatal Mothers in a Selected Tertiary Hospital, Kelambakkam, Kanchipuram District, Tamil Nadu

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Abstract

Knowledge on warning symptoms of high risk pregnancy as perceived by the antenatal mothers in a selected tertiary hospital, Kelambakkam, Kanchipuram District, Tamil Nadu, India". The objectives were to assess the knowledge on warning symptoms of high risk pregnancy perceived by the antenatal mothers to find out the association between the level of knowledge with demographic variables. The convenience sampling was used to select 60 Antenatal mothers. The data collection tools were validated and reliability was established. The data were collected by self-administered questionnaire. The collected data was Tabulated and Analyzed. Descriptive and Inferential statistical method were used. The study shows that 30% of the antenatal mothers had low level of knowledge, 57% of the antenatal mothers had moderate knowledge and 13% of the antenatal mothers had adequate knowledge regarding knowledge on warning symptoms of high risk pregnancy there was significant association between the knowledge and the selected demographic variables.

Keywords: Knowledge, warning symptoms, High risk pregnancy Antenatal mothers.

Introduction

"Birthing is the most profound initiation to spirituality a woman can have" —Robinlim

Pregnancy is a beautiful phase because it gives you the joy and fulfillment which comes from bringing a new life into the world. Pregnancy is not just a physical metamorphosis of the female body; it is also an emotional change that lives lasting impact on your life and alters your perspective entirely.

The pregnancy is defined as gestation, is the time during which one or more offspring develops inside a woman.[First cry parenting (2019)]¹ In our study we showed among five particular conditions of high risk pregnancy such as **Anemia, pregnancy induced hypertension, placenta previa, gestational diabetes mellitus, polyhydramnios.**

High-risk pregnancy defined as one where pregnancy is complicated by factor or factors that adversely affect

the outcome maternal or perinatal or both [Hiralalkonar (2016)].³

The term high risk "high risk pregnancy" suggests that in order to have a healthy and successful pregnancy and delivery, extra care is needed. This is often the case if antenatal mother suffer from a chronic illness or have other factors and conditions that may put antenatal mothers in the high risk category.

It is possible to begin a normal pregnancy and develop conditions that put antenatal mothers into the high risk category regardless what causes your pregnancy to become high risk, it was likely problems may persists with both mother and or the baby during the pregnancy, birth process, or even after the delivery.

The problems can be minor or life threatening in severity for both the mother and the baby, requiring extra care and monitoring from your doctor. [Eunice kennedyshirver National Institute of child Health and Human Development]¹⁰

Need for the Study

WORLDWIDE:

Hypertensive disorders in pregnancy (HDP) are the most common medical disorders in pregnancy and the greatest single cause of maternal mortality worldwide. Most of the complications caused by HDP may be reduced by early detection and proper management. Health education during antenatal care attendance may play an important role in preventing the disease to aggravate. The purpose of this study was to investigate the status of knowledge that Moroccan pregnant women both in Morocco and in Netherlands since yearly dedication provides the opportunity for follow up management and/or treatment. May reduced complications of HDP therefore, it is important to inform pregnant women about the signs and symptoms of HDP. [Ouasmani, Engelities B, Haddou Rahou (2017)]¹.

Pre-exposure prophylaxis (prep) is a well-established bio medical HIV prevention strategy and recommended to reduce HIV risk during per-conception, pregnancy and breastfeeding. Efforts are needed to translate global recommendation into national guidelines and implementation strategies. This article presents the current status of the policy guidance for the use of Pre during per-conception, pregnancy and breastfeeding, with a particular focus on high prevalence countries, including those in sub-Saharan Africa. [Davies N, Heffron R (2018)]²

INDIA:

In India 75% of maternal death occurred due to complication of pregnancy and 25% of maternal mortality is due to indirect obstetric causes and social factors. Early identification of these patients, followed by proper management and therapy can frequently modify or prevent a poor perinatal

STATE:

A total of 100 pregnant women attending antenatal clinics were interviewed, of whom 59 were from urban Chennai and the rest from Kanchipuram District. The risk factors of GDM, 48.8% of rural women were unaware of any risk factor while 55.9% of urban women reported family history diabetes as a risk factor. 49.2% of urban high risk mothers had

75.6% of rural mothers in high risk did not know long term consequences of GDM to babies born to GDM women. 50.8% of GDM women said GDM could lead to type 2 diabetes mellitus in future while only 45% of rural women were aware of this [R Kumari(2017)]³

District: A study conducted on anemia among pregnant women in rural area of Kanchipuram District. About 48.5% of pregnant women were in the age group of 15 to 4 years. In the study 41.5% were found to be anemic. About 38.1% of the study participants were found to have mild anemia, while 1.9% had moderate anemia and 1.5% had severe anemia. [Abiselvi A, Gopalakrishnan S, Umadevi R, (2017)]⁴

Govt scheme identifies 550,000 high risk pregnancies in 18 months: over 5.5 lakh women were found to have high risk pregnancies during screening under Pradhan Mantri Surakshit Matritva Yojana (PMSMA) since its launch in 2016, aims to ensure comprehensive and quality antenatal checkups for pregnant women across India. (2018)

Prevalence of high risk pregnancy observed was 33.64% caesarean section and birth weight less than 2500 gm. that were significantly associated with high risk pregnancy mothers height less or equal to 140 cm pregnancy outcome low birth weight was significantly associated with oligohydramnios and history of caesarean [Ashok R, Jatho, Mahendra D. Gawade, Suresh N. Ughade]⁵

Statement of the Problem: Knowledge on warning symptoms of High risk pregnancy as perceived by the Antenatal mothers attending antenatal out patient department in selected tertiary hospital, Kancheepuram District, Tamil Nadu, India.

Objectives:

- Assess the knowledge on warning symptoms of high risk pregnancy as perceived by antenatal mothers
- Associate the level of knowledge with selected demographic variable among antenatal mothers.

Sampling Technique: Sampling process of selecting a representative part of the Population. Thus, carefully carried out sampling technique helps to draw a sample represents the characteristics of the population and which the sample is drawn.

Convenience sampling technique was used by the researcher to select the sample.

Sampling Criteria:

Inclusion Criteria: Inclusion Criteria are characteristics that the subjects must have if they want to be included in the study. The inclusion criteria were :

- Antenatal mothers who are willing to participate in the study.
- Antenatal mothers who can understand Tamil & English language

Exclusion Criteria: Exclusion criteria make up the eligibility criteria used to rule out the target population for a research study. The exclusion criteria was:

- Antenatal mothers those already aware of the warning symptoms

Research Approach: A research approach is a framework or guide used for the Planning, Implementation and analysis of the study.

Quantitative approach was used for the study by the researcher.

Research Design: The research design is the master plan specifying the method and procedures for collecting and analyzing the needed information in a research study

Quantitative approach was used for the study by the researcher

Research Setting: A research setting is a physical, social and cultural site in which the researcher conducts the study.

The study was conducted at attending antenatal outpatient department in selected tertiary hospital, at Kanchipuram District, Tamil Nadu

Population: Population is the aggregation of all units in which a researcher is interested in other words, Population is a set of people or entities to which the results of a research are to be generalized.

All the Antenatal mothers attending out patient department in selected tertiary hospital, were the study population taken by the researcher.

Sample: Sample is a representative unit of a target population, which is to be worked upon by the researchers during their study. In other words sample consists of subsets of units which comprise the population selected by the researcher to participate in the research project.

All the Normal antenatal mothers were the study sample

Sample Size Estimation:

$$\text{Sample size } n = \frac{DEFF * Np(1-p)}{[(d_z / z_{21-.j/2}) * (N-1) + p * (1-p)]}$$

The sample size is=60

Data Collection Tool: A self-administered questionnaire was used as a tool for data collection by the researcher. It consists of following parts.

Part A: It consists of demographic variables like age of the antenatal mother, education and occupation.

Part B: It consists of 15 questions regarding the knowledge on High risk pregnancy.

Scoring and Interpretation:

Total number of knowledge question-15

Each correct answer will be given one mark.

Score	Level of knowledge
Below 50%	Low level of knowledge
51-74%	Moderate level of knowledge
Above 75%	High Level of knowledge

Data Collection Procedure: The researcher got prior permission and consent from the sample. After getting the permission, a self administered questionnaire was given to them. They read the questions carefully and answered. Duration of data collection was one week.

Plan for Data Analysis: The plan for data analysis includes Descriptive and Inferential statistics.

Table 1: Distribution of the Demography Variables of Antenatal mothers

Demographic Variables	Level of Knowledge				Chi Square (x ²) P Value<0.05
	Low Level of Knowledge	Moderate Level of Knowledge	High Level of Knowledge	Total	
Age in Year					(x ²)=1.331 df=4 P<0.05 *S
<16 Years	0	1	0	1	
16-35 Years	18	31	8	57	
>35 Years	1	1	0	2	
Educational Level					(x ²)=2.060 df=4 P<0.05 *S
No formal education	0	0	0	0	
Primary school	3	5	0	8	
Higher secondary school	4	5	1	10	
Graduation	12	23	7	42	
Occupation					(x ²)=1.810 df=2 P<0.05 *S
Employed	3	6	3	12	
Unemployed	16	27	5	48	
Parity					(x ²)=1.048 df=2 P<0.05 *S
0	19	19	3	32	
1-4	9	14	5	28	
>5	0	0	0		
Gestational Age (Weeks)					(x ²)=5.235 df=4 P<0.05 *S
1-12 Weeks	8	9	1	18	
13-26 weeks	7	9	2	18	
27-end of delivery	4	15	5	24	
Past Medical History					(x ²)=1.474 df=4 P<0.05 *S
Yes	3	8	2	13	
No	15	26	6	47	
Past Complicated Obstetrical History					(x ²)=5.130 df=4 P<0.05 *S
Yes	3	11	0	14	
No	16	22	8	46	

*NS- No Significant *S- Significant

Table 1 Shows that there is significant association between the selected demographic variables and knowledge.

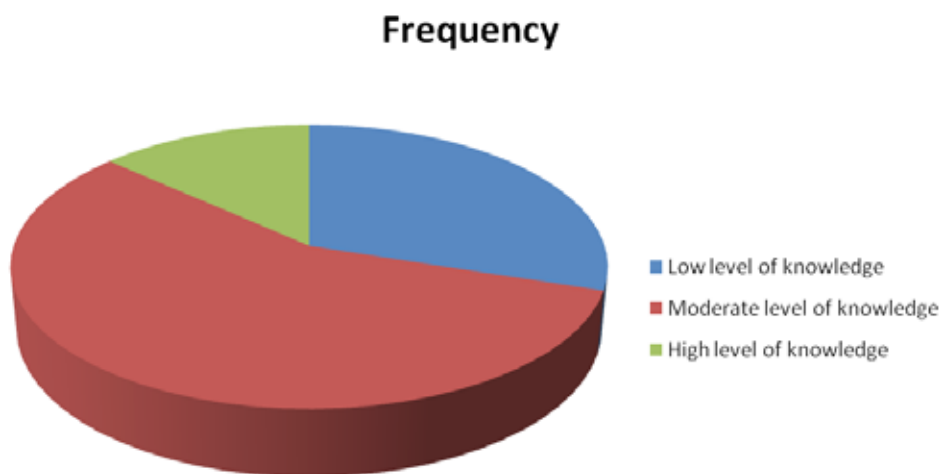


Fig. 1: Shows that 18 of the mothers had low level of knowledge among 30 mothers 34 of them had moderate level of knowledge and 8 mothers had high level of knowledge

Results and Discussion

The collected study was tabulated and analyzed. In the population majority 57% (34) of antenatal mother having moderate knowledge, 30% (18) having low level of knowledge, 13% (8) having high level of knowledge regarding knowledge on warning symptoms of high risk pregnancy among antenatal mothers.

Findings: Findings of the study were presented under the following headings based on the study objectives.

Objective 1: Assess the level of knowledge on warning symptoms of high risk pregnancy among antenatal mothers.

The finding of the present study reveals that:

- 18 (30%) of the Mothers had low level of Knowledge
- 34 (57%) of the Mothers had moderate level of Knowledge
- 8 (13%) of the Mothers had High level of knowledge.

Objective 2: Associate demographic variables and the level of knowledge on warning symptoms of high risk pregnancy among antenatal mothers .

Finding 1: Associate between Age and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

There was no significant association between the age and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

Chi square (χ^2) = 1.81 (p<0.05).

Finding 2: Associate between qualification and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

There was no significant association between qualification and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

Chi square (χ^2) = 4.35(p<0.05).

Finding 3: Associate between occupation of the mothers and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

There was no significant association between the occupation of the mother and the level of knowledge of warning symptoms of high risk pregnancy among antenatal mothers .

Chi square (χ^2) = 0.71(p<0.05)

Conclusion

This study shows that antenatal have less knowledge regarding warning symptoms of high risk pregnancy. This study will serve as a basis to develop educational program us to promote knowledge towards warning symptoms of high risk pregnancy perceived by antenatal mothers.

Conflict of Interest: Nil

Source of Funding: No source of Funding

Ethical Clearance: Obtained

Reference

1. Bora R, Sable C, Wolfson J, Boro K, Rao R. Prevalence of anemia in pregnant women and its effect on neonatal outcomes in Northeast India. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2014 Jun 1;27(9):887-91.
2. Arendz IJ, Oomen PH, Wolthuis A, Kroese JA, Veeger NJ, Spinder T. Prevalence of gestational diabetes in high-risk pregnancies: screened using an oral glucose tolerance test. *Nederlandsche tijdschrift voor gyneceskunde*. 2013; 157(18):A5409-
3. Majella MG, Sarveswaran G, Yuvaraj Krishnamoorthy KS, Arikrishnan K, Kumar SG. A longitudinal study on high risk pregnancy and its outcome among antenatal women attending rural primary health centre in Puducherry, South India. *Journal of education and health promotion*. 2019;8.
4. James DK, Steer PJ, Weiner CP, Gonik B. High risk pregnancy e-book: Management options-expert consult. Elsevier Health Sciences; 2010 Dec 3.
5. Aldrighi JD, Wall ML, Souza SR, Cancela FZ. The experiences of pregnant women at an advanced maternal age: an integrative review. *Revista da Escola de Enfermagem da USP*. 2016 Jun; 50(3): 512-21.

Molecular Detection of *Pseudomonas Aeruginosa* Isolated from Chicken Cans in the Markets of Al-Muthanna Province

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Abstract

Food safety is very necessary for the general health of the consumer and protection from disease, as well as the importance of economic sustain ability of the agricultural food sector. The consumer wants to make sure that the food is safe and that it is not contaminated with bacteria. Therefore, these tests must be performed to detect bacteria and ensure that food safety.

120 samples was collected from frozen chicken cans from the markets of Al-Muthanna province, using the sterile plastic bags and after isolation the results showed that (55) sample contain bacteria *Pseudomonas aeruginosa* from the total samples above.

The results of bacterial culture were positive in 45 samples whereas the results of direct molecular identification were positive in 55 samples.

Selective media used for bacteria identification such as MacConkey Agar, Methylene blue which has been given the proportion of isolation (15% and 85% respectively) also some isolates showed their ability to liquefy gelatin (65%) and fermented sugar lactose (100%) . however biochemical testing also used for all bacterial isolates for confirm diagnoses.

Polymerase chain reaction technique used for detection bacteria by specific primers sequence the result appear 45% of total sample contamination by *P. aeruginosa*.

The genome of *P. aeruginosa* is relatively large so encodes a large proportion of regulatory enzymes important for metabolism and efflux of organic compounds. This enhanced coding capability genome allows for great metabolic versatility and high adaptability to environmental changes,

According our result we recommend food factories to use sterilized materials more accurately and effectively to store frozen chicken cans.

Keywords: *P. aeruginosa*, culture media, PCR technique, food safety, canned chicken.

Introduction

The general characteristics of bacteria *Pseudomonas* species are widely spread in soil, aquatic environment and normal flora in plants and animals. For example, *Pseudomonas aeruginosa* which is an opportunistic pathogen causes disease and is largely isolated from wounds, burns and urinary tract infections¹. *P.aeruginosa* reduces the chances of successful tissue transplantation and causes septicemia for patients with

burns and is associated with mortality These bacteria can be transmitted to other areas of the body. The most common is the inflammation of the heart of people who use intravenous drugs and who have artificial valves due to the need of bacteria directly to the bloodstream and that these bacteria cause bacteremia, especially in patients who suffer from immunodeficiency, HIV and diabetes and in cases Severe burns¹.

Pseudomonas aeruginosa is an opportunistic

pathogen that is a leading cause of morbidity and mortality in cystic fibrosis patients and immuno-compromised individuals².

P.aeruginosa is a Gram-negative bacillus shape bacteria with a length of about 1-5 microns and its width (0.5-1). Micronized by mono flagellated monocytes does not have a Capsule that is not composed of aerobic spores and can grow in anaerobic conditions that cause common diseases of humans and animals found in soil Water, skin and plants, it is growing at a temperature above 42 m and has the potential to grow in diesel and fuel^{3,4}. *P.aeruginosa* bacteria are opportunistic and the most common infections occur in patients who are hospitalized, as well as in immunosuppressed persons such as AIDS, cancer, cystic fibrosis, neutropenia and also the loss of mechanical barrier or protection (skin mucosa). And the symptoms of this infection is inflammation and poisoning and occurs in the body members critical such as lung and urinary tract and kidney and skin injury and thin tissue, where it was found that about 6% of people exposed to burns die of infection with this bacteria⁵. Laboratory diagnosis is based on the sampling of blood, cerebrospinal fluid, blood, pus and gosaibular secretions and then is implanted and tested⁶. *P.aeruginosa* bacteria, especially isolated from wounds and burns, have resistance to many antibiotics such as Gentamicin, Aztreonam, Ceftriaxone, Pipracillin, Ciprofloxacin, Tobramycin, Cefsulodine and Amikacion^{7,8,9,10}

These bacteria are involved in serious infections that are difficult to treat and destroy due to their multiple antibiotic resistance. It is the most common cause of burn and wound injuries¹¹. These bacteria cause contamination of wounds that lead to tissue breakdown and extrusion of blood plasma outside the skin a good place for bacterial growth¹². As well as caused by bacteremia blood due to the arrival of the blood stream and then transmission of different tissues with a mortality rate of 30¹³. The World Health Organization has recently listed carbapenem-resistant *P. aeruginosa* as one of three bacterial species in which there is a critical need for the development of new antibiotics to treat infections^{14,15}.

PCR has the potential for identifying microbial species rapidly by amplification of sequences unique to a particular organism that is outer lipoprotein membrane (oprL) gene¹⁶.

Material and Method

1. All sample are collected from various markets in Al-Muthanna province.
2. Total of 120 tissue samples were taken from frozen chicken cans including the lung, liver and chest muscles in a sterile manner.
3. The samples were collected in sterile plastic bags and then sent to the laboratory.
4. The samples were crushed by a sterile ceramic vial and the starter was obtained and culture on test tube containing on nutrient agar then incubation at 37c for 24 hours.

Prepare Culture Media:

1. Were used Ashdown Selective broth media Add 10 grams of Trypton Soya Broth, 5 g of Pepton, 5 mg of Crystal Violate and 50 mg of Neutral Red to 1 liter of distilled water, add 40% Glycerin and heat with pH 7.2. Then sterilize and leave to cool down. (40 m) and then add antibiotic Colistin (20 mg/l) then preparation Ashdown`s Selective Agar (ASA) Prepare 40 ml of Trypton soya agar, 5 mg of Crystal Violate, 50 Neutral Neutral of red, 1 liter of distilled water, add 4% of Glycerin and heat with pH to pH 7.2. And then left to cool down (40) m then add antibiotic Gentamycin by (4 mg/l)¹⁷.
2. Nutrient Agar and broth preparation according to Himedia company after adjusting the pH using a ph-meter and sterilized with autoclave. After that samples were cultured on ASB and incubated at 35 ° C for 7 days until the color of the purple medium was changed and then cultured on the ASA using the loop in the Streaking method and incubated at 53 °C for 48 hours.¹⁸
3. Samples planted on the Ashdown selective broth, which gave the highest percentage of isolation of bacteria *Pseudomonas aeruginosa* (100%) and then planted on the Ashdown selective agar where the percentage of isolation (100%) was development and activate the colonies germ isolated from circles selective isolates through cultivation amid Neutrient agar which gave the percentage of isolation (100%)
4. biochemical diagnostic testing for all bacterial that isolates for example test production of the enzyme Catalase test as well as the production of the Oxidase enzyme which gave isolation rate (100%) for both.

- Molecular Detection

PCR assay for confirmation of *Pseudomonas aeruginosa* isolates.

1. DNA was extracted from samples by AccuPrep® Genomic DNA extraction kit (Bioneer, Korea).
2. PCR was performed on extracted DNA by using specific primer to oprL gene (Bioneer Company, Korea) were amplified according to references mentioned in table (1).
3. Primers were utilized in a 25 µl reaction containing 12.5 µl of Accu Power™ PCR PreMix (Bioneer, Korea), 1 µl of each primer of 20 pmol concentrations, 4.5 µl of free nuclease water and 6 µl of the template^{19,20}
4. The reactions were performed in a BioRad, USA thermal cycler. PCR was performed using the protocol: 94°C for 5min, followed by 35 cycles of 94°C for 45sec, 50°C for one min and 72°C for one min, followed by 72°C for five min.
5. For gel analysis, 10 µl of the products were loaded in each gel pit. PCR products were Imagine on 1% agarose gel electrophoresis (Consort, Belgium).²¹

Table (1): Specific primers sequence for detection *P. aeruginosa*

References	Amplicon (bp)	Sequence (5'-3')	Target Gene
(Xu et al., 2004)	bp 504	F: ATG GAA ATG CTG AAA TTC GGC R: CTT CTT CAG CTC GAC GCG ACG	oprL

Results

Various investigations were carried out on frozen canned chicken samples which included 120 sample evenly taken from the heart, liver and chest muscles all samples tested by different media, molecular and biochemical tests, all Tests showed that 55 samples were contaminated with *Pseudomonas aeruginosa* bacteria. Firstly, all sample cultured on ASB media, positive isolates changed the color of the medium to a reddish brown color. The bacteria were then isolated on the selective media ASA at 35°. Result show 40 sample contaminated by *p. aeruginosa* was diagnosed from frozen canned chicken (14 of heart, 14 of chest muscles, 12 of liver) all isolated characterized by colonies as large colonies and dark brown and brown after a period 24-72 hours. The colonies also showed different appearance

characteristics from a sticky to a grayish gray. To confirm the diagnosis of the bacteria was staining with Gram stain and appeared in the small bacillus in shape and gram-negative bacteria,

Secondly, molecular test carry out by used PCR technique for all samples was performed on extracted DNA by using specific primer to oprL gene, The results showed that 55 samples were contaminated with *Pseudomonas aeruginosa*.

Thirdly biochemical tests also carried out to positive sample which isolates from selective media ASA for confirm diagnoses, The results showed that all isolates were positive for the tests of catalase, phosphatase, oxides, growth at 37-42 m and the ability to grow on MacConky Agar and oxidation of lactose .

Table 2. Clarify Number of isolated and contaminated samples with *P.aeruginosa* from frozen canned chicken

No.	Type of sample	Number of sample	Number of isolates by culture media	No of bacteria by PCR technique	Percentage of contamination in all sample
1	Heart	40	14	16	45%
2	Chest muscles	40	14	21	
3	Liver	40	12	18	
4	Total	120	40	55	100%

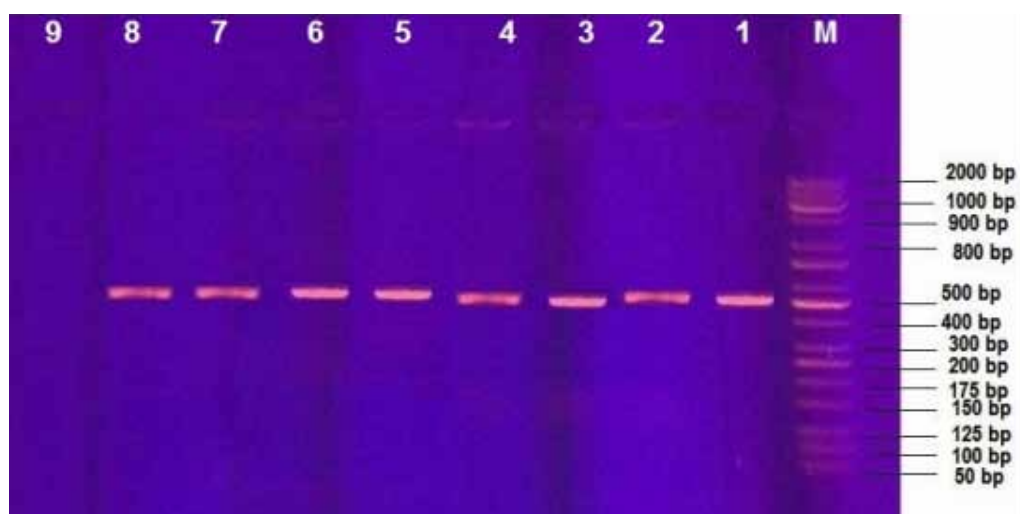


Figure 1. Agarose gel electrophoresis 1.5% for oprL PCR products, gel was electrophoresed for 1 hours at 70 Volt. The size of PCR product is 504 bp. All lanes show positive result except lanes 9.

Discussion

The results showed that 45% of the total examined samples were contaminated with bacteria *Pseudomonas aeruginosa* and this percentage proves the possibility and ability of *p. aeruginosa* to resist all sterilization conditions conducted by canned factories for frozen canned chicken, due to It has a genome (5.5–7 Mbp) is relatively large compared to other serial bacteria It encodes a large proportion of the regulatory enzymes important for metabolism, transport and flow of organic compounds. The improved coding power of the *P. aeruginosa* genome provides great metabolic ingenuity and high adaptability to environmental changes .

The results showed that there is a relative difference between the culture media and the molecular test, as it showed that the samples examined with PCR technique were diagnosed with *P. aeruginosa* a little more compared to the diagnosis of the culture media and this difference depends on that PCR technique detect bacteria based on its gene even where the probability of the bacteria being Dead or weak, so it cannot grow in the culture media.

Result of positive samples that were diagnosed from canned samples of the heart, liver and muscles, we notice that the proportions were close between the samples contaminated with *P. aeruginosa* and this is due to the ability of bacteria to grow in all wet tissues and the ability of *P. aeruginosa* to tolerate different conditions. is able to survive in a wide range of environments.

In addition to the high level of intrinsic antibiotic resistance of *P. aeruginosa*, the acquired resistance greatly contributes to development of multidrug-resistant strains, which increases the difficulty in eradicating this microorganism and leads to more cases of persistent infections

Therefore we recommend the food factories producing frozen chicken cans to take new sterilization and preservation method .

Conflict of Interests: Nil.

Ethical Clearance: Take from markets in Al-Muthanna province by approval ethical committee.

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References

1. Zheng P, Renee R, Bernard R, Tong JL, Zhenyu C. Antibiotic resistance in *Pseudomonas aeruginosa*: mechanisms and alternative therapeutic strategies. *Biotechnology Advances*. 2019 January–February; 37(1):177-192
2. Silby M, Winstanley C, Godfrey S, Levy S, Jackson R. *Pseudomonas* genomes: diverse and adaptable. *FEMS Microbiol Rev*. 2011; 35, 652-680.
3. Chen J, Chen Y, Hu P, Zhou T, Xu X, Pei X . Risk assessment of infected children with *Pseudomonas aeruginosa* pneumonia by combining host and pathogen predictors. *Infect Genet*. 2018 Jan; 57:82-87.

4. Zhang R1, Liu Z1, Li J1, Lei L1, Yin W1, Li M1, al, et al. Presence of VIM-Positive Pseudomonas Species in Chickens and Their Surrounding Environment. *Antimicrob Agents Chemother.* 2017 Jun 27;61(7).
5. Fekadu K. Pseudomonas infection in chickens. *Journal of Veterinary Medicine and Animal Health.* 2010 Nov;2(4):55-58
6. Fekadu K. *Standard Bacteriological Manual.* MYCOGS.2005; 1
7. Gong Q, Ruan MD, Niu MF, Qin CL, Hou Y, Guo JZ1. Immune efficacy of DNA vaccines based on oprL and opr F genes of Pseudomonas aeruginosa in chickens. *Poultry Science.* 2018 December 1;97(12):4219-4227
8. Jennings LK, Storek KM, Ledvina HE, Coulon C, Marmont LS, Sadvovskaya I, et al . Pel is a cationic exopolysaccharide that cross-links extracellular DNA in the Pseudomonas aeruginosa biofilm matrix. *Proc Natl Acad Sci U S A.* 2015 Sep 8; 112(36):11353-8
9. Balcht A, Smith R. Pseudomonas Aeruginosa: Infections and Treatment. *Informa Health Care.* 1994, 83–84.
10. Hassan H M. Characterization of Pseudomonas aeruginosa isolated from different pathological lesions in chickens. *M. Microbiology.*2013
11. Ahmed M, Sudhakar M, Senthil K, Molecular characterization of Pseudomonas sp. isolated from milk samples by using RAPD-PCR. *European Journal of Experimental Biology.*2014; 4(4):78-84
12. De Smet J, Hendrix H, Blasdel BG, Danis W K, Lavigne R. Pseudomonas predators: understanding and exploiting phage-host interactions. *Microbiology.* 2017 September.; 15 (9):517-530. doi:10.1038/nrmicro.2017.61. PMID 28649138.
13. Munita J.M, Arias C.A. Mechanisms of antibiotic resistance. *Microbiol Spectr.* 2016 Apr; 4(2).
14. Tacconelli E, Carrara E, Savoldi A, Harbarth S, Mendelson M, Monnet DL, et al. Discovery, research and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. *Lancet Infect Dis.* 2018 Mar; 18(3):318-327.
15. Cornelis P. *Pseudomonas: Genomics and Molecular Biology .* Caister Academic Press. 2008; 19-6
16. Worlitzsch D, Tarran R, Ulrich M, Schwab U, Cekici A, Meyer KC, et al. Effects of reduced mucus oxygen concentration in airway Pseudomonas infections of cystic fibrosis patients. *The Journal of Clinical Investigation.* 2002 February; 109 (3):317 25. doi:10.1172/JCI13870. PMC
17. Dzidic S, Suskovic J, Kos B. Antibiotic Resistance Mechanisms in Bacteria: Biochemical and Genetic Aspects. *Food Technology and Biotechnology.* 2008;46(1): 11–21.
18. Kitao T, Lepine F, Babloui S, Walte F, Steinbacher S, et al .Molecular insights into function and competitive inhibition of Pseudomonas aeruginosa multiple virulence factor regulator. *MBio.* 2018
19. Khan A, Cerniglia C . Detection of Pseudomonas aeruginosa from clinical and environmental samples by amplification of the exotoxin A gene using PCR. *Appl Environ Microbiol.* 1994;60:3739-3745
20. Itah A, Essien J. Growth Profile and Hydrocarbonoclastic Potential of Microorganisms Isolated from Tarballs in the Bight of Bonny. *World Journal of Microbiology and Biotechnology.* 2005;21 (6-7): 1317-22. doi:10.1007/s11274-004-6694-z
21. Yi-Wei T, Max S, Ian P, Dongyou L, Joseph S. *Molecular Medical Microbiology.* Elsevier. 24th November 2014;3: Second Edition

Analysis Midwife Workload with Nasa-TLX Method

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Abstract

Background: Results of preliminary studies conducted at the Health Community Centers in the city of Surabaya regarding duties and responsibilities as a midwife, showed that midwives had overlapping duties and responsibilities because midwives did not only handle maternal and child problems as their main duties and functions, but midwives also carried out all activities. This is due to the limited personnel owned by the Community Health Centers so that it can affect the workload of midwives because in addition to exercising their authority the midwife also carries out other tasks. Based on the above problems and remembering the duties and functions of midwives as maternal and child health providers, it is important to conduct research on midwife workload analysis in carrying out their authority in the working area of Surabaya Inpatient Health Centers.

Method: This study has a cross-sectional quantitative research design. In this study using 2 variables (exogenous), namely Midwife Work Performance and Midwife Performance or Productivity. In this study, the endogenous variables are the quality of midwife services in the Surabaya Inpatient Health Center. The population used in this study were all implementing midwives, who provided services in 10 inpatient health centers in Surabaya.

Results and Analysis: Pearson correlation test results indicate there is a significant relationship between workload and performance ($p = 0.000$) and there is a significant relationship between workload and service quality ($p = 0.000$).

Discussion and Conclusion: In order to avoid work fatigue, it is necessary to rearrange work shifts in accordance with the rules and conditions of work shift provisions in maternity inpatient units, the determination of clear rest hours, when service hours can be accompanied by work music and additional labor reduce workload, as well as the division of workload according to ability and routinely carry out refreshing to reduce saturation.

Keywords: *Workload, Performance and Service Quality.*

Introduction

The minister of Health Stated that one of the main targets. Health development contained in Medium Term Development Plan 2015- 2019 is increasing access and quality of basic health services and referrals especially in the small region, disadvantaged and border areas. This makes facilities role of the first instance as the spearhead of Indonesian health service. Therefore, improving the quality of health service in Indonesia especially in facilities role of an instance is something that can't be delayed anymore. Facilities role of first in instance National Health Insurance acts as a get keeper (goalkeeper). Minister of healths said facilities role

of the instance itself is one of the Community Health Centers.

Based on the above problems and the tasks carried out as maternal and child health care providers, a study of the analysis of workload was carried out in carrying out tasks in the work area of the Surabaya Inpatient Health Center.

Material and Method

This study has a cross-sectional quantitative research design. In this study using 2 causative variables (exogenous), namely Midwife's Workload and

Midwife’s Performance or Productivity. In this study, the resulting (endogenous) variable was the quality of midwife services at the Surabaya City Inpatient Health Center. The population used in this study were all implementing Midwives, who provided services in 10 Surabaya Inpatient Health Centers which at the time of this research was proposed 100 people while the sampling technique was using simple random techniques

sampling. The analysis in this study used Pearson’s correlation test.

Findings: Respondents in this study were midwives who served in the Surabaya City Inpatient Health Center. In this study the characteristics of the respondents were seen from the age of the midwife, length of service and level of education.

Table 1: Distribution of objective workload levels for midwives in surabaya city inpatient health centers

Health Center	Productive Time		% Productive	Time
	For 3 working days (Minutes)	For 1 working day (Minutes)	Time 1 day Work (from standard time)	Level
A	1178	392,67	93,49	High
B	1181	393,67	93,72	High
C	1161	387	92,14	High
D	1168	389,33	92,69	High
E	1167	389	92,61	High
F	1206	402	95,71	High
G	1170	390	92,85	High
H	1198	399,33	95,07	High
I	1165	388,33	92,45	High
J	1172	390,66	93,01	High
Total	11766	3921,99		
Average	1176,6	392,199	93,38	High

Table 2: The frequency of Workload Distribution

No.	Indicator	Category	Frequency	
			Σ	%
1.	Time Demands	Heavy	82	82
		Medium	12	12
		Light	6	6
2.	Physical Demands	Heavy	38	38
		Medium	35	35
		Light	27	27
3.	Performance Demands	Heavy	40	40
		Medium	32	32
		Light	28	28
4.	Mental Weight Levels	Heavy	48	48
		Medium	26	26
		Light	26	26
5.	Frustration Levels	Heavy	29	29
		Medium	48	48
		Light	23	23
6.	Business Levels	Heavy	78	78
		Medium	12	12
		Light	10	10

Based on table 1 it can be seen that all the percentage of productive time > 80% with the smallest percentage of productive time is 92,14% and the largest productive time is 95,71%. Based on table 2. The average percentage of work time for village midwives used for productive activities is also > 80%, which is 93,38% of the total work time in the work area of the Health Center in Surabaya, which indicates that the performance level of midwives in the work area Surabaya city health center is categorized as high.

Based on Table 2. Visible frequency distribution of Workload according to NASA-TLX calculations there are 6 dimensions (mental demands, physical demands,

time demands, effort demands, frustrating demands, performance demands) from the dimensions of mental demands, physical demands, time demands, business demands and the level of performance describes the weight of the category, while the level of frustration in the category is moderate.

The majority of respondents as much as 59% were satisfied with services at the health center and as many as 41% said they were quite satisfied with the services provided in the City Health Center Surabaya.

Based on the results of the Pearson correlation test analysis between the performance of midwives and midwives workload, the results were obtained:

Table 3. The relationship between Midwife and Performance Workloads

Variable	Mean	Median	SD	Minimum-Maximum	95% Confidence Interval (CI)	p-Value
Workload	395,36	394	53,61	275-536	384,142 – 406,578	0.000
Performance	81,8	80,5	17,645	41-128	78,11 – 85,49	

Based on the Table. 3 it can be seen the results of the Pearson Correlation test there is a significant relationship between midwife workload and performance (p = 0,000).

Based on the results of the Pearson correlation test analysis between midwife’s workload and midwife’s service quality, results were obtained:

Table 4. The relationship between Midwife’s Workload and Service Quality

Variable	Mean	Median	SD	Minimum-Maximum	95% CI	p-Value
Workload	395,36	394	53,61	275-536	384,142– 406,578	0.000
Quality	132,16	131,5	17,639	93-179	128,47 – 135,85	

Based on the Table. 4, it can be seen that the results of the Pearson correlation test, there is a significant relationship between workload and service quality of midwives in the Surabaya City Health Center.(p=0.000).

The model of system development and clinical performance management (SPMCK) for midwives, starts from the smallest element in the organization, namely at the level of “First Line Manager”, because productivity (services) is directly in the hands of individuals in teamwork.²

The measurement of mental workload in this study used the NASA-TLX questionnaire which consisted of 6 dimensions namely mental demands, physical demands,

time demands (temporal demand), performance (own performance), effort level and the level of frustration that will form the average WWL (subjective workload) of a person. Overall, it can be seen that the dimensions of time demands, level of effort and mental demands. is the highest dimension of the WWL average. This is that the dimensions that most often contribute to the magnitude of the WWL index are the level of effort, mental demands and physical demands. Based on the results of the study, the most contributing to the WWL index of midwives in the Surabaya City Health Center is the dimension of time demands. Time demands are the amount of pressure time felt during doing work. The results of this study indicate that midwives at the Surabaya City Inpatient

Health Center carry out their work quickly and tiring. The time demands at the Health Center are related to the accuracy and alertness in providing midwifery services. Limited service time with a large number of patients requires midwives to work quickly. This is in line with the results of research by Widayati et al, stating that the implementation of officers in providing services is influenced by the number of patients served. Midwives must be able to divide the time for all patients so that there is little time for each client.⁸ Whereas the time demands on maternity inpatient units are in the form of alertness in assisting labor because it relates to the lives of patients both mothers and their babies. Jobs that require time that add to the burden are administrative tasks. Administrative tasks in the form of records and reporting that must be completed every day so that each month can be collected to the relevant agencies on time in accordance with the provisions.

The results of the study which showed the highest score for the two were the level of effort. The level of effort in the work as a midwife is the amount of effort that must be spent both physically and mentally to complete the work. One of the levels of effort shown in the service at the mothers and children health. While the level of effort in the maternity care unit is to remain ready to provide midwifery services, especially labor at any time for 24 hours according to the work shift. The last dimension with the highest score is mental demands. In his work, the mental demands of the profession as a midwife are the amount of mental and perceptual activity needed in midwifery service work. A midwife is required to be always physically and psychologically prepared and has a high level of precision, patience and responsiveness in handling patients because of her work that involves a person's life.¹⁰ Mental demands based on identification results in midwives are at the time of the patient's history. Midwives try to dig up information to assess and determine the diagnosis by being proven through the results of a physical examination. The mental burden of additional midwives at the mothers and children health' policy is to evaluate the MCH program, which is almost all run by the mothers and children health' polyclinic Policewomen. Good mental preparation will provide calm in carrying out actions and decision making.

In this study, the frustration level of midwives obtaining a low score can be due to the working period of midwives at the Community Health Centers is 8 years. The working period proves that some respondents

have had a lot of experience in the field of midwifery care, so they are able and have their own coping mechanism in overcoming problems that arise in their work.⁵ Work period can significantly improve employee performance^[1]. The longer working period will affect the quality of work which leads to improvement in the performance of an employee. Mental workload is closely related to performance, the appropriate mental workload will produce optimal performance.⁹

The results of the identification of subjective assessments of physical workload that dominate the maternity inpatient unit in the delivery service. Midwives have a double burden to save the lives of mothers and their babies. Therefore in the process of childbirth requires a good physical condition.

The last dimension that gets the lowest score is Performance. Performance is satisfaction felt by midwives on midwifery services that have been given. Satisfaction will be obtained if the aspects of work and aspects support. According to the results of Martini's research⁴, performance is influenced by the workload.

The average length of work of respondents as midwives is 8,4 years. This means that on average midwives have carried out their duties as midwives over 3 years. Of course, during this period, midwives have had various experiences that make them more trained to face various obstacles or obstacles both from the patient and from the conditions of work. Duration of work is related to experience because with a long working experience, of course, the midwife has learned a lot through various failures and successes in carrying out her duties to provide services, according to the results of Priyadi.⁶ The level of a workload from midwives is grouped into 3 (three), namely mild, moderate and severe. The Workload is included in the heavy category if the average value of workload is > 80, moderate if the average workload is between 50-80 and is mild if the average workload is <50. In this study, the workload was measured using NASA TLX instruments because the questionnaire was the most reliable and valid questionnaire for measuring workloads and could be used in accordance with health services.³

The workload with the heavy level felt by most respondents can be due to the existence of multiple assignments in the Community Health Centers. As a result of a direct interview with one of the midwives who stated that outside of his role as a midwife also held

other roles such as the treasurer of one of the programs. Meanwhile, as midwives in the Community Health Centers, they have actually faced the demands of their own work. As the results of interviews with midwives stated that they often faced dilemmas when there were patients who needed counseling assistance but at the same time were also required to complete reports or attend meetings or activities outside the Community Health Centers. All of these conditions cause midwives to often complain of difficulties in managing time and become unable to carry out all their tasks to the maximum.⁷

In this study, a good performance was shown by some midwives who had not too heavy workloads, while a heavy workload made the midwives work poorly because of overload. This was consistent with the calculation of Pearson's correlation test that there was a significant relationship between midwife's workload and performance midwife.

Good performance can be influenced by various factors such as the commitment of each midwife and then signed by all employees in the Surabaya City Health Center to do their job well. This is consistent with Greenberg's explanation that organizational commitment is needed as one of the indicators of employee performance because employees who have high commitment can be expected to show optimal performance.⁴

Conclusion

On average, midwives who were respondents were 32,3 years old, 80% of midwives were last educated Associate's Degree in Midwifery, on average midwives had a tenure of 8,4 years in the Health Center. In this study, there was a significant relationship between midwife's workload and midwife's performance and there was a significant relationship between midwife's workload and service quality. This shows that in order to avoid work fatigue, it is necessary to rearrange work shifts in accordance with the rules and conditions of work shift provisions in maternity inpatient units, the determination of clear rest hours, when service hours can be accompanied by work music and additional labor reduce workload, as well as the division of workload according to ability and routinely carry out refreshing to reduce saturation.

Ethical Clearance: Taken from Health Polytechnic Health Ministry Surabaya committee.

Source of Funding: Self

Conflict of Interest: Nil

References

1. Hardikriyawan, Aldi, Margono. Pengaruh Pelatihan dan Masa Kerja Terhadap Kinerja Pegawai (Studi Pada Kantor Badan Pusat Statistik Kota Probolinggo). *Jurnal Ilmiah Mahasiswa Feb*, 2014, 3.1.
2. Hilman, A.R, Manajemen Mutu. Tentang Standar profesi Kebidanan. Jakarta. Kelas, E.I Faktor-faktor yang Berhubungan dengan Kinerja Bidan dalam Pelayanan Antenatal Terpadu di puskesmas Kota Manado. *Jurnal Kesehatan Masyarakat. UNDIP. Vol 2. No 1.*
3. Hoonakker, P., Carayon, P., Gurses, A.P., Brown, R., Khunlertkit, A., McGuire, K. and Walker, J.M., Measuring workload of ICU nurses with a questionnaire survey: the NASA Task Load Index (TLX). *IIE Transactions on healthcare systems engineering*, 1(2); 2011. p.131-143.
4. Martini, Y., Rostiana. Komitmen Organisasi Ditinjau Berdasarkan Iklim Organisasi dan Motivasi Berprestasi. *Phronesis*, 5 (9); 2003.p. 21-31.
5. Maharaja, R. Analisis Tingkat Kelelahan Kerja Berdasarkan Beban Kerja Fisik Perawat Di Instansi Rawat Inap RSUD Haji Surabaya. *Indonesian Journal of Occupational Safety and Health*, Vol 4, No.1 1 Jan-Jun 2015: 93-102
6. Priyadi. Pengaruh Umur, Masa Kerja dan Gaya Kepemimpinan terhadap Kinerja Karyawan PT. Mondrian Klaten. Skripsi. Surakarta: Fakultas Ekonomi Universitas Muhammadiyah Surakarta; 2009.
7. Santi, Mina.Yumei. Implementasi Kebijakan Pemberian Air Susu Ibu Eksklusif Melalui Konseling oleh Bidan Konselor. *Kesmas National Public Health Journal*, 2014, 8.8: 346-352.
8. Widayati, Rina Sri; Widagdo, Laksmo; Purnami, Cahya Tri. Analisis pelaksanaan konseling kontrasepsi oleh bidan di wilayah dinas kesehatan

- kota Surakarta. *Gaster: Jurnal Kesehatan*, 2014, 11.1: 78-87.
9. Wulanyani, Ni Made Swasti. Tantangan dalam Mengungkapkan Beban Kerja Mental. *Buletin Psikologi*, 21 (2); 2013. p. 80-89.
 10. Yolanda, Nadia; Tualeka, Abdul Rohim. Analisis hubungan faktor pekerjaan dengan stres kerja bidan di Rumah Sakit Syamrabu Bangkalan. *The Indonesian Journal of Occupational Safety and Health*, 2014, 3.2: 138-147.

Evaluation of Quality of Nursing Documentation in Surgical Wards at Baghdad Teaching Hospitals

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Introduction

Background: Nursing documentation has been one of the most important functions of nurses.

Objectives: To evaluate quality of nursing documents for nursing care at surgical ward and to find out the relationship between demographic characteristic with nursing documents.

Methodology: A descriptive design study was conducted in the period of 1st January 2017 to 15th August 2017. Utilizing a stratified random sampling method (60) nurses working in surgical ward at Baghdad teaching hospitals.

Results: The majority of the study participants were female who accounted for (58.3%) of the total participants while male constituted (41.7%) making a female male ratio of 1.5:1. Most of the study participants (46.7%) were between ages 18 and 27 years old. (71.7) of the nurses were married and the remainder was single. (45%) of the participants had institute graduate. Majority of them (31.7%) were employee (1-5) years in surgical wards and finally most of nurses (66.7%) have training session in the nursing documentation.

Conclusions: The study showed that nurses have poor nursing documentation in surgical ward and there is no significant association between the nursing documentation with some demographic characters of selected nurses but significant association between the nursing documentation with training course.

Keywords: *Evaluation, Quality of Nursing Documentation, Nursing care, Surgical Wards.*

Introduction

Nursing documentation is considered as an important indicator to develop nursing care. According to patient safety law, nurses have to document nursing interventions.^[1] Nursing documented has jointly practical and legal embodiment in client care thus kind documentation and true notify are fundamental to improve efficiency in client care in any case of the way used to document, the client's health-care register is a solemn, legal records is client's patronage

specifics^[2,3]. Nurse's ability to script in a pure brief, fair and legally precise way can safely decrease the danger of misunderstanding and passive patient result concerning to bad communication^[4,5]. Nurses have accepted that registration isn't dismissing from nursing care and it is not permissive. It is an integral section of on file nurses' practices and an important instrument that RNs use to secure high-finesse client care. Literature debate exceedingly the barriers encountered by nurses in recorded involving time limited, mismatches among staffing resources and work overload, shortage of pure guidelines for fill up documentation, repeated at documentation, and the routine systems and institutional policies usually related with protection precise documentation^[6]. The major responsibility of nursing documentation are patients' information transport to other health team members, promote professional autonomy.^[7]

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Methodology and Materials

A descriptive design study carried out to evaluate quality of nursing documentation in surgical wards at Baghdad teaching hospitals. The study was carried out during the period extended from 1st January 2017 to 15th August 2017. The study population included all nursing staff in four selected hospitals. Inclusion criteria for nurses were having at least 12 month clinical experience and having any educational level degree in nursing. The sample size estimated 70 nurses with pilot study. Then, these nurses selected to participate with stratified random sampling, according to the number of nursing staff employed in each hospital. Then, for evaluate of each nurse's documents, in four parts of nursing documents, was selected randomly and analyzed. The demographic data of self fill reporting. For evaluate of nursing documents for nursing care four observational checklists were used. These checklists were evaluate four parts of nursing documents including recording vital sign assessment (4 items), recording wound care

(dressing) (11 items), recording medication treatment (4 items) and recording intake and output (I & O) of fluids (10 items). The validity of checklists was determined by content validity and after receiving commends from 10 nursing member checklists were revised. The content validity of the instrument was established through a panel of (15) experts. . Test- Coefficients for (29) items of nursing documentation for nursing care were ($r=0.83^{**}$) . Data were collected between 8.30am to 12.30 pm. The data is analyzed by using SPSS version 20.0.

Results

This table revealed that(58.3%) of the study samples were females and most of them were age group (18-27) years old, a high percentage of them were institute graduate (45%), most of them(71.7%) were married, (31.7%) were for (1-5) years were employment in nursing, Majority of them (31.7%) were employee (1-5) years in surgical wards and finally most of nurses (66.7%) have training session in the nursing documentation.

Table (1): The Mean of Score of Nurses Documentation for Nursing Care at Surgical Wards

No.	Items	Always		Some time		Never		MS	Ass
		F	%	F	%	F	%		
Vital Signs									
1.	Body temperature	49	81.7	4	6.7	7	11.7	2.70	Good
2.	Pulse rate	28	46.7	10	16.7	22	36.7	2.10	Fair
3.	Respiration rate	34	56.7	9	15.0	17	28.3	2.28	Fair
4.	Blood pressure	31	51.7	9	15.0	20	33.3	2.18	Fair
	Total							2.315	Fair
Wound Care (Dressing)									
5.	Location of wound	14	23.3	8	13.3	38	63.3	1.60	Poor
6.	Size of wound	4	6.7	8	13.3	48	80.0	1.27	Poor
7.	Wound discharge	2	3.3	1	1.7	57	95.0	1.07	Poor
8.	Amount of discharge	2	3.3	4	6.7	54	90.0	1.07	Poor
9.	Color of discharge	2	3.3	3	5.0	55	91.7	1.07	Poor
10.	Odor of discharge	2	3.3	7	11.7	51	85.0	1.07	Poor
11.	Pain	1	1.7	3	5.0	56	93.3	1.05	Poor
12.	Signs of infection	3	5.0	1	1.7	56	93.3	1.12	Poor
13.	Signs of wound healing	2	3.3	1	1.7	57	95.0	1.08	Poor
	Dressing changes							1.15	Poor
14.	Morning	20	33.3	15	25.0	25	41.7	1.92	Fair
15.	Evening	21	35.0	16	26.7	23	38.3	1.97	Fair
	Total							1.28	Poor
Drugs Administration									
16.	Drug name	57	95.0	2	3.3	1	1.7	2.93	Good
17.	Route of administration	52	86.7	6	10.0	2	3.3	2.83	Good

No.	Items	Always		Some time		Never		MS	Ass
		F	%	F	%	F	%		
18.	Dose	44	73.3	11	18.3	5	8.3	2.65	Good
19.	Time of administration	54	90.0	2	3.3	4	6.7	2.87	Good
	Total							2.82	Good
Fluid Intake & Output									
Fluid Intake									
20.	Oral route	12	20.0	8	13.3	40	66.7	1.53	Poor
21.	IV infusion	5	8.3	9	15.0	46	76.7	1.32	Poor
22.	Nasogastric tube	1	1.7	5	8.3	54	90.0	1.12	Poor
23.	Gastrostomy route	1	1.7	5	8.3	54	90.0	1.12	Poor
Fluid Output									
24.	Urination	8	13.3	7	11.7	45	75.0	1.38	Poor
25.	Defection	8	13.3	7	11.7	45	75.0	1.38	Poor
26.	Vomiting	8	13.3	7	11.7	45	75.0	1.38	Poor
27.	Chest tube	2	3.3	4	6.7	54	90.0	1.17	Poor
28.	Drain	5	8.3	1	1.7	54	90.0	1.18	Poor
29.	Nasogastric tube	3	5.0	1	1.7	56	93.3	1.12	Poor
	Total							1.28	Poor

(A.D.): Assessment Degree, M.s=mean of score [(1 – 1.67) = poor (p); (1.67 – 2.34)= Fair (F); [(2.34 – 3) = Good (G)]

This finding of this table indicated that the mean of (2, 3, 4, 14 and 15) was fair documentation and good score was poor documentnon items (5, 6, 7, 8, 9, 10, 11, documentation on the remaining items. 12, 13, 20, 21, 22, 23, 24, 25, 26, 27, 28 & 29), items

Table (2): The Association between Nurses Documentation for Nursing Care Score and the Demographic Characteristics

Demographic Variables		Sum of squares	df*	Mean Square	F	Sig.
Age groups	Between Groups	.057	2	.029	.027	.974
	Within Groups	60.526	57	1.062		
	Total	60.583	59			
Gender	Between Groups	.022	2	.011	.043	.958
	Within Groups	14.561	57	.255		
	Total	14.583	59			
Level of education	Between Groups	2.268	2	1.134	2.395	.100
	Within Groups	26.982	57	.473		
	Total	29.250	59			
Years of employed in hospital	Between Groups	4.136	2	2.068	.617	.543
	Within Groups	191.114	57	3.353		
	Total	195.250	59			
Years of employed in surgical ward	Between Groups	3.512	2	1.756	.681	.510
	Within Groups	147.088	57	2.580		
	Total	150.600	59			
Training course	Between Groups	2.070	2	1.035	5.238	.008
	Within Groups	11.263	57	.198		
	Total	13.333	59			

This table indicates that there is no significant association between nurse's documentation for nursing care score and the demographic characteristics (age, gender, level of education, years of experience in surgical ward and years of employed in hospital).

Discussion

Throughout the course of the data analysis of the current study, the findings show the majority of the study were female who accounted for (60%) of the total participants while male constituted (40%). Most of the study participants (46%) were ages group (18-27) years old, the level of education represented that most of them (38%) were from institute graduate, most of them (74%) were married, (38%) for (1-5) years were employment in nursing, most of nurses (70%) have training special session in the nursing documentation. Majority of them (34%) were employee (1-5) years in surgical ward and finally

These findings are in line with study done by other researcher who reported that study the average age of nurses was 32.40+ 5.58 years and they have a 6.40+ 3.58 years clinical experience. of all, 147(86.8%) nurses were female and 168 (98.8%) of them has a BS degree in nursing. 83 (48.8%) nurses working in medical wards and 87(51.2%) were working in surgical wards [8].

These findings agreed with findings obtained from other study, who stated that the majority of participation nurses were female 142 (87.6%), most of them 104(61.2%) were married their mean of age group was 31.38 years, majority of them (51.2%) were working in surgical wards and almost of them (98.8%) had bachelor of science degree in nursing [9].

Twenty nine questions to assess nurses documentation for nursing care in surgical ward, in order to response to first question of the study table five. This table shows the nursing documentation in four selected parts of nursing documents including recording vital sign, recording wound care, recording medication treatment and recording intake and output of fluids, the total mean of score was poor nursing documentation. Further investigation of results of study revealed the most of items that weren't recorded by nurses in recording wound care dressing, location of wound (68%), size of wound (82%), wound discharge (96%), all items related to Amount of discharge, colour of discharge, odor of discharge (96%), signs of wound healing (94%) all items that mention up that weren't recorded by nurses, total mean of score related to wound care was poor.

In recording intake and output of fluids most items that weren't recorded were including, where not recording fluid take through mouth (64%), intravenous fluid (72%), nasogastric tube and gastrostomy route (88%) all items are absent (88%) all items are absent (88%) all items are absent in nursing documentation. Also recording were absent in fluid output including urination, defecation, vomiting (74%), chest tube, drain (88%) and nasogastric tube (92%) of all items related fluid intake and output not recorded by nursing, the total of mean of score related to fluid intake and output was poor.

In recording vital sign assessment art most items are recorded the mean of score of vital sign was fair. In recording medication treatment most items are recorded by nurses, the total of mean of score related drugs treatment was good.

This finding was in good agreement with that obtained from other researcher reported that the quality of nurses' documents was moderate. Further investigation showed that most items that weren't recorded by nurses in recording nursing report part were including "recording the time of reports" (100%), "recording the response of patients to interventions" (97.9%) and "recording the time of nursing cares" (96.5%). In recording medication treatment part most items that weren't recorded were including "respect suitable method for correct errors" (40.6%) and other items were completely respected by nurses. In recording intake and output of fluids most items that weren't recorded were including recording accurate time of checking I & O of fluids" (100%) and "recording the differences between the intake and output of fluids" (78.3%). In recording vital sign assessment part most items that weren't recorded were including "recording the location of controlling vital signs", "recording the unit of temperature", "the limb used for controlling the blood pressure" (100%) and "the unit of blood pressure" (97.1%) [8].

Another study agree with the finding of the study who stated the nursing records showed In the vital sign section, data showed that all of them had moderate level and their mean score were 10.69 ± 0.52 . In I & O fluid section data showed that 18.6% of flow sheets had moderate quality but most of them 81.4% had suitable quality and their mean score were 13.24 ± 1.07 . In chronology sections, all of flow sheets had suitable quality. In drug intervention part, mean score was 11.78 ± 1.42 and most (85.9%) of them had good quality [9].

These findings agreed with study done by other researcher who reported that the quality of nursing care records was poor and inadequate to reflect individualized nursing care. Their results suggested that more emphasis is needed in nursing practice and nursing education on the quality of record keeping in order increasing its evidential value^[12].

These finding is the same line with study done Rangraz Jedi et al by in one study, assessed the quality of 540 nursing documents and reported that only 11% of these documents didn't Contain necessary information^[13]. Hanifi, (2002) assessed the quality of 30 medical records and reported that only 16.1% of nursing documents had a good quality and 35.8% of them didn't contain necessary information^[14]. Findings of most other studies have also showed that nursing documents have inadequate information about nursing care process and are consistent with the findings of our study.^[15,16]

In order to respond to second question of the study the association between the nursing documentation for nursing care with some demographic characters of selected nurses. There are no significant relationship between nursing documentation and demographic characteristics of nursing, but significant relationship between nursing documentation and training course.

This finding was in good agreement with that obtained from other study who reported that correlation between age and clinical experience of nurses with quality of their documents chi-square test was used. Results showed that there was no meaningful statistical correlation between qualities of nurses' documents with their age ($\chi^2 = 1.34$, $df = 2$, $p = 0.51$)^[8].

Conclusions

The study concluded that; nurses that working in surgical ward in all selected teaching hospitals had poor documentation in most aspect of nursing daily documentation for nursing care. We recommend conducting teaching programs or sessions must emphasize on all aspects of nursing documentation, for improving quality of nursing documentation and also the study recommends to nursing documentation must be covered widely and in-depth in nursing curriculum of nursing schools.

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References

1. Agneta, Ö, Advanced Home Care Nurses Everyday Practice. PhD thesis, Karolin ska Institute, Stockholm, Sweden 2015:80-1.
2. Blair and Smith B, Nursing documentation: Frameworks and barriers. Contemporary Nurse. A Journal for The Australian Nursing Profession 2012; 41(2): 168-160.
3. Collins S, Cato K., Albers D, Scott K., Stetson P, Vawdrey D, et al, Relationship Between Nursing Documentation and Patients' Mortality. American Journal of Critical Care 2013; 22(4); 313-306.
4. Yeung M, Lapinsky S, Granton J, Doran D, Cafazz J, Examining Nursing Vital Signs Documentation Workflow Barriers and Opportunities in General Internal Medicine Units. Journal of Clinical Nursing 2012; 21(7/8): 982-980.
5. Wang N, Hailey D, Yu P, Quality of Nursing Documentation and Approaches to its Evaluation: a Mixed-method Systematic Review. Journal of Advanced Nursing 2011; 67(9); 1858-1875.
6. Asamani J, Amenorpe F, Babanawo F, Ansah A, Nursing Documentation of Inpatient Care in Eastern Ghana. British Journal of Nursing 2014; 23(1): 54-56.
7. Cheevakasemsook A, Chapman Y, Francis K, Davies C, The Study of Nursing Documentation Complexities. International Journal of Nursing Practice 2014; 12(6):74 -68.
8. Ali R M., MadinehJ, Farahnaz A Z, Azad R, Vahid Z Z, Quality of Nursing Documents in Medical-Surgical Wards of Teaching Hospitals related to Tabriz University of Medical Sciences. IJNMR2009; 14(2):.45-50.
9. Madineh J, Vahid Z, Azad R, Alireza M, Fahime M,. Knowledge and Practice of Tabriz Teaching Hospitals Nurses Regarding Nursing Documentation. Thritha J Med Sci, 2013;2(1):.134-138.

10. Inan N and Dinc I, Evaluation of Nursing Documentation on Patient Hygiene Care. *International Journal of Nursing Practice* 2013; 19(1):394-401.
11. Rangraz J F, Farzandi P M, Musavi S, Assessing Recorded Information in Patients' Medical Records in Emergency Departments of Kashan Hospitals. *Feiz Research-Scientific Journal* 2004;8(31):61-73.
12. Hanifi N, Mohammadi I, Assessing the Reasons for Uncorrected Documentation in Nursing. *Hayat* 2004; 10(2) : 39-49.
13. Lee TT. Nursing Diagnoses Factors Affecting their use in Charting Standardized Care Plans. *J Clin Nurs* 2005; 14(5):7-640.
14. Thoroddsen A, Thorsteinsson HS, Nursing Diagnosis Taxonomy Across the Atlantic Ocean Congruence Between Nurses' Charting and the NANDA Taxonomy. *J Adv Nurs* 2002;37(4):81-372.

Controversy of the Capability of Voters with Mental Health Disorder in the General Election

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Abstract

In the Republic of Indonesia's Constitution, Article 22E paragraph (1), it is stated that the execution of the general election must be done in a manner which is direct, general, libre, confidential, honest and fair. Every citizen has a right which is guaranteed constitutionally to participate in the general election including those who are mentally disabled.

They have the right to freely participate both directly or by electing the representatives who will be in the government. Historically, the prohibition of the voting rights for mentally disabled people is not in accordance with the Human Rights except with clear circumsance.

Keywords: *Voters, discrimination, mental health disorder, disabled people.*

Introduction

The human right is a right which sticks to the human beings. It is a basic right possessed by every human being justly and it is the main right which is the most important compared to other rights.

No one can object nor limit the human rights of the citizens and the government must guarantee it. The right to participate in the government is owned by every citizen, including those who are disabled. They have the right to freely participate both directly or by electing the representatives who will be in the government.² This right is guaranteed by the government.

People with disabilities are part of the Indonesian citizens who have the right to participate actively in the political life. According to the Constitution No. 39 year 1999, Article 43 paragraph (1) regarding the Human Rights (Fascicle of the Republic of Indonesia year 1999 No. 165, Additional Fascicle of the Republic

of Indonesia No. 3886, further written as UU 39/1999), it has been regulated that every citizen has the right to obtain the same opportunity in the governmental affairs, both to elect or to be elected. Apart from that, in the Convention on the Rights of Persons with Disabilities which are stated in the Constitution No. 19 year 2011 on the Convention on the Rights of Persons with Disabilities) there has been a guarantee of the rights of the disabled people in the general election.²

The government which is elected (either directly or chosen by the representatives who are in the government) are usually applied by countries which are democratic. Democracy and the human rights are two main principles which cannot be ignored when a country has claimed itself to be a democratic state.⁵

Democracy can also be said as a form of government which gives the highest power to the hands of the people, where every citizen has the same rights and responsibilities in the law and in the government without exception. The people have the highest power in the state. Because of that, the democracy which is implemented by the Indonesian government is a form of democratization in establishing the state's power which is applied through the general election. Article 22E paragraph (1) of Republic of Indonesia's 1945 Constitution regulates that the general election must

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be established directly, publicly, freely, confidentially, honestly and justly.

With the establishment of a general election which is free, honest and just, it is an indication that there exists a democratic political life. So, the establishment of the general election should give a chance to all members of the society to express their opinions constitutionally in the political system which apply.⁴

Theoretically, the general election is thought to be the most basic stage within the sequence of the democratic governmental life. It is the engine which activates the democratic political mechanism system.³In expressing their opinions, the people may do so through the general election, thus the election is a sign of the people's aspirations in a democracy. Without the general election, a country cannot be claimed as a democratic country in its real definition. This means that the basic of a democratic state life is that the citizens have the right to actively participate in the political process, including in general elections.⁸

Every citizen, without exception, have the same rights and are guaranteed to be able to actively participate in politics. In the constitutional rights and in the human rights' point of view, the protection of the people's rights in the political sector, which are juridical-constitutionally regulated in the 1945. The state also guarantees that every citizen has the right to elect and to be elected without exception.

The thing which becomes an interesting problem is regarding the controversy of the people with mental health issues' capability in voting in the general election. This is related to the Decree of the Constitutional Court 135/PUU-XIII/2015, thus there are no discriminations for the citizens who have the right as voters. Because of that this research regarding the controversy of the capability of voters with mental health issues must be done. Thus, here we describe the general election, the concept of participation and the criteria of people with mental health disorder as voters.

In this paper, we analyze whether or not the people with mental health disorders have the capability of becoming electors in a general election. Thus, this paper uses a Sociological approach with a post-positivism paradigm, that the participation of the people with mental health disorders as voters in an election is a reality which occurs in the governmental life of the Indonesians.

Method

This Research is **sociological juridical normative** research⁹, or what Wignjosoebroto mentioned as **anon doctrinal** research, which is a research which uses the practice of law, it is said that the law is identical with the not only the written norms which are made and constitutionalized by the institutions but also the living law. Satjipto Rahardjo mentions that this research views the law as progressive law, this method is called a **sociological analysis**¹⁰.

Discussion

Article 24 paragraph (2) of Republic of Indonesia's 1945 Constitution and Article 2 of the Constitution No. 24 year 2003 regarding the Constitutional Court (Fascicle of the Republic of Indonesia year 2003 No. 98, Additional Fascicle of the Republic of Indonesia No. 4316, further written as UU MK), determines that the Constitutional Court is a juridical institution apart from the Supreme Court and the juridical institution underneath it which undergo the independent judicial power to establish fairness to enforce the law and justice.

The establishment of the Constitutional Court as a Special Tribunal separately from the Supreme Court, carrying out duties, is a conception which is able to be traced long before the modern nation-state, which basically tests out the harmony of lower legal norms with higher legal norms⁷according Article 1 paragraph (2) of the 1945 State Constitution. This implies that the implementation of popular sovereignty through the constitution needs to be escorted and guarded.

In accordance with one of the authorities of the Constitutional Court in terms of judicial review of The Constitution (judicial review), on the petition submitted by: (1) The Healthy Soul Association; (2) The Election Center for the Access of People with Disabilities/PPUA PENCA; (3) Associations for Elections and Democracy/Perludem; and (4) Khorunnisa Nur Agustyati, which is decided by the Constitutional Court Decision Number 135/PUU-XIII/2015, on October 13th 2016 against provisions of the sound of Article 57 paragraph (3) letter a of Law Number 8 of 2015 concerning Amendments to Law Number 1 Year 2015 concerning the Establishment of Government Regulations

In the verdict, the Petitioners considered that with the provisions of the sound of Article 57 paragraph (3) letter a of constitution 8/2015, it was considered

detrimental to the constitutional rights of people with mental health as they lost their right to be registered as voters in the election. In the conduct of elections, it is regulated that all citizens who have met the criteria as voters have the right to vote.

Many assumptions mind on how can such people take account on their actions when they hardly able to take care of themselves. Article 29 Numbers (ii) UU 19/2011 and Article 13 letter c, letter f and letter g, Article 77 of Act Number 8 of 2016 concerning People with Disabilities (Fascicle of the Republic of Indonesia year 2016 No. 69, Additional Fascicle of the Republic of Indonesia No. 5871, hereinafter referred to as Law on Persons with Disabilities), that the guaranteed protection is required for people with mental/memory disorders, including in an election democratic party.

According to the Law on People with Disabilities, the definition of a person with disabilities is a person who suffers physical, mental, intellectual and/or sensory limitations for a long period of time and experience difficulties in interacting with their surroundings and difficulties in fully and effectively participate with other citizens with the same rights. Bawaslu (General Election Watch Body) through its members, Mochammad Afifuddin, emphasized that people with disabilities must be facilitated in realizing their right to vote and be elected in the conduct of elections.

In the aforementioned Court Decision, the Court reckon that mental disorders and memory disorders are two things with different characteristics. Mental disorders and memory disorders are two categories which intersect but cannot always solely equated that way. Memory disorders (memory) are problems caused by deterioration or decrease in physical quality—brain as a vehicle for storing and processing memory, whereas mental disorders are not always caused by problems of mere physical quality degradation. Each type of disorder, both mental disorders and memory disorders, have various derivatives.

The Court also opines that generally, mental disorders and/or memory disorders, from medical perspective, have several more specific types. From the duration/the time of the said disorders, principally they can be divided into two categories, a) relatively permanent/chronic mental and/or memory disorders; and b) temporary mental and/or memory disorders, neither permanent nor episodic.

The Court understand that in everyday societal interactions, the term mental and/or memory disorders are being referred to something as a “crazy” condition, which is medically referred to as psychosis. In fact, “crazy” is only one condition amongst mental abnormalities.

The other types of mental abnormalities include mental disorders (neurosis), which has a very wide range of categories. The range of mental and/or memory disorders categories, in casual conversation, fell into various terms, which includes “stress”, “anxiety”, “paranoid”, “*latah*” (a condition where a person subconsciously and spontaneously repeat a particular word under mild surprise), “phobia” and “bad thoughts”.

After careful examination from the Court according on Article 73 *juncto* Article 150 of the Mental Health Law stipulates that mental health checks for legal purposes must be conducted by psychiatrist specialists and even involve other specialist doctors and/or clinical psychologists. Election organizers are certainly not the right institution to carry out such tasks because the organizing institution general elections are not designed to make mental and/or memory health diagnoses.

In the KPU Regulation No. 4 of 2015 concerning Updating of Data and List of Voters in the Election of Governors and Deputy Governors, Regents and Deputy Regents and/or Mayors and Deputy Mayors, it has been stipulated that residents whose memory/mental is challenged must be proven with doctor’s note. So that people whose memory/mental is challenged, to be able to be included as voters in the election needs to provide doctor’s note which states they are able to be included as a voter.

The Court opines in its consideration that with regard to the testing of Article 57 paragraph (3) letter of a Law 8/2015 on the 1945 State Constitution, the Court suggests: (1) mental and memory disorders are two different conditions despite being categorically intersected, (2) not all people who are experience mental/memory disorders will lose the ability to become voters in general elections; (3) the absence of guidelines/criteria and the absence of appropriate institutions/professions to conduct psychiatric analysis of prospective voters, resulting in the *a quo* potentially causing violations of constitutional rights.

The KPU has registered the persons with mental disabilities as voters. And in the 2019 Election, with the

letter number 1401/PL.02.1-SD/01/KPU/XI/2018, KPU registers voters with mental disabilities. Such action by KPU is a real form of a reality that guarantees equal political rights for every citizen in accordance with the provisions in various laws including the Disability Law, Election Law and the United Nations Convention on the Rights of Persons with Disabilities that have been ratified by Indonesia.

Sarah Birch stated that voting right is actually a universal right which cannot be reduced. The universal voting right means that every citizen has the voting right without any discrimination.¹ From Sarah Birch opinion, it can be concluded that the voting right attached to every citizen doesn't see the citizen as individual, regardless their physical and psychological conditions with exception Fajri Nursyamsi and team stated that they isisa "subject" who have the rights and are able to decide freely for their own life based on their own conscience as well as actively become part of the society.⁶

Based on the Explanation of UU 19/2011 Article 1, the purpose of this convention is to promote, to protect and to guarantee full and equal enjoyment of all human rights and fundamental freedom for all disabled people and to increase respect on the dignity attached to them.

To respect and to uphold the Human Rights of disabled people considering every aspects and limitations that can hinder them in using their political right in the general election. The regulation in the Constitution 8/2016 Article 75 paragraph (2) stated also that the government and the local government are obligated to guarantee the rights and chances for disabled people to vote and to be voted. Medically, one's capacity to vote in the general election is not determined by diagnosis or symptoms suffered by patient, but from their cognitive capability (thinking ability). It means that mentally disabled people such as schizophrenia, bipolar, or severe depression are not automatically lost their capacity to decide their choice.⁶

Generally, mental disabilities of people are chronic and episodic (recurrent). If the recurrence period happens in the general election day, especially when voting, surely, we cannot force them to come to the Voting Venue (TPS-) to participate in voting.⁶ Historically, the prohibition of the voting rights for disabled people is not in accordance with the Human Rights development internationally.⁶

Then in 2013, the Human Rights Council stated that the state counterpart must review the form of discrimination or prohibition towards political rights for disabled people. Therefore, international Human Rights development tends to guarantee more the political rights for disabled people, including mentally disabled people.⁶

The chief of local psychiatric hospital (RSJD) of Surakarta, Totok Hardiyanto, in one of the explanations regarding whoever has the right to be the owner of the vote in the general election stated that not all patients who are treated have the right to vote for the nation leader candidate. It is caused by the various severeness condition of each treated patient, it explained also by dr. Aliyah Himawati Rizkiyani, SpKJ, a psychiatrist. In her explanation, she stated that patient will be examined to find whether they are worthy or not as a voter.

Aside from these two aspects above, in the general election it needs also an inclusive general election guaranteed by Constitution. Its purpose is that the disabled people needs are protected and respected hence they can act independently and with guarantee. Juridically, the regulation on disabled people based on the Human Rights are as follows.¹

1. Law 39/1999 Article 42 which regulates the rights of disabled people, namely:
2. Law 8/2016 Article 13

From the Constitutional regulations above, in general the rights whose owned by disabled people in the general election are as follows: (i) the right to obtain information regarding general election; (ii) the right to be registered to vote; (iii) the right on the access to the Voting Place; (iv) the right to vote confidentially; (v) the right on receiving information including general election information; and (vi) the right to participate as general election organizer.¹

Conclusion

Mentally disabled people have the capability to participate in a general election as a voter with recommendation and approval from psychiatrist. Therefore, Constitution must regulate the guidelines/criteria strictly of mentally disabled people who participate as a voter in the general election so there would not be any discrimination toward all citizens and it needs regulation regarding the proper organisation/profession to conduct mental analysis toward voter candidates.

Ethical Clearence: Yes

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References

1. Agus RI, Maharani AEP, Kusumo ATS. The Human Rights Fulfillment of Disabled People in Establishing the Regional General Election through the Increase of the Regional General Election Commission's Roles to Strengthen the Local, 2018;4(3).
2. Baehr PR. The Human Rights in Foreign Politics. Jakarta: Obor Foundation Indonesia; 1998.
3. Handoyo HC. The Indonesian Governmental Law: To the Consolidation of the Democratic System. Yogyakarta: Atmajaya University Press; 2009.17p.
4. Haris S. The Search for the Future Executive Institution Format. Noer M (Editor), Building the
Medico-legal Update, April-June 2020, Vol. 20, No. 2 693
New Indonesia. Jakarta: Nasional University Press; 2000.
5. Merly M. The Accessibility of the 2014 General Election in its Implication to the Political Defense (Analysis of the Disabled Students in the Disability Service Center, UIN Sunan Kalijaga Yogyakarta), J National Defense. August 25th, 2015;21(2).
6. Nursyamsi F et al. The Disability Law Framework in Indonesia: The road to Indonesia as a Disability-Friendly Country. Jakarta: PSHK Publishers; 2015.
7. Siahaan M. Procedural Law of the Republic of Indonesia's Constitutional Court. Jakarta: Republic of Indonesia's Constitutional Court; 2006.
8. Sodikin. The General Election Law, the General Election as the Practice of Governance. Bekasi: Gramata Publishing; 2014.
9. Soekanto S, Mamudji S. Normative Legal Research, Jakarta: Raja Grafindo Persada; 1985.
10. Sunggono B. The Methodology of Legal Research. Jakarta: Raja Grafindo Persada; 1997.

Motivation for Choosing Neurology as a Career among Students of Baghdad Medical College

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Abstract

Purpose: To test the influence of specific factors on motivation for neurology career and especially the effect of taking neurology course and the effect of gender on them.

Materials and Method: This is an observational cross-sectional, self-administered questionnaire-based study. Structured online surveys were offered to a random sample of 170 final year students of College of Medicine\University of Baghdad from July to September 2018. Assessment included factors that might influence students' choice of neurology as a future career, gender effect on those factors and especially evaluating the impact of exposure to neurology course on their determination for choosing neurology.

Results: A total of 150 students responded to this survey (88% responder rate). About 35.3% of the participants anticipated that they would chose neurology as their future career. The strongest motivational factors were: passion in neurology (50%), role model (38%) and prestige (36%). Family and friend's effect and having an illness in the family were less motivating factors. Taking the neurosciences module did motivate the students to choose neurology as their future career (p=0.001).

Conclusion: Neurology is generally well-regarded by students in our college. There was a statistically significant association between choosing neurology as a future career and the influence of studying neuroscience module. Other significant associations were: will to help neurologically ill patients, having passion in neurology, role model, prestige and family pressure.

Keywords: Neurology, career, medical students, neuro-module, Baghdad.

Introduction

It is often thought that undergraduates do not make their career preferences until after they have graduated from medical school. However, not only

entrants of medical schools¹, but even applicants to medical schools, often have strong preferences for or against some medical careers.²⁻⁴ Neurology, it appears, has a reputation among medical specialties of being particularly hard. Particularly interesting is the concept of "Neurophobia," i.e., perception that neurology is a difficult and complicated subject to understand.⁵

Little is known about the factors that motivate medical students to seek careers in Neuro-medicine. Their choice has been associated with multiple factors, the main ones were intellectual property, helping people with neurological disorders, passion in neurology, role model. Other less chosen factors were prestige, family

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and friends influence, having a neurological illness in the family or among friends and controllable life style.^{6,7,8,9} Academic exposure to neurology course has a very prominent effect on promoting choosing neurology as a future career whether that course was taken before or after graduation.^{6,7,8,10}

Age was seen to affect motivation, older applicants having experience with neurology chose intellectual property over interesting in helping people, while younger ones chose the latter.⁷

Factors that deterred students from choosing neurology were: difficulty of the subject, perception of non-interference, poor quality of life and excessive clinical activities.^{6,11}

As regards gender issue, there is an increase in the number of women in neurology in the United State 'US', but even in the US, woman are still facing gender issues when working in neurology, mostly related to underestimation of their skills and adverse social expectations.¹²

No study on students' selection of neurology as future specialty was conducted before in Iraq.

This study was conducted with the objectives to evaluate the known factors that influence the student's choice of neurology as a future career, the effect of gender on those factors and to evaluate the impact of exposure to neurology course on their determination of choosing neurology.

Material and Method

An observational cross sectional survey study was conducted from July to September of 2018 at the College of Medicine, university of Baghdad. Initially 10 students were chosen for a pilot study to assess the accuracy and reliability of the questionnaire, then 170 students were randomly selected from all final (6th) year medical students. Consent was taken from the participants and they were informed of the confidential nature of the survey. Participation was voluntary and unpaid.

Inclusion criteria: 6th grade [final year] medical students of Baghdad University/College of Medicine.

Exclusion criteria: Students who were unwilling to participate or those who incorrectly/incompletely filled the questionnaire were excluded.

The questionnaire gathered information about: Demographic data: including gender; if the students would choose neurology as a career in the future (yes or no); factors related to choosing neurology as a career (family/friends influence, family/friends doctor, family/friends with neurological disorder, being influenced by role model, being influenced by prestige, passion in neurology, interest in helping people with neurological disorders, other cause). Questionnaire about the effect of neurology module included: score of neurology course in second academic year, score of neuroscience module in fifth academic year, did neurology courses in second, fifth academic years affect your motivation for choosing neurology as a future career?

Data management and statistical analysis:

Initial survey forms for the pilot study were on paper and distributed manually to the students, while the final survey forms included in our study were prepared via Google forms and were distributed online by using Facebook to all of the respondents. The data was encoded and submitted into SPSS (version 24). All the data were set as categorical variables and the descriptive statistics were presented in frequencies, percentages and 95% standard deviations and confidence intervals. Chi-square test [and fisher exact test when applicable] were used to analyze the significance of association between different variables. Unless otherwise noted, statistical significance we set as $p < 0.05$.

Results

A total of 150 students were included in this study. A responder rate of 0.88. Male respondents totaled 41 (27.3%) and 109 (72.7%) were females. About 53 (35.3%) of the participants said that they'll choose neuroscience as their future career and the remaining 97 (64.7%) preferred to choose other specialties. Of 109 female participants 40 (36.7%) were going to choose neuroscience compared to 13 (31.7%) of 41 males, a non-statistically significant difference ($\chi^2 = 0.3247$, $p = 0.569$).

Factors related to choosing neurology as a career:

The number of students motivated by each factor in the survey and its percentage from the whole sample was as follows: interest in helping people with neurological disorder 125 (83%), passion in neurology 77 (51%), role model 57 (38%), Prestige 54 (36%), family/friend with a neurological disorder 49 (33%), family influence 37 (24.7), presence of family/friend doctor 36 (24%).

Figure (1) displays the percentages of students choosing each motivational factor from the sample of students who were willing to choose neurology as a future career.

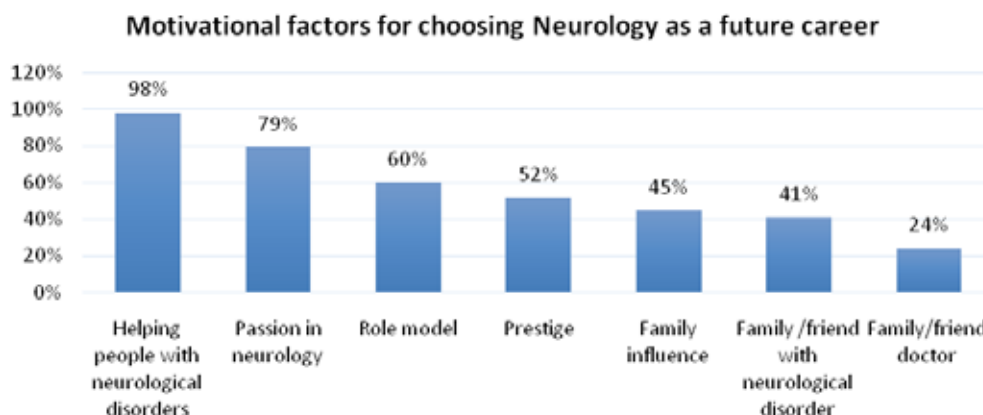


Figure 1: Motivational factors for choosing neurology as a futur career in 53 students who made the choice of neurology as a future career.

Descriptive statistics for motivational factors for choosing neurology per the two choice groups and significance of differences were calculated and are depicted in Table 1.

Table 1: Descriptives and significance of motivational factors for choosing neurology per choice groups

Motivational Factors	Did you choose neurology as future career?								Significance	
	YES (n=53)				NO (n=97)				X ²	P
	Fr	Mean	SD	95% CI	Fr	Mean	SD	95%CI		
Interested in neurology due to family influence	24	45%	6.8	31.4%-72%	13	13%	3.40%	6%-20%	18.747	0.001
Have family/friend doctor that motivates you to choose neurology	13	24%	5.80%	12.4%-35.6%	23	23%	4%	15%-31%	0.013	0.911
Have family/friend with neurological disorder	22	41%	6%	29%-53%	27	27%	4.50%	18%-36%	2.914	0.088
Get influenced by role model	32	60%	7%	46%-74%	25	25%	4.4%	16%-34%	17.42	0.001
Prestige	28	52%	6%	24%-40%	26	27%	4%	17%-35%	10.076	0.002
Have passion in neurology	42	79%	5%	68%-90%	35	36%	4.80%	27%-45%	25.559	0.001
Interested in helping people with neurological disorders	52	98%	1.9%	94%-100%	73	75%	%4	67%-83%	12.89	0.001

The association between gender and the factors that influence the students’ choice of Neurology was calculated and presented in Table 2.

Table 2: Significance of the effect of gender on motivational factors for choosing neurology as a future career

Motivational Factors	Male (n=41)		Female (n=109)		X ² test Statistic	P-value
	Fr.	%	Fr.	%		
Interested in neurology due to family influence	9	22%	28	26%	0.224	0.636
Have a family/friend doctor that motivates you to choose neurology	15	37%	21	19%	4.899	0.027
Have a family/friend with neurological disorder	12	29%	37	34%	0.296	0.586
Get influenced by role model	16	39%	41	38%	0.025	0.874
Prestige	21	51%	33	30%	5.672	0.017
Have passion in neurology	18	44%	59	54%	1.247	0.264
Interested in helping people with neurological disorders	34	83%	91	83%	0.102	0.935

The effect of Neuroscience modules: The distribution of students according to their scores at the end of the second and fifth grade neuroscience modules

per choice groups and significance of their differences, was calculated and depicted in Table 3.

Table 3: Significance of association of students’ scores of neuroscience modules and choosing neurology as a future career

End module scores		Would you choose neurology as your future career?				X ² Test statistic	P-value
		Yes (n=53)		No (n=97)			
		Fr.	%	Fr.	%		
Score category in neuroscience (second grade)	Excellent	6	11.3%	14	14.4%	2.611	0.625
	Very good	15	28.3%	24	24.7%		
	Good	22	41.5%	36	37.1%		
	Average	5	9.4%	17	17.5%		
	Borderline pass	5	9.4%	6	6.2%		
Score category in neuroscience (fifth grade)	Excellent	0	0.0%	5	5.2%	7.507	0.115
	Very good	16	30.2%	23	23.7%		
	Good	22	41.5%	28	28.9%		
	Average	7	13.2%	25	25.8%		
	Borderline pass	8	15.1%	16	16.5%		

Of males: 5,10,14,10,2 in 2nd grade and 1,6,18,6,10 in 5th grade had excellent, very good, good, average and borderline scores respectively. The respective results for females were 15, 29, 44, 12, 9 in 2nd grade and 4, 33,32,26,14 in 5th grade (p<0.05 for both grades).

The student’s perception of the motivational effect of taking the neuroscience module of the fifth year and of both the second and fifth year, on their perceived choice of selecting Neurology as a future career was calculated and depicted in Figure 2. The difference was found be statistically significant ($\chi^2=62.060, p<0.001$).

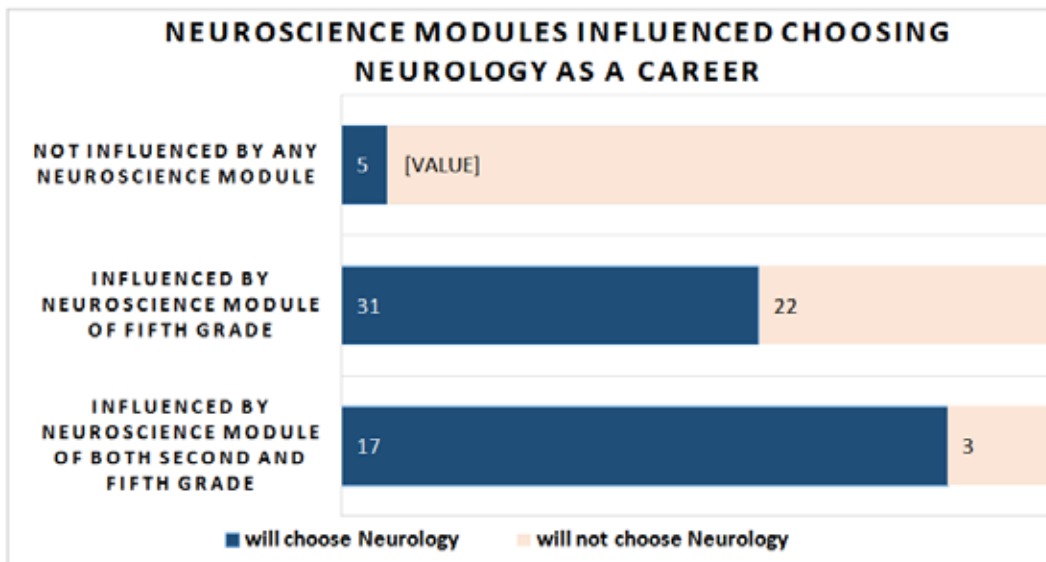


Figure 2: A component bar chart showing the number of students per each influence group and their perceived choices for choosing Neurology as a career.

Discussion

Neurology was the career of choice for 35.3% of students in this study, suggesting that neurology is generally well-appreciated by our students. In comparison to Gupta N. et al study⁶ in which only 19% of students were willing to choose neurology.

The percentage of female students in our college is very high, constituting 54.4% in a prior study¹³ and around 72.7% in this study. Therefore gender related motivational issues to neurology must be addressed.

Analyzing the factors that are related to choosing neurology: 24.7% said that their families had an influence on their interest, whereas Gupta N. et al study showed that only 2% of the students reported family influence and pressure.⁶ This rather big difference could be due to cultural difference and differences in family involvement in students' life between different societies. There was not gender difference regarding this factor.

For the family/friend neurologist influence, 24% agreed that having a family/friend neurologist doctor motivated them to pick neurology. After extensive research this was not tested by other studies as a relating factor, although it shows a large effect on students in this study. However this study didn't reveal any significant association between this factor and the will to choose neurology as a future career. However this study did show that males are more prone to be affected by that factor than females ($p=0.027$).

Students who have a family/friend with a neurological disorder were 32.7%, this was also not tested by other studies. However this study didn't show any significant association between this factor and choosing neurology as a future career at 0.05 level of significance, however the result was significant at 0.10 level. No gender difference was found in this study.

Having a role model influenced 38%, which is consistent with the findings of Thomas R. which had 37% influence on the students.⁸ This factor is consistently reported in most studies about motivation in neurology.^{6,7,8} This came here as the third highest factor that motivated students in our sample before prestige and family/friends impact, which largely agrees with earlier studies.^{6,7,8} This equally affected both genders in this study.

Considering neurology as a prestigious job inspired 54 (36%), on the other hand Gupta N.⁶, showed that 18% considered neurology as a prestige job. This might be because considering neurology as prestige might signal cultural grounds for this difference. In our study this significantly affected males more than females ($p=0.017$).

Passion in neurology was shown to affect more than half of the students and without gender related differences, this agrees with the findings of Gupta N.⁶ in which also about more than half of the students (52%) were passionate and interested in neurology as a job. Passion in neurology was one of the commonest factors related to picking neurology among students in this study. Also this agrees with most studies.^{6,7,8}

Students who reported having an interest to help people with neurological diseases were 83.3%. Also 82.6% were interested in helping people with neurological diseases in the study of Albert D¹⁰. This agrees with most studies.^{6,7,8} In our study this included all students who would and wouldn't choose neurology as a future career, males and females alike, but surprisingly it was much lower in the group who didn't will to choose neurology as a future career that the difference was significant! Interest in helping people came first before passion in neurology, this agrees with older studies about younger students being motivated by interest in helping people as contrasted with older more experienced trainees in neurology which preferred intellectual content.⁷

Meanwhile, for the effect of neuroscience modules and the students' choice of neurology, there was no statistically significant association between students' score and their choice of neurology as a future career and the same applies to gender effect on scores, this finding agrees with Goni U. et al which also stated having no gender associated difference with different scores.¹⁴

This study revealed a statistically significant association between choosing neurology as a future career and the influence of neuroscience of 2nd and 5th grade. These findings are supported by all prior studies^{6,7,8,10} all of which reported the effect of undergraduate or postgraduate courses in neurology on future choice of neurology as a career. Also this agrees with general studies on education modules in career development of students, which asserted that they successfully improve career maturity, career self-efficacy concept, motivation and career planning ability for the students.¹⁵

CONCLUSION

- Neurology is generally well-regarded by students of our college.
- There was a statistically significant association between perception of choosing neurology as a future career and factors of: will to help neurologically ill patients, having passion in neurology, role model, prestige and family pressure, in a descending manner.
- There was a statistically significant association between the perception of choosing neurology as a future career and the influence of studying neuroscience module.

Ethical Clearance: Given by Research Committee at Medical Education Unit\College of Medicine-University of Baghdad.

Funding: Self

Competing Interests Statement: Nil

References

1. Wright B, Scott I, Woloschuk W, Brenneis F, Bradley J. Career choice of new medical students at three Canadian universities: family medicine versus specialty medicine. *CMAJ* 2004; 170(13):1920-1924.
2. McManus C, Lefford F, Furnham F, Shahidi S, Pincus T. Career preference and personality differences in medical school applicants. *Psychology, Health and Medicine* 1996; 1(3):235-248.
3. Hutt R, Parsons D, Pearson R. The timing of and reasons for doctors' career decisions. *Health Trends* 1981; 13(1):17-20
4. Zeldow B, Preston C, Daugherty R. The decision to enter a medical specialty: timing and stability. *Medical Education* 1992;26(4):327-332.
5. Jozefowicz R. Neurophobia: the fear of neurology among medical students. *Arch Neurol* 1994;51(4):328-329.
6. Gupta NB, Khadilkar SV, Bangar SS, Patil TR, Chaudhari CR. Neurology as career option among postgraduate medical students. *Ann Indian Acad Neurol* 2013; 16:478-82.
7. Albert DV, Hoyle C, Yin H, McCoyd M, Lukas RV. Why neurology? Factors which influence career choice in neurology. *Neurological Research* 2016;38(1):10-4.
8. Thomas R, Devine H, Donnelly A, et al. Why neurology? The career choices of current UK neurology trainees. *Journal of Neurology, Neurosurgery & Psychiatry* 2015; 86 (11), e4.132-e4
9. Schwartz RW, Jarecky RK, Strodel WE, Haley JV, Young B, Griffen WO Jr. Controllable lifestyle: a new factor in career choice by medical students. *Acad Med* 1989; 64(10):606-9.
10. Farrow A, Gordon D, Prodan C. The Effect of a Clerkship Didactic Curriculum on Medical Student Career Choice in Neurology (S6.002). *Neurology* 2017; 88(16 Supplement):S6.002
11. Roy B, Banerjee I, Sathian B. Neurology as future career – medical student's opinion and factors influenced: A study from Nepal. *Neurons* 2014, 1(1): 23-27
12. Collins TR. Women in Neurology Should Be Aware of Gender Issues and Work More on Self Promotion, Career Development Coach Says. *Neurology Today* 2010; 10 (1):16
13. Al-Johar ZA, Ridha AA, Zidan DS, Salih DM. Motivation for Choosing Medicine as a Career, among Students of Baghdad Medical College. *Indian J Public Health Res Dev* 2019; 10(10): 1286-1291
14. Goni U, wali S, Ali H, Bularafa M. Gender Difference in Students' Academic Performance in Colleges of Education in Borno State, Nigeria: Implications for Counselling. *JEP* 2015; 6(32): 107-114.
15. Miles, J. The impact of a career development programme on career maturity and academic motivation [Unpublished Master's Thesis on the internet]. Stellenbosch: Stellenbosch University; 2015 [cited 2019 July 19]. Available from: http://scholar.sun.ac.za/bitstream/handle/10019.1/97917/miles_impact_2015.pdf?sequence=2.

Assessment of Occurrence of RAS in Children and its Association with Oral Hygiene

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Abstract

Objective: To assessing occurrence of minor recurrent aphthous stomatitis (RAS) in children and its association with oral hygiene.

Materials and Method: The present study was conducted on 428 school children of age ranged 6- 13 years of both genders. Complete oral examination for assessment of decayed teeth, missing and filled teeth and DMFT index was done. The data was analyzed using IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp with Chi square test.

Results: In 291 (67.9%) cases, type of RAS was minor, in 85 (19.8%) major and in 52 (12.1%) herpetiform. Most common factors causing RAS in children was food stuffs in 210 (49%) followed by nutritional deficiency in 166(38.7%), stress in 38 (8.8%) and other factors in 14 (3.2%) patients. 312 (72.8%) patients had dmft score >1, 97 (46.1%) patients had intolerance to milk products, 58 (27.6%) had intolerance to egg, 20 (9.52%) to fish and 35 (16.6%) had to gluten. 102 (23.8%) patients had history of coeliac disease in family. The difference was significant ($P < 0.05$).

Conclusion: Recurrent aphthous stomatitis minor was most commonly occurring among children. Maximum number of patients had dmft score >1 and intolerance to food stuff.

Keywords: Children, dmft, Recurrent aphthous stomatitis.

Introduction

Recurrent Aphthous Stomatitis (RAS) is a chronic inflammatory condition characterized by multiple ulcerations in the oral cavity. It is painful condition.¹ Aphthous ulcers present as shallow ulcers usually oval or round in shape, measures less than 1 cm in size, having necrotic centres and are covered with yellow

of grey pseudomembrane. Surrounding mucosa is erythematous.² There are 3 main types of aphthous ulcers such as recurrent aphthous major, recurrent aphthous minor and herpetiform ulceration. Fourth variety is seen associated with Behcet's syndrome. The most common site of occurrence is tongue and soft palate, buccal mucosa, floor of mouth etc.³

The prevalence of Recurrent Aphthous Stomatitis varies from 5%- 50% of population. It is considered to be the disease of young adults. It is seen in age group 10-30 years of both genders. A RAS minor present as 2-5 ulcers with a size < 1 cm in diameter. It lasts upto 2 weeks and disappears and heal without formation of scar.⁴

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RAS major form is quite less common than the minor type, with size >1 cm in diameter. It is evident in approximately 7% - 20% of population. It persists more than 2 weeks and can last for month. It heals itself by leaving scars.⁵

The herpetiform form manifests as pinpoint ulcers with size 0.1- 0.2 cm in maximum dimensions. It is seen in 5% - 10% of RAS cases. It occurs in clusters and number may range from 5 to 100.⁶

It is multifactorial in nature. Aetiology can be allergy, stress, trauma, anxiety, genetic predisposition and endocrine disorders. Children oral healthy can play an important role in development of RAS. Thus monitoring of children’s behavioural attitudes, habits and oral hygiene practice become importance.⁷ Considering this, the present study aimed in assessing occurrence of RAS in children and its association with oral hygiene.

Materials and Method

The present study was conducted in the department of Oral health, College of Applied Health Sciences in Al-Rass, Kingdom of Saudi Arabia. It comprised of 428 school children of ager ranged 6- 13 years of both genders. General information such as name, age etc. was recorded. Complete oral examination for all patients was done. It comprised of assessment of decayed teeth, missing and filled teeth and DMFT index. All were subjected to psychosocial interview and asked about their habits.

Data analysis: The obtained data was analyzed using IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp using Chi Square test, at Significance of P < 0.05.

Ethical aspect: Ethical approval was obtained from institute prior to the study. All parents of children were informed regarding the study and written consent was obtained.

Results

Table I shows that age group 6 years had 35 male and 32 female, 7 years had 32 male and 30 female, 8 years had 26 male and 24 female, 9 years had 27 male and 25 female, 10 years had 23 male and 21 female, 11

years had 25 male and 20 female, 12 years had 40 male and 36 female and 13 years had 12 male and 20 female.

Table II shows that in 291 (67.9%) cases, type of RAS was minor, in 85 (19.8%) major and in 52 (12.1%) herpetiform. The difference was significant (P< 0.05).

Table III shows that most common factors causing RAS in children was food stuffs in 210 (49%) followed by nutritional deficiency in 166(38.7%), stress in 38 (8.8%) and other factors in 14 (3.2%) patients.

Table IV shows that 312 (72.8%) patients had dmft score >1, 97 (46.1%) patients had intolerance to milk products, 58 (27.6%) had intolerance to egg, 20 (9.52%) to fish and 35 (16.6%) had to gluten. 102 (23.8%) patients had history of coeliac disease in family. The difference was significant (P< 0.05).

Table I: Distribution of patients

Age (Years)	Male	Female	Total
6	35	32	67
7	32	30	62
8	26	24	50
9	27	25	52
10	23	21	44
11	25	20	45
12	40	36	76
13	12	20	32
Total	220	208	428

Table II: Different types of RAS in patients

Type	Number	P value
Major	85 (19.8%)	0.01
Minor	291 (67.9%)	
Herpetiform	52 (12.1%)	

Chi Square test, Significance, P< 0.05

Table III: Factors responsible for recurrent aphthous stomatitis in children

Type	Number	P value
Food stuff	210 (49%)	0.001
Nutritional deficiency	166(38.7%)	
Stress	38 (8.8%)	
Other factors	14 (3.2%)	

Chi Square test, Significance, P< 0.05

Table IV: dmft score and RAS

Parameters	Score	RAS	P value
Dmft score	0	116(27.1%)	0.01
	>1	312 (72.8%)	
Food stuff	Milk products	97 (46.1%)	0.01
	Egg	58 (27.6%)	
	Fish	20 (9.52%)	
	Gluten	35 (16.6%)	
Coeliac disease in family	Yes	102 (23.8%)	0.001
	No	326(76.1%)	

Chi Square test, Significance, $P < 0.05$

Discussion

Recurrent aphthous stomatitis is a multifactorial disease of young adults. Among various forms, minor RAS is commonly seen in all age groups. However, the occurrence of RAS in children is not uncommon.⁸ The present study aimed in assessing occurrence of RAS in children and its association with oral hygiene.

In present study we included 428 children which were found to be positive for RAS of both genders. In present study, maximum patients were of age 12 years (76) of which male were 40 and female were 36. Age group 6 years had 35 male and 32 female, 7 years had 32 male and 30 female, 8 years had 26 male and 24 female, 9 years had 27 male and 25 female, 10 years had 23 male and 21 female, 11 years had 25 male and 20 female and 13 years had 12 male and 20 female.

Tecco et al⁹ included 401 school-children age ranged 5–10 years old. Oral examination showed presence of RAS of minor type. There was statistically significant relation between the presence of decayed teeth and minor RAS and between the decayed missing or filled teeth (DMFT) index and minor aphthous stomatitis. Authors found no systematic association to clinical or psychological/psychosocial indices and RAS.

We found that 291 (67.9%) cases, type of RAS was minor, in 85 (19.8%) major and in 52 (12.1%) herpetiform. Tarakji et al¹⁰ in their study found that family history plays an important role in etiopathogenesis of disease.

The role of environmental risk factors in the etiology of RAS is not fully understood.¹¹ It is found that patients of RAS have iron, folic acid and vitamin B12 deficiency. RAS found to be associated with bacterial or viral aetiology. RAS is also seen in HIV/AIDS patients.¹²

Studies have mentioned the increased levels of salivary cortisol or of reactive oxygen species in the saliva in the disease process.¹³ It is found that children under school work load stress start parafunctional habits that cause traumatic injuries to the area, resulting in an episode. Thus the role of stress can be considered in RAS. It has also been linked to immune system changes, which may partially explain the role of stress in the etiology of RAS.¹⁴

We found that common factors causing RAS in children were food stuffs in 210 (49%) followed by nutritional deficiency in 166(38.7%), stress in 38 (8.8%) and other factors in 14 (3.2%) patients. Table IV shows that 312 (72.8%) patients had dmft score >1, 97 (46.1%) patients had intolerance to milk products, 58 (27.6%) had intolerance to egg, 20 (9.52%) to fish and 35 (16.6%) had to gluten. The difference was significant ($P < 0.05$). We found recurrent aphthous stomatitis minor was most commonly occurring among children.

Quiroz et al¹⁵ in their study assessed the cases of recurrent aphthous ulcerations on 4895 patients. There were 161 (3.3%) had objection of oral aphthous ulcerations, 76(47.2%) were identified as suffer from recurrent aphthous ulcerations. The tongue was the most affected anatomical region, with 27 individuals (39.7%), followed by the buccal mucosa, with 22 cases (32.3%).

The limitation of study is small sample size. Treatment modality of patients was not discussed. Assessment of RAS stomatitis has not been studied extensively. Large scale studies are required to substantiate the results.

Conclusion

Authors found that recurrent aphthous stomatitis minor was most commonly occurring among children. Maximum number of patients had dmft score >1 and intolerance to food stuff.

Conflict of Interest: Nil

Financial Support: Nil

References

- Sridhar T, Elumalai M, Karthika B. Recurrent Aphthous Stomatitis: A Review. *Biomed Pharmacol J* 2013;6(1):33-39
- Edgar NR, Saleh D and Miller RA. Recurrent aphthous stomatitis: A review. *J Clin Aesthet*

- Dermatol 2017; 10: 26-36.
3. Akintoye SO and Greenberg MS: Recurrent aphthous stomatitis. *Dent Clin North Am* 2014; 58: 281-297.
 4. Belenguer- Guallar I, Jiménez-Soriano Y, Ariadna Claramunt-Lozano A. Treatment of recurrent aphthous stomatitis. A literature review. *J Clin Exp Dent*. 2014;6(2):e 168–e74.
 5. Patil S, Reddy SN, Maheshwari S, Khandelwal S, Shruthi D, Doni B. Prevalence of recurrent aphthous ulceration in the Indian Population. *Journal of clinical and experimental dentistry*. 2014 Feb;6(1):e36-e40.
 6. Altenburg A, El-Haj N, Micheli C, Puttkammer M, Abdel-Naser MB, Zouboulis CC. The treatment of chronic recurrent oral aphthous ulcers. *Dtsch Arztebl Int*. 2014;111(40):665–73.
 7. Lundgren GP, Karsten A, Dalhoef G. Oral health-related quality of life before and after crown therapy in young patients with amelogenesis imperfecta. *Health Qual Life Outcomes*. 2015;13:197–205.
 8. Singh M. Daily Supplementation of recommended dose of multivitamin does not reduce the frequency and duration of recurrent aphthous ulcers. *J Evid Based Dent Pract*. 2013;13:27-8.
 9. Tecco S, Sciara S, Pantaleo G, Nota A, Visone A, Germani S, Polizzi E, Gherlone EF. The association between minor recurrent aphthous stomatitis (RAS), children's poor oral condition and underlying negative psychosocial habits and attitudes towards oral hygiene. *BMC pediatrics*. 2018 Dec 1;18(1):136.
 10. Tarakji B, Gazal G, Al-Maweri SA, Azzeghaiby SN, Alaizari N. Guideline for the Diagnosis and Treatment of Recurrent Aphthous Stomatitis for Dental Practitioners. *J Int Oral Health*. 2015; 7:74-80.
 11. Swain SK, Gupta S and Sahu MC: Recurrent aphthous ulcers still a challenging clinical entity. *Apollo Med* 2017; 14: 202-206.
 12. Staines K, Greenwood M. Aphthous ulcers (recurrent). *BMJ Clin Evid* 2015; 1303.
 13. Namrata M, Abilasha R. Recurrent aphthous stomatitis. *Int J Orofac Biol* 2017;1:43-7.
 14. Sridhar T, Elumalai M, Karthika B. Recurrent Aphthous Stomatitis: A Review. *Biomed Pharmacol J* 2013;6:17-22
 15. Queiroz SI, Silva MV, Medeiros AM, Oliveira PT, Gurgel BC, Silveira ÉJ. Recurrent aphthous ulceration: An epidemiological study of etiological factors, treatment and differential diagnosis. *Anais brasileiros de dermatologia*. 2018 Jun;93(3):341-6.

Effects of Health Perception, Generativity and Wisdom on Job Competency of Korean Care Workers

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Abstract

Purpose: The purpose of this study is to produce fundamental materials for nursing intervention development for care workers' job competency enhancement by analyzing impact of care workers' health perception, generativity and wisdom on job competency.

Method: Data was collected by means of self-report questionnaire with ethical considerations from 116 care workers at two nursing homes and one care worker center in D Borough in D City, two nursing homes in J Borough and one nursing home in S Borough. The collected data was then analyzed by frequency scale, mean, standard deviation, t-test, ANOVA, Pearson correlational coefficients and stepwise multiple regression.

Results: The care workers' health perception scored 3.86 points out of 5 points, generativity scored 2.75 points out of 4 points and wisdom scored 3.49 points out of 5 points and job competency scored 3.79 points out of 5 points. The job competency of care workers was a moderate positive correlation with health perception ($r=.49$, $p<.001$), generativity ($r=.34$, $p<.001$), wisdom ($r=.47$, $p<.001$). The health perception ($\beta=.346$, $p<.001$) of care workers had a significant influence on job competency. Health perception, wisdom and work experience of care workers explained 39.6% of job competency.

Conclusion: Care workers should be provided with environmental and institutional strategies for constant service provision without career disruption. Job competency affected by care workers' health, wisdom and work experience, therefore, regular check-up and spur for maintenance of good health are required, in addition to constant refresher and capability enhancement education for extended wisdom on caring and life in daily lives. On top of that, a capability management program should be developed in consideration of the said factors. Job competency increased in proportion to work years in elder caring, therefore, institutional management of manpower is needed in policy-level.

Keywords: Health perception, Generativity, Wisdom, Job competency, Care workers.

Introduction

The country's current population is 51,635,000 as of 2018 and expected to increase until otherwise

in 2031, while the current population over age 65, which is 7,381,000, is expected to increase until 2050 (18,813,000). Given the rapid population ageing, the elderly over age 65 is forecasted to reach 41.0% in 2060¹ from 14.3% in 2018. Accordingly, there has been a need of health and welfare policies for the elderly called out to date, especially of high-quality services of health and medical employees for elderly's better health and life quality.

In this regard, the country implemented the National Long-Term Care Insurance in 2008 whereby

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complimentary caring is provided to the elderly of great age or with a senile disease struggling in daily lives to assist in housework and physical activities in order to help improve their health and life in later years and also ease burden on their families to ultimately enhance the national quality of life and has been reinforcing medical and nursing service, day and night caring service, senior welfare centers and elderly care facilities for those over age 65 annually.¹ Professional nursing centers, elder care hospitals and educational institutions have devoted to cultivating care workers as the professionals to provide quality in-home services

Care workers' job competency can be seen as a worker's capability to provide efficient in-home care services using its acquired skills and knowledge as internalized with its own values and job attitude. Internalization processes differently by individual and thus the quality of service appears differently depending on how the worker internalizes its acquired skills and knowledge upon its own values and attitudes when rendering care services². Simply put, care workers' job competency is an integral of worker's set of values, attitude, knowledge and skills.

Impact factors on enhancement of care workers' job competency will vary, although the primary should be worker's subjective perception of its own health. The subjective health perception is an overall wellness of physical, psychological and social functional ability³, being neutral between human and environment, with an ability to adapt to environment, perform social tasks and roles⁴. Hence, positive self-perception of health is seen to reduce work stress and enhance job competency.

According to Erikson's human development and life cycle theory, generativity is an adult's ability to self-survive and create fruits and thoughts that will outlast for next generations as it looks after families, society and system, maintains and succeeds cultural tradition and also an affection to nurture and lead next generations.⁵ Generativity ideally arouses one's passion and resolution to provide a guidance outside the range of caring, nurturing and family and takes a form of advice, teaching, guidance and volunteer activity in work place and local community. Accordingly, an individual with high generativity is influential on others with desirable results.⁶ Most care workers are falling in the middle-aged bracket, whose development task is achievement of generativity. Generativity is also considered an essential element and value for care workers' job competency

enhancement given its attributes.

A research on job competency of 120 care workers at elders nursing home⁷ revealed wisdom as the most influential factor on job competency. A wise man has problem-solving capability and insights to embrace life and build a stronger relationship with others. As wisdom refers to, in cognitive terms, keen eyes, insights and exceptional judgement, while in private terms, balanced integration and consonance of ego⁸, a wise care worker assumes positive attitude and performs impartial, empathic communication in elder caring.

Therefore, this study attempts to identify impact factors on enhancement of care workers' job competency after defining the degree of health perception, generativity and wisdom in respect of the level of job competency.

Method

Subjects: The subjects of this study are 116 care workers with more than 6 months of work experience selected from two nursing homes and one care worker education center in D Borough in D City, two nursing homes in J Borough and one nursing home in S Borough. All participation was made voluntarily by grownup male and female workers upon their understanding of purpose of this study as submitted with written consent. As the least number of samples for 5 predictors, effect size 0.15, significance level 0.05 and power 0.90 was calculated to be 116 by G-power 3.1.9.4 program, but given elimination rate 10%, a total of 128 workers were surveyed initially, with those with less than 6 months of work experience excluded later on, leaving the final number to be 116. Ahead of the survey, the participants were informed of this study's purpose and survey method, that the survey results would be anonymized as confidential and be only used for study purpose. They submitted a study participation acceptance form, knowing participation could be revoked anytime if desired.

Instruments:

Health Perception: The Korean version of THI (Todai Health Index)⁹, developed by Health Department of Tokyo University Medical School, was used as amended and supplemented for this study. The tool consisted of 30 questions across 4 sections-physical, psychological, spiritual and social. Using a 5 point Likert scale, a higher score indicated a better condition of health perceived. For this study's reliability, Cronbach's

α was shown .94.

Generativity: LGS (Loyola Generativity Scale), developed by McAdams and Aubin¹⁰, used by Hong¹¹, was employed as amended for this study. It consisted of 19 questions on such concepts as teaching, knowledge transfer, positive contribution to society, caring and responsibility for others, creativity and productivity, sustainable legacy. Using a 4 point Likert scale, a higher score indicated a higher level of generativity. For research reliability, Cronbach’s α of this study was shown .79.

Wisdom: Korean Men’s Wisdom Scale (KMWS), developed by Kim¹² was used. It consisted of 43 questions across 4 sectors of cognitive ability, refinement and balance, positive attitude toward life, empathic interpersonal relationship. Using a 5 point Likert scale, a higher score indicated a higher level of wisdom. For research reliability, Cronbach’s α of this study was shown .97.

Job Competency: National Capability Standard (NCS), restructured for care workers by Lee¹³ was used. It consists of 24 questions on communication capability, problem-solving capability, self-development capability, interpersonal relationship capability, technique capability and professional ethic capability. Using a 5 point Likert scale, a higher score indicated a higher degree of job competency. For research reliability, Cronbach’s α of this study was shown .94.

Data Collection: The researchers of this study visited 5 nursing homes and 1 care worker education center in D City to provide explanation on the purpose of this study to care workers directly after getting approval of the center head and manager upon explanation of the purpose and method of this study. Written consent was submitted by participants ahead of survey for data collection.

Ethical Consideration: Approval was acquired by the ethics committee of K University on the objective, methodology and protection of rights of study participants (KNU_IRB_2019-90). During the study period the guidelines on ethical studies were observed.

Data Analysis: Using the SPSS/WIN 23.0 program, the general characteristics and variables were analyzed for frequency, percentage, mean and standard deviation. The difference in job competency across different general characteristics was analyzed using a t-test,

ANOVA and Scheffe test. The correlation between care workers’ variables was analyzed using Pearson’s correlation coefficients. Multiple regression analysis was conducted to analyze the factors affecting the subjects’ job competency.

Results

General Characteristics of Korean Care Workers: The average age of 116 care workers was 57.43 ± 0.51 , with the majority in the age bracket of 50-59 (44.0%). Female care workers accounted for most (112 people, 96.6%). For educational background, 93 had a minimum high school education (80.2%). The average years of work experience was 42.5 ± 33.20 months, with 47 workers less than 24 months (40.5%). The majority of respondents had received 1 or more refresher education or professional education for the past one year (85 people, 73.3%). More than a half earned less than KRW1 million (73 people, 62.9%). For the form of job, in-home care service job took up the majority (112 people, 96.6%). Those who care one person a day were 62 (53.4%).

Degree of Health Perception, Generativity, Wisdom and Job Competency in Korean Care Workers: Korean care workers’ health perception scored 3.86 points out of 5 points, generativity scored 2.75 points out of 4 points and wisdom scored 3.49 points out of 5 points and job competency scored 3.79 points out of 5 points (Table 1).

Table 1. Degree of Health Perception, Generativity, Wisdom and Job Competency in Korean Care Workers

Variables	M±SD	Range
Health perception	3.86±0.51	1~5
Generativity	2.75±0.32	1~4
Wisdom	3.49±0.50	1~5
Job competency	3.79±0.48	1~5

Difference in Job Competency across General Characteristics: Comparative analysis of job competency According to general characteristics found that work years ($F=5.19, p=.007$) and form of job ($t=4.38, p=.016$) make differences in job competency: A group of people with more than 5 years of work experience showed a higher level of job competency than a group with years between 2 and 5; a group of people who provide in-home care service showed a higher level of job competency than a group on shifts at institutions.

Correlation between Perceived Health Perception, Generativity, Wisdom and Job Competency in Care Workers: The job competency of Korean care workers was a moderate positive correlation with health

perception ($r=.49, p<.001$), generativity ($r=.34, p<.001$), wisdom ($r=.47, p<.001$) (Table 2).

Table 2. Correlation between Health Perception, Generativity and Wisdom on Job Competency in Korean Care Workers

Variables	Health perception r (p)	Generativity r (p)	Wisdom r (p)	Job competency r (p)
Health perception	1			
Generativity	.43(<.001)	1		
Wisdom	.43(<.001)	.45(<.001)	1	
Job competency	.49(<.001)	.34(<.001)	.47(<.001)	1

Factors affecting Job Competency in Korean Care Workers: To find out the factors affecting the job competency of Korean care workers was conducted multiple regression analysis by the stepwise method with health perception, generativity and wisdom as independent variables and work experience and type of working agency among general characteristics. The problem of multicollinearity expected in the multiple regression analysis was 0.1 or higher with the tolerance limit of 0.533~0.785 and the variance inflation factors (VIF) was 1.274~1.877 that did not exceed the

standard of 10 or higher, so there was no problem of multicollinearity. Also, the Durbin-Watson value was 1.795, with no problem of auto correlation. The analysis showed that health perception ($\beta=.346, p<.001$) had a high influence on the job competency of Korean care workers and As it shows explanation power of 39.6%, showed that the higher the degree of health perception and wisdom and the longer of work experience, the higher the job competency is. Health perception, wisdom and work experience were the variables affecting the job competency of Korean care workers (Table 3).

Table 3. Factors affecting Job Competency in Korean Care Workers

Variables	B	SE	β	t	p
Constant	1.552	.341		4.554	<.001
Health perception	.330	.080	.346	4.138	<.001
Wisdom	.347	.082	.353	4.246	<.001
Work experience (25~60 months)	-.368	.099	-.375	-3.735	<.001
Work experience (over 61 months)	-.261	.100	-.264	-2.615	.010
R ² = .396 Adj. R ² = .375 F=18.218 p<.001					

Reference: work experience (less than 24 months)

Discussion

This study’s job competency was shown 3.79 out of 5 possible, similarly to that of Kim’s² research (3.68±0.51) on 217 in-home service care workers. These levels are merely modest, requiring improvement. Generativity was shown 2.75 out of 4 possible, also moderate and similar to that of Hong¹¹’s research

(2.70±0.42) on adults in senescence. The average age of this study’s subjects was 57.4, with the majority over age 50, whose development task should be considered generativity achievement. According to McAdams & Aubin¹⁰, an adult fosters, educates, leads and promotes a progressive spirit of next generation and attains generation of products and fruition of life beneficial to

social systems, i.e., generativity. Generativity is a drive for one's better perception of itself and its own life to help assess oneself more positively and meaningfully. People with more generativity associated resources and abilities tend to be more supportive for others and feel more responsibility for society.¹¹ Generativity is deemed the main concept to motivate in care workers' job performance who are mostly middle-aged, therefore, they should be aided with a chance of improvement.

This study found that job competency had pure correlations with health perception, generativity and wisdom, while impact factors on job competency as health perception, wisdom and work experience. Subjective perception of good health is a comprehensive self-evaluation in physical, physiological, psychological and social terms where health is the key element of every life. Generativity is also a main element of caring for others.¹¹ Wisdom is another essential element of care workers' performance as a wise man displays comprehension, communication skill, competence, interpersonal relationship and social humbleness.¹⁴ Therefore, it is always needed to consider and devise measures to improve the said concepts for enhancement of care workers' job competency. On top of that, care workers should make daily efforts to stay fit through regular check-up and to make early detection of possible disease for timely treatment and further to nurture wisdom while constantly pursuing relevant job experiences for extended knowledge and skills. There should also be institutional aids; local governments, educational institutions and practical affair institutions should exert best possible endeavors to achieve job competency improvement and quality environment formation.

Conclusions

For enhancement of care workers' job competency, daily care for health management is needed, for early detection of possible disease for timely treatment as well. They should endeavor to increase generativity, the development task of the middle-aged and to live a wise life individually. As this study finds health perception, wisdom and work experience as the main impact factors of job competency, care workers should be provided with a chance to improve their knowledge and skill for continued caring service without career disruption, assisted by job capability enhancement programs and quality environment devised by their employer institutions in consideration of the said elements, health,

wisdom and generativity.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

References

1. Statistics Korea. 2018 Elderly Statistics, http://kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode=read & aSeq=370781 & pageNo= & amSeq= & sTarget= & sTxt=
2. Kim, AR. Impacts of Care Worker's Self-efficacy and Stress-coping Ability on Job Competency: Focused on Female Care Workers providing Home Care Services in the C. Region. Master thesis, Korea Nazarene University, 2019.
3. Kim, MA. Influence of Job Stress and Perceived Health on Health Promotion Behaviors of Geriatric Hospital Nurses, Master thesis, Dongshin University, 2019.
4. Cho, WJ. An Empirical Study on Adult Perception of Health Behavior. Doctoral dissertation, Yonsei University, 1983.
5. Erikson, E. H. Identity, Youth and Crisis. New York: Norton. 1968.
6. Taylor, A. Generativity and adult development: Implications for mobilizing volunteers in support of youth. In Clary, E. G. & Rhodes, J. E.(eds.), Mobilizing Adults for Positive Youth Development, Springer. 2006, 83-100.
7. Kim, HK, Lee, NY., & Park, CH. Effects of Self-efficacy and Wisdom on Job Competency of Care Workers in Korea, Indian Journal of Public Health Research & Development, submitting, 2020.
8. Lee, SL, Cho, SH. The Development and Validity of the Korean Wisdom Scale. THE Korean Journal of Culture and Social Issues, 2012; 18(1), pp.1-26.
9. Lim, KH. A Study on Shifting Nurses' Health Conditions and Job Satisfaction, Master thesis, Hanyang University.
10. Hong, EJ. A Study on Helping Activities of Mature and Senior Age Group and Their Generativity. Doctoral dissertation, Yonsei University, 2008.
11. Kim, MH. Development and Validation of a Wisdom Scale for Korean Senior Citizens. Doctoral dissertation, Kyungsoong University, Pusan, 2014.

12. Lee, J. Learning Transfer and Job Competency of Care Workers': Focusing on Dementia job trainingprogram participants, Doctoral dissertation, Gachon University, Seongnam, 2017.
13. McAdams, DP., de St. Aubin, E. A theory of generativity and its assessment through self-report, behavioral act and narrative themes in autobiography. *Journal of Personality and Social Psychology*, 1992, 62, 1003-1015.
14. Lee, SL, Cho, SH. Counselor's Wisdom, Counseling Processes and Outcomes, *The Korean Journal of Counseling and Psychotherapy*, 2010, Vol. 22, No. 1, 71-94

Effects of Self-efficacy and Wisdom on Job Competence of Care Workers in Korea

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Abstract

Purpose: The purpose of this study was to analyze the effect that self-efficacy and wisdom on job competence in care worker in Korea.

Method: The subjects of this study were 123 care workers. The data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient and stepwise multiple regression using the SPSS Window 23.0 program.

Results: The care workers' self-efficacy scored 3.80 points out of 5 points and wisdom scored 3.63 points out of 5 points and job competence scored 3.66 points out of 5 points. The job competence of care workers was a high positive correlation with self-efficacy ($r=.53$, $p<.001$), wisdom ($r=.72$, $p<.001$). The wisdom ($\beta=.715$, $p<.001$) of care workers had a significant influence on job competence, showing a 51.1 percent explanation power.

Conclusion: The self-efficacy and wisdom of care workers showed a positive correlation with job competence, the higher the degree of self-efficacy and wisdom was found to be, the higher the job competence. Wisdom is the most influential variable on the job competence of care workers. Therefore, in order to improve the health and quality of life of the elderly who living at home by increasing the job competence of the care workers, it is necessary to provide the intervention program so that self-efficacy and wisdom can be developed. Especially, wisdom has the attribute that can be acquired through experience while living, so it is also necessary to train them to make a successful resolution in response to various problems. This study is aimed at the care workers who provide home care, so it is suggested that the study is repeated targeting the care workers who work in the hospital by expanding the institution.

Keywords: Care workers, Self-efficacy, Wisdom, Job competence.

Introduction

The medical expenses of the elderly aged 65 or older are 34.5% of the total medical expenses according to the statistics of 2013 and the medical expenses of the elderly will account for 45.6% of the total medical expenses in

2020, which is caregiving and health management for the elderly is emerged as an important national issue.¹ According to the statistical data of the elderly in 2018, The elderly aged 65 tend to increase their medical and caregiving services to 38.6% among the social concerns for their aging and In 2017, the number of welfare facilities for the elderly is 76,371, which is increasing every year and the number of elderly care facilities and day and night protection services is continuously increasing.² Among the health workforce who care for the elderly, the care workers are the primary workforce who care for the health of the elderly such as nursing and bathing in the geriatric hospitals, the care facilities

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and the home, their professional ability play significant role in managing the health of the elderly. Also, only those who have completed a specific education at an educational institution recognized by the Ministry of Health and Welfare and obtained a certificate through a qualification test may work as a care worker.

On the other hand, competence is an internal characteristic of an individual who causes effective and excellent performance by the criteria in a specific situation or job, it is defined as the total aggregate of the features, actions and ³ characteristics necessary to achieve successful job performance.⁴ Competence means the individual's performance as a result of applying what the learner has learned to work and measuring competency means measuring an individual's performance. Jang⁵ stated that the competence of the care worker who directly provides the service is a critical factor that governs the quality of service and that the environment should be developed so that he or she can acquire nursing skills with a sense of occupation. Shin⁶ defined Job competence as a whole of a given role within the organization, such as the mission and strategy that an individual seeks to perform a successful job in the enterprise or organization and such as skills, attitudes and knowledge necessary to perform. Therefore, this job competence of care workers plays an essential role in the service targeting the elderly and it is considered to be an essential factor in improving the quality of life and health preservation of the elderly. In particular, since the care workers who belong to the visiting care center visits the elderly's home and takes care of the elderly almost alone, it is thought that the level of individual competence plays a significant role in the health and quality of life of the elderly.

Once we analyze the factors that are relevant to Job competence so far, we can take into account the variable of self-efficacy and wisdom. When care workers perform caring, they need assurance and judgment of their actions in dealing with complex situations. Self-efficacy is the primary source of action and is caused by subjective judgments in repeated tasks that are truly self-assured of their ability and this can be enhanced by the development of active ability to react and expertise and if this process is repeated, subjective judgment is likely to lead to objective judgments⁷, so the self-efficiency is judged to have a positive effect on the job competence of care workers who take care of the elderly in vulnerable situations and also contributes to the improvement of job competence volume.

Also, Wisdom is the core of human development⁸ because it is the work of the mind to discern the reason or good or evil of things and positive qualities such as self-integration and maturity, judgment and interpersonal skills and understanding of life. Wisdom can be said as a mature mental activity that solves various problems in life through a balanced integration of cognitive, emotional, mental, moral and relational factors. In the case of a wise care workers, it is thought that they will be able to perform the job well if they take care of the elderly with such as a positive attitude, a sympathetic interpersonal and a perspective.

Therefore, in this study, we intend to use that targeted on care workers to identify the extent of their job competence and analyze the extent to which their effectiveness and wisdom affect the job competence of the care workers as a baseline data for developing an arbitration program to increase the amount of job competence of care workers.

Method

Subjects: The subjects of this study were 123 care workers in charge of visiting care centers located in Dong-gu, Jung-gu and Seo-gu, D city. They are adult men and women who understood the purpose of the study and voluntarily expressed their willingness to participate and provided written consent. The study subjects were those with at least six months of experience as care workers. The number of samples was calculated using the G-power 3.1.9.4 program. The number of samples required to maintain the effect size .15, significance level .05, power .90 and four predictors was 108 people and the subjects were 130, considering a 20% dropout rate.

Instruments:

Self-efficacy: The tool that the general Self-efficacy scale developed by Chen, Gully, & Eden⁹ then adapted by Noh¹⁰ was used. It is a 5-point Likert scale with 8 questions in total and is from 'Strongly disagree' of 1point to 'Strongly agree' of 5points, which means that the higher the score is, the higher the degree of self-efficacy. The reliability in the study of Noh¹⁰ was Cronbach's $\alpha=.83$ and this study was .85

Wisdom: KMWS developed by Kim¹¹ was used. In total, 43 questions consist of 4 sub-regions as 16 questions for cognitive competence, 11 questions for purify and balance, 10 questions for positive attitudes of life and 6 questions for empathetic interpersonal relations. By the

scale of from ‘Strongly disagree’ of 1 point to ‘Strongly agree’ of 5 points, we could see that the higher the score, the higher the degree of wisdom is. The reliability at the time of development was Chronbach’s $\alpha=.93$ and this study was .95.

Job competence: We use the tools from National Occupational Capacity Standards with (NCS) adapted by Lee to suit for care workers. In total, 24 questions consisted of sub-regions as 4 questions for communication competence, 3 questions for problem-solving competence, 4 questions for self-development competence, 4 questions for interpersonal competence, three questions for technical competence and 6 questions for vocational ethics competence. By the scale of from ‘Strongly disagree’ of 1point to ‘Strongly agree’ of 5points, we could see that the higher the score, the higher the degree of job competence is. The reliability at the time of development was Chronbach’s $\alpha=.85$ and this study was .93.

Data collection: Researchers were visited four visiting care centers located in Dong-gu, Jung-gu and Seo-gu in D city in person to explain the purpose and method of research to the Director of the Center and got permission, then explain the purpose of the study to the care workers and complete the questionnaire after obtaining written consent. Use time to complete the questionnaire was about 15 to 20 minutes.

Ethical consideration: Approval was acquired by the ethics committee of K University on the objective, methodology and protection of rights of study participants (KNU_IRB_2019_66). During the study period the guidelines on ethical studies were observed.

Data analysis: Using the SPSS/WIN 23.0 program, the general characteristics and variables were analyzed for frequency, percentage, mean and standard deviation. The difference in job competence across different general characteristics was analyzed using a t-test, ANOVA and Scheffe test. The correlation between the subjects’ variables was analyzed using Pearson’s correlation coefficients. Multiple regression analysis was conducted to analyze the factors affecting the subjects’ job competence.

Results

General Characteristics of Care Workers: The average age of 123 nursing care providers was 56.13

and 39.8 % (49 people) of them was over 60 years old as the most significant number and most of them 83.7% (103 people) was female and for the graduation level was mostly high school graduates as 64.2 %(79 people) . The average working experience of care workers was 41 months, with 70.6% (72 people) groups of less than three years as the most significant number. The group that said they had no experience in receiving remuneration or professional education within the past year as the most significant number 44.7 percent (55 people) and in total income accounted, 510,000 won ~ 1 million won was more than the majority as 61.8 % (76 persons). Service institutions were mostly cases of visiting care performing as 87.8 % (108 people).

Degree of Self-efficacy, Wisdom and Job Competence in Care Workers: The care workers’ self-efficacy scored 3.80 points out of 5 points and wisdom scored 3.63 points out of 5 points and job competence scored 3.66 points out of 5 points (Table 1)

Table 1. Degree of Self-efficacy, Wisdom and Job Competence in Care Workers

Item	M±SD	Range
Self-efficacy	3.80±0.52	1~5
Wisdom	3.63±0.44	1~5
Job competence	3.66±0.47	1~5

Difference in Job Competence across General Characteristics: Looking at the difference in job competence according to general characteristics of care workers was, it has shown that there was no difference in the degree of the job competence in all characteristics of age, gender, education, work experience, In-service education or professional education, total income and the type of service institution.

Correlation between Self-efficacy, Wisdom and Job Competence in Care Workers: The self-efficacy and wisdom ($r=.70, p<.001$) of the care workers showed a high positive correlation and the self-efficacy and job competence ($r=.53, p<.001$) and the wisdom and job competence ($r=.72, p<.001$) also showed a high positive correlation. In other words, the higher the degree of self-efficacy of care workers, the higher the degree of wisdom and the higher the degree of self-efficacy or the higher the degree of wisdom was found to be, the higher the degree of job competence (Table 2).

Table 2. Correlation between Self-efficacy, Wisdom and Job Competence in Care Workers

Variables	Self-efficacy r (p)	Wisdom r (p)	Job competence r (p)
Self-efficacy	1		
Wisdom	.70(<.001)	1	
Job competence	.53(<.001)	.72(<.001)	1

Factors affecting Job Competence in Care Workers: To find out the factors affecting the job competence of care workers was conducted multiple regression analysis by the stepwise method with self-efficacy and wisdom as independent variables. The problem of multicollinearity expected in the multiple regression analysis was 0.1 or higher with the tolerance limit of 1.000 and the variance inflation factors (VIF) was 1.000 that did not exceed the standard of 10 or

higher, so there was no problem of multicollinearity. Also, the Durbin-Watson value was 1.341, with no problem of auto correlation. The analysis showed that wisdom($\beta=.715$, $p<.001$) had a high influence on the job competence of the care workers and As it shows explanation power of 51.1%, showed that the higher the degree of wisdom, the higher the job competence is and wisdom was the only variable affecting the job competence of the care workers.

Table 3. Factors affecting Job Competence in Care Workers

Variables	B	SE	β	t	p
Constant	.878	.249		3.526	.001
Wisdom	.765	.068	.715	11.243	<.001
R ² =.511 Adj. R ² =.507 F=126.408 p<.001					

Discussion

This study analyzes the relationship between self-efficacy and wisdom and to identify the influential factors of job competency in order to provide high-quality care services on visiting the elderly’s home by using their job competency targeted to care workers belonging to the visiting care center.

According to the study, Most of the care workers were middle-aged women. That is similar to Lee13’s study result. Middle-Aged women cover most of the care worker jobs. As their level of job competency is moderate, they need continued and planned training for enhanced job competency. The care workers who are visiting the home must use their competence to provide care services without the supervision of the medical practitioner, so they should seek to improve job competence through training. Since the job training with inappropriate timing and duration act as an obstructive factor to care workers, it should be considered and provided the job training.

As self-efficacy can increase performance by making efforts, challenges and actions as the primary source of behavior, so it is necessary to consider for job competence. Also, care workers should be able to demonstrate their job competence through efforts to increase wisdom, as wisdom, which is the result of the study targeting the counselors, was an important factor affecting the counseling process and performance. Wisdom people are enhanced in their ability to accept life and build relationships with others from a high problem-solving ability and insight, so it becomes a positively necessary factor for care workers.

Therefore, it is necessary to provide job education programs considering the variables of self-efficacy and wisdom of care workers.

Conclusions

Self-efficacy and wisdom of care workers had a positive correlation with job competence, the factor affecting the job competence of care workers was

wisdom, which had a significant effect. Therefore, should be developed and applied to the caring arbitration programs that encourage caregivers to increase their self-efficacy, which is the confidence that they can do and to exercise their wisdom to pay more attention to their duties and solve various problems.

Thereby it can bring about the effect of the quality of life and health recovery of the elderly who are provided with care at home by improving the competencies of care workers. In the future, it proposes that the study is repeated targeting the care workers working in hospitals.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

References

1. Health Insurance Review & Assessment Service. 2013 Health Insurance Fees Statistics. Seoul: Health Insurance Review & Assessment Service, 2013.
2. Korean National Statistics office. The Elderly Person Statistics. 2018. <http://kostat.go.kr>
3. Spencer, L., & Spencer, S. *Competence at Work: Models for Superior Performance*. NY: John Wiley & Sons, 1993.
4. Abraham, SE., Karns, LA., Shaw, K., & Mena, MA. Managerial Competencies and the Managerial Performance Appraisal Process. *Journal of Management Development*, 2001; 20(9-10): 842-852.
5. Jang, YJ., A Study on the Determinants of Training Transfer on the Education and Training in Firms. Master thesis, Ewha Womans University, Seoul, 2002.
6. Shin, SH. A Study on the Influence of Servant Leadership on the Job Attitude of Employees: Focusing on the Moderating Effect of the Emotional Intelligence and the Managerial Competency of the Leader. Doctoral dissertation, Kyung Hee University, Seoul, 2011.
7. Kim, HH. The Effect of Geriatric Care helper's Knowledge of Dementia on Job stress, Self-efficiency and Care Fulfillment. Doctoral dissertation, Daegu Haany University, Daegu, 2014.
8. Ardelt, M. Antecedents and Effects of Wisdom in old age: A Longitudinal Perspective on Aging Well. *Research on Aging*, 2000; 22, pp. 360-394.
9. Chen G. Gully MS. Eden D. Validation of a New general Self-efficacy Scale. *Organizational Research Method*. 2001; 4(1): 62-83.
10. Noh, JH. Why should I be thankful? The Effects of Gratitude on Well-being under the Stress. Unpublished master's thesis. Ajou University. Suwon, 2005
11. Kim, MH. Development and Validation of a Wisdom Scale for Korean Senior Citizens. Doctoral dissertation, Kyungsung University, Pusan, 2014.
12. Lee, J. Learning Transfer and Job Competence of Care Workers': Focusing on Dementia job training program participants, Doctoral dissertation, Gachon University, Seongnam, 2017.
13. Lee, YJ. Study on Job Training Empowerment Measures for Care Givers. *Journal of Welfare for Aged*, 2013; 61, pp.339-358.
14. Kim, AR. Impacts of Care Worker's Self-efficacy and Stress-coping Ability on Job Competency: Focused on Female Care Workers providing Home Care Services in the C. Region. . Master thesis, Korea Nazarene University, Cheonan, 2019.
15. Lee, SL, Cho, SH. Counselor's Wisdom, Counseling Processes and Outcomes. *The Korean Journal of Counseling and Psychotherapy*, 2010; 22,1, pp. 71-94.

Detection for Virulence Factors of Amoebic Dysentery in Bloody Diarrheal Children Under 7 Years

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Abstract

Background: Amoebiasis, or amoebic dysentery, is a term used to describe an infection caused by the protozoan *Entamoebahistolytica*.

Aim: Identify *E.histolytica* virulence factors (amoebapore and cysteine proteinase) that play a critical role in pathogenesis of amoebic dysentery by using PCR results.

Method: Detect the major virulence factors of the intestinal parasite *E.histolytica* on Stool samples were collected from 56 samples by using PCR technique and. The DNA sequencing analysis was performed for confirmative genetic identification of some local *Entamoebahistolytica*.

Result: To detect the major virulence factors (V.F.) (cysteine proteinase and amoebapore) of *E.histolytica*, PCR technique was conducted, by using specific primers for *E.histolytica*, a 56 samples were positive to *E.histolytica* using PCR technique was diagnosed previously, the result showed that 54 stool samples were bloody & positive to virulence factor cysteine proteinase, and 37 stool samples were bloody & 53 samples were positive to virulence factor Amoeba pore.

Conclusion: Cysteine proteinase and Amoebaporesis the most important virulence factors in *E.histolytica* that play a critical role in the mediated intestinal cell lysis.

Keywords: Bloody diarrheal; Child; amoebic dysentery; Health.

Introduction

E.histolytica is protozoan parasite that causes amoebic dysentery in humans. the infection leads to severe diarrheal disease may be causes colitis in children. Worldwide, amebiasis remains a significant cause of morbidity and mortality in Iraq¹.

According to World Health Organization found the amebiasis is the second or third most frequent parasitic

disease, exceeded only by malaria and schistosomiasis; and contributing towards the high global burden of diarrhea, notably in regions with low economic development and settings with poor sanitation^{2,3}.

The invasive intestinal Amoebiasis remains for several weeks of cramping, abdominal pain, bloody diarrhea and weight loss⁴.

The symptoms of the disease depend on multiple virulence factors among *E. histolytica* presence of these factors has been linked to be risky for complicated signs⁵.

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Materials and Method

56 Stool samples were isolated from bloody diarrheal children & were positive for *E. histolytica* causing PCR previously (from the beginning of October 2018 till the

end of January 2019) the samples collected from (Al-Hamza general hospital, AL-Sedeer hospital and private clinic) in Al- Diwaniya governorate in Iraq country . PCR was used to detect two proteins (amoebapore C and cysteine proteinase) as a major virulence factors of *E.histolytica* and The DNA sequencing analysis was performed for confirmative genetic identification of some local *Entamoebahistolytica* isolate No.1 - No.6 based on small subunit ribosomal RNA gene and identified the

genetic variation between *Entamoebahistolytica* isolates and NCBI-Genbank *Entamoebahistolytica* isolates.

Molecular Method: The molecular method conventional PCR was also used in the present study to detection the DNA of *Entamoebahistolytica* in stool samples . The Positive result of conventional PCR was 56 sample as shown in Figure (1) .

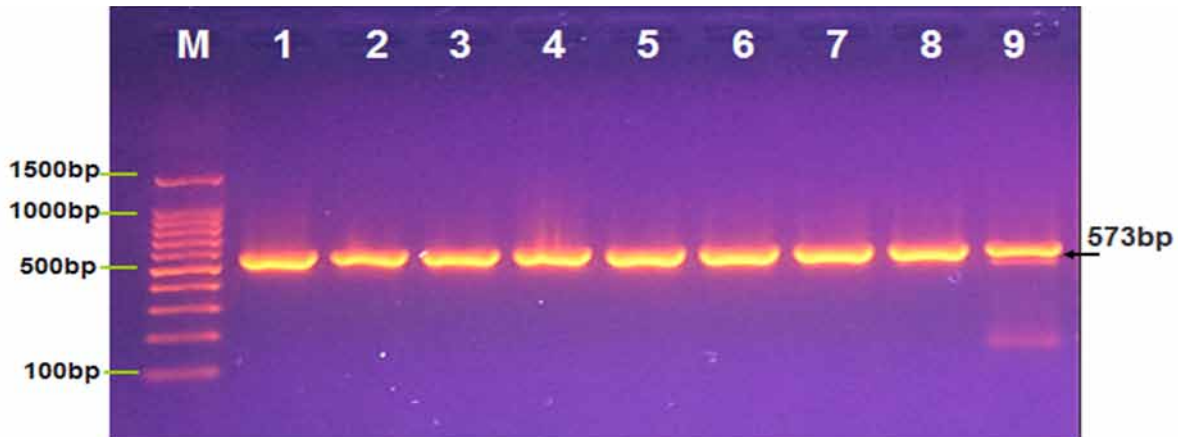


Figure (1): Agarose gel electrophoresis image that showed PCR product analysis for 18S ribosomal RNA gene in *Entamoebahistolytica* isolates. M (Marker ladder 1500-100bp). Lane (1-7) some positive samples at 573bp product size.

The prevalence rate of virulence factors Amoeba pore and Cystein proteinase among children with diarrhea results shows Amoeba pore was seen in 53 (94.6 %), whereas, Cystein proteinase was seen in 54 (96.4 %) of patients.

In the present study the amplified DNA showed that the amoebapore C has (928 bp) in 53 samples, Figure (2).

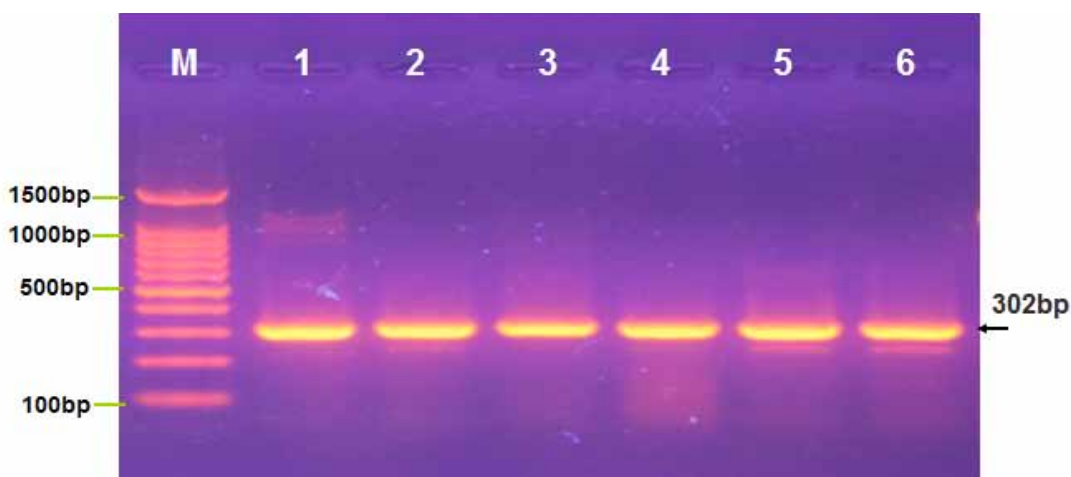


Figure (2): Agarose gel electrophoresis image that showed PCR product analysis for Amoebapore C gene in *Entamoebahistolytica* isolates. M (Marker ladder 1500-100bp). Lane (1-6) some positive samples at 302bp product size.

The results of this estimation revealed that the amplified DNA has (885 bp) for cysteine proteinase in 54 samples, Figure (3).

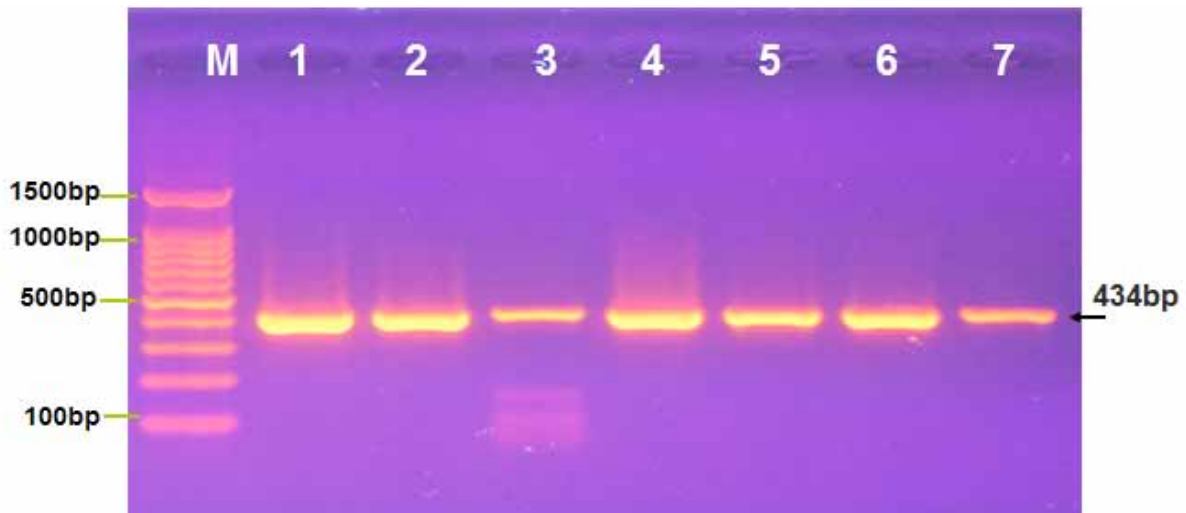


Figure 3: Agarose gel electrophoresis image that showed PCR product analysis for Cysteine protease gene in Entamoeba histolytica isolates. M (Marker ladder 1500-100bp). Lane (1-7) some positive samples at 434bp product size. Amplification Product 900.

The virulence factor Amoeba pore was also more frequently observed in children with bloody diarrhea than children with non-bloody diarrhea, 69.8 % versus 30.2 %, respectively ($P = 0.001$). This result may be due to that amoeba pores produced by *E. histolytica* trophozoite play an important role in formation of intestinal ulcer because it cause tissue lysis and flask shape ulcer. *E. histolytica* enzyme insert the trophozoite into epithelial cell of large intestine causes host cell membrane more permeability and cell dying. This agrees with Mirelman et al⁶; Bracha et al⁷; Zhang et al.,⁸.

The virulence factor Cystein proteinase was also more frequently observed in children with bloody diarrhea than children with non bloody diarrhea, 54(100 %) versus 0 (0%), respectively ($P = 0.001$), as shown in table (1). The role of this virulence factors (cysteine proteinase & Amoeba pore) (which is the most important V.F. secreted by *E. histolytica*) the trophozoite of *E. histolytica* can invade the epithelial cell of host cell & lysis of junction between these cell then killed & engulf the debris & erythrocytes, the trophozoite can travel through the portal circulation to the liver & produce liver abscesses by making a breach to the mucosal barrier and this lead to life threatening if not treated^{9,10}.

Table 1: Association between virulence factor Cystein proteinase and Type of diarrhea

Type of diarrhea	Positive n = 54	Negative n = 2	P
Bloody, n (%)	54 (100.0 %)	0 (0.0 %)	< 0.001 ¥ HS
Non bloody, n (%)	0 (0.0 %)	0 (0.0 %)	

DNA Sequence results: The DNA sequencing analysis was performed for confirmative genetic identification of some local Entamoeba histolytica isolate No.1 - No.6 based on small subunit ribosomal RNA gene and identified the genetic variation

between Entamoeba histolytica isolates and NCBI-Genbank Entamoeba histolytica isolates.

The DNA sequencing analysis results were showed that the local Entamoeba histolytica Human

isolates appeared highly genetic confirmation into NCBI-Genbank Entamoebahistolytica isolates with less genetic variation between Entamoebahistolytica isolates according to phylogenetic tree analysis and NCBI-BLAST Homology Sequence identity (%).

The local Entamoebahistolytica isolate No.1 - No.6 were showed closed related to NCBI-BLAST Entamoebahistolytica isolate (AB845672.1) at total genetic changes (0.01-0.004%)

The NCBI-BLAST Homology Sequence identity

(%) between local Entamoebahistolytica Human isolates and NCBI-BLAST submitted Entamoebahistolytica isolates were show (98-99%) as showed in table (2). The genetic identified local Entamoebahistolytica Human isolates (No.1-No.6) were submitted in NCBI-Genbank for accession numbers (MN227232.1-MN227237.1) as showed in table (2).

The local Entamoebahistolytica Human isolates were submitted in Genbank database as (Entamoebahistolytica isolate IQ-D small subunit ribosomal RNA gene, partial sequence) with their nucleotide sequence,

Table (4) the NCBI-BLAST Homology Sequence identity (%) between local Entamoebahistolytica Human isolates and NCBI-BLAST submitted Entamoebahistolytica isolates:

Entamoebahistolytica isolate No.	Genbank Accession number	NCBI-BLAST Homology Sequence identity (%)		
		Identical Entamoebahistolytica	Genbank Accession number	Identity (%)
E.histolytica isolate No.1	MN227232.1	Entamoebahistolytica	AB845672.1	98.52%
E.histolytica isolate No.2	MN227233.1	Entamoebahistolytica	AB845672.1	99.01%
E.histolytica isolate No.3	MN227234.1	Entamoebahistolytica	AB845672.1	98.52%
E.histolytica isolate No.4	MN227235.1	Entamoebahistolytica	AB845672.1	98.52%
E.histolytica isolate No.5	MN22723261	Entamoebahistolytica	AB845672.1	98.52%
E.histolytica isolate No.6	MN227237.1	Entamoebahistolytica	AB845672.1	98.07%

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

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References

- Shirley, DT; Farr, L; Watanabe, K; Moonah, S “A Review of the Global Burden, New Diagnostics and Current Therapeutics for Amebiasis”. Open Forum Infectious Diseases. (2018). 5 (7): ofy161. doi:10.1093/ofid/ofy161. PMC 6055529. PMID 30046644.
- World Health Organization Deworming for health and development. Report of the third global meeting of the partners for parasitic control. (2018). WHO/CDS/CPE/PVC/2005.14, World Health Organization, Geneva, 2005. Available from: http://apps.who.int/iris/bitstream/10665/69005/1/WHO_CDS_CPE_PVC_2005.14.pdf. Accessed in (Apr 11).
- Santos FL, Gonçalves M de S, Soares NM Validation and utilization of PCR for differential diagnosis and prevalence determination of Entamoebahistolytica/ Entamoebadisparin Salvador City, Brazil. Braz J Infect Dis.;(2011).15(2):119-25
- Haque R., Huston C.D., Hughes M., Houpt E. and Petri W.A. Amebiasis,” New England Journal of Medicine, (2003) 348, 1565–1573.
- Bernin H., Marggraff, C. Jacobs, T. et al., “Immune markers characteristic for asymptotically infected and diseased Entamoebahistolytica individuals and their relation to sex,” BMC Infectious Diseases, (2014) 14, 1: doi: 10.1186/s12879-014-0621-1
- Mirelman, D.; Anbar, M.; Nuchamowitz, Y.; and Bracha, R. Epigenetic silencing of gene expression in Entamoebahistolytica. Arch Med Res. (2006);37(2):226-33

7. Bracha R.; Nuchamowitz Y.; Leippe M.; Mirelman D. Antisense inhibition of amoebapore expression in *Entamoeba histolytica* causes a decrease in amoebic virulence. *Mol. Microbiol.* (1999). 34:463–472.
8. Zhang, X.; Zhang, Z., Alexander, D.; Bracha, R.; Mirelman, D.; and Stanley, S.L.Jr. Expression of amoebapores is required for full expression of *Entamoeba histolytica* virulence in amoebic liver abscess but is not necessary for the induction of inflammation or tissue damage in amoebic Colitis. *Infection and immunity.* (2004). 72(2): 678–683.
9. Prakash V. and Bhimji SS., “Amoebic Liver. StatPearls Publishing,”(2017). <https://www.ncbi.nlm.nih.gov/books/NBK430832>
10. Wuerz T., Kane J. B, Boggild, A. K .and etal. “A Review of Amoebic Liver Abscess for Clinicians in a Nonendemic Setting,” *Canadian Journal of Gastroenterology & Hepatology*, (2012). 26, 10: 729–733.

Effects of Self-efficacy, Health Perception, Social Support and Perceived Disability on Health Promoting Behavior of Nursing Students

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Abstract

Purpose: This study is a descriptive survey to investigate the relationship between health promoting behaviors and self-efficacy, health perception, social support and perceived disability and to identify factors affecting health promoting behaviors among nursing students.

Method: With the permission of the Education Committee of the Department of a University, 249 nursing college students explained the purpose and method of research and collected data with written consent. The data were analyzed by the t-test, ANOVA and Pearson's correlation and Stepwise Multiple Regression using the SPSS 24.0 program.

Results: The health promoting behaviors of the subjects were a positive correlation at the statically significant level at the self-efficacy ($r=.73$, $p<.001$), health perception ($r=.50$, $p<.001$), Social support ($r=.62$, $p<.001$) and a negative correlation at the perceived disability ($r=-.29$ $p<.001$). Regression analysis showed that health condition ($\beta =-.144$, $p <.001$), health concern ($\beta=-.147$ $p<.001$), self-efficacy ($\beta=.523$, $p<.001$) and social support ($\beta=.199$, $p<.001$) explained 62.0% of health promoting behaviors and health conditions, health concern, self-efficacy and social support were the main factors influencing health promoting behaviors of nursing student.

Conclusion: Through the result of this study, it is necessary to develop programs that allow nursing students to observe their health conditions and raise their interest in health and promote self-efficacy and social support.

Keywords: *Nursing students, Health promoting behaviors, Self-efficacy, Social support, Perceived disability.*

Introduction

With the growing interest in health, health care method are emerging to improve health levels through changes in personal lifestyles and living environments, rather than health care which is practiced after getting a disease. The

WHO¹, which calls the health care method as a health promoting behaviors, defines it as a health promoting behaviors which improves the health level of individuals and society that needs to be improved and maintained and maximizes health potential. Health promoting behaviors are affected by various sub-components, such as personal physiological, psychological, sociocultural factors, cognitive factors, previous related behaviors and behavior intentions. Specific health promoting behaviors include anti-smoking, anti-alcoholism, exercise, diet and stress management and such actions require a community-oriented and systematic approach, along with the legal and institutional support of the state,

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rather than a personal approach to effectively operate health promotion.

The results of the study using the health promoting behavior model of Pender² shows that the variables of self-efficacy, health perception, perceived disability and social support were highly relevant with health promoting behaviors and influencing factors. Self-efficacy has been shown to be a main predictor and the most important factor for motivating health promotion. Health perception is said to have a significant impact on physical activity as it forms the basis for health promoting behaviors.³ The study also found that perceived disability is a variable that affects health promoting behaviors⁴ and the lower perceived disability of behavior, the higher level of health promoting behaviors.⁵ The higher level of social support and relationship satisfaction was reported to have a positive effect on the practice of health promoting behaviors.⁶

Since nursing college students are prospective nurses, it is important to establish proper health promoting behaviors for nursing students because they will be responsible for education and role models for improving health promotion activities. However, health promoting behaviors are fundamentally not bounded and multidimensional, so it is necessary to study whether the health of college students has a significant effect on college life or how it is effective to help them improve their health. Although there are many papers that investigate health-related variables for nursing college students, comprehensive studies on factors such as self-efficacy, health perception, perceived disability and social support, which have been shown to significantly affect health promoting behavior, are not sufficient, therefore these important factors are used to help nursing college students establish health promoting behaviors and to provide basic data for developing health promotion programs.

Method

Subjects: The subjects of this study were 250 nursing college students in 2nd, 3rd and 4th grades who majored in nursing at H University located in H province, Cheongnam in Korea. The number of participants was calculated by setting the level of 0.05 for significance, power of 0.95, effect size of 0.15 and 14 predictors using the G*Power 3.1.9.2 program and the number of samples calculated was 194 among 250 subjects which were randomly selected considering the dropout rate of

20%. A total of 249 parts (99%) of 250 questionnaires were used as final analysis data, except for one of the unfaithful responses. A total of 249 copies were used as the final analysis data.

Instruments: Health promoting behavior: Measured by the health-promoting lifestyle measuring tool of Korean (adults) developed by Park⁷. It is a 5point Likert scale with total of 60 questions and indicates that the higher the score, the higher the level of health promoting behavior. The reliability at the time of development was Cronbach's $\alpha=0.92$ and the reliability of this study is .94.

Self-efficacy: Measured by a tool which was developed by Sherer and Maddux⁸ and supplemented by Lee⁹. It is a 5point Likert scale with total of 17 questions and indicates that the higher the score, the higher the level of self-efficacy. The reliability at the time of development was Cronbach's $\alpha=0.85$ and the reliability of this study is .95.

Health perception: Measured by a tool which was developed by Ware¹⁰ and supplemented by Lee¹⁰. It is 4point Likert scale with total of 20 questions and indicates that the higher the score, the higher the level of health perception. The reliability at the time of development was Cronbach's $\alpha=0.72$ and the reliability of this study is .74.

Perceived disability: Measured by a tool which was developed by Moon¹¹ as a health belief measurement tool and modified by Seo.¹² It is a 4point Likert scale with total of 10 questions and indicates that the higher the score, the higher the level of perceived disability. The reliability at the time of development was Cronbach's $\alpha=0.73$ and the reliability of this study is .86.

Social support: Measured by a tool which was developed by Park¹³ It is a 5point Likert scale with total of 18 questions and 1 point of 'never', 5 point of 'always' indicates that the higher the score, the higher the level of social support. The reliability at the time of development was Cronbach's $\alpha=0.95$ and the reliability of this study is .96.

Data Collection: This study was approved by the Board of Education of H College and published the research contents on the bulletin board of the nursing department between September and November 2019 and distributed questionnaires in groups at certain times and places. The research was collected after a fully trained assistant obtained written consent from the candidate

and completed the questionnaire in a written manner.

Ethical Consideration: Approved by the K University Institutional Bioethics Committee (KNU_IRB_2019-58) for this study. The survey was prepared with voluntary participation, there were no disadvantages of discontinuing the questionnaire and that the data would be processed anonymously. The information collected was used for three years for the study and promised to be stored in lockers.

Date Analysis: Using the SPSS/WIN 24.0 program, the general characteristics of the subjects were analyzed as frequency and percentages, the difference in health promoting behavior according to the general characteristics was t-test, ANOVA and Scheffe test, variables was mean and standard deviation and the correlation between variables was analyzed as Pearson's correlation coefficient and the influence factor analysis was stepwise multiple regression.

Results

General Characteristics of Subjects: The sex of the subjects was 214 (85.9%) of females, most of

them were 222 (89.2%) under 29 years of age and 138 (55.4%) of third graders were more than half. 171 people (68.7%) did not have a religion, 166 people (66.7%) were drinking alcohol and 230 people (92.4%) did not smoke and the academic grades of 161 people (64.7%) was in middle. The health condition answered their condition was moderate was 153 (61.4%), 142 (57.0%) were interested in their health and 184 (73.9%) responded that the economic status was moderate.

Difference in Health Promoting Behavior across General Characteristics: Gender ($t=-1.97, p=.049$), age ($t=-2.58, p=.010$), grade ($t=3.16, p=.044$) and religious status ($t=2.45, p=.015$), drinking ($t=.75, p=.454$), smoking ($t=-.921, p=.358$), grades ($t=5.05, p=.007$), Health condition ($t=25.35, p<.001$), health concern ($t=18.80, p<.001$) and economic level ($t=9.04, p<.001$) showed differences in health promoting behavior. Male students, those in their 30s and over and those in a religious group, those who reported middle grades had higher levels of health promoting behavior. It is showed that the higher or moderate health condition, health concern and economic status tend to do health promoting behaviors (Table 1).

Table 1: Difference in Health Promoting Behavior across General Characteristics

Characteristics	Categories	Number	Frequency (%)	Mean±SD	Health promoting behavior t or F(p) Scheffe test
Sex	Female	214	85.9	3.19±.52	-1.97(.049)
	Male	35	14.1	3.38±.48	
Age	29 years old or younger	222	89.2	3.19±.52	-2.58(.010)
	30 years old or older	27	10.8	3.46±.41	
Grade	Second grader a	79	31.7	3.29±.49	3.16(.044)
	Third grader b	138	55.4	3.22±.53	a>c
	Fourth grader c	32	12.9	3.02±.48	
Religion	Yes	78	31.3	3.34±.50	2.45(.015)
	No	171	68.7	3.16±.52	
Academic grade	High a	29	11.6	3.27±.48	5.1(.007)
	Middle b	161	64.7	3.28±.51	-
	Low c	59	23.7	3.03±.53	
Health condition	Good a	56	22.5	3.56±.46	25.35(<.001)
	Moderate b	153	61.4	3.18±.45	a>b>c
	Bad c	40	16.1	2.88±.56	
Health concern	High a	90	36.1	3.42±.47	18.80(<.001)
	Middle b	142	57.0	3.15±.48	a,b>c
	Low c	17	6.8	2.69±.54	
Economic status	High a	18	7.2	3.38±.44	9.04(<.001)
	Middle b	184	73.9	3.27±.48	a,b>c
	Low c	47	18.9	2.94±.59	

Health Promoting Behavior, Social Support, Self-efficacy, Health Perception and Perceived Disability: The average score of health promoting behavior was $3.22 \pm .52$ out of 5 points, self-efficacy was 3.55 ± 0.73 out of 5 points, health perception was 2.73 ± 0.33 out of 4 points and social support 3.82 ± 0.66 out of 5 points. The perceived disability score was 2.08 ± 0.55 out of 4 points.

Correlation between Social Support, Self-efficacy, Health Perception, Perceived Disability and Health Promoting Behavior: Health promoting behaviors were positive correlation in statistically significant with self-efficacy ($r=.73, p<.001$), health perception ($r=.50, p<.001$), social support ($r=.62, p<.001$). There was negative correlation with perceived disability ($r=-.29, p<.001$) (Table 2).

Table 2: Correlation between Related variables and Health Promoting Behavior

Variables	Self-efficacy r (p)	Health perception r (p)	Social support r (p)	Perceived disability r (p)
Health promoting behavior	.73(<.001)	.50(<.001)	.62(<.001)	-.29(<.001)

Factors affecting Health Promoting Behavior: In order to identify factors affecting the health promoting behavior of the subject, significant variables among the general characteristics were piled up as covariates and multiple regression analyses were performed in a step-by-step manner, including independent variables. In the regression analysis, there was no autocorrelation (Dubin-Watson=1.94) and the problem of multicollinearity was the tolerance limit -.915 was more than 0.1 and the VIF

was not more 1.09 to 1.78 under 10, so there was no problem.

The regression model for health promoting behavior was significant and explanator power was 62.0%. the health status ($\beta=-.144, p<.001$), health concern ($\beta=-.147, p<.001$), self-efficacy ($\beta=.523, p<.001$) and social support ($\beta=.199, p<.001$) was a significant factor in health promoting behavior (Table 3).

Table 3: Factors affecting Health Promoting Behavior of Subjects

Variables	B	SE	β	t	p
A constant	1.75	.202	8.690	.000	
Health condition	-.121	.036	-.144	-3.346	.001
Health concern	-.131	.037	-.147	-3.562	<.001
Self-efficacy	.372	.037	.523	10.120	<.001
Social support	.158	.042	.199	3.789	<.001
R=.788 R ² =.620 Adj. R ² =.614 F=99.63 p<.001					

Discussion

The health promoting behavior of the subjects was 3.22 out of 5 points, which was higher than 2.71 of Park & Kim¹⁴ and lower than 3.28 of Kim & Yoon¹⁵. The health promoting behaviors of nursing college students need to be guided to live up to the point with health promoting behaviors continue to be moderate.

Health promoting behavior according to general characteristics showed significant differences in gender, age, grade, religion, academic grade, health status, health interest and economic status. Since men have higher health promoting behavior than women, it is necessary to encourage them to increase their interest in women. Age is under 29 years old and higher grades have lower health promoting behavior, so it is necessary to give

more attention to them. The health condition and health-related group showed better health promoting behavior than the lower group. A study in Baek et al.¹⁶ found that groups with higher health conditions and higher health concerns performed better than those with lower health conditions, consistent with the results of a study in Kim, Kim and & Park¹⁷ that showed that the better health conditions, the more health importance is perceived, it tends to do actions such as health promoting behaviors. Therefore, it would be desirable to increase interest in health for nursing college students to maintain good health.

There was a significant correlation between the health promoting behavior, self-efficacy, health perception, social support and perceived disability of nursing college students and the most descriptive factors affecting health promoting behavior were self-efficacy, accounting for 52% of the total. These results are higher than 23.5% for them¹⁷ and 23.9% for Park & Kim.¹⁵ Since self-efficacy is believed to be able to successfully perform the necessary actions to achieve the desired results, it is necessary to develop programs that enhance the ability to communicate with health-related beliefs to improve the self-efficacy of nursing college students. Health perception was recognized at a normal level and was a correlated with influenced by health promoting behavior. These results were similar to those of Hong³ with an average of 3.42±.66 points. Nursing college students who are interested in health and maintain a steady state of health need to be encouraged to take good care of their health so that they can recognize their health as well as their patients in the future. Social support was also a main factor in health promoting behavior. The study by them¹⁷ also showed high correlation with health promoting behavior, which is consistent with the results of this study. It is also advisable to establish a support group of family, peers and experts in relation to health in order to enhance the practice of health promoting behavior for nursing college students.

On the other hand, perceived disability has a negative relationship with health promoting behavior, so we should try to eliminate the uncomfortable environment that makes us avoid health promoting behaviors and create conditions for active health promotion.

Conclusions

The purpose of this study was to identify factors affecting health promoting behavior for nursing college

students. Since the health promoting behavior of the subjects shows moderate values, the self-efficacy, health perception and social support should be considered and ongoing efforts and should be made to reduce health-related obstacles to better conduct health promoting behaviors. The higher the self-efficacy, health perception and social support of nursing students, the lower the perception of disability show the higher health promoting behavior so it is necessary to be included in the study. Factors affecting the health promoting behavior of nursing students are health conditions, health concerns, self-efficacy and social support, so that the health conditions are recognized well during everyday life and programs should be prepared to increase self-efficiency for students. It is also necessary to develop a well-developed support system to recognize that it has social support.

Since the subjects who were participated in this study are the future nurses, it is desirable to prepare policies and systems so that students can increase their health-promoting behaviors and implement them in the middle of their daily lives. In addition, research is also needed on the remaining factors that affect the health promoting behavior of nursing students.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

References

1. WHO. Global Health Observatory: Risk Factor, 2006.
2. Pender. NJ. Health promotion in nursing practice (3rd eds.). Norwalk, Conn: Appleton & Lange. Pender. N.J.1996.
3. Hong SH. A Convergence Study on Health Promotion Behavior of Nursing and Normal University Students The Korea Convergence Society, 2018,9(6), 339-346.
4. Kim HK. Health Promotion Behavior and Influence Factors of University Students Using Pender Models Journal of Women's Health Nursing. 2006, 12(2), 132-141.
5. Choi ES. Factors affecting emergency medical students' health-enhancing behavior using Pender models. Journal of the Korean Emergency Medicine, 2007, 11(2),5-17.

6. Oh HC. The deciding factor for national health 1: Health life habits. *The Journal of Prevention*. 1993,26(4),54-479.
7. Park IS. A study on the health-promoting lifestyle a doctoral dissertation from the graduate school of Pusan National University, 1995.
8. Sherer, M., Maddux, J.E., Mercadante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R.W. The self efficacy scale: Construction and validation. *Psychol rep*, 1982.51, 336-671.
9. Lee JH. A Study on the Prediction Factors of Health Promotion Behavior of Nurses Working at the Daily Medical Center and a Master's Degree thesis from Korea University. 1998.
10. Lee TH. Analyses of Variations Affecting Health Promotion Behavior and a thesis on the Master's Degree from Yonsei University's Graduate School. 1989.
11. Moon, JS. A Study of instrument development for health belief of Korean adults. Unpublished doctoral dissertation. Yonsei University, Seoul.. 1990.
12. Seo HM., Ha YS. Factors affecting the health lifestyle of the elderly. *Journal of the Korean Nursing Society*, 2004, 34(7), 1288-1297.
13. Park JW. A work study for the development of social support scale a doctoral dissertation from Yonsei University, 1985.
14. Park DY., Kim MJ. The effect of a nursing college student's family function, health awareness and self-efficiency on health promotion behavior. *the Korean Society of Contents Association*. 2017, 17(6),561-570.
15. Kim MS., Yoon SY. The Effect of Eating and Self-Efficiency on Health Promotion Behavior of Nursing University Students in the Unified Age a convergent journal. 2017, 7(2), 111-117.
16. Baek HJ et al. Factors affecting the health-promoting lifestyle of nursing college students. *The Korea Institute of Health Care*, 2011, 25(1), 73-83.
17. Kim JH, Kim SJ and Park YH. Factors affecting the health-promoting behavior of female college students. *Adult Nursing Society*, 2001,13(3), 433-440.

Molecular Detection of Some Virulence Genes in *Staphylococcus aureus* Isolated from Different Human Clinical Specimens

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Abstract

Staphylococcus aureus is a significant bacteria in numerous simple and more severe diseases of humans because it possesses many virulence factors which are controlled by various genes that promote invasion of the host cells.

A total of ninety isolates of *Staphylococcus aureus* obtained from various human clinical specimens distributed as urine samples (30/90) (33.3%), wound swabs (28/90) (31.1%), blood samples (24/90) (26.7%) and sputum swabs (8/90) (8.9%). The clinical specimens were submitted to diagnostic microbiology laboratories of Al-Hillah Teaching Hospital, Babylon maternity and children's Hospital and AL-Mahaweel General Hospital during the interval from April to September 2019, in Babylon Governorate, Iraq.

The multiplex PCR assay was achieved to identify four selected virulence genes such as (*sea*, *seb*, *eta* and *tst*) in *S. aureus* strains by using specific primers and depending from sizes of the products PCR amplicons. Each 90 isolates of *S. aureus* in human clinical specimens were examined. The results revealed that, the most frequent gene is *sea* 74 (82.2%), followed by *seb* gene 71 (78.9%), *tst* gene 44 (48.9%) and *eta* gene 32 (35.6%) was reported as the least frequent detected gene.

Furthermore, it was found that, the predominant toxin genes represent the highest rate in *S. aureus* strains isolated from wound swabs 85 (38.5%), followed by blood samples 69 (31.2%), urine samples 54 (24.4%) and finally the sputum swabs 13 (5.9%).

Keywords: : *Staphylococcus aureus*, virulence genes, molecular detection, enterotoxine.

Introduction

Staphylococcus aureus is a gram-positive, coccobacterium, responsible for both nosocomial

and community-acquired infections and implicated in hospital acquired infections. It causes a different illnesses extending from soft tissue to skin infections to severe life-threatening infections such as toxic shock syndrome (types 1 and 2)^[1]. *S. aureus* is implicated in various diseases like impetigo, furuncles or boils, cellulitis and postoperative wound infections at different destinations. The organism is associated with serious and life-threatening infections including osteomyelitis, pneumonia, bacteremia, cerebritis, meningitis, acute endocarditis, myocarditis and pericarditis. Furthermore, it is associated with toxin-related diseases^[2]. Additionally,

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it is widely prevalent and related with urinary tract infections [3]. *S. aureus* is capable of producing a series of virulence factors such as surface associated adhesions, enzymes and exotoxins, which play the main role in its invasive potential and pathogenicity [4]. Some of the virulence factors, such as hemolysins (H1 α and H1 β), fibronectin-binding proteins A and B, Pantone-Valentine leucocidin (PVL), enterotoxins (SEs) and toxic shock syndrome toxin-1 (TSST-1) [5], coagulase and exfoliative toxin (ET) [6]. There are six serotypes of staphylococcal enterotoxin have been recently characterized, the most widely recognized groups are *Sea*, *Seb*, *Sec*, *Sed* and *See* [7,8]. These groups are the essential causative agent of food poisoning in humans and animals and this can result in intense intestinal peristalsis [9]. The superantigens group, including SE, TSST and ET toxins, these exotoxins display proteolytic and toxic or lytic effectiveness in the cells that assist local invasion and spread. Moreover, it has been reported that ETs ETA and ETB are either in coupling or separated participatory in the appearance of staphylococcal scalded-skin syndrome [10]. The gene of some toxins is situated in the chromosomal DNA, whereas, the others might be situated in mobile and transferable extra chromosomal DNA and by horizontal gene transfer (HGT) that is able translocating between bacteria [11]. Genes for staphylococcal enterotoxin groups, for example, *sea* genes harbored by a bacteriophage vector, *seb* and *sec* genes are situated on the chromosomes, while *sed* genes conveyed by a plasmid (pIB485) [12].

The current study was aimed to estimate the frequency, detect the existence of some selected virulence genes such as (*sea*, *seb*, *eta* and *tst*) in *Staphylococcus aureus* strains isolated from different human clinical specimens and evaluated the relationships between these clinical specimens and their ability to yield virulence factors.

Materials and Method

Isolates Collected: All the isolates analyzed in this study, 90 non duplicates *Staphylococcus aureus* isolates were cultured collections from various clinical specimens of patients suffering from different systemic infections distributed as urine samples (30), wound swabs (28), blood samples (24) and sputum swabs (8). These clinical specimens were submitted to diagnostic microbiology laboratories of Al-Hillah Teaching Hospital, Babylon maternity and children's Hospital and AL-Mahaweel General Hospital during the interval from April to September 2019, in Babylon Governorate, Iraq. The all demographic data such as type of infection, site of specimen isolation, age and gender of patients were listed in the diagnostic laboratories.

Laboratory Diagnosis:

Bacterial Isolation and identification: According to the procedures recommended by [13], Confirmation the all of isolates as *S. aureus* was based on the inoculated onto mannitol salt agar and incubated for 24-48 HR. in at 37°C. Colonies were identified relied upon the colony size, shape, color, borders and texture. Colonies showing the common morphological appearance were investigated as *S. aureus* by Gram staining, then specimens were exposed to the Biochemical tests such as (Coagulase, Catalase, Citrate utilization, Urease, Nitrate reduction and Voges-Proskauer tests). After concurrence, the samples were put in the medium TSB which include 20% at -20° C of glycerol until further usage.

The detection molecular of genes virulence in *Staphylococcus aureus*: The detection of Four virulence genes (*sea*, *seb*, *eta* and *tst*) of the *S. aureus* isolates was done as previously described by using multiplex PCR [6]. Itemized sequences of the initial was summarized in Table (1).

Table (1): Oligonucleotide primer sequence and size amplicon

Target gene	Initial Sequence from 5' to 3'	Product size (bp)	Reference
sea	GSEAR-1GGTTATCAATGTGCGGGTGG GSEAR-2CGGCACTTTTTCTCTTCGG	102	Mehrotra et al., 2000
seb	GSEBR-1 GTATGGTGGTGTAAGTACGAGC GSEBR-2 CCAAATAGTGACGAGTTAGG	164	
eta	GETAR-1 GCAGGTGTTGATTTAGCATT GETAR-2 AGATGTCCCTATTTTGCTG	93	
tst	GTSSTR-1 ACCCTGTTCCTTATCATC GTSSTR-2 TTTTCAGTATTTGTAACGCC	326	

Multiplex PCR conditions: Bacterial DNA was improved through utilize primer pairs for each gene and were prepared by using the master mixes of components from the GeneAmp kit (Perkin-Elmer, Norwalk, Conn.) and according to manufacturer's instructions with some modifications. The mixture reaction the volume final completed to 50 µl with sterilized D.W. Multiplex initial contained 200 µM deoxy-nucleoside tri-phosphates,

5 µl of 10× buffer reaction, 1.5 mM of MgCl₂, 20 pmol each of *sea* and *seb* primers, 50 pmol of *eta*, 20 pmol of the *test*. 2.5 U of *Taq* DNA polymerase (Ampli Taq DNA polymerase, Perkin-Elmer) and 10 - 1,000 ng of template DNA.

Conditions of the Thermal cycling: Conditions of the Thermal cycling was performed according of the following in table (2).

Table (2): multiplex PCR for detection of sea, seb, eta and tst genes virulence in Staphylococcus aureus strains

Steps	Temperature (°C)	Time (min)	No. of cycles
Initial denaturation	94	5	1
Denaturation	94	2	35
Annealing	57	2	
Extension	72	1	
Final extension	72	7	1

The PCR products and 100bp molecular weight DNA ladder were isolated by electrophoresis. The electric flow was permitted at 90 V for 30 min. Detection was acknowledged by the existence of a specific DNA bands on agarose gel 1.5 %, stained with bromide ethidium dye and finally the bands were visualized on UV transilluminator and photographed via utilize photo documentation method. The results positive was distinguished when the DNA band equal to the aim size product .

Results

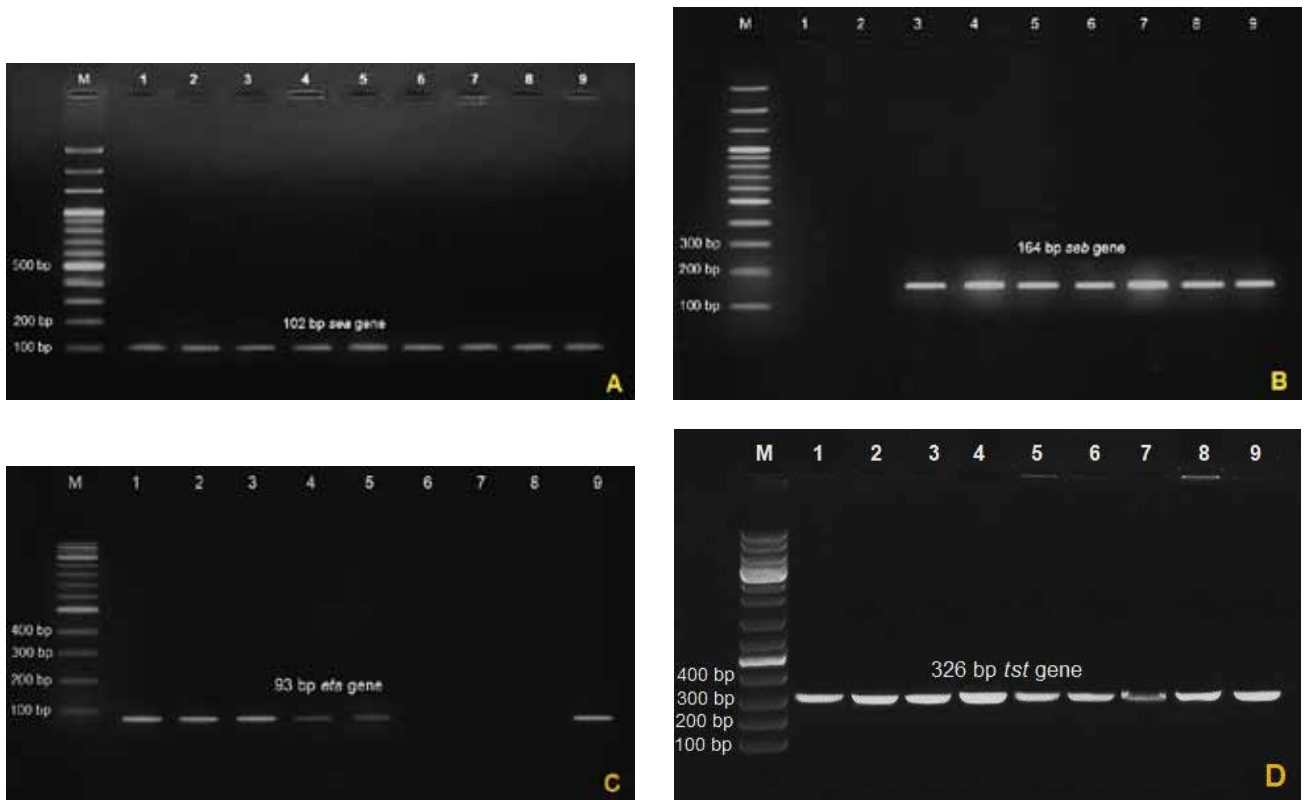
Ninety isolates of *Staphylococcus aureus* was cultured collections from various clinical specimens of patients suffering from different systemic infections distributed as urine samples (30/90) (33.3%), wound swabs (28/90) (31.1%), blood samples (24/90) (26.7%) and sputum swabs (8/90) (8.9%), the results appear in table (3).

Table (3): Distribution of Staphylococcus aureus isolates according to the type of specimens

Type of specimens	No. of positive specimens	Percentage
Urine samples	30	33.3 %
Wound swabs	28	31.1 %
Blood samples	24	26.7 %
Sputum swabs	8	8.9 %
Total	90	100 %

The all (90) isolates of *S. aureus* were subjected to the multiplex PCR assay to identify Four virulence genes (*sea*, *seb*, *eta* and *tst*) by using specific primers

and rely of sizes products amplicon of the PCR, results of PCR are shown in fig. (1).



Figures (1) Agarose gel electrophoresis of multiplex PCR assay to identify Four virulence genes (sea, seb, eta and tst) in Staphylococcus aureus strains isolated from wound, blood, urine and sputum specimens. Lane M: marker with 100 bp ladder.(A) Lanes 1-9: positive to sea gene, product size: 102 bp (B) Lanes 1 and 2:negative to seb gene, product size: 164 bp, while lanes 3-9: positive to seb gene. (C) Lanes 1-5 and 9: positive to eta gene, product size: 93 bp, while lanes 6-8: negative to eta gene. (D) Lanes 1-9: positive to tst gene, product size: 326 bp.

The results found that, thesea gene were the utmost frequent 74 (82.2%), followed via seb 71 (78.9%), tst 44 (48.9%) and eta 32 (35.6%) reported as the least frequent detected gene.

On the other hand, The results revealed that the prevalence of the virulence genes in*S. aureus* strains

represent the highestrate in wound swabs85 (38.5%), followed bybloodsamples69 (31.2%), urine samples54 (24.4%) and sputum swabs13 (5.9%). The results are shown in the table (4) and the prevalance of (*seb, sea, eta* and *tst*) genes in*S. aureus* isolates regarding the clinical specimens of different infections were shown in figure (2).

Table (4): Distribution of genes virulence in Staphylococcus aureus isolates from clinical specimens of different infections

Type of specimen	sea %	seb %	tst %	eta %	Total %
Wound swabs	27(30%)	26 (28.9%)	18(20%)	14(15.6%)	85 (38.5%)
Blood samples	22 (24.4%)	21 (23.3%)	16(17.8%)	10(11.1%)	69 (31.2%)
Urine samples	20(22.2%)	19 (21.1%)	8(8.9%)	7 (7.8%)	54(24.4%)
Sputum swabs	5(5.6%)	5 (5.6%)	2(2.2%)	1(1.1%)	13(5.9%)
Total	74(82.2%)	71(78.9%)	44 (48.9%)	32(35.6%)	221(100%)

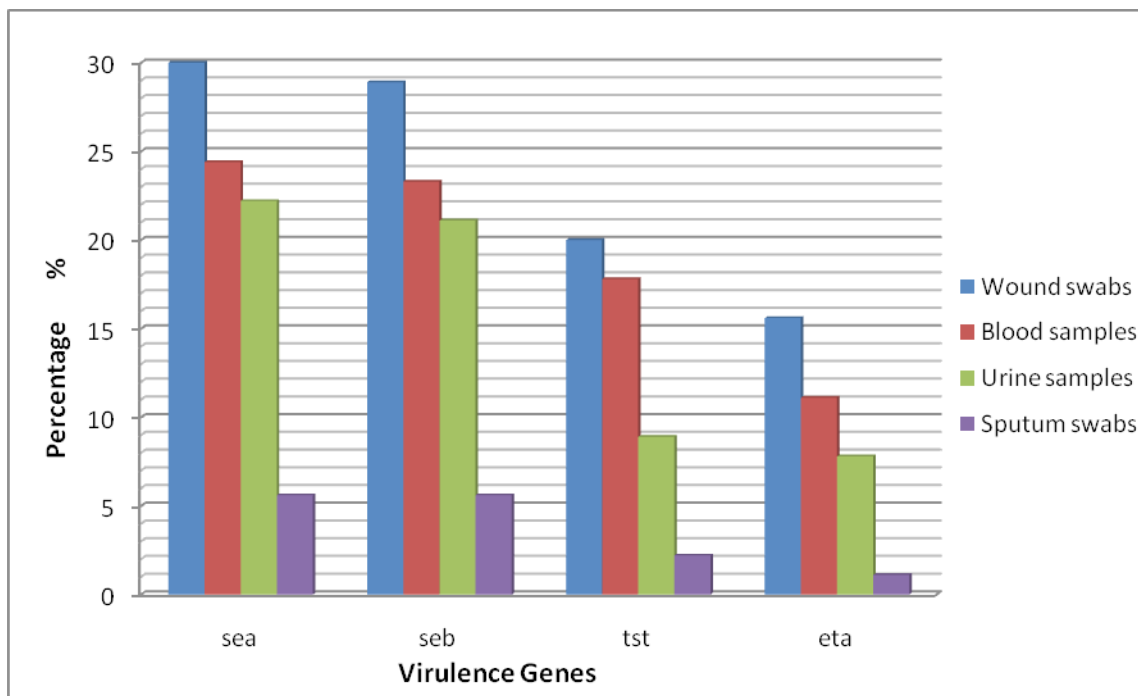


Figure (2): Prevalence the genes virulence in *Staphylococcus aureus* isolates for clinical specimens of several infections

Discussion

Staphylococcus aureus is a significant pathogen that contributed to the severity of the infection in humans because of its producing various virulence factors that are involved in colonization and the invasion of the host leading to cause subsequent infections, these virulence factors are linked with various virulence genes.

In this study, the findings revealed that the *sea* gene was the most prevalent at a rate of (82.2%) followed by the *seb* (78.9%), *tst* (48.9%), while the *eta* gene was the least frequently detected gene at a rate of (35.6%). The high prevalence of *sea* gene refers to it plays an important role in the pathogenesis of *S. aureus* infection. These results were agreed to a previous result studies which indicated that *sea* gene was the most prevalent (40.6%) followed by *seb*, *tst* and *eta* genes (19.6%, 12.8% and 11.3%) respectively in *S. aureus* isolated from different patients^[14]. Different other previous study revealed by^[15] demonstrated that these *seb* gene were the utmost prevalent (44.3%) followed by the *sea* gene (32%), while *tst* gene was identified at a very low rate (1%) among *S. aureus* strains in various kinds of disease, also pointed out that the pathogenicity of *S. aureus* is related to its ability for antibiotic resistance and the toxin production.

However, the result of our study is in contrast with the results of the study which indicated that *sea* gene were the utmost frequent gene (33%) and *seb* gene was identified at a very low rate (5%), while the *tst* genes was not identified in any isolates^[16]. Additionally, the low rate of *eta* gene in the current study is in accordance with previous study in Baghdad, Iraq, reported by^[17], who found that *eta* gene was detected at a lower rate in *S. aureus* isolates from various clinical specimens and the result is in agreement with the other result reported in Cote D'Ivoire^[18]. Exfoliative toxins were caused impetigo consider as one of the fundamental bacterial diseases^[19].

Moreover, the results indicated that the majority of toxin genes produced by *S. aureus* strains were isolated from wound swabs at a rate of (38.5%), followed by blood samples (31.2%), urine samples (24.4%) and finally sputum swabs (5.9%).

S. aureus strains produce enterotoxins related with the food poisoning have antigenic and emetic effectiveness^[20]. Thus, we believe that the presence of enterotoxin genes in the strains isolated from wounds, blood, urine and sputum specimens of different infections is probably due to human or environmental

contamination via the existence of open injuries. These results were corresponded to the results study conducted in South-Western Nigeria by [21], who showed that the toxigenic of *S. aureus* isolates was found mainly in the wound and blood samples, suggesting that the toxin genes are very important and play essential role in the survival of *S. aureus* strains at these sites.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

References

- Rahimi F, Bouzari M, Katouli M, Pourshafe MR. Prophage and antibiotic resistance profiles of methicillin-resistant *Staphylococcus aureus* strains in Iran. *Adv Virol.* 2012;157(9): 1807-1811. 3.
- Dinges MM, Orwin PM, Schlievert PM. Exotoxins of *Staphylococcus aureus*. *Clin Microbiol Rev.* 2000; 13:16-34.
- Baba-Moussa L, Anani L, Scheftel JM, Couturier M, Riegel P, Haekou N, Hounsou F, Monteil H, Sanni A, Pre'vost G, Virulence factors produced by strains of *Staphylococcus aureus* isolated from urinary tract infections. *Journal of Hospital Infection.* 2008; 68: 32-38.
- Ferry T, Perpoint T, Vandenesch F, Etienne J. Virulence determinants in *Staphylococcus aureus* and their involvement in clinical syndromes. *Curr Infect Dis Rep.* 2005; 7: 420-428.
- Puah S, Chua K, Tan J. Virulence factors and antibiotic susceptibility of *Staphylococcus aureus* isolates in ready-to-eat foods: detection of *S. aureus* contamination and a high prevalence of virulence genes. *Int. J. Environ. Res. Public Health.* 2016; 13(2):199.
- Mehrotra M, et al. Multiplex PCR for Detection of Genes for *Staphylococcus aureus* Enterotoxins, Exfoliative Toxins, Toxic Shock Syndrome Toxin 1 and Methicillin Resistance. *Journal of Clinical Microbiology.* 2000; 38(3): 1032-1035.
- Eshraghi S, et al. Prevalence of *tst*, *entC*, *entA* and *entA/C* genes in *Staphylococcus aureus* strains isolated from different foods". *Tehran University of Medical Sciences.* 2009; 67(7): 470-476.
- Vasconcelos NG and de Souza MdLR. Staphylococcal enterotoxins: molecular aspects and detection method. *Journal of Public Health and Epidemiology.* 2010; 2(3) 29-42.
- Karahan M, et al. Investigation of toxin genes by polymerase chain reaction in *Staphylococcus aureus* strains isolated from bovine mastitis in Turkey. *Foodborne Pathogens and Disease.* 2009; 6(8): 1029-1035.
- Dinges MM, Orwin PM, Schlievert PM. Exotoxins of *Staphylococcus aureus*. *Clin. Microbiol. Rev.* 2000; 13: 16-34.
- Cunha MLRS, Calsolari R.A. Toxigenicity in *Staphylococcus aureus* and coagulase-negative staphylococci: epidemiological and molecular aspects. *Microbiol Insights.* 2008; 1: 18-26.
- Argudín MA, Mendoza MC, González-Hevia MA, Bances M, Guerra B, Rodicio MR. Genotypes, exotoxin gene content and antimicrobial resistance of *Staphylococcus aureus* strains recovered from foods and food handlers. *Applied Environ Microbiol.* 2012; 78: 2930-2935.
- . Cheesbrough M. *District laboratory practice in tropical countries.* Cambridge: Cambridge University Press. 2006.
- Kandala NJ, Abdulateef M, Imad N. Genotyping of *Staphylococcus aureus* Isolates Based on Methicillin Resistance Genes and its Relatedness to some Putative Virulence Factors. *Iraqi Journal of Science.* 2017; 58(2A): 626-638
- Sina H, Ahoyo TA, Moussaoui W et al. Variability of antibiotic susceptibility and toxin production of *Staphylococcus aureus* strains isolated from skin, soft tissue and bone related infections. *BMC Microbiology.* 2013; 13(1): 188.
- Wang LX, Hu ZD, Hu YM, et al. Molecular analysis and frequency of *Staphylococcus aureus* virulence genes isolated from bloodstream infections in a teaching hospital in Tianjin, China. *Genet Mol Res.* 2013; 12(1): 646-654.
- Plano LR. *Staphylococcus aureus* exfoliative toxins: how they cause disease. *J. Invest. Dermatol.* 2004; 122: 1070-1077.
- Kacou N, Koffi K, Ekaza E, Kouamé E, Anne B, Dosso M. *Staphylococcus aureus* infection and virulence genes in Abidjan (Côte d'Ivoire). *Eur J Sci Res* 2011; 52: 339-344
- Sabouni F, Mahmoudi S, Bahador A, Pourakbari

- B, Sadeghi RH, Ashtiani MTH, Nikmanesh B, Mamishi S. Virulence Factors of *Staphylococcus aureus* Isolates in an Iranian Referral Children's Hospital. *Osong Public Health Res Perspect.* 2014; 5(2): 96-100.
20. Ikeda T, Tamate N, Yamaguchi K, Makino S: Mass Outbreak of Food Poisoning Disease Caused by Small Amounts of Staphylococcal Enterotoxins A and H. *Appl Environ Microbiol.* 2005; 71: 2793-2795.
21. Ali OA, Ogbolu DO, AO, Okorie AN, Aknola JO, Daniel JB. Association of virulence genes with *mecA* gene in *Staphylococcus aureus* isolates from Tertiary Hospitals in Nigeria. *Indian J PatholMicrobiol.* 2015; 58: 464-471

Estimating Soil Pollution Range with Heavy Metals in Some Areas of Baghdad City

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Abstract

The current study aims to identify soil pollutants from heavy metals as they were taken 23 soil samples and divided into six regions lies in Baghdad governorate, they included (Amiriya, Sayyidia, Yarmouk, Naffak Al-Shurtah, Palestine Street, Adhamiya). The ratio of heavy metals measured in these soils and it observed that iron has the highest average of values and It was in Amiriya city and it reached to 287.67ppm and highest Zn average was in Adhamiya city and it reached to 45.67ppm and the highest average of Mn in the Amiriya city and it was 65.25ppm, while pb made highest average values in Adhamiya city and it was 33.53ppm, while copper recorded the highest average values in Saidia and it reached to 18.57ppm. Finally, both cadmium and nickel recorded high average values in Saidia city and it was (4.42-68.05) ppm, respectively, moreover Heavy metals values compared with standard, as the values of Fe, Zn, Cu, pb, Ni, Mn, were within the allowed limits in the soil, for as for Cd it was not within limits standard.

Keywords: Soil pollution, heavy materials, Baghdad city.

Introduction

Environmental pollution in some developing countries may happened due to the negative impact of technological developments, like urbanization and industrial development which happened because of bad planning for waste disposal and management [1,2,3]. Pollution sources include accidental leakage or leakage of chemicals in addition to human activities, surface runoff, atmospheric precipitation of chemicals used in agriculture or manufacture, materials stored or dumped over or inside the soil in addition to transported or filled pollutants and demolitions which may lead to soil and water pollution even Inside residential locations[4,5]. Abegunde & Adelekan^{[6],[7]} assured that survival and continously of heavy elements in the environment may

lead to bioaccumulation and causing many dangers for some creatures more than if it found in the environment alone, so Heavy metal pollution threatens agriculture And other human food sources in addition to its effect on vegetation growth and low plant resistance to different pests.

Materials and Method

Sample Collection: Samples collected from January 2019 until the end of February 2019, 23 samples from 6 stations (agricultural nurseries) lies in Baghdad city and it included (Amreya, Sayyidia, Yarmouk, Baffak Al-Shurtah, Palestine Street, Adhamiya), samples collected randomly From the surface layer of the soil (5-10 cm depth) using pre-sterilized augar and it transferred to sterile polyethylene bags and taken to the lab to analyze and examine it. To Measure heavy metals in the soil, Method was followed [8].

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Results and Discussion

Fe: Amiriya city recorded the highest values of iron averages, it reached to (2784.67 ± 22.22) ppm and the lowest averages values recorded by Adhamiya city

and it reached to (2641.80 ± 74.37) ppm and the results of the statistical analysis showed that there were no significant differences between the averages where the value of LSD was (187.09) in $P < 0.05$ level as table (1) shows. Fe is a nutritional element organisms need to, including microbes, plants and the rest of organisms. Iron available in many rocks and Ground metals and during soil development this content Exposed to to enrichment or depletion, as the presence of calcium carbonate And bicarbonates in very large quantities impede the absorption of iron by living organisms and the soil pH plays an important role in this absorption and the abundance of iron in the soil [9]. The current stud results agreed with some of the previous studies, as the current study of iron recorded very high values and it is likely that the high concentrations of iron in the soil will be due to the fact that Iraqi fertilizers added to the soil contain high amounts of iron [10], as World Health Organization [1] indicated that the allowed limits for iron in water were 0.3 ppm.

Zn: Adhamiya city recorded the highest values of iron averages where it recorded (45.67 ± 5.74) ppm and the lowest averages values recorded by Yarmouk city and reached to (26.63 ± 1.88) ppm and the results of the statistical analysis showed that there were significant differences between the averages where the value of LSD (13.50) at the level of $P < 0.05$, as in Table (1). The results of examining the element zinc in the soil showed that it is within the allowed limits. Contrast relationship between zinc and other positive ions, especially $Cu + 2$ and $Fe + 2$ irons, reduces zinc Absorb. And the high concentration of phosphorus also reduces zinc absorb, which is the most common reaction in soil types that have a limited amount of zinc [11]. This agree with [12] by his current study of heavy elements pollution to the sides of the highway between Al-Ramady and Al-Rutbah cities, as the allowed concentrations of zinc in the soil ranged between $(150-300)$ ppm, as World Health Organization [1] indicated.

Mn: The current study results found that the highest averages value of the of manganese in the soil was (65.25 ± 3.65) ppm, in soil samples in the Amiriya city, while the lowest average value (55.16 ± 5.68) ppm was in soil samples for Naffak Al-Shurtah area. LSD test shows that there were no significant differences at the level ($P < 0.05$) between these data because of its value which was (17.35) Table (1) and as noted from the table that the values of manganese averages ranged between $(55-65)$ ppm, So it Considered within the allowed limits

in the soil, where it reached (300) ppm [2]. The current study results agreed with [13,14] in recording the current study with high values of manganese in the soil samples under study that were within the allowed limits.

Pb: current study results recorded the highest values of lead averages in Adhamiya city and it reached to (33.53 ± 5.82) ppm, either lowest averages values recorded in Yarmouk city and it were (22.10 ± 1.64) (ppm), It is the same for Amiriya city, which also recorded low levels of lead in soil samples under study, where the averages values were (23.43 ± 1.61) ppm. Statistical analysis results indicated the presence of significant differences between averages values of soil samples, where the value of LSD (11.38) at the level of $P < 0.05$, Table (1). The values of lead did not exceed allowed limits as World Health Organization [1] indicated and it was $(50-140)$ ppm), Current study results from [15] agreed, by registering close values of the lead element in soil samples and this observed in the current study and it may happened due to the convergence of lead concentrations values due to the high stability of the lead element in the soil, as [16] showed that the lead component is not biodegradable by soil biology and remains attached to soil particles and is transported from a place to another by the wind. The recording of low lead values in soil samples may happened due to the high susceptibility of the roots of the plants in the soil samples under study to the absorption of this element from the soil and its accumulation within the parts of the plant and this what [17] assured .

Cu: Current study results recorded copper highest averages values in the Saidia city and it reached to (18.57 ± 4.92) ppm and Yarmouk city recorded lowest averages values and it were (12.66 ± 0.34) ppm). Statistical analysis results indicated that there were no significant differences between soil samples averages values, where the value of LSD (6.73) at the level of $P < 0.05$, Table (1). Current study results of the copper element in soil samples were within allowed limits that were $(50-140)$ ppm according to the World Health Organization [1]. Heavy elements, such as lead, cadmium, copper, nickel, mercury and other elements are the most dangerous pollutants for soil, water and air and the most important sources of pollution with these elements are Exhausts are automobile waste and factory waste, metal smelting, combustion of coal and incorrect method of using pesticides and fertilizers [18]. Minor concentrations of copper element in the soil may happened due to soil base elevation, as in the oxidizing acidic medium or in

the acidic oxidizing environment the copper element has a high mobility and agricultural activities may add large amounts of copper element to the soil [16]. Current study results agreed with [19], in recording low values of copper in the soil, which the researcher attributed that to the inability of some heavy elements such as copper, lead, nickel, cadmium and mercury to solubility in the soil, which lead to their accumulation in the soil.

Cd: Current study results showed that the highest value average of cadmium in the soil was (4.42 ± 1.19) ppm, in soil samples in Saydiya city, while the lowest average value was (2.48 ± 0.11) ppm in the soil samples for Amiriya city, This results were approach to Naffak Al-Shurtah and Yarmouk cities, where they recorded average values of (2.51 ± 0.11) and (2.96 ± 0.19) ppm, respectively. LSD test shows a significant difference at the level of ($P < 0.05$) between this data because of its value which was (1.597) Table (1) and as noted from the table that the values of cadmium averages exceeded the allowed limits according to the World Health Organization [1] Where the values ranged between (1-3) ppm. The addition of heavy metals leads to many changings in the metabolic activity of microorganisms which is represented by a decrease in the ATP concentration and respiration rate. Many enzymes secreted by microorganisms contribute to the recycling of materials and nutrients that exist in the soil and therefore the rate of transformation of these substances adjusted when heavy metals added to the Soil, because it effects on the activity of extracellular enzymes [20].

Ni: Current study results recorded highest values of nickel averages in Adhamiya city and it reached to (68.05 ± 7.41) ppm, either the lowest averages values recorded by Amiriya city and it were (22.10 ± 2.86) ppm. Statistical analysis results indicated that there were

significant differences between soil samples averages values, where the value of LSD (21.126) at the level of $P < 0.05$, Table (1), the values of the averages for the current study were within the allowed limits in the soil according to the World Health Organization [1] where the values ranged between (30 - 75) ppm. The highest mean values recorded by the current study of the nickel element may happened due to some human activities and environmental factors that would increase the concentrations of this element and from these salinity factors as they play an important role by reducing the toxicity of heavy elements by forming complexes with chloride ions and make the element not bioavailable to microorganisms [21]. Concentrations of nickel and heavy elements can also increase as a result of sedimentation of the atmospheric components near the mineral refineries as well as from the applications of the bio-solids and sludge generated from wastewater and thus becomes a very toxic heavy element for soil rehabilitation [22], Soil factor is the most important and influencing on the availability of nickel and its solubility is the pH, as the amount of nickel available to the plant decreases with the high acidity of the soil and therefore the plants that grow in lands with high pH may be more vulnerable to the occurrence of nickel deficiency in them [23], Study results agreed with the researchers above in recording high nickel values in the soil and that they considered within allowed limits. Also, the presence of high concentrations of positive heavy elements such as iron in the soil leads to reducing the absorption of nickel in the soil and this was confirmed by the correlation coefficient between iron and nickel, as it reached to (-0.06) at the level of $P < 0.05$ and this was confirmed by researchers [24]. As the researchers found an antagonistic relationship between nickel and zinc and iron.

Table (1): Shows averages values and heavy metals standard error in the soil (Fe, Zn, Pb, Mn, Cu). In six soil samples

Source of Sample (Soil)	Standard Error±Average						
	Ni	Cd	Cu	Pb	Mn	Zn	Fe
Amiriya	22.10±2.86	2.48±0.11	14.35±1.44	23.43±1.61	65.25±3.65	31.75±5.54	2784.67±22.22
Sayyidia	4.42±1.19	4.42±1.19	18.57±4.92	26.32±2.30	58.90±9.85	29.20±3.88	2657.00±62.95
Yarmouk	2.96±0.19	2.96±0.19	12.66±0.34	22.10±1.64	56.40±3.63	26.63±1.88	2706.00±25.05
Naffak Al-Shurtah	2.51±0.11	2.51±0.11	13.36±0.44	31.93±4.90	55.16±5.68	39.18±4.56	2760.67±12.45
Palastine street	3.27±0.23	3.27±0.23	13.95±0.77	26.33±2.06	57.59±2.39	37.60±3.36	2702.50±73.66
Adhamiya	3.58±0.19	3.58±0.19	15.34±1.20	33.53±5.82	56.42±5.78	45.67±5.74	2641.80±74.37
LSD value	1597*	1.597*	6.73 NS	11.38*	17.35NS	13.50*	187.09NS

* ($P < 0.05$).

Conclusions

1. Heavy metals are very dangerous materials for all life forms.
2. The concentrations of heavy metals were within the permissible limits, but the cadmium recorded very high concentrations.
3. The high concentrations of heavy metals under the current study are a danger to human life if the soil is used in agriculture, especially cadmium and causes many diseases.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

1. WHO, Guideline for Drinking Water Quality, 1st ed. Addendum to the 3ed ed., vol. 1: Recommendations, World Health Organization, Geneva, 2006. 515p.
2. Moon, C., Michael, W. and Evans A. Introduction to Mineral Exploration, Blackwell Publisher, London. 2006. 480P.
3. Rajaganapathy V., Xavier F., Sreekumar D. and Mandal P. K. Heavy Metal Contamination in Soil, Water and Fodder and their presence in Livestock and Products: A Review. *Journal of Environmental Science and Technology*, 2011. 4:234-249.
4. Worksafe V. Industry Standard Contaminated Construction Sites. EPA Victoria, www.worksafe.vic.gov.au, First Edition. 2005. pp. 1-28.
5. Shayley H., McBride M and Harrison E. Sources and Impacts of Contaminants in Soils. Cornell Waste Management Institute. 2009. pp.1-6.
6. Adelekan B. A. and K. D. Abegunde. Heavy Metals Contamination of Soil and Groundwater at Automobile Mechanic Villages in Ibadan, Nigeria. *International Journal of the Physical Sciences*, 2011. vol. 6(5), pp. 1045-1058.
7. Yildiz D., Kula I., AY G., Baslar S. and Dogan Y. Determination of Trace Elements in the Plants of Mt.Bozdag, Izmir, Turkey. DOI:10.2298/ABS1003731Y. *Arch.Biol.Sci.*, 2010. 62(3), 731-738.
8. Al-Khafaji, Ali Khalil Abdul-Kazim Badi. Detecting the state of pollution of the soil and waters of the Lake Sawa region using remote sensing techniques, Master Thesis, Faculty of Agriculture, Al-Muthanna University. 2016
9. Helms, T. C., R. A. Scott, W. T. Schapaugh, R. J. Goos, D. W. Franzen and A. J. Schlegel. Soybean Iron-Deficiency Chlorosis Tolerance and Yield Decrease on Calcareous Soils. *Agronomy Journal*. Volume. 2010. 102(2):492-498.
10. Al-Qaraghuli, N. A. Contents of nutrient elements (Total, water soluble and available) in the fertilizers (TSP, MAP, NP & NPK) produced from Al-Qaim plant, Iraq, *Iraqi Journal of Agricultural Sciences*, 2005. Vol. 36, No. 5, pp. 35-41.
11. Slaton, N. A., Richard J. Norman and Charles E. Wilson. Effect of Zinc Source and Application Time on Zinc Uptake and Grain Yield of Flood-Irrigated Rice. *Agronomy J.* 2005. Vol. 97 (1): 272-278.
12. Awadh, Salih Muhammad. Assessment of the potential pollution of cadmium, nickel and lead in the road-side dust in the Karkh district of Baghdad City and along the highway between Ramadi and Rutba, West of Iraq. *Merit Research Journal of Environmental Science and Toxicology*. 2013. Vol.1(7)pp.126-135. <http://www.meritresearchjournals.org/est/index.htm>.
13. Al-Shihadat Mahmud. Effect of Different Treatments of Fertilizing on the Nutritional Status of Micronutrients on the Al-Helwani Grapevine, *Syrian Journal of Agricultural Research*. 2017. 4(3):1-17.
14. Veliksar, S.; S. Toma; O. Bogdevich; E. Rotari; J. Kreidmam; and O. Cerbu. Effect of foliar applied Iron and nickel on the trace element content of aerial grapevine organs. *International symposium on foliar nutrition of perennial fruit plants*. Nov/31/2002. Merano, Italy. Actahort.) ISHS. 2002. 594 : 251 – 257.
15. Al-jibury, Dunya Abdul-Razzaq Abbas. Study of Different Quantitative Criteria of Pollution with Cadmium, Lead, Zinc and Nickel Elements for Roadside Soils and Plants in Baghdad Province. Thesis in Agriculture at the University of Baghdad. 2016
16. Endale, T., Negussie, M., Chandravanshi, B. S. and Feleke, Z. Determination of the level of lead in the roadside soils of Addis Ababa, Ethiopia. *SINET Ethiop J Sci*. 2012, 35(2), 81-94.
17. Al-Kazaeh, Dounia K. Kassaf and Hayfaa J. Al-Tamimi. Role of Bioremediation In Removal of

- Cadmium and Lead From Soils Fertilized With Phosphorus and Organic Manures and Irrigated With Different Irrigation Source of Water. *Journal of Basrah Research*. 2014. 40(3B).
18. Saleh, Farah Subhi. The effect of soil pollution with different concentrations of cadmium and lead on the concentration of carbohydrates, proteins and some mineral elements in the *Helianthus annuus L.* sunflower. *Al-Rafidain Science Journal*, 2012. Volume 23 (4): 41-55.
 19. Abbas, Hashem Khaled. Uses of temporary agricultural lands in Maysan Governorate and their relationship to soil salinity and degree of chemical interaction, *Journal of the College of Education for Girls*. 2015. Volume 26 (3): 739.
 20. Ahmad, Munad. The effect of mercury contamination on the spread of soil fungi in the Izabab area. PhD thesis, Faculty of Science, Mentouri University of Constantine. Algeria. 2007
 21. Maytham, Abdullah. An evaluation of air, water and soil pollutants in Baghdad using the Geographic Information System (GIS), PhD Thesis, Department of Earth Sciences - College of Science/University of Baghdad. 2005
 22. Qi Tang Wu, Liang Hei, J. W. C. Wong, Christophe Schwartz, Jean –Louis Morel (). co – cropping for phyto-separation of zinc and potassium for sewage sludge. Elsevier ltd1954-1960. 2007.
 23. Al-Shammari, Faek Hassan Ali. The effect of lead and nickel on growth and some physiological aspects of sunflower *Helinthus anus L.*, *Journal of Education and Science*. 2009. Volume 22 (2).
 24. Serbula, S. M., Kalinovic, T. S., Ilic, A. A., Kalinovic, J. V. and Steharnik, M. M. Assessment of airborne heavy metal pollution using *Pinus spp.* and *Tilia spp.* *Aerosol and Air Quality Research*, 2013. 13, 563-573.

Heart Irregularities Detection Based ECG Signals

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Abstract

ECG waveform plays vital role in providing the most information of the heart activity. This paper presents the design and implementation of an expert system for diagnosis of the heart abnormal activity. The proposed system consists of three parts; the first part includes the ECG waveform picking up and conditioning circuit. The second part performs waveform configuration, while the third part represents the core of the proposed diagnosis system which contains the algorithm that compares the acquired waveform with standard one. Any deviation in duration or amplitude from the standard will be detected by this algorithm and indicate heart abnormality. Experimental test has been performed for different waveforms and show promising results toward precise diagnosis of heart irregular activities.

Keywords: ECG Circuit; Arduino Uno; MATLAB.

Introduction

The heart function can be recorded as an electrical waveform which is called Electrocardiogram (ECG). ECG is a semi periodic repeating waveform that represent the heart function which acts as a source of bio events⁽¹⁾. The main feature of the recorded waveform is the amplitude-phase relationship therefore, any deviation from the standard amplitude-phase relationship can be indicated as a presence of an abnormality⁽¹⁾.

The primary pacemaker of the heart is cells group called "Sino-Atrial (SA node)"⁽¹⁾. SA is laying at the top of right atrium near the entry of the Vena Cava. The function of the SA node is to initiate the heart activity by generating impulses at the normal rate of the heart which is about 60-100 beat per minute for adult at rest. The impulses generated by SA contracts the atrial muscle and this impulse propagates through the atrial wall to the Atria-Ventricular (AV) node which is located at the lower part between the two atria. AV node ensures that

the ventricles contracted after the completion of the atria contraction. The standard ECG waveform is shown in Fig. 1.

The tie taken for an impulse to leave the SA node and reach ventricles is marked from the initial of the P wave to the beginning of the R or Q wave respectively. QRS is indicated by the pulse that transferred from the interventricular system to the Ventricles by passing through the free walls of Ventricles.

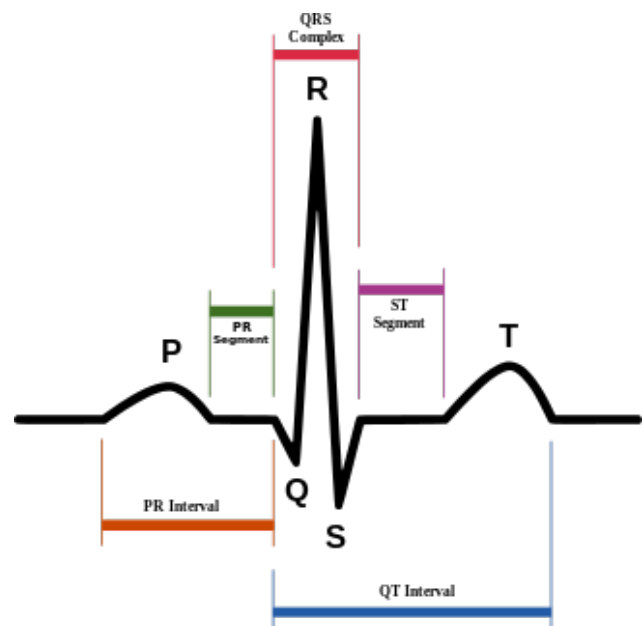


Fig. 1: A Typical ECG Signal

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Therefore, Ventricular contraction (systole) period is represented by one complete cycle and called QT wave. The time taken by the Ventricular diastole is represented by the period from the completed of T wave to the initial of the next Q wave⁽¹⁾. Table 1 shows the normal duration and amplitude for each part of ECG waveform.

Table 1: Normal ECG Parameters

Phase	Duration (Sec)	Amplitude (Volt)
Plus Wave	0.06-0.11	<0.25
PR Interval	0.12-0.20	-
PR Segment	0.08	-
QRS Complex	<0.12	0.8-1.2
ST Segment	0.12	-
QT Interval	0.36-0.44	-
T Wave	0.16	<0.5

Many researchers have been explored and propose different method for recording and analyzing ECG waveform⁽²⁾. Naazneen M. G, et. al.⁽²⁾ presents a simple 3-leads (ECG) monitoring and heart rate measurement system with LCD output. U. Pradhan and Naveen Kumar S.K⁽³⁾, suggest a circuit of a three leads ECG amplifier system which can achieve, amplifying and filtering the low amplitude, desired ECG signals. D. K. Ojha and M. Subashini⁽⁴⁾, propose a method of converting (ECG) information from paper charts into digital ECG signals using MATLAB. P. R. K. Shrivastava et. al.⁽⁵⁾ present an analysis of (ECG) waveform to detect abnormalities present regarding P and QRS complex peaks. M. K. Islam et. al.⁽⁶⁾ propose a study and analysis of ECG based on signal processing by means of MATLAB tools.

H.Gholam-Hosseini and H.Nazeran⁽⁷⁾ show a set of techniques that efficiently extract important features from the ECG data which used in automatic cardiac arrhythmia.

A. T. Rao et. al.⁽⁸⁾, suggest remote monitoring of the patients’ ECG signal and heart beat anywhere and anytime using wireless sensor network based on ZigBee modules and Arduino Uno board to process the data information.

In this paper, the circuit which is measures the ECG signal has been designed. The resulted analog ECG signal is configured and transformed to digital form via Arduino the fed to the pc through USB port. Analysis and detection of the heart irregularities is accomplished by a MATLAB program based on the data received from Arduino to detect the heart irregularities. This paper is organized as follows:

Section II presents the proposed system structure, details design of the pick-up and conditioning stage has been explained in section III. Section IV explain how to use the Arduino – uno to configure the preprocessed ECG waveform before transmit it to the diagnosis stage. An algorithm of diagnosis process is illustrated in section V, simulation results was presented in the conclusion.

Proposed Diagnosis System: Fig. 2 shows the structure of the block diagram of system which consist of three main stages, these are;

- Pick up and conditioning stage.
- Configuration stage.
- Diagnosis stage.

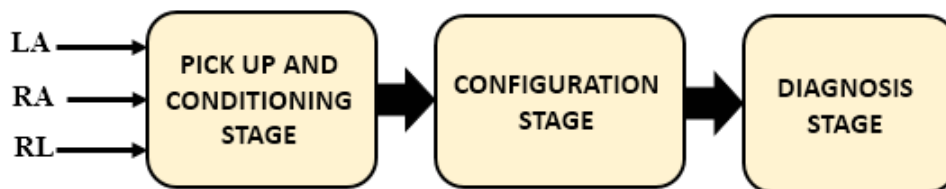


Fig. 2: Basic Block diagram of diagnosis system.

Pick Up and Conditioning Stage: As its name, the job of this stage is firstly picking up the ECG waveform by using 3-leads which are fixed on the left arm (LA), right arm (RA) and right leg (RL)

Since the picked waveform is very small in its amplitude, therefore, the main challenge of this stage includes amplifying the desired weak signal in the presence of noise from other muscles and electrical source.

The constraint in designing this stage is to satisfy the following requirements:

- The ECG waveform should not be influenced in any way by this stage.
- The measured ECG waveform should not be distorted.
- This stage should provide a separation of ECG and interference as best as possible.
- The stage protection of patient and device from electrical shock.

According to the above requirements, the design of this stage concerned with filtering and amplifying.

The required bandwidth for ECG signal(0.5Hz-30Hz) for normal heart human, so the bandwidth of the circuit has been chosen to be within this rang. Also, the gain should be enough to make the signal observable however, it should not be large enough to saturate the devices, so that no false peak should occur. Fig. 3 shows diagram of ECG circuit which is implemented using multisim 10.1 with ECG electrode to simulates the real-time ECG waveform.

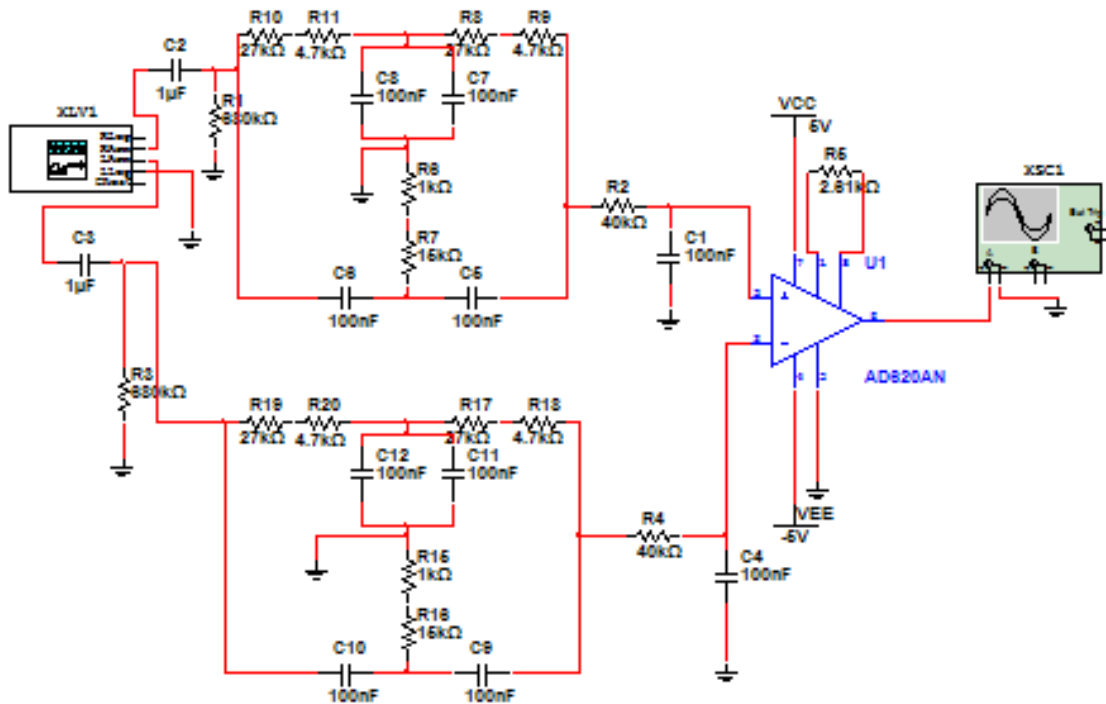


Fig. 3: Schematic of ECG Circuit

The ECG circuit consists of:

High Pass Filter: This filter used to eliminate an effect of the dc-offset caused by the dc bias on the surface of the patient’s body. The value of the cutoff frequency The RC passive filter was used. The value of the cutoff frequency (f_c) is 0.23Hz, where $f_c = 1/2\pi RC$.

Notch Filter: This block is used to eliminate an effect of power line interference which operates at 50Hz. we use proposed adaptive filtered algorithm to remove the power line noise⁽⁹⁾. Therefore, the cutoff frequency (f_c) is 50 Hz for notch filter.

Low Pass Filter: This filter used to eliminate an effect of EMG noise and frequencies higher than 40 Hz with any interference caused by sources. For this purpose, the RC passive filter was used. The value of the cutoff frequency (f_c) is 40Hz. Where

$$f_c = 1/2\pi RC.$$

Instrumentation Amplifier AD620: AD620 is a specific instrumentation amplifier used specially in bio-medical application because it has high CMRR (Common Mode Rejection Ratio) and low input noise amplifier. It well suited for medical applications, such as ECG and non-invasive blood pressure monitors.

Rg can be calculated by using the formula:

$$R_g = \frac{49.4k\Omega}{G-1}$$

Choose Rg is 2.61KΩ then the calculated gain is 19.93. Table 2 shows required values of Rg for different gains.

Table 2: values of Rg for various of AD620

1% std Table Value of R _g	Calculated Gain	0.1% std table value of R _g	Calculated gain
49.9 k	1.990	49.3 k	2.002
12.4 k	4.984	12.4 k	4.984
5.49 k	9.998	5.49 k	9.998
2.61 k	19.93	2.61 k	19.93
1.00 k	50.40	1.01 k	49.91
499	100.0	499	100.0
249	199.4	249	199.4
100	495.0	98.8	501.0
49.9	991.0	49.3	1003.0

Configuration Stage: The second stage of the proposed system is Arduino. The Arduino is described as “some open-source electronics prototyping platform based on flexible, easy to use of the hardware and software”⁽¹⁰⁾. It can read analog input voltage (at input A0) and converts it to serial data, which is sent via the USB cable to display on the computer. The Code that used to communicate the USB/serial port the PC. The **Arduino Uno ADC** is of 10-bit resolution (so the integer values from (0-(2¹⁰) 1023)). This means that it will map input voltages between 0 and 5 volts into integer values between 0 and 1023. Therefore, for every (5/1024= 4.9mV) per unit. The Arduino would then calculate the patient’s heart rate by connected the output ECG circuit to analog input (pin A0) of Arduino board with baud rate 115200 bps, then Arduino device is connected to the USB port that continuously reads ADC data and sends it via the USB to MATLAB.

Diagnosis Stage: The main purpose of this stage is to extract the needed features from the acquired and pre-processed ECG signal. The extracted features which include amplitudes and intervals of QRS complex, PR intervals and ST intervals, will compared with the normal analogues features firstly, signal will have received from the configuration stage via USB port, the following codes is used for this purpose

```
Board=serial ('COM6', 'Baud Rate', 115200);
fopen (board);
v(x)=fscan(board,'%d');
```

The received signal will be processed using MATLAB software package which implements an algorithm that performs the extraction and diagnosis tasks per abnormal state illustrated in fig.4 .

- Sinus Tachycardia: if heart rate more than 100bpm.



Sinus Tachycardia

- Sinus Bradycardia: if heart rate less than 60bpm.

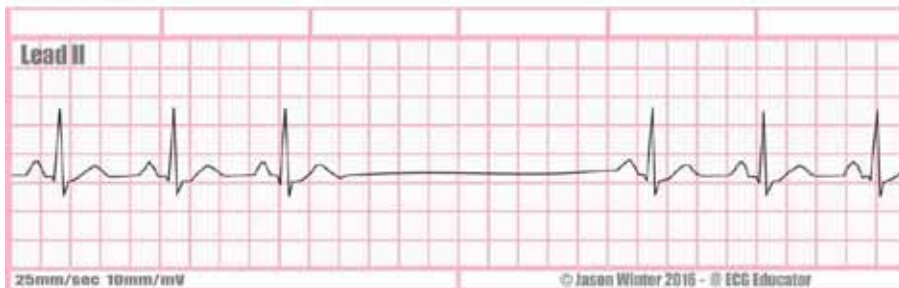
Sinus Bradycardia



Sinus Bradycardia

- Sinus Arrest: occurs when there is a sudden absence of electrical activity initiated by the SA node.

Sinus Arrest



Sinus Arrest

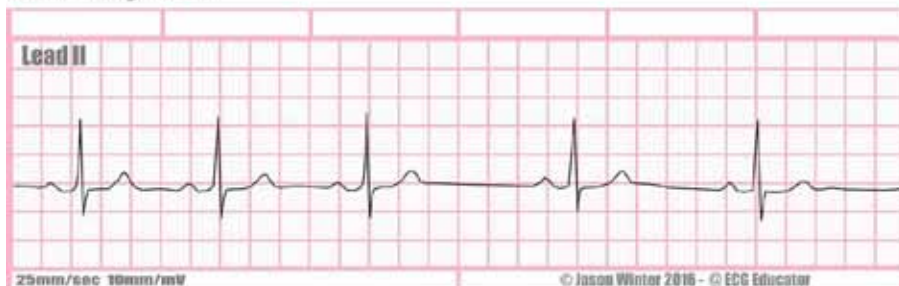
- Bundle Branch Block: can be diagnosed when the duration of the QRS complex on the ECG exceeds 0.12sec.



Bundle Branch Block

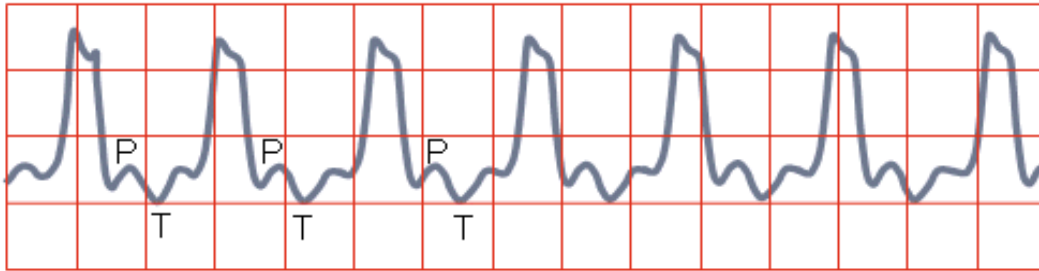
- Sinus Arrhythmia: occurring variation in heart rate that occurs during a cardiac cycle by measuring difference distance between R-R interval.

Sinus Arrhythmia



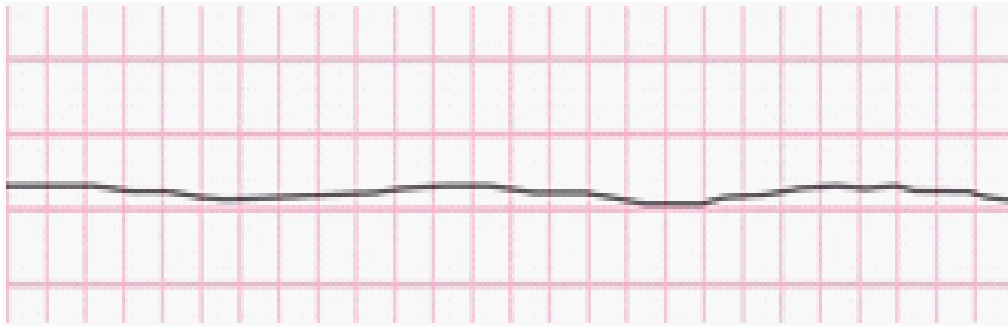
Sinus Arrhythmia

- Ventricular Tachycardia: causing rapid with heart rate >120 bpm and wide Ventricular QRS-complexes more than 0.12 sec.



Ventricular Tachycardia

- Asystole: no electrical activity from the heart and therefore no blood flow.



Asystole

Fig. 4: Abnormal state of ECG signal

The algorithm implemented in this paper focusses on the measurements of the time period between two successive R wave in order to extract the heart rate (normally 60 to 100 bpm for an adult), also it's calculates the QRS duration and amplitudes. The following procedure is considered to perform the diagnosis task:

1. Remove low frequency components as follow:

- Transform the signal to frequency domain using fft.
- Remove low frequency components.
- Back to time domain using ifft.

2. Find local maxima using windowed filter.

3. Remove small values, store significant ones.

Results

The ECG signal send to MATLAB via USB cable associated with the Arduino Uno where MATLAB in the reception of data on digital format in real time,

MATLAB starts to Remove low frequency components and detection of R- peaks then diagnosis some of heart disaes for ECG signal. In MATLAB code was taken waves of 2 or above in order to avoid the person movement at the beginning of measurement signal.

MATLAB show the results to diagnosis of heart irregular activities.

Conclusion

A diagnosis system has been designed and implemented to acquire the ECG signal. Preprocessing of ECG is performed in the designed analog circuit which consists of instrument amplifier and filters for amplifying ECG and removing different types of noise from it. Arduino has been used as a mediator which converts the analog signal into a digital form and then sent to the computer via USB port. An algorithm for R Peak and QRS complex detection using MATLAB software package has been proposed. Extraction of the R Peak and QRS complex obtained and used to compare

with the normal waves. Four types of heart abnormality are detected by using this proposed system.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

1. R. S. Khandpur, "Handbook of Biomedical Instrumentation", Tata McGraw-Hill publishing Company Limited, New Delhi 2005.
2. Naazneen M. G., S. Fathima, S. H. Mohammadi, Sarah Iram L. Indikar, A. Saleem, M. Jebran "Design and Implementation of ECG Monitoring and Heart Rate Measurement System," International Journal of Engineering Science and Innovative Technology (IJESIT), ISSN: 2319-5967, ISO 9001:2008 Certified, Volume 2, Issue 3, May 2013.
3. U. Pradhan, Naveen Kumar S.K, "Design of a Three Lead ECG Amplifier System," International Journal of Advanced Research in Computer Science and Software Engineering, 2015; 5, 12, 77-80.
4. D. K. Ojha, M. Subashini, "Analysis of Electrocardiograph (ECG) Signal for the Detection of Abnormalities Using MATLAB," International Journal of Medical, Health, Biomedical, Bioengineering and Pharmaceutical Engineering 2014;8, 120-123
5. Ravichandran L, Harless C, Shah AJ, Wick CA, McClellan JH, Tridandapani S. Novel Tool for Complete Digitization of Paper Electrocardiography Data. *IEEE J TranslEng Health Med.* 2013;1:1800107. doi:10.1109/JTEHM.2013.2262024
6. M. K. Islam, A. N. M. M. Haque, G. Tangim, T. Ahammad and M. R. H. Khondokar "Study and Analysis of ECG Signal Using MATLAB & LABVIEW as Effective Tools," International Journal of Computer and Electrical Engineering, 2012: 4: (3), 404-408
7. H.Gholam-Hosseini and H.Nazeran "Detection and Extraction of the ECG Signal Parameters," Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 20, No 1,1998.
8. T. Rao, M.Gopi, M.VS.Prasad "Real Time ECG Signal Transmission for Remote Monitoring," International journal of engineering development and research (IJEDR), 2014: 2: 348-354
9. Levkov, C., Mihov, G., Ivanov, R. et al. Removal of power-line interference from the ECG: a review of the subtraction procedure. *BioMedEngOnLine* (2005). 4, 50 <https://doi.org/10.1186/1475-925X-4-50>
10. Massimo Banzi, David Cuartielles, Tom Igoe and GianlucaMartinoand David Mellis. *The Arduino.* <http://www.arduino.cc/>, February 2011.

Phytochemical Screening by HPLC and FTIR Spectroscopy of Glucokinin Isolated from Methanol Extract of *Bauhinia Variegata*

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Abstract

The isolation of active plants compounds lead to discover a several drugs derived directly from plants. In the current study, the Glucokinin was isolated and purified from the methanol leave extract of medicinal plant *Bauhinia variegata*, the attempts to identified and characterized it's functional groups by the HPLC and FT-IR spectroscopy was worked in this study. By using FT-IR spectroscopic the Glucokinin shown different functional groups. The FTIR spectrum of the purified material, Glucokinin from the methanol leaf extract of *B. variegata* indicate the presence of different functional groups. The peak near 1650 cm⁻¹ is the amide I band..

Keywords: *Bauhinia variegata*, Glucokinin, HPLC, FT-IR, medicinal plant.

Introduction

Medicinal plants have been used for thousands of years in folk medicines in Asian and African populations and many plants are consumed for their health benefits in developed nations^[1]. It is estimated that 70–95% of the population in developing countries continues to use traditional medicines^[2]. Natural products, such as plants extract, either as pure compounds or as standardized extracts, provide unlimited opportunities for new drug discoveries because of the unmatched availability of chemical diversity^[3]. Plant polyphenols act as strong antioxidants and they protect cell constituents against oxidative damage, thus averting the deleterious effects on nucleic acids, proteins and lipids in cells^[4]. The flavonoids, which are the largest and most studied

polyphenols, are gaining interest as antioxidants because of their high capacity to scavenge free radicals. Flavonoids prevent hydroxy radical induced damage 10 by donating an electron to neutralize the species^[5]. The isolation of plant active compounds not a new trend but begun before two century when the painkilling drugs were discover like morphine from *Papaver somniferum* L., digitoxin, the cardiac glycoside, isolated from *Digitalis purpurea* and a lot other natural compounds that some of them still in use^[6]. These compounds play strong role in development of therapeutics treatments^[7]. *Bauhinia variegata* L which commonly known as mountain ebony, orchid-tree, poor-man's orchid, camel's foot and Napoleon's hat, belongs to the family Leguminosae^[8]. It was planted in garden, park and roadsides as ornamental plant in many warm temperate and subtropical regions. It was native to Southeast Asia and grows in tropical and subtropical climate^[9]. All parts of the plant (leaves, flower buds, flower, stem, stem bark, seeds and roots) were used in traditional medicine. It was traditionally used in the treatment of bronchitis, leprosy, tumors, astringent, tonic, anthelmintic, antidiabetic, laxative and for piles, used in the treatment of worm infestations, diarrhea and piles^[10]. The phytochemical screening revealed that *B. variegata* contained terpenoids,

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flavonoids, tannins, saponins, reducing sugars, steroids and cardiac glycosides^[11].

Pharmacological studies showed that *B. variegata* exerted anticancer, antioxidant, hypolipidemic, antimicrobial, anti-inflammatory, nephroprotective, hepatoprotective, antiulcer, immunomodulating, molluscicidal and wound healing effects^[12]. A wide range of chemical compounds isolated so far from the plant are β -sitosterol, kaempferol-3-glucoside, tannins, carbohydrates, amides, reducing sugars, vitamin C, crude protein, fibers, calcium, phosphorus, quercetin, rutin, quercitrin, apigenin, apigenin-7-O-glucoside, heptatriacontan-12, 13diol and dotetracontan-15-en-9-ol^[13]. In addition, the presence of insulin-like molecules was demonstrated in the leaves of *B. variegata* where a protein was found that has a partial amino acid sequence identical to that of bovine insulin^[14]. The activity of this insulin-like protein on serum glucose levels of four-week-old Swiss albino (CF1) diabetic mice was similar to that of commercial swine insulin used as control^[11]. This study aim to identify the functional groups of Glucokinin that purified from the leave methanol extract of *B. variegata* by using HPLC and FT-IR techniques.

Materials and Method

Plant Preparation: The fresh leaves of *B. variegata* were collected from the gardens of Baghdad University, then washed well with tap water. The clean leaves then dried under shad, after that the dried leaves placed in oven for couples of hours. The dried leaves grinded by electric blender.

Plant Extraction: Fifty grams from the powdered leaves of *B. variegata* were taken and placed in 350 ml from %70 methanol for one week under room temperature and shaken between time to time. After that, the residues were taken off by filter paper, then the methanol was removed by using the rotary evaporator, in room temperature, until dryness.

Partial separation by column chromatography: Partial separation for flavonoids is done by using open glass column (2×17) cm which was filled by Sephadex LH20 (prepared by weighing 10g from powder Sephadex LH20 and dissolving it in 70% methanol and waiting until activated, approximately half an hour). This material separate the plant chemical components according to their molecular weight. Two gram from plant crude extract dissolved in 3 ml from 70% methanol, then added to the sephadex column, the elution solvent

was 70% methanol also. When the chromatography was running 35 tube were collected with 5 ml from solvent in each one of tubes. All fractions were tested for FeCl₃ 1% solution as colorimetric test for polyphenols identification. Only the positive results elution's are collected.

Final purification by column chromatography:

The same glass column (2×17) was used with new sephadex LH 20, the positive tubes that were collect from the first column were concentration by oven in 40-60 °C then were added to the second column, the elution solvent was methanol 70%. Twelve tubes were collected and the FeCl₃ 1% was used to test all the tubes, only the dark green tubes were taken.

Detection of phytochemical components: To detection of the essential phytochemical components the standard protocols were used which involved the basic colorimetric method that established to detect the presence of the major phytochemicals in extract as, terpenes and steroids tannins phenols saponins resins alkaloids and flavonoids^[15, 16].

High performance liquid chromatography (HPLC): The HPLC for the methanolic extract of *B. variegata* and the Glucokinin were carried out by using the following conditions According to^[17].

Mobile Phase	Acetonitrile : D.W (80 :20)
Column	C 18 – ODS (25 cm * 4.6 mm)
Detector	UV – 280 nm
Flow rate	1 ml/min

Fourier transform infrared FT-IR spectroscopic analysis: Fourier Transform Infrared Spectrophotometer (FTIR) is perhaps the most powerful tool for identifying the types of chemical bonds (functional groups) present in compounds. The wavelength of light absorbed is characteristic of the chemical bond as can be seen in the annotated spectrum. By interpreting the infrared absorption spectrum, the chemical bonds in a molecule can be determined [18]. Five milligram from the isolated material mixed with 100 mg KBr pellet then loaded in in FTIR spectroscopy (Shimadzu, IR Affinity 1, Japan), with a Scan range from 600 to 4000 cm⁻¹.

Results and Discussion

In this research, Glucokinin which isolated from the methanolic extract of *B. variegata* was screening for its properties and its chemical structure by using

different method such colorimetric test, HPLC and FT-IR techniques. The data of the colorimetric test for the crude methanol extract of *B. variegata* and the pure Glucokinin were shown in table (1) where observed that the crude extract have a positive result for all of the tannins, phenols, saponins, alkaloids, resins, flavonoids, terpenes and steroids and this agree with previous study that support the presence of various phytochemical compounds flavonoids, alkaloids, saponins, sterols, tannins and other components in the methanolic extract of *B. variegata* [19,20,21]. While the phenols and flavonoids were positive for the results of colorimetric Glucokinin tests.

The results that obtained from the HPLC were shown in Figure 1, 2 and 3. In Table (2) shown that the partial purification of methanol extract of *B. variegata* have more than one compound with different retention times and one of these compound is similar in retention time of the insulin (3.464) which used as standard, the retention time of insulin shown in table (4). While table

(3) elucidate the HPLC for the pure sample, Glucokinin, wherein one peak can be observed that and it's have the same retention time (3.448) with the retention time of insulin (3.464). This finding agrees with previous study that suggests the presence of insulin like protein (Glucokinin) in this plant^[11].

Table 1: detection of some phytochemicals in crude methanol extract of *Bauhinia variegata* compare to Glucokinin

Phytochemicals	Crude extract	Glucokinin
Tannins	+	-
Phenols	+	+
Saponins	+	-
Alkaloids	+	-
Resins	+	-
Flavonoids	+	+
Terpenes	+	-
Steroids	+	-

Table 2: HPLC for partial purification of methanol.

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]
1	2.752	397.524	34.283	4.0
2	3.448	8495.209	546.300	86.3
3	3.952	647.612	61.651	6.6
4	4.596	190.111	21.147	1.9
5	8.272	115.417	7.697	1.2
	Total	9845.873	671.079	100.0

Table 3: HPLC for Glucokinin extract of *B. variegata*

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]
1	3.448	1941.018	222.024	100.0
	Total	1941.018	222.024	100.0

Table 4: HPLC for insulin

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]
1	3.464	1733.879	251.386	100.0
	Total	1733.879	251.386	100.0

The FTIR spectrum of the purified material, Glucokinin from the methanol leaf extract of *B. variegata* indicate the presence of different functional groups. The

results shown in Fig. (1) and Table (5). The peak near 1650 cm^{-1} is the amide I band. It results from the C=O stretching of the peptide bond. Similarly, the peaks near

1540 cm⁻¹ (N-H bending/C-N stretching) and 1240 cm⁻¹ (C-N stretching/N-H bending) are called the amide II band and amide III band, respectively. Also the peak near 3300 cm⁻¹ is thought to be N-H bending and the peak near 1400 cm⁻¹ to result from protein side-chain COO⁻. The finding of protein side chain consider logical result as in previous study the amino acids sequence of Glucokinin found to be partially similar to the sequence of bovine insulin^[14]. As the absorption peak position and shape of the amide I band differ according to the secondary structure, peak analysis can yield information on the secondary structure.

Table 5: FTIR spectral peak values and functional groups obtained from the isolated material

Peak Values	Functional Groups
3383	OH group
3300	N-H bending
2929	C-H stretching
2858	CH ₃
1724	C=O carbonyl group
1651	C=O stretching of the peptide bond, amide I
1540	N-H bending/C-N stretching, amide II band
1361	protein side-chain COO ⁻ .
1240	C-N stretching/N-H bending, amide III
1062	C-O group

Conclusion

This compound play an important role in the medical value of *B. variegata* as anti-diabetic plant. The success of isolation and purification of Glucokinin from plants, which consider as less toxic, lower cost and less cross reactive effects supply the medical fields with alternative source of human and animal insulin.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

- Rajeswara Rao BR, Singh K, Sastry KP, Singh CP, Kothari SK, Rajput DK and Bhattacharya AK. Cultivation Technology for Economicaly Important Medicinal Plants. In: Reddy KJ, Bahadur B, Bhadraiah B, Rao MLN, editors. *Advances in Medicinal Plants*. University Press; Hyderabad 2007. p. 112-122.
- Robinson MM, Zhang X. *The World Medicines Situation 2011. Traditional Medicines: Global Situation, Issues and Challenges*. Geneva: World Health Organization.
- Cosa P, Vlietinck AJ, Berghe DV, Maes L. Anti-infective potential of natural products: How to develop a stronger in vitro 'proof-of-concept'. *J. Ethnopharmacol* 2006 106: 290–302.
- Rice-Evans C. *Current Medicinal Chemistry*. 2001 8(7), 1, p. 797- 807.
- Souza RSO, Albuquerque UP, Monteiro JM, Amorin ELC. Jurema-preta (*Mimosa tenuiflora* [wild.] poir) a review of its traditional use, phytochemistry and pharmacology. *Braz Arch Biol Techn* 2008 51(5):937-947.
- Elbaz HA, Stueckle TA, Tse W, Rojanasakul Y and Dinu CZ. Digitoxin and its analogs as novel cancer. *Exp.Hematol.Oncol*. 2012 1, 4.
- Gordaliza M. Natural products as leads to anticancer drugs. *Clin.Transl. Oncol*. 2007 9, 767–776.
- Kanak S and Verma Anita K. Evaluation of antimicrobial and anticancer activities of methanol extract of in vivo and in vitro grown *Bauhinia variegata* L.2012
- Ghaisas MM, Shaikh SA and Deshpande AD. Evaluation of immunomodulatory activity of ethanolic extract of the stem bark of *Bauhinia variegata* Linn, *Int. J. of Green Pharmacy*. 2009 70-74.
- Gupta R, Paarakh MP and Gavani U. Isolation of Phytoconstituents from the leaves of *Bauhinia variegata* Linn., *Journal of Pharmacy Research*. 2009 2(8):1315-1316.
- Azevedo CR, Maciel FM, Silva LB, Ferreira ATS, da Cunha M, Machado OLT, ... Xavier-Filho J. Isolation and intracellular localization of insulin-like proteins from leaves of *Bauhinia variegata*. *Brazilian Journal of Medical and Biological Research*. 2006 39(11), 1435–1444.
- Al-Snafi AE. The Pharmacological Importance of *Bauhinia variegata*. A Review *International J. of Pharmaceutical Sciences and Research*. 2013 4(12).
- Vijay Kumar MMJ, Eswarappa B, Yadav D. Bodke, Jayadevaiah KV and Basavaraja HS. Isolation of Phytoconstituents from the Stem Bark of *Bauhinia Variegata* Linn. *Pharma Tutor Magazine*. 2014 2(9).

14. Azevedo CR. Caracterização parcial de insulina de folhas de *Bauhinia variegata*. Campos dos Goytacazes: Centro de Biociências e Biotecnologia, Universidade Estadual do Norte Fluminense; 2003 [Master's thesis].
15. Evans WC. Pharmacognosy 13th (Eds) Balliere Tindal, London. 1989 419-420.
16. Harborne JB. Phytochemical method. A guide to Modern Technique of Plant Analysis, Chapman Hall, London. 1984.
17. Najjar H, Alawi M, AbuHeshmeh N and Sallam A. A rapid, Isocratic HPLC Method for Determination of Insulin and Its Degradation product. *Advance in Pharmaceutics*. Article ID 749823, 2014 6 pages.
18. Goudanavar P, Shah SH and Hiremath D (2011). Development and characterization of Lamotrigine orodispersible tablets: Inclusion complex with hydroxy propyl β -CD. *International Journal of Pharmacy and Pharmaceutical Sciences*.2011; 3: 975- 1491.
19. Pachouri K. and Yadav S. Physicochemical and Phytochemical Analysis of *Bauhinia variegata* Modern analytical HPTLC Fingerprinting. *IJSER*. 2015; 6(8).
20. Alyawer SMF. Extraction and Purification of Active Compounds from *Bauhinia variegata* L. and Assessment its Hypoglycemic Effect in Alloxan Induced Diabetic Mice. M.Sc. thesis . Genetic Engineering and Biotechnology for Postgraduate studies. University of Baghdad. 2015.
21. Al-Jumaily, EF. and Fakhri.S.M. Hypoglycemic and Hypolipidemic Effect of Active Compounds (Glucokinin or Plant Insulin) from *Bauhinia variegata* L. in Alloxan Induced Diabetic Mice. *World Journal of Pharmaceutical Sciences*. 2016; 4(2): 263-270.

Burn Injury Characteristics and Outcomes among Hospitalized Patients in Tertiary Burn Unit

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Abstract

Background: Burn Injuries constituted an important high priority health problem especially in little and medium salary republics including Iraq.

Objective: Identify the characteristics of burn injuries and its outcomes among patients admitted to Al-Hilla Teaching Hospital burn unit–Babylon Province Iraq.

Method: This was observational cross sectional hospital based study, burn injury data were collected from the interview of burn patients admitted to burn unit of Al Hilla Teaching Hospital, Babylon Province, Iraq during the last four months during the year 2019, using special data collection questionnaire included; burn patients demographic characteristics, period of hospital stay (days), size of total body surface areas, degrees of burn injuries, types of treatment and the outcomes.

Results: The highest proportion of cases were males, the majority of patients were young adults and children, about four fifth of cases were rural dwellers (78%). The means and standard deviations of duration of hospitalization and total surface areas were 5.72+53 days and 21,9+21.1 respectively, about two thirds of the study group were second and or third degrees burn, only 12% of patients were treated surgically by wound excision and skin graft, 67% of patients were cured while the case fatality rate was 9%.

Conclusion: Children, males and poorly educated patients were the majority of cases, about nine in tenth were treated conservatively and about two thirds of cases were cured.

Keywords: Burn injuries, Characteristics, outcomes, Babylon Province, Iraq.

Introduction

Burn is one of the most severe injuries [1] Burns representing a common type of domestic trauma [2]. Burn injuries are one of the very important health problems that cause to prolonged hospitalization and hence increased expenses for patients, their families

and society [3]. Burn injuries are more common in developing countries including Iraq, especially in poor socioeconomic and rural areas [4,5]. The number of burn injuries worldwide was very high in 2017 According to the Global Burden of Diseases [6], accidental burn damage is considered the 3rd common reason of death in the USA [7], these injuries have a major economic and psychosocial impacts [8,9]. Some countries have made substantial progress in reducing the incidence and mortality of burns by implementing measures related to prevention and treatment [4-6,10-12] that is why during the last decades, an important progress has been made in reducing the morbidity and mortality of burns [10,13,11,14]. Burn patients were more often seen during the winter months. Unintentional and intentional burn injuries vary

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across age groups, sex, income and global region but the majority of burn patients were children, young adults and males^[12,15]. In contrary to low and middle income countries in high-income ones, the trend recently has been a reduction in burn incidence, burn severity, length of hospital stay and mortality rate^[13-17,16-20]. Research on burn in Iraq were limited, this study was conducted to describe the characteristics and the outcomes of burn injuries among Iraqi hospitalized patients.

Method

A cross sectional observational descriptive study displayed on peoples admitted at Burn Wards Center in Al Hilla Teaching Hospital – Babylon province – Iraq(the only tertiary referral burn center), during the period from the beginning of September through the end of December 2019. Ethical approval was obtained from the ethical committee of Babylon medical college. Data were collected through interviewing patients or their companions after taking their verbal consents. A pretested questionnaire which includes information about demographic characteristics of enrolled patients suffering from burn injuries who admitted to this referral burn center, data included age (years), gender, level of education, place of residence, size of burns using the Lund and Browder chart^[18]. Most burns are small and superficial (First Degree) involve only the epidermis causing only local injuries. When estimating the degree of burn in this study, only partial thickness and full thickness burns are considered and superficial burns are excluded.

However, burns can be deeper; partial thickness burns (second degree) extend through the epidermis and into the dermis, full-thickness burns (third degree) extend through both the epidermis and dermis and into the subcutaneous fat or deeper^[19,20]. All patients with burn injury were studied consecutively. No patient was excluded from the study. Descriptive statistics including frequencies, percentages, means and standard deviations were demonstrated in tables and graphs. Inferential statistics (chi square test) were used to detect significant study associations using SPSS version 24. The P values less than 0.05 were considered significant.

Results

In this study males to female ratio is 1, 2:1 this increase in male ratio does not reach the statistically significant level $p > 0.05$. [Figure 1].

Figure [2] shows that children and young adults are highly affected by burn injuries, the vast majority of cases are below 30 years of age.

Table [1] reveals that most of the victims are living in rural regions compared to urban dwellers, this difference is highly significant $p < 0.05$.

Table [2] shows the means and standard deviations of the duration of admission and the Total Body Surface areas (TBSA) are 5.72±53 days and 21,9±21.1 respectively. Depicts that the most common group of duration of admission is 1-5 days, which constitutes (67%). Table [3], explains the outcomes of cases, 67% were cured, only 9 cases died (case fatality rate is 9%). And also show that (12%) of cases were treated by wound excision and or skin graft. Table [4] reveals that the high proportion of burns patient have TBSA 10-20%. And also shows that 34% patients suffer second and or third degree burn injuries.

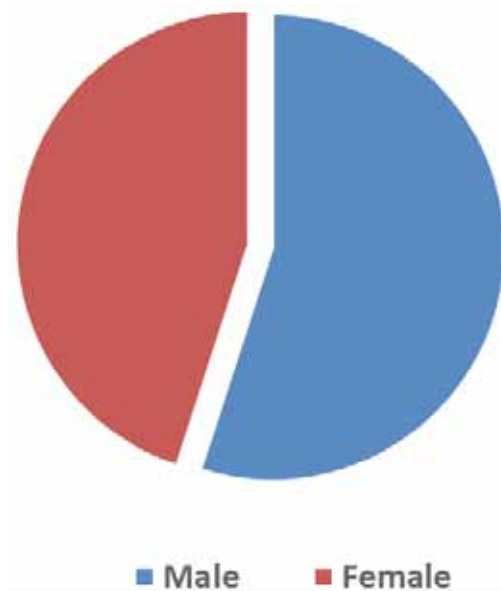


Figure (1): distribution of burn cases by gender (Male to Female Ratio 2:1).

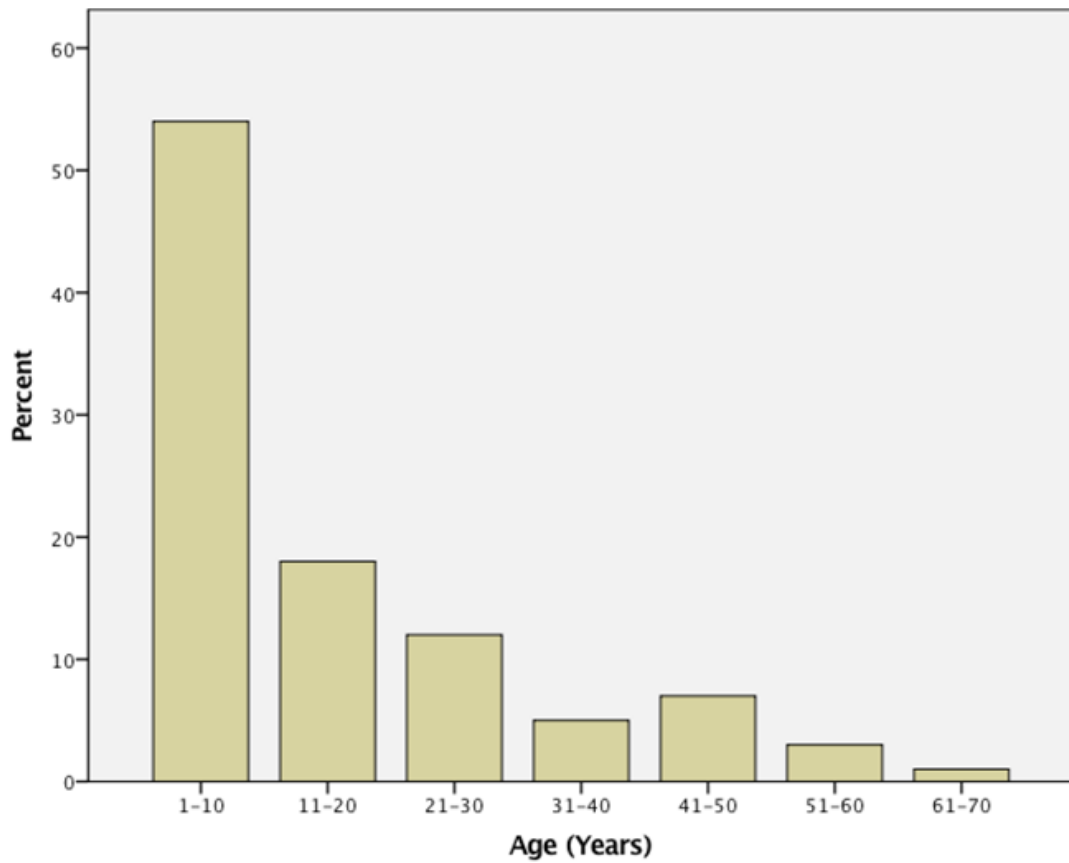


Fig (2): Distribution of the burn injury cases by age group.

Table (1): Distribution of burn cases by place of residence

Place of residence	Frequency	Percentage
Rural	78	(78)
Urban	22	22
Total	100	100

The chi-square statistic is 17.0139. The p-value is .000037. Significant at $p < 0.05$.

Table 2: Frequency distribution of cases by level of education and duration of admission

Level of Education	Frequency	Percentage
Below school	52	52.0
Primary school	12	12.0
Intermediate	6	6.0
Secondary school	17	17.0
Collage	9	9.0
Illiterate	4	4.0
Duration of stay in the hospital (days)	Frequency	Percent
1-5	62	62.0
6-10	24	24.0
11-15	10	10.0
16-20	1	1.0
21-25	2	2.0
30-35	1	1.0

Table 3: Frequency distribution of the study group according to the outcome and the type of treatment.

Outcome	Frequency	Percent
Cured	67	67.0
Discharge on his responsibility	3	3.0
Discharge on family responsibility	16	16
Referred to another department or hospital	5	5.0
Died(case fatality)	9	9.0
Treatment	Frequency	Percent
Conservative	88	88.0
Wound Excision & Skin Graft	12	12.0
Total	100	100.0%

Table 4: Frequency distribution of the study group according to the Total body surface areas and degree of burn.

Total Body Surface Area	Frequency	Percent
Below 10 %	29	29.0
11-20 %	39	39.0
21-30 %	16	16.0
31-40 %	6	6.0
41-50	2	2.0
More than 50 %	8	8.0
Degree of burn	Frequency	Percent
2° degree burn	66	66.0
3° degree burn	8	8.0
2° & 3° degree burn	26	26.0

Discussion

The finding of this study reveals that males are predominantly affected as compared to females but this does not reach the significant statistical difference this finding does not agree with the findings of other researchers [21-28] while other study reported a similar finding in gender composition ratio [29] but our finding disagrees with the findings of other researchers who found that females were suffered burn injuries significantly more than males [30-32]. Regarding age of patients, this study clarifies that the vast majority of the victims are below 30 years of age and mainly children below ten years, this result is similar to result reported by other studies [26,33] and this explain why that most of the burn victims were male in gender due to that the boys are more susceptible to burn accidents because they are more active than the girls.

A study conducted by Nthumba on burn patients in sub-Saharan region shows similar finding, where kids

aged ≥ 10 years characterized more than 80% of the burn persons [26].

The majority of cases in our study were living in rural areas, this finding goes in line with the finding of similar study conducted in Pakistan [32] this may be due to the poor safety awareness of cooking among rural dwellers among others such as the lack of level of domestic safety.

High proportion of burn patients are poorly educated, this finding is in consistent with the finding of local study [28].

The current study reveals that the mean duration of hospital stay of burn patient is 5.7days this finding is close to the finding (7.1days) of similar study conducted on convenient sample of 75 burn patients at Pakistan Institute of Medical Sciences in Islamabad [32] but its lower than the average hospital stay of burn patients studied by Bataineh et al. in north Jordan 16 days [22] and

this lowest mean duration in the hospital stay compared to the other studies comes from two reasons, the first that we include in this study all the patients including those who discharge within one or few days after admission on the family or their responsibility (19%) as shown in table 5, and the second reason was related to that the specialist staff policy is to early discharge the patient with low percentage and degree burns to avoid serious complications.

This study identifies that the mean of TBSA among victims is about 22% which is much lower than that reported by other study conducted at a tertiary burn care center in the National Institute of Burn and Plastic Surgery in Dhaka Bangladesh on 66 hospitalized burn patients which was 46.4% [32]

The proportion of second-degree burns in our study is higher than that reported by local study conducted in the medical city teaching hospital-Baghdad [28].

The case fatality rate among the study group in this study is about one in tenth which is higher than that reported by other study conducted in Jordan [22] but the mortality in our study is lower than what was reported by other study and the cure rate was much higher than what was depicted by Bahansali et al 7.3% [28]. Those who need surgical intervention of some sort once or twice by wound excision and or skin graft in this study are about 12% which much is less than that reported by Fathallah in Basrah province where about 22.4% of the studied burn patients were treated by surgical intervention, this difference may be related to the difference in the sample size or the availability of resources required for plastic surgery including trained medical staff [34].

Conclusion

Children, males and poorly educated patients were the majority of cases, about nine in tenth burn cases were treated conservatively and about two thirds of cases were cured, the case fatality rate is relatively high. There is a strong need to take suitable and effective measures to prevent and control the issue of burn on a national level. Improvement of the quality of health care service in burn center is strongly requested.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

References

1. Yucel Y, Acar HA, Erkal KH, Arditı NB. Retrospective analysis of patients with burn injury treated in a burn center in Turkey during the Syrian civil war. *Saudi Med J.* 2017 Jan; 38(1): 93–96. doi: 10.15537/smj.2017.1.16448
2. Brusselaers N, Monstrey S, Vogelaers D, Hoste E, Blot S. Severe burn injury in Europe: a systematic review of the incidence, etiology, morbidity and mortality. *Critical care.* 2010;14(5):R188
3. Mohadeth Ardebili F, BozorgNejad M, Manzari ZS. Burn injury in Mottahari Burn Center in Tehran, Iran. *World J PlastSurg* 2016;5:77-79
4. Mehrabani D, Farjam M, Geramizadeh B, Tanideh N, Amini M, Panjehshahin MR. The healing effect of curcumin on burn wounds in rat. *World J PlastSurg* 2015;4:29-35
5. Vaghardoost R, Kazemzadeh J, Dahmardehei M, Rabiepoor S, Farzan R, Kheiri AA, Khosravy R, Manafi F. Epidemiology of Acid-Burns in a Major Referral Hospital in Tehran, Iran. *World J PlastSurg* 2017;6(2):170-175
6. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional and national incidence, prevalence and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *Lancet.* 2018;10159:1789–858.
7. Lee CJ, Mahendraraj K, Houg A, Marano M, Petrone S, Lee R, Chamberlain RS. Pediatric Burns: A Single Institution Retrospective Review of Incidence, Etiology and Outcomes in 2273 Burn Patients (1995-2013). *J Burn Care Res.* 2016 Nov/Dec; 37(6):e579-e585
8. Sadeghi-Bazargani H, Maghsoudi H, Ranjbar F, Mashadi-Abdollahi. H. Stress disorder and PTSD after burns injuries: a prospective study of predictors of PTSD at Sina Burn Center, Iran. *Neuropsychiatr Dis Treat.* 2011; 7: 425– 429.
9. Mohammed AAQ The prevalence of burn related deaths in Basrah. *The Medical Journal of Basrah University;*2018 36, (1):22-28.
10. Jeschke MG, Peck MD. Burn care of the elderly. *J Burn Care Res.* 2017;38(3):e625–28.
11. Kraft R, Herndon DN, Al-Mousawi AM, et al. Burn

- size and survival probability in paediatric patients in modern burn care: A prospective observational cohort study. *Lancet*. 2012;379(9820):1013–21.
12. Kuvandik G, Ucar E, Karakus A. Epidemiology and cost of burns in emergency department during Syrian civil war. *Bratisl Med J* 2018; 119 (11) 731-73.
 13. Aldana MC, Navarrete N. Epidemiology of a decade of Pediatric fatal burns in Colombia, South America. *Burns* 2015; 41:1587.
 14. Smolle C, Cambiaso-Daniel J, Forbes AA, et al. Recent trends in burn epidemiology worldwide: A systematic review. *Burns* 2017; 43:249.
 15. Santos JV, Oliveira A, Costa-Pereira A, et al. Burden of burns in Portugal, 2000-2013: A clinical and economic analysis of 26,447 hospitalisations. *Burns* 2016; 42:891.
 16. Hwee J, Song C, Tan KC, et al. The trends of burns epidemiology in a tropical regional burns center. *Burns* 2016; 42:682.
 17. Saeman MR, Hodgman EI, Burris A, et al. Epidemiology and outcomes of pediatric burns over 35 years at Parkland Hospital. *Burns* 2016; 42:202.
 18. Gillenwater J. & Garner W. in *Grabb and Smith's Plastic surgery* by Chung K.C. 8th Edition. Wolters & Kluwer. 2019; 179
 19. Jiang, M. J., Li, Z. & Xie, W. G. Epidemiological investigation on 2 133 hospitalized patients with electrical burns. *Zhonghuashaoshangzazhi = Zhonghuashaoshangzazhi = Chinese journal of burns*33, 732–737 (2017).
 20. Stiles K. Emergency management of burns: part 2. *Emerg Nurse*. 2018 Jul;26(2):36-41.
 21. Othman N, Kendrick D. Epidemiology of burn injuries in the East Mediterranean Region: a systematic review. *BMC Public Health*;2010;10 (83).
 22. Bataineh Z, Alquran T, Al-Balas H, Khammash MR. Pattern of burn injury at north of Jordan. *International Journal of Burns and Trauma* 2018; 8(1):1-5
 23. Toppi J, Cleland H, Gabbe B. Severe burns in Australian and New Zealand adults: Epidemiology and burn centre care. *Burns*. 2019 Sep;45(6):1456-1461.
 24. Wang W, Zhang J, Lv Y, Zhang P, Huang Y, Xiang F .Epidemiological Investigation of Elderly Patients with Severe Burns at a Major Burn Center in Southwest China.*MedSciMonit*. 2020 Jan 6; 26:e918537.
 25. Morgan A, Bin Sultan AM, Al Harbi AM, Aljuhayyim AS, Al Hatlan OA. Aldhfyhan Y. Burn Injuries and Associated Causes in AL KHARJ Province of Saudi Arabia : are they preventable ? *Int. J. Adv. Res.*2017; 5(2), 1885-1891.
 26. Nthumba PM. Burns in sub-Saharan Africa: A review. *Burns*. 2016 Mar;42(2):258-66. doi: 10.1016/j.burns.2015.04.006. Epub 2015 May 14
 27. Adejumo PO, Akese MI.A five-year prevalence study of burn injury in a Nigerian teaching hospital. *World Hosp Health Serv*. 2012;48(1):31-4.
 28. LamiFH,AlNaser RK. Epidemiological characteristics of burn injuries in Iraq: A burn hospital-based study. *Burns* 2019;45(2): 479-483
 29. He S, Zuo ZL Epidemiological investigation on 1 946 hospitalized pediatric patients with burns. *Zhonghua Shao Shang ZaZhi*. 2018 Oct 20; 34(10):696-700
 30. Tripathee S, Basnet SJ .Epidemiology and outcome of hospitalized burns patients in tertiary care center in Nepal: Two year retrospective study. *Burns Open* 2017; 1(1): 16-19].
 31. Karki B, Rai SM, Nakarmi KK, Basnet SJ, Magar MG, Nagarkoti KK, Thapa S. Clinical Epidemiology of Acute Burn Injuries at Nepal Cleft and Burn Centre, Kathmandu, Nepal 2018. *Ann Plast Surg*. 2018 Mar;80(3 Suppl 2):S95-S97.
 32. Saaq M, Ashraf B. Epidemiology and Outcome of Self-Inflicted Burns at Pakistan Institute of Medical Sciences, Islamabad. *World J PlastSurg* 2014;3(2):107-114.
 33. Alhaider AKH, Hassan AJ, Hameed LM. Case Fatality Rate, Determination and Causes of Death in Al Nassiriay Burn Center at 2015 and 2016. *Thi-Qar Medical Journal (TQMJ)* 2018;15(1):30-42
 34. Fathallah ZF. Epidemiological study of burn injuries in Basrah. *Bas J Surg*, 2005;11(1):60-66.

Isolation and Identification of Mycoplasma from Eye Infection Diseases

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Abstract

The aim of this research was to identify the role of mycoplasma bacteria in eyes infections. A 100 samples were isolated from patients whom suffering from eye infections for 2nd Jan - 30th June 2018 . The clinical isolates were cultivated on mycoplasma media . Biochemical tests were then performed. Three types of mycoplasma were isolated (*M.pneumoniae*in 42 cases, *M.salivarium*in 30 cases & *M.hominis*in three cases). Six cases were recorded single infection . The highest incidence of mycoplasma in the age group (11-20 years).

Keywords: Infection diseases; eye; *M.pneumoniae*; *M.salivarium*

Introduction

The eye is the sensory organ of living organisms, which is influenced by many different environmental factors and conditions may cause damage or injury to the eye⁽¹⁾. Microorganisms can cause eye infections, causing many diseases, including Conjunctivitis, which invade any part of the eyeball or surrounding area ⁽²⁾. The lesions include the anterior part of the cornea, the wet membrane, the outer lining of the eye and the inner conjunctive eyelids), some of which extend to the inner parts of the lower and upper eyelids, causing severe damage to the eyes⁽³⁾.

The normal flora is found in most external parts of the eye, such as eyelids and conjunctiva and may also be present in the internal parts, reinforcement eye immunity for its important defense role by inhibiting the growth of the most common bacterium strains⁽²⁾ and bacterial species that cause extensive damage to the eyes. *Streptococcus hemolyticus*, *Hemophilus influenza*,

Pseudomonasaeruginosa, *Neisseria gonorrhoeae* & *Staphylococcus aureus*⁽⁴⁾.

Some types of mycoplasma species effected on eyes with many infections such as conjunctivitis, blurred vision, double vision, vproblems with glasses or medical lenses, increased sensitivity to light, spots in the eyes, dryness and aquatic eyes. Temporary for adults and children⁽⁵⁾. Mycoplasma has only a plasma membrane distinct from other bacteriostatic species by not possessing the cell wall⁽⁶⁾, which is not sensitive to penicillin and beta-cam⁽⁷⁾ beta-lactam) and are weak for the gram dye but are classified as Gr^{-ve}, spherical form or thread ⁽⁸⁾. Mycoplasma cause many diseases for humans, animals and plants ⁽⁹⁾.

Materials and Method

A 100 swabs were collected patients with eye infections of all age groups, both genders from Basra General Hospital, Al-Sader Educational Hospital, Al-Fayhaa General Hospital Al-Mawani Hospital in Basra Governorate, in addition to private clinics and 50 control samples from healthy persons. Swabs cultivated on Monophasic Diphasic Culture Setup (MDCS)(10). After that, colonies stained with nigrosin stain .

Biochemical test for Mycoplasma: Several biochemical tests were used⁽¹¹⁾, diagnosis of byfermentation of carbohydrates, arginine deaminase,

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coagulated serum digestion, casein digestion, hemolysis test, phosphatase test, film and spot in egg yolk, urease test, hem adsorption tetrazolium reduction test and gelatin liquefaction.

Result

A 100 samples by 3 swabs from each sample of the infected eyes and those who showed symptoms of inflammation of the eyelids and conjunctivitis and blockage of the lacrimal system and inflammation of the cornea and solid. MDCS used to isolate and demonstrate the role of mycoplasma in the eye infection diseases (incidence of conjunctivitis, inflammation of the eyelids

and inflammation of the cornea). Three species of Mycoplasma were isolated (75%).

The colonies of Mycoplasma appeared 48-72 hours like fried egg. *M.pneumoniae* colonies appeared in sphere (figure 1). Whereas, the colonies of *M.saliverium* appeared cocci (figure 2). *M.hominis* appeared in a convex spherical (figure 3). This is the first study in Iraq which isolated Mycoplasma from eye infections. This method is fast result for positive isolation by changing the color of the liquid medium from orange to yellow during 24 hours after that colonies appeared on the upper phase of the MDCS.

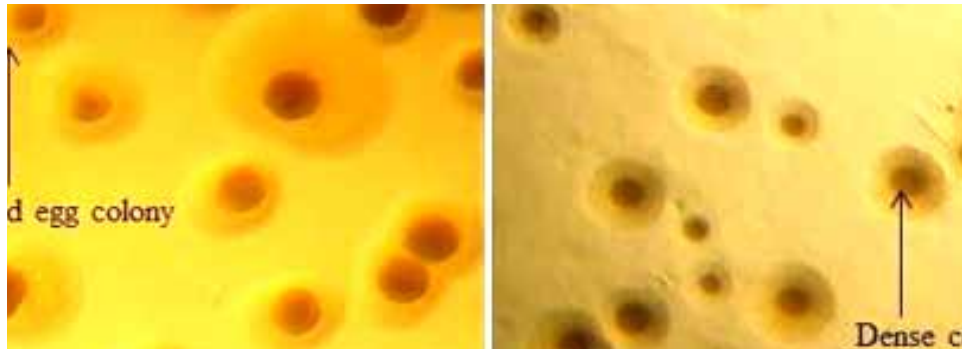


Figure (1): Colonies of *M.pneumoniae* (100×)

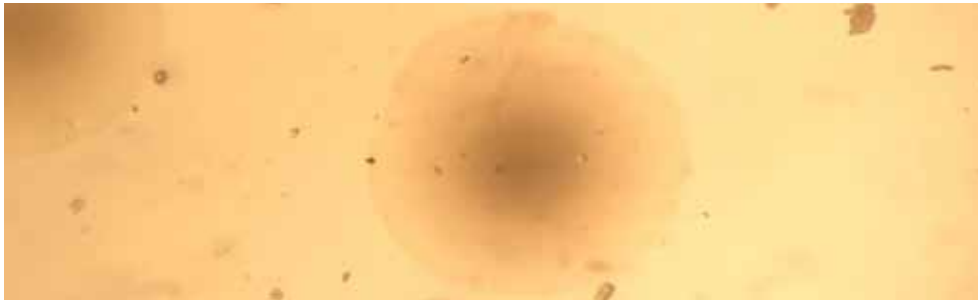


Figure (2): Colonies of *M.saliverium*

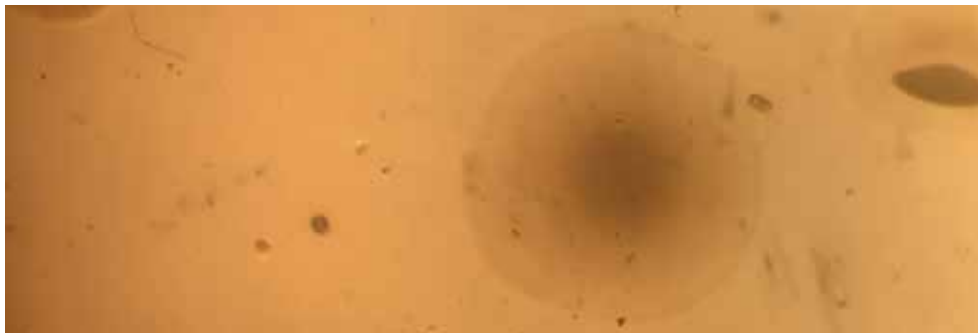


Figure (3): Colonies of *M.hominis*

Diagnosis of Mycoplasma species explain in table 1.

Table (1): Biochemical testsfor diagnosis mycoplasma species.

Mycoplasma spp.	Glucose Fermentation	Arginine Hydrolysis	Urea test	Tetra-zolium reduction Ae/An	Hemo-lysis	Phos-phatase test	Casein diges-tion	Gelatin liquefac-tion	Film or spot in egg youk	Serum Coagu-lated	Hemad-sorbtion
M.pneumoniae	+	-	-	+/+	β	-	-	-	-	-	+
M.salivarium	-	+	-	-/W	-	+	-	-	+	-	-
M.hominis	-	+	-	-/-	-	-	-	-	-	-	-

β : Complete hemolysis of erythrocytes; A/An : Aerobic/Anaerobic; W : Weak

Distribution of Mycoplasma which isolated within the study according to species: The highest incidence of *M. pneumoniae* was in 42 cases (56%), of which 4 were single (9.6%), 38 (89.4%), followed by *M. salivarium* isolated single infection in 2 cases (6.6%) and 28 cases with mixed infection (93.4%)

Figure (4) explain mycoplasma distribution among study patients. The second group (11 – 20 years) recorded highest percent in mycoplasma isolation but the last group (61 – 70 years) recorded lowest percent.

M. hominis isolated only in the first group (0 – 10 years).

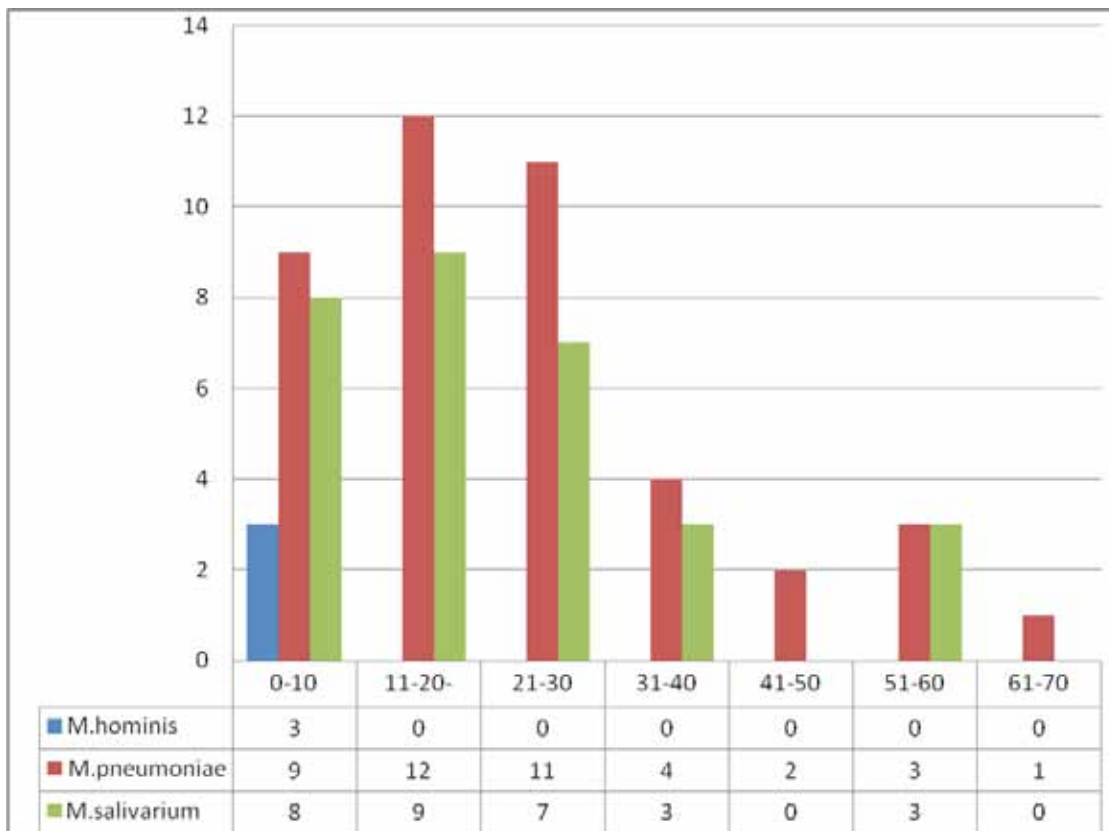


Figure 4 : Distribution of mycoplasma depending on patients age

Discussion

Mycoplasma lack cell wall and it is causative agents for many diseases . In this study we isolate 3 species of mycoplasma (*M. pneumoniae*, *M. salivarium* & *M. hominis*).

It is the first study in Iraq which isolate mycoplasma from eye infections (conjunctivitis, inflammation of the eyelids and inflammation of the cornea) .

This study agree with the study of ⁽¹²⁾, which found that *M. pneumoniae* are common cause of eye injuries,

causing conjunctivitis, optic neuritis and iris. In⁽¹³⁾ isolate *M.salivarium* from joints of septic arthritis patient also, in⁽¹⁴⁾ diagnosed *M.salivarium* from mouth ulcerpatients. The results of the study showed that *M.hominis* were isolated from eye injuries by(4%) agree with the study of⁽¹⁵⁾ which isolated from newborns and their mothers which suffering from genital inflammation.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

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References

1. Smolin, G.;Tabbara, K. and Whitcher, J. "Infectious Diseases of the Eye", Williams & Wilkins, London. (2010).
2. Todar, K.Pseudomonas aurogenosa. Todar's online textbook. www. textbook of bacteriology.net. (2004).
3. Pierce, J.M.;Ward,M.E. and Seal, D.V. Ophthalmianeonatorum in the 1980s: incidence,etiology and treatment. Br.J. Ophthalmol. (1982), 66:728-731
4. Collee, J.G.; Fraser, A.G.; Marmion, B.P. and Simmons, A.. Mackie and McCartney "Practical medical microbiology". 14th ed., Churchill Livingstone Inc., New York; (1996)
5. Lipsky,B.A.;Weigelt,J.A.; Gupta,V.; Killian,A. and Peng,M.M. Skin,softtissue,bone, and joint infections in hospitalizpatients:epidemiology and microbiology,clinical and outcomes. J.Infect. Control. Hosp. Epidemiol.(2007). 28(11):208-210.
6. Haggerty, C. Totten, P. Ferris, M. Martin, D. Hoferka, S. Astete, S. ondo, R.Norori, J. and Ness, R. Clinical characteristics of bacterial vaginosis among women testing positive for fastidious bacteria. J. Sex Tras.Infect.(2009). 85:242-248.
7. Ryan, J .; Mariano, J. What are mycoplasmas? Bionique testing laboratories. Available from : <http://www.bionique.com/mycoplasma-resources/faq/what-are-mycoplasma.html>; (2011).
8. Held, P. Clean culture. Drug. Disco. Develop. Maga., (2008). 11: 30 – 32.
9. Pitcher, D. and Nicholas, R. Mycoplasma host : fact or fiction. Vet. J. (2005). 170 (3) : 300 –306
10. AL – Ghizawi, G. Typical and atypical pneumonia characteristics bacterial profile of Cassese. Ph.D. thesis, college of Education, Basra university (2001) . P 108.
11. Holt, J., Kriog, N ., Sneoth, P., staley, J. and Williams, S. The mycoplasmas or (mollicutes) : cell wall – less bacteria in Bergey's manual of determinative bacteriology mycoplasmas, V:1. Academic Press, New York, N.Y, 9thed, U.S.A. (1994). 30:705-707.
12. Eva, B., Jorgen, S. and Peter, L. Conjunctivitis associated with M. genitalium infection, Clin . Inf . Dis. (2004). 39 :67 – 69
13. Kadhim, M. Isolation and identification of some Mycoplasmaspp. from septic arthritis in Basra city .M.Sc. Thesis, College of Education, University of Basra, Iraq. (2010). P 71.
14. Saaed, Z. The Role of Mycoplasma in oral cavity diseases and the efficiency of some toothpaste and antibiotic on them. M. Sc. Thesis, College of Education, University of Basra, Iraq. (2013). P 107
15. Khan,J.; Farzand, R. and Ghumro,P.B. Antibiotic sensitivity of human genital mycoplasmas.J.Micro. Res.(2010). 4(9):704-707.

The Association of T45G Polymorphism in the Adiponectin Gene with Some Hormonal Parameters in Iraqi Women with Polycystic Ovary Syndrome

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Abstract

This study was reflected on the correlations between the polycystic ovary syndrome (PCOS) and a Single Nucleotide Polymorphism (SNP) T45G in the adiponectin gene among Iraqi infertile women with polycystic ovary syndrome. Eighty primary infertile women with PCOS, sixty-two secondary infertile women with PCOS and 50 healthy fertile women in Iraq were included in this study, Blood samples were collected from the infertility clinic in Azadi Teaching Hospital and AL-Salam Hospital. The age of infertile and fertile women was ranged from 18 to 46 years. Results showed association between T45G polymorphism in the adiponectin gene and infertile PCOS women. Moreover, infertile women with PCOS with these polymorphisms have been reported to have higher LH, FSH and prolactin concentrations and BMI. In conclusion 45T→G polymorphisms have been shown to be associated with an increased risk of PCOS women with PCOS with these polymorphisms have been reported to have higher LH, FSH and prolactin concentrations and BMI.

Keywords: *Adiponectin, adipokines, PCOS.*

Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common causes of ovulatory infertility affects 4 - 12% of women in reproductive age [1]. The exact cause of PCOS is unknown, in some cases it may be a familial disorder, but the genetic basis of the syndrome remains unclear [2]. Adiponectin (APN) is described as a 'beneficial' adipokine in reproduction, both adiponectin receptors ADIPOR1 and ADIPOR2 are expressed in human hypothalamus and pituitary [3]. The human adiponectin gene was localized to chromosome 3q27, a region highlighted as a genetic susceptibility locus for type 2 diabetes and metabolic syndrome [4]. The major action of APN is to increase insulin sensitivity by stimulating glucose uptake in the liver and muscle, decreasing hepatic gluconeogenesis. It has been shown that adiponectin inhibits LH and GNRH release [5]. At physiological levels, adiponectin induces the expression of genes associated with periovulatory remodeling of the ovarian follicle in porcine granulosa cells [6] suggest that APN may play an active role in ovulation. Moreover, a

number of studies investigated the association of PCOS with polymorphisms of the APN gene [7] recently found a significant association of APN T45G polymorphism with PCOS by a meta-analysis. As the most abundant adipokine in the human body, APN seems to play an important role in the pathogenesis of PCOS. The aim of the present study was to assess the influence of Evaluation luteinizing hormone (LH), follicle-stimulating hormone (FSH), testosterone (T) and Prolactin (PRL) among Iraqi infertile women with polycystic ovary syndrome and possible correlations with T45G polymorphism in the adiponectin gene.

Materials and Method

This study included 192 samples were taken from women, who were diagnosed with polycystic ovarian syndrome based on the criteria proposed by [8]. The study has included two main patients groups :

1. Eighty primary infertile women with PCOS.
2. Sixty two secondary infertile women with PCOS.

Their ages ranged between (18-46) years old referred to infertility clinic in Azadi Teaching Hospital and AL-Salam Hospital in Iraq. A total of 50 healthy females participated in the study. Control individuals were healthy volunteers or endocrinology outpatients without any endocrine related diseases except for simple overweight/obesity. Body mass index (BMI) was calculated as weight in kg divided by (height) 2 in m². In the 2nd day of menstrual cycle after Venous blood sample (5 ml) was collected from control and patients groups, Each blood sample was divided into two tubes as follows: Serum tubes used for hormonal and biochemical testes and another tubes containing the anticoagulant acid citrate dextrose (ACD) for molecular analysis.

Hormonal analysis For FSH, LH, T and PRL in serum was determined by using commercially available enzyme-linked immunosorbent assay (ELISA) kits (bioactiva diagnostic, Germany).

Genotype Analysis: Genomic DNA of 192 samples were extracted from whole blood of women with PCOS and the controls^[9]. The adiponectin 45TG polymorphism was genotyped by amplification of genomic DNA using the following primers: forward, 5'-TAG AAG TAG ACT CTG CTG AGA TG-3' was chosen as the forward primer and 5'-CTC CCT GTG TCT AGG CCT TAG-3'^[10]. A 423 bp band was observed for the adiponectin gene after PCR amplified. The product was digested with *Sma*I (New England BioLabs Inc.) and the digestion products were resolved by electrophoresis in a 3% agarose gel, Examination of the bands occurring after development of the cleavage products on the gel revealed a 423 bp band

for the TT genotype in individuals with the wild-type genotype, 265 and 158 bp bands for the GG genotype in individuals with homozygous mutant genotypes and 423, 265 and 158 bp bands were observed in individuals with heterozygous genotypes^[10].

Statistical Analysis Data: Statistical analysis was performed using Statistical Package for the Social Sciences software (Mini-tab version 17). All data were presented as mean \pm S.D (standard deviation). Paired T test were used to compare between means of variables between groups, Genotype and allelic frequencies were compared between the groups by chi-squared test. Logistic regression analysis was applied by using F-Test to find out if the means among populations are significantly different by applied Duncan's multiple range test. A p value less than 0.05 was considered statistically significant.

Results and Discussion

The results of hormonal study were as follows as shown in the table (1):

- There is significant ($P < 0.05$) decrease in FSH levels in the infertile PCOS women groups than in healthy fertile women.
- There is significant ($P < 0.05$) increase in LH, prolactin, testosterone levels in the infertile PCOS women groups than in healthy fertile women.

The table (1) showed also significantly higher $P \leq 0.05$ BMI among women with primary infertility than in women with secondary infertility and control groups.

Table (1): Baseline characteristics of the primary and secondary infertile women with PCOS and the control groups

Parameters	Primary infertile women with PCOS N=80	Secondary infertile women with PCOS N= 62	Control N=50	P-value
LH (mIU/ml)	13.40 \pm 0.159	17.70 \pm 1.85	5.457 \pm 0.058	≤ 0.05
FSH (mIU/ml)	4.056 \pm 0.061	4.671 \pm 0.099	5.809 \pm 0.148	≤ 0.05
Prolactin (ng/ml)	15.95 \pm 0.55	22.98 \pm 0.20	10.68 \pm 0.359	≤ 0.05
Testosterone (ng/ml)	2.1450 \pm 0.181	1.0978 \pm 0.076	0.3869 \pm 0.011	≤ 0.05
BMI (Kg/m ²)	34.338 \pm 1.089	30.097 \pm 0.661	23.241 \pm 1.101	≤ 0.05

Products of PCR of Adiponectin gene for all patients and control groups were analyzed on agarose gels figure (1). The PCR product of 423 bp was treated with the restriction enzyme *Sma-I*. The bands occurring after development of the cleavage products on the gel revealed a 423 bp band for the TT genotype in individuals

with the wild-type genotype, 265 and 158 bp bands for the GG genotype in individuals with homozygous mutant genotypes and 423, 265 and 158 bp bands were observed in individuals with heterozygous genotypes (TG) (Figure 2).

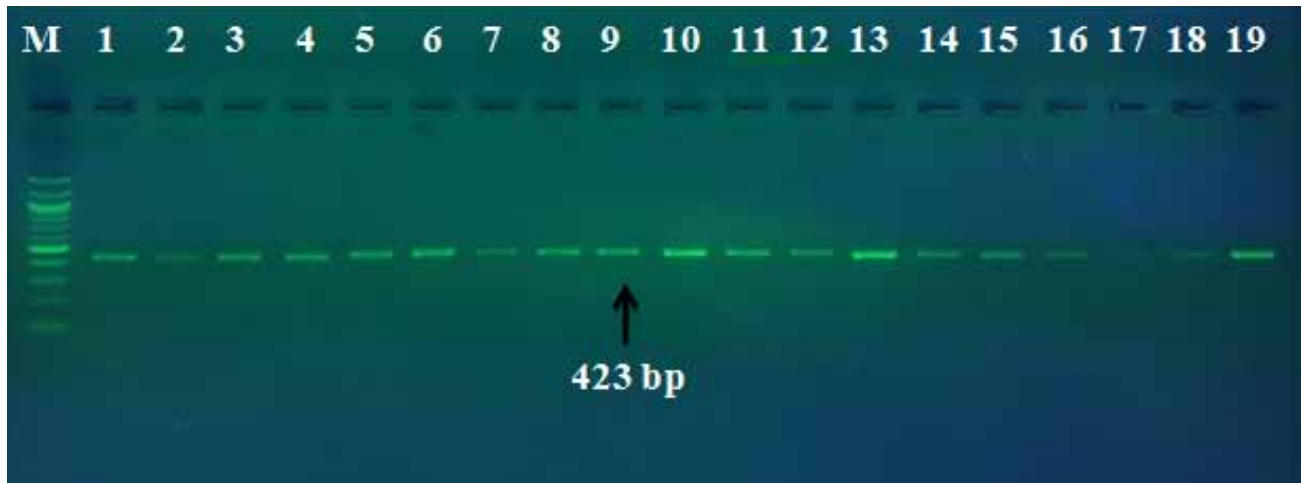


Figure (1) : PCR amplification products of adiponectin gene on 2% agarose gel

Lane M : DNA ladder (100 bp)

Lane (1 to 19) : PCR amplification products 423 bp for adiponectin gene for study groups samples

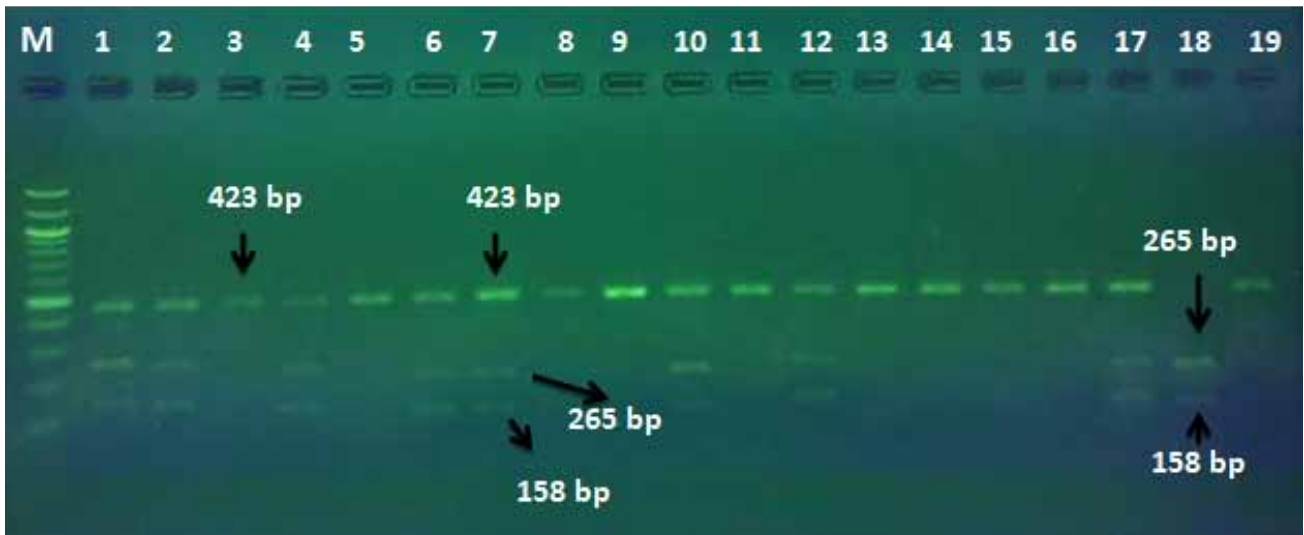


Figure (2) : Gel electrophoresis of PCR products (Adiponectin) for healthy and patients groups digested with *Sma-I* restriction enzyme on 3% agarose.

Lane M : DNA ladder (100 bp)

Lane (3,5,8,9,11,13,14,15,16) : The normal homozygote genotype (TT) bands after digestion with *Sma-I* with molecular size 423 bp

Lane (18) : The mutant homozygote genotype (GG) bands after digestion with *Sma-I* with molecular size 265 bp,158 bp.

Lane (1,2,4,6,7,10,12,17,19) : The mutant heterozygote (TG) bands after digestion with *Sma-I* with the molecular size 423 bp, 265 bp and 158 bp.

Table (2): The observed and expected numbers and allele frequencies for Adiponectin gene in the study groups

Groups	Genotype	Observed Number	Expected Number	X ²	P-value
Control	TT	45	40.5	X ² = 50, d.f. = 2	≤0.001
	GG	5	0.5		
	TG	0	0.18		
Total	50				
Frequency of T allele	0.9				
Frequency of G allele	0.1				
Primary infertile women with PCOS group	Genotype	Observed number	Expected number	X ² = 11.56, d.f. = 2	≤0.01
	TT	52	46.5		
	GG	10	4.5		
TG	18	29.04			
Total	80				
Frequency of T allele	0.762				
Frequency of G allele	0.238				
Secondary infertile women with PCOS group	Genotype	Observed number	Expected number	X ² = 2.77, d.f. = 2	NS
	TT	38	35.6		
	GG	6	3.6		
TG	18	22.8			
Total	62				
Frequency of T allele	0.758				
Frequency of G allele	0.242				

*d.f : degree freedom; ** P ≤ 0.001; * P ≤ 0.01; NS : No significant

The study of the adiponectin gene polymorphism at the location +45 in exon 2 has indicated the presence of two alleles (T and G) gene and three genotypes (TT, GG, TG) which shown a difference in the allelic frequency table (2) among the community of Patients, Whereas Healthy women were shown only two genotypes (TT and GG). There was a difference in the P-value between the observed and expected numbers among control group for adiponectin gene, Also primary infertile women with PCOS group were showed high statistically significant difference (X²=11.56, P< 0.05) between the observed and expected numbers among their cases group for adiponectin gene. Whereas no significant difference was detected (X²= 2.77, P=0.05) between the observed and expected numbers among secondary infertile women with PCOS group. That's mean the primary infertile women with PCOS group were not subjected to hardy Weinberg equilibrium when compared with control group. When the community study where not subjected to hardy Weinberg equilibrium that referred the evolution occurred and there was at least one powerful evolution change (may be under mutation effect) lead

to occurred disequilibrium that disturbed the stability of the cases study and effect on the community structure and it's allele frequency [11]. The results showed there is a correlation ship between adiponectin gene SNP rs2241766 polymorphisms (T45G) in exon 2 and primary infertile women with PCOS.

The results of the present study agreement with the case-control study of [12] in that showed significant association between the ADIPOQ 45T→G polymorphism and risk of polycystic ovary syndrome (PCOS) and the appearance of the allele G increased this risk [13]. Whereas disagreed with the study performed in Greek women, no significant difference was detected between 45T→G polymorphism frequencies in the PCOS and control groups and this polymorphism at position 45T→G had not been associated with a risk for development of PCOS.

The results in the table (3) showed that the primary infertile women with PCOS group carrying the TG genotype significantly higher FSH, prolactin levels and BMI ($p \leq 0.05$) than in those with the TT and GG

genotypes. In patients with secondary infertility with PCOS group exhibiting the GG genotype, observed a higher LH level with statistical significance ($p \leq 0.05$)

than in those with the TT and TG genotypes and patients carrying the TG genotype significantly higher BMI with statistical significance ($p \leq 0.05$).

Table (3) : Mean (\pm SD) clinical biochemical parameters and BMI levels with the (TT, GG, TG) genotypes of the adiponectin gene in the control, primary and secondary infertile women with PCOS group

Parameters	Control group		P-value	Primary infertile women with PCOS group genotype			p-value	Secondary infertile women with PCOS group genotype			p-value
	TT	GG		TT	GG	TG		TT	GG	TG	
	Mean \pm SD	Mean \pm SD		Mean \pm SD	Mean \pm SD	Mean \pm SD		Mean \pm SD	Mean \pm SD	Mean \pm SD	
LH	5.28 \pm 2.35	5.55 \pm 1.50	NS	14.65 \pm 8.29	15.38 \pm 7.90	10.63 \pm 8.81	NS	17.751 \pm 1.312	23.123 \pm 3.302	13.780 \pm 1.906	0.045*
FSH	5.60 \pm 1.88	6.22 \pm 1.75	NS	3.931 \pm 2.540	2.674 \pm 1.789	4.741 \pm 2.644	0.052*	4.474 \pm 0.447	6.243 \pm 1.125	4.727 \pm 0.650	NS
Prolactin	9.84 \pm 6.00	8.91 \pm 5.75	NS	11.05 \pm 14.47	25.04 \pm 17.45	15.59 \pm 12.09	0.019*	21.397 \pm 2.091	20.460 \pm 5.262	26.596 \pm 3.038	NS
Testosterone	0.406 \pm 0.261	0.266 \pm 0.117	NS	2.222 \pm 1.374	1.906 \pm 1.316	2.191 \pm 1.524	NS	1.222 \pm 0.161	0.908 \pm 0.406	0.883 \pm 0.234	NS
BMI	23.42 \pm 2.60	24.56 \pm 2.88	NS	28.406 \pm 4.811	31.350 \pm 3.131	32.360 \pm 4.48	0.005*	29.87 \pm 0.723	24.95 \pm 1.821	34.58 \pm 1.051	0.001*

* $P \leq 0.05$; NS : No significant

In human, adiponectin was present mainly in growth hormone (GH), follicle-stimulating hormone (FSH), luteinising hormone (LH) and thyroid stimulating hormone (TSH) producing cells, whereas adiponectin receptors were located in the gonadotrophs, somatotrophs and thyrotrophs, but not in corticotrophs or lactotrophs [14]. The presence of adiponectin and its receptors in the ovaries during all periods of the estrous cycle, make Adiponectin plays a key role in oocyte maturation, granulosa cell proliferation and steroid secretion through its impact on genes important for ovarian follicular development and ovarian reserve [15].

The presence of adiponectin receptors in the GnRH neurons and pituitary cells and its influence on the GnRH, LH and FSH release suggests an important role of adiponectin at the hypothalamic-pituitary axis in the control of fertility in female by regulating the activity of hypothalamic-pituitary axis, because its deficiency disrupts FSH and LH secretion as well as LH surge. Adiponectin mutation also causes significant reduction in GnRH immunoreactive neurons, which helps explain the disrupted estrous cyclicity and ovarian functions [16].

Women with PCOS has shown that adiponectin messenger RNA (mRNA) expression is significantly

lower in women with PCOS compared with weight-matched women without PCOS, This decreased expression, occurs in both subcutaneous and visceral fat tissue [17]. For more, adiponectin increased the expression of PPARA and peroxisome proliferator-activated receptor gamma coactivator 1-alpha genes involved in the regulation of energy homeostasis, especially fatty acid oxidation and carbohydrate metabolism [18] and that may be elucidated BMI value in the PCOS groups in the present .

According to this observation in the [19] in women with PCOS, possibly as the result of high levels of androgens, adiponectin receptors are upregulated in both subcutaneous and visceral fats, this may be a compensatory mechanism to achieve some insulin sensitivity and that deals with this study.

Conclusion

In conclusion 45T→G polymorphisms have been shown to be associated with an increased risk of PCOS, women with PCOS with these polymorphisms have been reported to have higher LH, FSH and prolactin concentrations and BMI.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

- Majumdar A, Singh TA. Comparison of clinical features and health manifestations in lean vs obese Indian women with polycystic ovarian syndrome. *J Hum Reprod Sci.* 2009;2:12-7.
- El Hayek S, Bitar L, Hamdar LH, Mirza FG, Daud G. Polycystic ovarian syndrome: An updated overview. *Front.physiol.* 2016, 7:124.
- Kubota N, Yano W, Kubota T, Yamauchi T, Itoh S, Kumagai H, Kozono H, Takamoto I, Okamoto S, Shiuchi T. Adiponectin stimulates AMP-activated protein kinase in the hypothalamus and increases food intake. *Cell Metabolism*, 2007. 6:55–68.
- Kissebah AH, Sonnenberg GE, Myklebust J, Goldstein M, Broman K, James RG, Marks JA, Krakower GR, Jacob HJ, Weber J, Martin L, Blangero J, Comuzzie AG. Quantitative trait loci on chromosomes 3 and 17 influence phenotypes of the metabolic syndrome. *Proc Natl Acad Sci USA*, 2000. 97:14478–14483
- Wen JP, Lv WS, Yang J, Nie AF, Cheng XB, Yang Y, Ge Y, Li XY, Ning G. Globular adiponectin inhibits GnRH secretion from GT1–7 hypothalamic GnRH neurons by induction of hyperpolarization of membrane potential. *Biochemical and Biophysical Research Communications*, 2008. 371 :756–761.
- Ledoux S, Campos DB, Lopes FL, Dobias-Goff M, Palin MF. Adiponectin induces periovulatory changes in ovarian follicular cells. *Endocrinology.* 2006. 147 5178–5186.
- Mahdi WKM, Mohammed MS, Sanad AS. Association of polycystic Ovary Syndrome and adiponectin Gene Polymorphism. *Arch.Clin. Microbiol*, 2016. 7(3): 20.
- Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus workshop group. Revised 2003 consensus on diagnostic criteria and long-term health risk related to polycystic ovary syndrome (PCOS). *Hum.Reprod.* 2004. 19: 41-47.
- Ali SM, Mahnaz S, Mahmood T. Rapid genomic DNA extraction (RGDE0. *Forensic sciences international: Genetics supplement series*, 2008. 1(1):5-63 .
- Demirci H, Yilmaz M, Ergun MA, Yurtcu E, Bukan N, Ayvaz G. Frequency of adiponectin gene polymorphism ovary syndrome and the association with serum adiponectin androgen levels, insulin resistance and clinical parameters. *Gynecological endocrinology*, 2010. 26(5):348-355 .
- Snustad DP, Simmons MJ. *Genetics*. 6th edn., John Wiley and Sons, Inc. 2012.
- Marioli DJ, Koika V, Adonakis GL, Saltamavros AD, Karela A. No association of the G972S polymorphism of the insulin receptor substrate-1 gene with polycystic ovary syndrome in lean PCOS women with biochemical hyperandrogenemia. *Arch Gynecol Obstet.* 2010. 281: 1045-1049.
- Ranjzad F, Mahmoudi T, Irani SA, Mahban A, Nikzamir A. A common variant in the adiponectin gene and polycystic ovary syndrome risk. *Mol Biol Rep.* 2012. 39: 2313-2319.
- Psilopanagiotti A, Papadaki H, Kranioti EF, Alexandrides TK, Varakis JN. Expression of adiponectin and adiponectin receptors in human pituitary gland and brain. *Neuroendocrinology.* 2009. 89 38–47.
- Merhi Z, Bazzi A, Bonney E, Buyuk E. Role of adiponectin in ovarian follicular development and ovarian reserve. *Biomedical Reports.* 2019. doi:10.3892/br.2019.1213.
- Cheng L, Shi H, Jin Y, Li X, Pan J, Lai Y, Lin Y, Jin Y, Roy G, Zhao A. Adiponectin Deficiency Leads to Female Subfertility and Ovarian Dysfunctions in Mice. *Endocrinology*, 2016. 157, 4875–4887.
- Carmina E, Chu MC, Moran C, Tortoriello D, Vardhana P, Tena G, Lobo R, Preciado R. Subcutaneous and omental fat expression of adiponectin and leptin in women with polycystic ovary syndrome. *Fertility & Sterility*, 2008. 89:642–648.
- Shehzad A, Iqbal W, Shehzad O, Lee Y. Adiponectin: Regulation of its production and its role in human diseases. *HORMONES*, 2012. 11(1):8-20.
- Tan BK, Chen J, Digby JE, Keay SD, Kennedy CR, Randeve HS. Upregulation of adiponectin receptor 1 and 2 mRNA and protein in adipose tissue and adipocytes in insulin-resistant women with polycystic ovary syndrome. *Diabetologia*, 2006. 49: 2723–272

Prostate Specific Antigen and Prostate Volume; How They are Correlated in Patients with Benign Prostatic Hyperplasia

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Abstract

Background: Human prostate-specific antigen (PSA) is a glycoprotein with approximately 7% (wt/wt) carbohydrate. The PSA assay, along with other diagnostic parameters, is considered the most useful early malignancy marker to confirm the diagnosis of prostate disease. Benign prostatic hyperplasia (BPH) and prostatic cancer are the most common prostate diseases.

Objective: The study was designed to assess the diagnostic sensitivity of PSA with different prostate volume (PV) in Iraqi men aged (40 to 88) to define better predictions for early detection of prostatic cancer.

Method: The subjects involved in this study were 119 consecutive male aged (40-88) years with BPH. Prostate volume (PV) (measured by transrectal ultrasound: TRUS) and PSA density (PD) data distribution were evaluated. Variables of the clinical and laboratory display were expressed as mean \pm SD. ANOVA were used for the comparison of variables. Pearson correlation coefficients were calculated for the whole study.

Result: Mean (\pm SD) age of the subjects included in this study was 63.23 \pm 11.12 years ($p < 0.01$). The PSA values in different age groups (40–54, 55–69, 70+), were: 5.71 \pm 4.47, 7.87 \pm 4.55 and 10.22 \pm 7.26 ng/mL respectively. There was a significant increase between the second and third group ($P < 0.05$), while there was a highly significant increase between the first and third age groups ($P < 0.01$). The correlation between PV and tPSA was (+0.305) based on the Pearson's correlation coefficient ($P < 0.01$).

Conclusion: Increase in prostate volume is associated with increased serum PSA level. A PSA level depicts approximate prostate volume and may have clinical potential in the management of BPH patients where PSA and prostate volume were significantly correlated in BPH patients.

Keywords: Prostate-Specific Antigen (PSA), TotalPSA, Free PSA, prostate volume (PV), Prostate density (PD), Benign prostatic hyperplasia (BPH) and prostatic cancer.

Introduction

The prostate gland is an accessory sex organ located on the bladder neck. Its hypertrophy causes urinary symptoms of a static (hesitation, retention) and dynamic (emergency, dribbling) nature. The incidence of prostate damage increases with age⁽¹⁾.

The prostate specific antigen (PSA) is an organ

specific tumor marker, single polypeptide chain glycoprotein with 240 amino acid residues, (molecular weight: 26,496), which consists of four carbohydrate side chains with several disulfide bonds⁽²⁾.

The PSA assay, along with other diagnostic parameters (ultrasound, international prostate symptom score), is the most useful investigation in the early detection of malignancy of the prostate gland⁽³⁾.

Benign prostatic hyperplasia (BPH) and prostatic cancer are the most commonly diagnosed prostate pathologies⁽⁴⁻⁶⁾.

Different factors like age, prostate volume (PV) and serum prostate specific antigen (PSA) determine the natural course of prostatic disease and the course which has been well studied⁽⁷⁾⁽⁸⁾.

The aim of each type of screening is to improve early detection of certain disease, reduce mortality rate and to improve the quality of life. The mortality rate of Pca can be decreased, if the disease is diagnosed early when it is confined to one organ⁽⁹⁾.

PSA is available in several isoforms. Two main forms are currently being measured. The PSA which is complexed with α 1-antichymotrypsin and the free or uncomplexed PSA (fPSA)⁽¹⁰⁾

Numerous studies have reported extensively on the importance of total PSA (tPSA) and fPSA as tumor markers in the assessment of PCa and also the patients at risk.⁽¹¹⁻¹⁵⁾

With this context, the present study is carried out in order to assess the levels serum PSA (total and free) and its relation to PV in Iraqi men suffering from benign prostatic conditions (BPH) in different age groups. The study was designed to assess the sensitivity of PSA with different prostate volume (PV) in Iraqi men aged (40 to 88) to define better predictions for the early detection of prostatic cancer.

Method

A total of 140 consecutive male patients aged more than 40 years presented, with symptoms of lower urinary tract suggesting prostatic hyperplasia, to the Urology Department of AL-Ramadi Teaching Hospital and private urology clinics, Iraq, from July 2018 to April 2019. 21 (15%) of them were diagnosed with prostatic cancer and so excluded & the remaining 119 (85%) had BPH and were enrolled in this study.

The BPH was diagnosed according to the results of clinical and laboratory data and prostate biopsy when it is indicated. The main indication for the evaluation was lower urinary tract symptoms (LUTS)

A consent form was obtained from all patients who were subsequently subjected to a systematic assessment, including their medical history for the duration of symptom and assessment of severity of their symptoms, duration of medical treatment, previous surgical intervention and for complicated systemic disease, thorough physical examination, digital rectal examination (DRE), focused neurological assessment, uroflowmetry and the estimation of the prostatic volume by transrectal ultrasonography using the formula: $(\Pi/6) \times \text{height} \times \text{width} \times \text{length}$ ⁽¹⁶⁾. Prostate density (PD) was calculated by dividing the preoperative PSA value by the estimated prostate volume.⁽¹⁷⁾

In this study, blood was drawn by venipuncture from patients and blood is left to clot at the room temperature.

Isolation of the serum was done by centrifugation 1 to 2 hours after blood collection and analysed to determine the total and the free PSA levels using Tosoh AIA-600 and patients with tPSA more than 4 ng/ml were underwent transrectal prostate biopsy to exclude prostatic cancer.

Patients with neuropathic bladder dysfunction, bladder stones, urinary tract infection, previous urinary tract surgery or medications especially the 5 alpha reductase inhibitors, any systemic hormonal treatment, diabetes mellitus and chronic kidney disease were excluded from this study.

Division of the patients in this study into 3 groups was done according to the age: those who are 40 to 54 years and those who are 55 to 69 years and those who are over 70 years.

The study was approved by the ethical committee in the college of medicine.

Results

The mean age of the patients was 63.23 ± 11.12 years. The older age of the patients involved in this study was 88 years and minimum age was 40 years. The highest PSA level obtained in this study was 26.86 ng/ml and minimum was 2.87 ng/ml, though the mean PSA was 8.25 ± 5.84 ng/ml ($p < 0.01$). Table-1.

Table (1): Clinical parameters of patients with Benign prostatic Hyperplasia.

Parameters	40-54y	55-69y	70+y	Total	p-value
Number of patients (%)	25 (21.0)	52 (43.7)	42 (35.3)	119 (100)	
Age, mean \pm SD	48.64 \pm 3.83	60.27 \pm 4.22	75.57 \pm 5.31	63.23 \pm 11.12	
TRUS/PV mean \pm SD	33.99 \pm 17.04	38.41 \pm 15.46	35.84 \pm 10.64	36.57 \pm 14.31	
f-PSA, mean \pm SD	1.35 \pm 1.28	2.23 \pm 1.56	2.60 \pm 2.21	2.18 \pm 1.81	p<0.05
t-PSA, mean \pm SD	5.71 \pm 4.47	7.88 \pm 4.55	10.22 \pm 7.26	8.25 \pm 5.84	p<0.01
r-PSA, mean \pm SD	24.47 \pm 17.82	28.94 \pm 17.21	23.73 \pm 9.88	26.16 \pm 15.25	
PD, mean \pm SD	0.49 \pm 0.61	0.79 \pm 1.94	0.55 \pm 0.33	0.64 \pm 1.32	

Abbreviations: TRUS/PV, transrectal ultrasound estimated prostate volume; f & t-PSA, free & total-prostate specific antigen; rPSA, PSA ratio (free/total; PD, Prostate density; SD, standard deviation

Statistical analysis was carried out by SPSS statistics (IBM Corp., New York, United States) version 23 program. The differences in numerical data (age, PV, PD and PSA) among different age groups were analyzed by One-way analysis of variance (ANOVA) test. Comparison of age with other variables such as prostate volume was done by Pearson correlation test. AP value

of less than 0.05 was considered statistically significant.

The PSA values in different age groups (40–54, 55–69, 70+), were, respectively, 5.71 \pm 4.47, 7.87 \pm 4.55 and 10.22 \pm 7.26 ng/mL. There was a significant difference between the second and third group ($P < 0.05$), while there was a highly significant increase between the first and third age groups ($P < 0.01$).

The correlation between PV and PSA is 0.305 based on the Pearson's correlation coefficient ($P < 0.01$), Table-2.

Table (2): Pearson Correlations

Parameters	PD	PV	rPSA	fPSA	tPSA
Age	-0.050	-0.008	0.031	0.295**	0.321**
tPSA	0.090	0.305**	0.022	0.770**	
fPSA	0.171	0.238**	0.594**		
rPSA	0.226*	0.064			
PV	-0.410**				

*The correlation is significant at the 0.05 level (2-tailed), **The correlation is significant at the 0.01 level (2-tailed).

Discussion

Bladder obstruction due to an enlarged prostate is the main contributor to the pathophysiology of clinical BPH⁽¹⁸⁾. However, imaging modalities were used to estimate the size of the prostate. PSA is typically used as an additional assessment in BPH patients to determine which patient benefits from a prostatic biopsy.

The correlation between the serum PSA level and PV, in Iraqi men with BPH proven by biopsy, was determined by this study. In this study, the mean PV was

(36.57 \pm 14.31) and the mean PSA was (8.25 \pm 5.84) while in study on determination of age specific range of PSA done by Hilan and Rifaat⁽¹⁹⁾ on healthy Iraqi men as a control reference value, the mean PAS was (1.31 \pm 0.66). In comparison with the normal reference PSA range, the mean PSA in current study was increased. The cause for this higher mean PSA level may be due to larger mean PV in this study; as there is a significant correlation between PSA and PV (Pearson Correlations: 0.305 $p < 0.01$), the increased mean PSA may be explained by this finding.

Also, significant correlation was seen between the age and the PSA in this study (Pearson Correlations: 0.321 $p < 0.01$). These results are comparable to that obtained among other ethnic groups as shown in table-3.

Table 3: Comparison of PSA and prostate volume in Study of BPH population (Iraqi men) and other ethnicities

Ethnicity	No.	Age (years) Mean (range)	PSA (ng/ml) Mean \pm SD	PV (ml) Mean \pm SD	Correlation
			r Age vs PSA	r Age vs PV	r PSA vs PV
			(p-value)	(p-value)	(p-value)
Iraqi (Current study)	119	63.23(40-88)	8.25 \pm 5.84	36.57 \pm 14.31	
			0.321	NS	0.305
			(0.0001)		(0.001)
Indian(20)	40	64.1 (46-84)	2.3 (0.28-8.76)	43.0 (23.8-143)	
			0.493	0.340	0.933
			(0.001)	(0.03)	(0.001)
Indian(21)	162	NA (50-93)	17.85 \pm 13.80	37.20 \pm 32.07	
			0.445	NS	0.59
			(0.05)		(0.001)
Saudi(22)	447	64.2 (20-89)	2.2 \pm 1.5	35.2 \pm 22.5	
			0.324	0.306	0.441
			(0.0001)	(0.001)	(0.0001)
White (European) (23)	354	70.2 (45-91)	3.9 \pm 4.2	40.1 \pm 23.9	
			0.28	0.25	0.54
			(0.0001)	(0.0001)	(0.0001)
Nigerian(24)	120	65.6 (45-85)	12.44 \pm 15.49	72.79 \pm 44.38	
			0.026	NS	0.337
			(0.05)		(0.05)
Indonesian(25)	1638	65.67(40-92)	4.78 \pm 2.74	43.93 \pm 21.08	
			0.07	0.12	0.26
			(0.008)	(0.0001)	(0.0001)

No.: Number of patients, NS: not significant, NA: not available.

The age of the BPH patients did not correlate with the PV and was not significant. In this study, PV did not increase or decrease in the different age groups. Selection bias may be the cause for this difference. There was unequal distribution of the patients in this study among the study groups with about 21 % of patients lie in the 40-50 year old age group and this unequal distribution may explain the statistical analysis difference. If we had recruited younger patients, the correlation between the age and PV might have been significant. This conclusion is in line with what Duvedietal does observed in their study of Indian men⁽²¹⁾ and Udeh et al. of Nigerian men⁽²⁴⁾.

A significant correlation was seen between PV and PSA density (PD) ($r=0.410$, p -value <0.001) in BPH

patients. This finding also agreed with what Duvedi et al. does observed in their study of Indian men⁽²¹⁾.

In our study, no correlation was observed between PD or PV vs advancing age in BPH patients, but Serum PSA was found to be significantly correlated with PV. Therefore, before interpreting PSA values, prostate volume should be taken into consideration in order to get rid of the undue prostatic biopsies depending on the level of PSA alone.

Limitation: Further studies with larger sample size and age-matched control group are required to validate our findings and to maximize the diagnostic accuracy of PSA while testing the relationship between PV, PSA density and patient age.

Conclusion

The age of patients with BPH was correlated with PSA levels (free & total). Therefore the age of the patients should be taken into consideration while interpreting PSA levels. PV and PD did not increase or decrease with age in this study. PSA and prostate volume were significantly correlated in BPH patients. Increase in prostate volume is associated with increased serum PSA level. PSA levels depicts approximate prostate volume and may have clinical potential in the management of patients with BPH.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

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References

- Banerjee B, Iqbal BM, Kumar H, Kambale T, Bavikar R. Correlation between prostate specific antigen levels and various prostatic pathologies. *JMS - J Med Soc.* 2016;30(3):172–5.
- Watt KWK, Lee PJ, M'Timkulu T, Chan WP, Loor R. Human prostate-specific antigen: Structural and functional similarity with serine proteases. *Proc Natl Acad Sci U S A.* 1986;83(10):3166–70.
- Polascik TJ, Oesterling JE, Partin AW. Prostate specific antigen: a decade of discovery-what we have learned and where we are going. *J Urol.* 1999;162(2):293–306.
- Lepor H. Pathophysiology, epidemiology and natural history of benign prostatic hyperplasia. *Rev Urol.* 2004;6(Suppl 9):S3.
- Al-Khalil S, Ibilbor C, Cammack JT, de Riese W. Association of prostate volume with incidence and aggressiveness of prostate cancer. *Res Reports Urol.* 2016;8:201–5.
- Al-Khalil S, Boothe D, Durdin T, Sunkara S, Watkins P, Yang S, et al. Interactions between benign prostatic hyperplasia (BPH) and prostate cancer in large prostates: a retrospective data review. *Int Urol Nephrol.* 2016;48(1):91–7.
- Oesterling JE, Kumamoto Y, Tsukamoto T, Girman CJ, Guess HA, Masumori N, et al. Serum prostate-specific antigen in a community-based population of healthy Japanese men: lower values than for similarly aged white men. *Br J Urol.* 1995;75(3):347–53.
- Kim JS, Ryu J-G, Kim JW, Hwang EC, Jung S II, Kang TW, et al. Prostate-Specific Antigen fluctuation: what does it mean in diagnosis of prostate cancer? *Int braz j urol.* 2015;41(2):258–64.
- Azab S, Osama A, Rafaat M. Does normalizing PSA after successful treatment of chronic prostatitis with high PSA value exclude prostatic biopsy? *Transl Androl Urol.* 2012;1(3):148.
- Jemal A, Siegel R, Ward E, Murray T, Xu J, Smigal C, et al. Cancer statistics, 2006. *CA Cancer J Clin.* 2006;56(2):106–30.
- Stamey TA, Yang N, Hay AR, McNeal JE, Freiha FS, Redwine E. Prostate-specific antigen as a serum marker for adenocarcinoma of the prostate. *N Engl J Med.* 1987;317(15):909–16.
- Labrie F, Dupont A, Suburu R, Cusan L, Tremblay M, Gomez J-L, et al. Serum prostate specific antigen as pre-screening test for prostate cancer. *J Urol.* 1992;147(3 Part 2):846–51.
- Brawer MK, Chetner MP, Beatie J, Buchner DM, Vessella RL, Lange PH. Screening for prostatic carcinoma with prostate specific antigen. *J Urol.* 1992;147(3 Part 2):841–5.
- Sawyer R, Berman JJ, Borkowski A, Moore GW. Elevated prostate-specific antigen levels in black men and white men. *Mod Pathol an Off J United States Can Acad Pathol Inc.* 1996;9(11):1029–32.
- Seabury CA, Calenoff E, Ditlow C, Bux S, Clarke H, Issa M, et al. Evaluation of a new serum testing method for detection of prostate cancer. *J Urol.* 2002;168(1):93–9.
- Wolff JM, Boeckmann W, Mattelaer P, Handt S, Adam G, Jakse G. Determination of prostate gland volume by transrectal ultrasound: correlation with radical prostatectomy specimens. *Eur Urol.* 1995;28:10–2.
- Murciano-Goroff YR, Wolfsberger LD, Parekh A, Fennessy FM, Tuncali K, Orio PF, et al. Variability in MRI vs. ultrasound measures of prostate volume and its impact on treatment recommendations for favorable-risk prostate cancer patients: A case series. *Radiat Oncol.* 2014;9(1):1–6.
- Shapiro E, Lepor H. Pathophysiology of clinical benign prostatic hyperplasia. *Urol Clin North Am.* 1995;22(2):285–90.

19. Hailan M, Rifat UN. Age-specific reference ranges of serum prostate-specific antigen in Iraqi men. *Arab J Urol* [Internet]. 2011;9(4):273–7. Available from: <http://dx.doi.org/10.1016/j.aju.2011.09.005>
20. Deori R, Das B, Rahman MA. A Study of Relationship of Prostate Volume, Prostate Specific Antigen and age in Benign Prostatic Hyperplasia. *Int J Contemp Med Res*. 2017;4(7):1582–6.
21. Duvedi P, Singh H, Bedi GK, Kaur M. Role of Prostate-Specific Antigen (PSA) in Patients with Benign Prostate Hyperplasia. *J Clin Diagnostic Res*. 2019;15–7.
22. Mosli HA, Abdel-Meguid TA-A. The relationship between prostate volume, prostate-specific antigen and age in Saudi men with benign prostatic conditions. *African J Urol*. 2010;16(4):117–23.
23. Vesely S, Knutson T, Damber J-E, Dicuio M, Dahlstrand C. Relationship between age, prostate volume, prostate-specific antigen, symptom score and uroflowmetry in men with lower urinary tract symptoms. *Scand J Urol Nephrol*. 2003;37(4):322-8.
24. Udeh E, Dakum N, Amu O, Ramyl V. Correlation between serum prostate specific antigen and prostate volume in Nigerian men with biopsy proven benign prostatic hyperplasia: prospective study. *Int J Urol*. 2009;7(2).
25. Putra IBOW, Hamid ARAH, Mochtar CA, Umbas R. Relationship of age, prostate-specific antigen and prostate volume in Indonesian men with benign prostatic hyperplasia. *Prostate Int* [Internet]. 2016;4(2):43–8. Available from: <http://dx.doi.org/10.1016/j.pnil.2016.03.002>

Molecular Detection of *Pseudomonas Aeruginosa* Isolated From Chicken Cans in the Markets of Al-Muthanna Province

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Abstract

Food safety is very necessary for the general health of the consumer and protection from disease, as well as the importance of economic sustain ability of the agricultural food sector. The consumer wants to make sure that the food is safe and that it is not contaminated with bacteria. Therefore, these tests must be performed to detect bacteria and ensure that food safety.

120 samples was collected from frozen chicken cans from the markets of Al-Muthanna province, using the sterile plastic bags and after isolation the results showed that (55) sample contain bacteria *Pseudomonas aeruginosa* from the total samples above.

The results of bacterial culture were positive in 45 samples whereas the results of direct molecular identification were positive in 55 samples.

Selective media used for bacteria identification such as MacConkey Agar, Methylene blue which has been given the proportion of isolation (15% and 85% respectively) also some isolates showed their ability to liquefy gelatin (65%) and fermented sugar lactose (100%) . however biochemical testing also used for all bacterial isolates for confirm diagnoses.

Polymerase chain reaction technique used for detection bacteria by specific primers sequence the result appear 45% of total sample contamination by *P. aeruginosa* .

The genome of *P. aeruginosa* is relatively large so encodes a large proportion of regulatory enzymes important for metabolism and efflux of organic compounds. This enhanced coding capability genome allows for great metabolic versatility and high adaptability to environmental changes,

According our result we recommend food factories to use sterilized materials more accurately and effectively to store frozen chicken cans.

Keywords: *P. aeruginosa*, culture media, PCR technique, food safety, canned chicken.

Introduction

The general characteristics of bacteria *Pseudomonas* species are widely spread in soil, aquatic environment and normal flora in plants and animals. For example, *Pseudomonas aeruginosa* which is an opportunistic pathogen causes disease and is largely isolated from wounds, burns and urinary tract infections¹. *P.aeruginosa* reduces the chances of successful tissue transplantation and causes septicemia for patients with burns and is associated with mortality These bacteria

can be transmitted to other areas of the body. The most common is the inflammation of the heart of people who use intravenous drugs and who have artificial valves due to the need of bacteria directly to the bloodstream and that these bacteria cause bacteremia, especially in patients who suffer from immunodeficiency, HIV and diabetes and in cases Severe burns¹.

Pseudomonas aeruginosa is an opportunistic pathogen that is a leading cause of morbidity and mortality

in cystic fibrosis patients and immunocompromised individuals².

P.aeruginosa is a Gram-negative bacillus shape bacteria with a length of about 1-5 microns and its width (0.5-1). Micronized by monoflagellated monocytes does not have a Capsule that is not composed of aerobic spores and can grow in anaerobic conditions that cause common diseases of humans and animals found in soil Water, skin and plants, it is growing at a temperature above 42 m and has the potential to grow in diesel and fuel^{3,4}. *P.aeruginosa* bacteria are opportunistic and the most common infections occur in patients who are hospitalized, as well as in immunosuppressed persons such as AIDS, cancer, cystic fibrosis, neutropenia and also the loss of mechanical barrier or protection (skin mucosa). And the symptoms of this infection is inflammation and poisoning and occurs in the body members critical such as lung and urinary tract and kidney and skin injury and thin tissue, where it was found that about 6% of people exposed to burns die of infection with this bacteria⁵. Laboratory diagnosis is based on the sampling of blood, cerebrospinal fluid, blood, pus and gosaibular secretions and then is implanted and tested⁶. *P.aeruginosa* bacteria, especially isolated from wounds and burns, have resistance to many antibiotics such as Gentamicin, Aztreonam, Ceftriaxone, Pipracillin, Ciprofloxacin, Tobramycin, Cefsulodine and Amikacion^{7,8,9,10}

These bacteria are involved in serious infections that are difficult to treat and destroy due to their multiple antibiotic resistance. It is the most common cause of burn and wound injuries¹¹. These bacteria cause contamination of wounds that lead to tissue breakdown and extrusion of blood plasma outside the skin a good place for bacterial growth¹². As well as caused by bacteremia blood due to the arrival of the blood stream and then transmission of different tissues with a mortality rate of 30¹³. The World Health Organization has recently listed carbapenem-resistant *P. aeruginosa* as one of three bacterial species in which there is a critical need for the development of new antibiotics to treat infections^{14,15}.

PCR has the potential for identifying microbial species rapidly by amplification of sequences unique to a particular organism that is outer lipoprotein membrane (oprL) gene¹⁶.

Material and Method

1. All sample are collected from various markets in Al-Muthanna province.
2. Total of 120 tissue samples were taken from frozen chicken cans including the lung, liver and chest muscles in a sterile manner.
3. The samples were collected in sterile plastic bags and then sent to the laboratory.
4. The samples were crushed by a sterile ceramic vial and the starter was obtained and culture on test tube containing on nutrient agar then incubation at 37c for 24 hours.

Prepare Culture Media:

1. Were used Ashdown Selective broth media Add 10 grams of Trypton Soya Broth, 5 g of Pepton, 5 mg of Crystal Violate and 50 mg of Neutral Red to 1 liter of distilled water, add 40% Glycerin and heat with pH 7.2. Then sterilize and leave to cool down. (40 m) and then add antibiotic Colistin (20 mg/l) then preparation Ashdown`s Selective Agar (ASA) Prepare 40 ml of Trypton soya agar, 5 mg of Crystal Violate, 50 Neutral Neutral of red, 1 liter of distilled water, add 4% of Glycerin and heat with pH to pH 7.2. And then left to cool down (40) m then add antibiotic Gentamycin by (4 mg/l)¹⁷.
2. Nutrient Agar and broth preparation according to Himedia company after adjusting the pH using a ph-meter and sterilized with autoclave. After that samples were cultured on ASB and incubated at 35 ° C for 7 days until the color of the purple medium was changed and then cultured on the ASA using the loop in the Streaking method and incubated at 53 °C for 48 hours.¹⁸
3. Samples planted on the Ashdown selective broth, which gave the highest percentage of isolation of bacteria *Pseudomonas aeruginosa* (100%) and then planted on the Ashdown selective agar where the percentage of isolation (100%) was development and activate the colonies germ isolated from circles selective isolates through cultivation amid Neutrient agar which gave the percentage of isolation (100%)
4. biochemical diagnostic testing for all bacterial that isolates for example test production of the enzyme Catalase test as well as the production of the Oxidase enzyme which gave isolation rate (100%) for both.

- Molecular Detection

PCR assay for confirmation of *Pseudomonas aeruginosa* isolates.

1. DNA was extracted from samples by AccuPrep® Genomic DNA extraction kit (Bioneer, Korea).
2. PCR was performed on extracted DNA by using specific primer to oprL gene (Bioneer Company, Korea) were amplified according to references mentioned in table (1).
3. Primers were utilized in a 25 µl reaction containing 12.5 µl of AccuPower™ PCR PreMix (Bioneer, Korea), 1 µl of each primer of 20 pmol concentrations, 4.5 µl of free nuclease water and 6 µl of the template^{19,20}
4. The reactions were performed in a BioRad, USA thermal cycler. PCR was performed using the protocol: 94°C for 5min, followed by 35 cycles of 94°C for 45sec, 50°C for one min and 72°C for one min, followed by 72°C for five min.
5. For gel analysis, 10 µl of the products were loaded in each gel pit. PCR products were Imagine on 1 % agarose gel electrophoresis (Consort, Belgium).²¹

Table (1): Specific primers sequence for detection *P. aeruginosa*.

References	Amplicon (bp)	sequence (5'-3')	Target Gene
(Xu et al., 2004)	bp 504	F: ATG GAA ATG CTG AAA TTC GGC R: CTT CTT CAG CTC GAC GCG ACG	oprL

Results

Various investigations were carried out on frozen canned chicken samples which included 120 sample evenly taken from the heart, liver and chest muscles all samples tested by different media, molecular and biochemical tests, all Tests showed that 55 samples were contaminated with *Pseudomonas aeruginosa* bacteria. Firstly, all sample cultured on ASB media, positive isolates changed the color of the medium to a reddish brown color. The bacteria were then isolated on the selective media ASA at 35°. Result show 40 sample contaminated by *p. aeruginosa* was diagnosed from frozen canned chicken (14 of heart , 14 of chest muscles, 12 of liver) all isolated characterized by colonies as large colonies and dark brown and brown after a period 24-72 hours. The colonies also showed different appearance

characteristics from a sticky to a grayish gray. To confirm the diagnosis of the bacteria was staining with Gram stain and appeared in the small bacillus in shape and gram-negative bacteria,

Secondly, molecular test carry out by used PCR technique for all samples was performed on extracted DNA by using specific primer to oprL gene, The results showed that 55 samples were contaminated with *Pseudomonas aeruginosa* .

Thirdly biochemical tests also carried out to positive sample which isolates from selective media ASA for confirm diagnoses, The results showed that all isolates were positive for the tests of catalase, phosphatase, oxides, growth at 37-42 m and the ability to grow on MacConky Agar and oxidation of lactose .

Table 2. Clarify Number of isolated and contaminated samples with *P.aeruginosa* from frozen canned chicken

No	Type of sample	Number of sample	Number of isolates by culture media	No of bacteria by PCR technique	Percentage of contamination in all sample
1	Heart	40	14	16	45%
2	Chest muscles	40	14	21	
3	Liver	40	12	18	
4	Total	120	40	55	100%

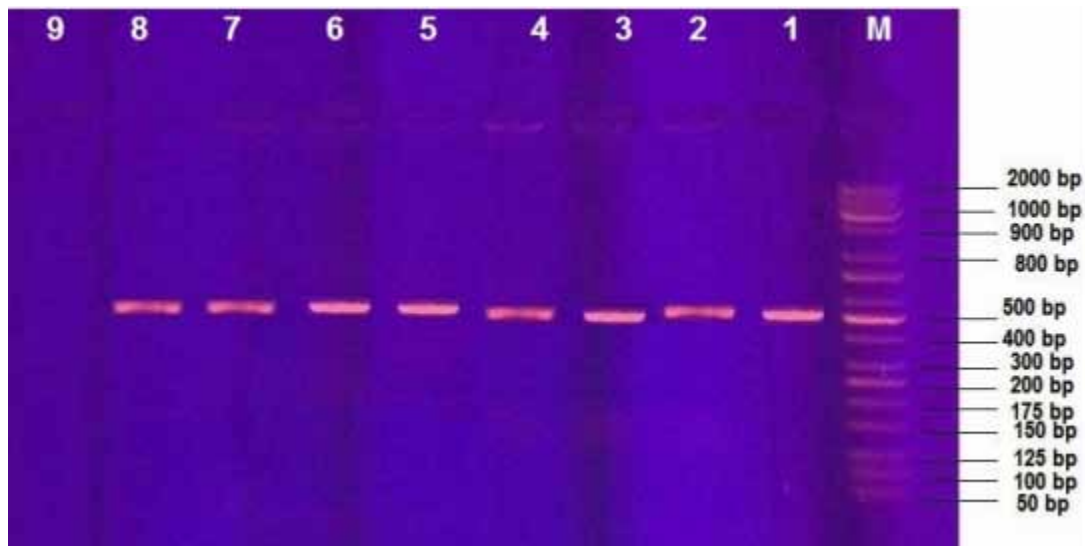


Figure 1. Agarose gel electrophoresis 1.5% for oprL PCR products, gel was electrophoresed for 1 hours at 70 Volt. The size of PCR product is 504 bp. All lanes show positive result except lanes 9.

Discussion

The results showed that 45% of the total examined samples were contaminated with bacteria *Pseudomonas aeruginosa* and this percentage proves the possibility and ability of *p. aeruginosa* to resist all sterilization conditions conducted by canned factories for frozen canned chicken, due to It has a genome (5.5–7 Mbp) is relatively large compared to other serial bacteria It encodes a large proportion of the regulatory enzymes important for metabolism, transport and flow of organic compounds. The improved coding power of the *P. aeruginosa* genome provides great metabolic ingenuity and high adaptability to environmental changes .

The results showed that there is a relative difference between the culture media and the molecular test, as it showed that the samples examined with PCR technique were diagnosed with *P. aeruginosa* a little more compared to the diagnosis of the culture media and this difference depends on that PCR technique detect bacteria based on its gene even where the probability of the bacteria being Dead or weak, so it cannot grow in the culture media.

Result of positive samples that were diagnosed from canned samples of the heart, liver and muscles, we notice that the proportions were close between the samples contaminated with *P. aeruginosa* and this is due to the ability of bacteria to grow in all wet tissues and the

ability of *P. aeruginosa* to tolerate different conditions. is able to survive in a wide range of environments.

In addition to the high level of intrinsic antibiotic resistance of *P. aeruginosa*, the acquired resistance greatly contributes to development of multidrug-resistant strains, which increases the difficulty in eradicating this microorganism and leads to more cases of persistent infections

Therefore, we recommend the food factories producing frozen chicken cans to take new sterilization and preservation method .

Conflict of Interests: Nil.

Ethical Clearance: Take from markets in Al-Muthanna province by approval ethical committee.

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References

1. Zheng P, Renee R, Bernard R, Tong JL, Zhenyu C. Antibiotic resistance in *Pseudomonas aeruginosa*: mechanisms and alternative therapeutic strategies. *Biotechnology Advances*. 2019 January–February; 37(1):177-192
2. Silby M, Winstanley C, Godfrey S, Levy S, Jackson R. *Pseudomonas* genomes: diverse and adaptable.

- FEMS Microbiol Rev.2011; 35, 652-680.
3. Chen J, Chen Y, Hu P, Zhou T, Xu X, Pei X . Risk assessment of infected children with *Pseudomonas aeruginosa* pneumonia by combining host and pathogen predictors. *Infect Genet.* 2018 Jan; 57:82-87.
 4. Zhang R1, Liu Z1, Li J1, Lei L1, Yin W1, Li M1, al, et al. Presence of VIM-Positive *Pseudomonas* Species in Chickens and Their Surrounding Environment. *Antimicrob Agents Chemother.* 2017 Jun 27;61(7).
 5. Fekadu K. *Pseudomonas* infection in chickens. *Journal of Veterinary Medicine and Animal Health* .2010 Nov;2(4):55-58
 6. Fekadu K. *Standard Bacteriological Manual* .MYCOGS.2005;1
 7. Gong Q, Ruan MD, Niu MF, Qin CL, Hou Y, Guo JZ1. Immune efficacy of DNA vaccines based on *oprL* and *oprF* genes of *Pseudomonas aeruginosa* in chickens. *Poultry Science.*2018 December 1;97(12):4219-4227
 8. Jennings LK, Storek KM, Ledvina HE, Coulon C, Marmont LS, Sadvovskaya I,et al . Pel is a cationic exopolysaccharide that cross-links extracellular DNA in the *Pseudomonas aeruginosa* biofilm matrix. *Proc Natl Acad Sci U S A.* 2015 Sep 8;112(36):11353-8
 9. Balcht A, Smith R. *Pseudomonas Aeruginosa: Infections and Treatment.* Informa Health Care. 1994, 83–84.
 10. Hassan H M. Characterization of *Pseudomonas aeruginosa* isolated from different pathological lesions in chickens. *M.Microbiology.*2013
 11. Ahmed M, Sudhakar M, Senthil K, Molecular characterization of *Pseudomonas* sp. isolated from milk samples by using RAPD-PCR. *European Journal of Experimental Biology.*2014; 4(4):78-84
 12. De Smet J, Hendrix H, Blasdel BG, Danis W K, Lavigne R. *Pseudomonas* predators: understanding and exploiting phage-host interactions. *Microbiology.* 2017 September.; 15 (9):517-530. doi:10.1038/nrmicro. 2017.61. PMID 28649138.
 13. Munita J.M , Arias C.A. Mechanisms of antibiotic resistance .*Microbiol Spectr.* 2016 Apr;4(2).
 14. Tacconelli E, Carrara E, Savoldi A, Harbarth S, Mendelson M, Monnet DL,et al. Discovery, research and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. *Lancet Infect Dis.* 2018 Mar;18(3):318-327.
 15. Cornelis P. *Pseudomonas: Genomics and Molecular Biology* . Caister Academic Press. 2008;19-6
 16. Worlitzsch D, Tarran R, Ulrich M, Schwab U, Cekici A, Meyer KC, et al. Effects of reduced mucus oxygen concentration in airway *Pseudomonas* infections of cystic fibrosis patients. *The Journal of Clinical Investigation.* 2002February;109 (3):317-25. doi:10.1172/JCI13870. PMC
 17. Dzidic S, Suskovic J, Kos B. Antibiotic Resistance Mechanisms in Bacteria: Biochemical and Genetic Aspects. *Food Technology and Biotechnology.*2008;46(1): 11–21.
 18. Kitao T, Lepine F, Babloui S, Walte F, Steinbacher S, et al .Molecular insights into function and competitive inhibition of *Pseudomonas aeruginosa* multiple virulence factor regulator. *MBio.*2018
 19. Khan A, Cerniglia C . Detection of *Pseudomonas aeruginosa* from clinical and environmental samples by amplification of the exotoxin A gene using PCR. *Appl Environ Microbiol.*1994;60:3739-3745
 20. Itah A, Essien J. Growth Profile and Hydrocarbonoclastic Potential of Microorganisms Isolated from Tarballs in the Bight of Bonny. *World Journal of Microbiology and Biotechnology.* 2005;21 (6-7): 1317-22. doi:10.1007/s11274-004-6694-z
 21. Yi-Wei T, Max S, Ian P, Dongyou L, Joseph S. *Molecular Medical Microbiology.* Elsevier. 24th November 2014;3: Second Edition

Digital Education of Rural India to Impact Rural Economy

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Abstract

Education plays an important role within the development of people thereby influencing the growth of the state. Education is one among the necessary sectors within the economy that had brought revolutionary changes within the recent times. Republic of India that was once thought-about as majorly associate in nursing agricultural economy is currently developing in numerous sectors at a quicker rate.

However, the evolution data of knowledge and technology has created a divide between the urban and therefore the rural Republic of India despite of globalization. It's thanks to the digitalization in numerous sectors that has taken place across globe. Villages in Republic of India form the backbone of our nation contributory to socio- economic and human resource development of the state. As per 2011 census, nearly sixty eight of the Indian population belongs to geographic area. Though the life within the rural areas is currently connected to cell phones, smartphones, digital TV transmission, however to an oversized extent they're stop from the most stream of urban areas thanks to lack of infrastructure support, poor property, language barriers particularly within the education sector. Digital technology makes life easier for each educators and students. So as to rework into a Digital India, it's to develop the facilities of rural little villages beside sensible cities in Republic of India.

Results and Conclusions: This paper tries to debate regarding the digital tools to be developed in rural areas in a reasonable manner and therefore the core elements of Digital technology likewise because the future scope and challenges of a rural society in moving towards Digital education.

Keywords: Digital Education, Rural areas, web facility, Digital tools, generation Z.

Introduction

The educators' of Republic of India has created several eminent persons within the country. a toddler might forget his or her subjects however will always remember his teacher. Yes, the students' future is formed by the teachings of his guru. It's the World Health Organization build ministers, doctors, engineers etc.

In many ways Rural Republic of India has benefitted from the developments in science and technology directly likewise as indirectly but with the emergence of digitalization rural Republic of India continues to be insulation behind digital infrastructure and digital skill which impact the economy of the country. There has been a known observation that was created by the daddy of the state a few years ago that still holds true that claims, "Villagers comprise the core of Republic of Indian Society and conjointly represent the important India. And as our country progresses digitally and technically it's to confirm that awareness of Digital skill is being provided to the lots of rural Republic of India in such the simplest way that may scale the agricultural economy. These days' digital devices have become a desire instead of a wish for the folks. Survival while

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not web and smartphone or computers will build any individual tough to maneuver within the quick paced world.

Village's extremely obsessed with agriculture sector and really less attention is paid in education. Considering the high rise of population in rural sector villager's interest in education has been supported by the govt. through numerous facilities like free middle day meal, books, scholarships and different incentives. On the opposite hand the govt. is additionally that specialize in raising the standard of education. Government is attempting many initiatives for raising the standard of education realizing the issues of poor infrastructure, web property, absence etc. Sincere initiatives are place up to boost the village way in par with the urban population. Villagers terribly poor in deciding downside determination and reasoning and analytical thinking talents. Poverty, state and illiteracy continue to be gift. Thus the most reasons for these are strictly lack of quality education and a lot of significantly steering towards learning. Rural students are quite energetic, enthusiastic and arduous operating thus if target-hunting within the right direction the expansion of the village can happen mechanically.

Rural Population and Issues: India could be a home to almost 430 million kids within the cohort between 0-18 years within the country. These kids being the longer term of our nation becomes imperative to produce necessary mean that to understand and alter use of their potential by providing necessary means that to uplift their quality of education. hence forward a progressive education system must be channelize to guide their path which may address prevailing considerations of lack of qualified lecturers, inadequate fashionable teaching materials, that have an effect on the standard of education.

One of the common issues two-faced within the rural sector is that the large quantitative relation of rural-urban registration in faculties that 7:5 nearly sixty per cent of the agricultural students lack reading skills despite improvement within the Teacher pupil quantitative relation which rose from thirty two in 2009-10 to 24 in 2015-16. Butsingle teacher faculties in rural places continue to be a significant concern in several rural components of the country. Recent numbers suggests that the amount of single teacher faculties in Republic of India account for ninety seven,273 i.e. 8.8 per cent of the overall faculties within the country These problems

make to lack of quality education and high drop outs in rural faculties in Republic of India.¹⁰

Therefore to combat the scholar teacher quantitative relation within the times the employment digitalized technology can facilitate in mitigating the same considerations. Education are often digitalized within the rural faculties by giving providing multimedia system teaching tools and interesting students through digitalized teaching tools like sensible boards, LCD screens Videos, to show them totally different ideas. Digital Media can modify the lecturers to deliver their sessions remotely across many locations. As per the information in 2016 nearly nine, 07,585 posts for lecturers are lying vacant in elementary faculties and one,06,906 posts in secondary faculties.⁶

One of the foremost problems found within the rural students was lack of interest that accounted for twenty. 24 per cent of the college kids. With the interactive learning tools will build students fascinating to attend the faculties' often.⁴

Leverage of Digital Emotional Intelligence through Digital Technology: In order to supply quality education within the rural place the technological development exposes new potentialities and learning ways that are continually being challenged within the academic system. Thus it's essential to develop digital emotional intelligence with the offered digital technologies. Some lecturers feel that technology will erase their role, however indeed technology will ne'er scale back the role of an educator. Thus digital emotional intelligence and digital technologies must be leveraged to make a much better impact within the academic institutes of Rural Republic of India.

Review Literature: From the review of literature it's clear that analysis has been allotted in emotional intelligence textile the wants of scholars. Thus keeping this the current study has been allotted.

Gopal, D.H. Jagadeesh (2018)¹, rumored the extent of relationship between emotional intelligence and burnout among teacher educators. The author disclosed that to scale back the teachers' burnout and to boost the amount of the teachers' engagement, Emotional intelligence is vital in terms of teaching profession, since it might predict a much better angle toward work and a lower probability to expertise burnout.

Chitra Krishnan, RichaGoe et al., (2017)², studied

the link of expertise and age of a private on the amount of emotional intelligence. Author found perception and therefore the level of emotional intelligence in an exceedingly person on the idea of his/her cohort and gender. Results of the Z-test shows that respondents take age teams differ in emotional intelligence except between age teams of 25-35 and on top of fifty five and all over those females have higher emotional intelligence than males.

Success of Emotional Intelligence in on-line

Learning: The writers assessed the use of composed words because the essential variety of correspondence, while not nonverbal signs and noticed that: “understudies’ neglected needs for human contact, absence of self-inspiration, or sentiments of disconnection will stop accomplishment in on-line courses” (Berenson, Boyles and Weaver, 2008). These variables are usually sincerely based mostly responses that has to be perceived and oversaw if understudies got to work with success within the on-line condition. This is not to scale back the need for these characteristics; in any case, the emotions got to be managed initial with the goal that the fundamental problems are often attended.

A recent report titled, affiliation between Understudies’ fervent information, Social Bond and Communications in internet based mostly Learning, is one among few examinations that thought-about the difficulties connected with an internet schoolroom condition.

There are 3 key focuses that attended feelings and recognition:

1. “The restricted ecological ability to check feelings in web learning might convey a lot of noteworthy enthusiastic separation to understudies World Health Organization has low capability to check feelings.”
2. “It is tough to check feelings in an exceedingly internet based learning condition thanks to the accentuation on content based correspondence, that doesn’t need outward look.”
3. “It may well be all the lot of attempting for folks with a lower capability to check feeling to grasp others’ sentiments in on-line things.” These 3 hindrances happen often once understudies at first, start an internet category or build a progress from Associate in Nursing on-ground to an internet scenario. The motivation behind why it’s hard for understudies

to check feelings is that they need not engineered up Associate in nursing adjusted variety of fervent information.

Creating Virtual fervent Insight: Using Goleman’s model of fervent insight, he provides a 3 stage method that adjusts it to be used by understudies within the on-line schoolroom.

Stage One: look into and traumatize your fervent standing

Before we have a tendency to begin to figure within the on-line schoolroom, think about the dimension of fervent heedfulness and readiness for operating during this innovation based mostly condition. Begin by leading a private self-check and build these inquiries: however would I feel at the current time? Am I ready to start out category currently and partake? Do I actually have considerations, dissatisfactions, or diversions that I actually have to address? Likewise we are able to take enthusiastic insight appraisals, as an example, the one offered by the institution for welfare and Human Potential, check your combining weight. What we want to make is our enthusiastic heedfulness, as a ways for overseeing however we have a tendency to feel and dominant any negative feelings.

Stage Two: Take Associate in nursing interest for all intents and functions with a Reason

Social contribution in an internet category contains of virtual associations in an exceedingly virtual area. Understudies rely on recognitions, which thus build feelings. Composed correspondence has the flexibility to adapt or de-refine the educational procedure, dependent on the interpretation of the messages. Composed messages and posts speak and convey a “tone” in light-weight of the mechanics of the reaction and therefore the word selections used. For example, poor writing system and syntax, or improper formulation, might prompt a negative observation regarding oneself – that likewise produces Associate in nursing enthusiastic reaction. A virtual scenario needs intentional associations, taking under consideration what we have a tendency to compose and the way it’s introduced. It prescribed build posts disconnected initial and at that time scan them thus anyone would possibly hear to make your mind up however they may be seen. This can prompt advancement of virtual, social heedfulness.

Stage Three: build a Social closeness: Relationship

the board in an exceedingly virtual scenario contains of finding new method for interfacing with, distinctive with and participating in discussions. Just about each on-line category includes a dialog board necessity, in order that could be a strategy for creating a scholastic network. There's an opportunity to post a presentation, which is able to modify professional to finish up a "genuine" individual to the category. What are often done is to make and traumatize our virtual character. We won't management the observations or enthusiastic responses of schoolmates; however, we can build up the image delineated through the posts. Ceaselessly choose accent that's affordable for a erudite scenario and abstain from formulation, as an example, slang, content informing shortened forms, or composing all told ace. The advancement of a positive image is to boot advantageous in light-weight of the actual fact that it influences operating associations with totally different understudies and teacher.

The online schoolroom could be a dynamic, intuitive condition that's created necessary through the character of posts and messages lecturers will build. Like another schoolroom condition, sentiments ought to be surveyed and fervent responses oversaw, thus it will connect with success with totally different cohorts. Once virtual fervent information is made educators approach the educational procedure equitably and keep one's distance from abstract reactions that build boundaries to correspondence.

Affordable Digital Tools for Rural College lecture rooms

There are differing types of various advances as of currently will use in rustic lecture rooms to urge to the net administrations. as an example,

- (i) **Class Website:** a straightforward technique to point out your understudy's work is to create a website page supposed for category. Once a web site page is planned, specialists will post prep assignments, understudy work, adages, question and answer contests, therefore considerably a lot of.
- (ii) **Blogs:** It allows the understudies to stay up a running discourse, as an example, a diary, musings, thoughts and assignments that to boot accommodate understudy remark and reflection.
- (iii) Wikis are a lot of gathering focused to modify numerous people from the gathering to change a solitary report and build an extremely communitarian

and cautiously altered completed item.

- (iv) **Wireless schoolroom mouthpieces:** Uproarious lecture rooms are every day by day event and with the help of amplifiers, understudies will hear their educators all the a lot of plainly. The advantage for instructors is that they nevermore lose their voice by the day's finish.
- (v) **Interactive Whiteboards:** Associate in nursing intelligent whiteboard that offers contact management of laptop applications. This upgrade the involvement within the schoolroom by demonstrating no matter is often on a laptop screen. This guides in visual learning, likewise because it is intelligent, therefore the understudies will draw, compose, or management photos on the intuitive whiteboard.
- (vi) **Online Media:** Gushed video sites are often wont to upgrade a schoolroom exercise. Instructive advancements are planned to reinforce coaching. a little of the bonded blessings are recorded underneath: I) easy to-get to course materials. Lecturers will post the course material or vital knowledge on a course website, which suggests understudies, will learn right away and space they lean toward and may get the examination material quickly. ii) Heading to understudies. iii) Understudy inspiration: laptop based mostly steering will offer moment input to understudies and clarify right answers. iv) Rules in learning v) Wide support: Learning material are often used for long separation learning and are hospitable a lot of intensive cluster of onlookers. vi) Increased understudy composing v) Logical, numerical, vital thinking aptitudes vi) Separated Guidance: Instructive innovation provides the thanks to focus on dynamic understudy cooperation and to exhibit separated addressing procedures.
- (vii) Data regarding the innovation, occupations, degrees and openings.¹¹

Going disconnected - sinking handiness problems: Other than having the quality eLearning edges, mLearning gets arrangements which allow about to the substance disconnected in an exceedingly protected manner. This functions the problem of not having consistent internet handiness. The data is shipped back to the server once related to the net, on these lines simply following the course advancement and gathering input.

Conclusion

Indian rural schools' problems may well be unraveled by leading edge innovations and devices. Work space and capability virtualization causes the country understudies to urge the investigation, information, subject and learning materials. Mists registering to boot assist the understudy with obtaining any learning materials over internet. The Moodle instruments serves to provincial understudies in intelligent learning and to urge legitimate bearings. Totally different innovations bolster provincial college understudies from multiple points of read. Propelled device and advancements provides correspondence master and quality materials. It takes care of the problems like I) Absence of import coaching and fewer enough examination materials ii) Lack of specialists direction in learning iii) Not sharing the data regarding in progress patterns and openings iv) Absence of presentation to current world and v) Lack of legitimate direction towards seeking once occupation organized courses vi) Absence of on-request information so forth.

For what reason improve grades?: Execution patterns uncover that urban students perpetually secure most well-liked evaluations over their rustic partners. It's not gauge that influences their execution, but the assets and openings accessible to them. Once more, we won't state that instructing is certainly not associate in nursing ennobling business. There are extremely energetic instructors out there to possess any reasonably impact. In any case, poor compensation and deficient getting ready are exhausting.

Innovation, on its half, will probably unquestionably influence the character of instruction and what is more to interrupt the advanced separation tormenting our framework.

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Source of Funding-Self

Ethical Clearance: Approved by SRC Committee at Department of Management Studies.

References

1. Gopal, D.H. Jagadeesh: Relationship between Emotional Intelligence and Burnout among Teacher Educators: The International Journal of Indian psychological science; 2018.
2. Priyavrat Mishra. A Study of the Factors of Emotional Intelligence. IOSR Journal of Business and Management. 2018.
3. Nina Barłózek: Teachers' emotional intelligence—an important part within the learning process: Opole University.
4. <https://www.indiatoday.in/education-today/featurephilia/story/india-rural-education-problems-958214-2017-01-31>
5. International Journal of laptop Applications (0975 – 8887) Volume 36– No.10, Dec 2011
6. <http://www.forbesindia.com/blog/education/digital-education-among-students-in-rural-areas/>
7. <https://www.onlinecollegecourses.com/2012/05/21/online-students-need-virtual-emotional-intelligence/>
8. Educational data system in Republic of India and its Limitations: Suggestions for Improvement <http://www.educationforallindia.com/page121.htm>
9. On the issues two-faced by Indian education system <http://www.indiaeducationreview.com/vc-desk/problems-faced-indian-education-system-0>
10. Ministry of rural development, government of Republic of India <http://rural.nic.in/>
11. Journal of yank Indian Education Volume ten no 1 <http://jaie.asu.edu/v10/V10S1eig.html>

Structural Non-Structural Protein-1 Virus Dengue of Risk Factors on Functional Interference Hepar

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Abstract

The causes of hepatic damage to DHF are mixed. Dengue virus can infect the liver and cause damage. Histopathology of the liver in cases of fatal dengue shows that hepatocytes and Kupffer cells can be the target of viral replication and there is involvement of apoptotic mechanism. This study aims to determine the association between dengue virus NS1 protein and degree of clinical manifestation of dengue infection with hepatic dysfunction. Blood samples after taking the serum, were examined for dengue virus NS1 protein and SGOT and SGPT examinations at the Surabaya Health Laboratory Center. Data analysis used Chi Square, Fisher's Exact, Anava and Dunnet ($\alpha = 0.05$). The results shows that the correlated variable significantly with dengue hemorrhagic manifestation degree was dengue virus NS protein1 ($p = 0.047$), with correlation strength of 26.8%. Variables significantly correlated with liver dysfunction were degree of clinical manifestation of dengue fever ($p = 0.037$) with correlation strength of 33.5% and dengue virus NS protein1 ($p = 0.023$) with correlation strength of 29.3%. There was a significant relationship between the presence of dengue virus NS1 protein and the incidence of DHF. There was a significant relationship between the presence of dengue virus NS1 protein with hepatic dysfunction (SGOT and SGPT) in dengue virus infection.

Keywords: *Non-structural protein 1, Hepatic function disorder, Dengue virus infection.*

Introduction

Dengue fever (DD) and dengue hemorrhagic fever (DHF) is a major global problem. Two and a half to 3 billion people, especially those living in tropical and sub-tropical urban areas are at risk of dengue virus infection. It is estimated that there are about 100 million cases of DD per year and as many as 500,000 dengue cases require hospitalization and the disease annually affects 90% of children under 15. The average death rate in dengue reached 5% or the number of deaths per year about 25,000 people, while the death rate in some countries in Asia about 0.5-3.5%¹.

In Southeast Asia, Indonesia ranks first as a country with a high endemic predicate for DHF. In Indonesia and Surabaya the four serotypes of dengue virus are still endemic and in the period 2003-2005 DEN-2 (65%) was the dominant serotype followed by DEN-3 (15%), DEN-4 (12%) and DEN-1 (8%). The rate of dengue fever in Indonesia until July 2008 was about 78.18 per 100,000 population, while in Surabaya 76 out of 100,000

population with a mortality rate of 0.46% in 2008. In 2007 Surabaya was included in 7 districts/cities with a high incidence of DHF².

Hepar is one of the target organs of dengue virus infection. In patients with DHF or SSD, it was often found that in liver function dysfunction degrees mild to moderate and in some people occur hepatic encephalopathy that resulted in the death. Dengue virus can cause dengue virus hepatitis, where SGOT levels are higher than SGPT with a ratio of about 1: 1.5. In some cases, DHF can occur fulminant hepatitis, fulminant liver failure and acute liver failure³.

The incidence of hepatic dysfunction in patients with dengue hemorrhagic fever in some countries in Asia 30-90%. A prospective study of patients with dengue infections in Thailand obtained 34.6% of 191 cases of hepatic dysfunction. Impaired hepatic function among patients without shock by 30% and patients with shock by 42.25%. Approximately 8% of patients with hepatic

dysfunction develop into hepatic encephalopathy. It is recommended the importance of detection of high levels of SGOT and SGPT to anticipate the possibility of disease development to hepatic encephalopathy⁴.

NS1 protein dengue virus is one of the nonstructural protein with a molecular weight of 46-50 kilodalton, a glycoprotein and the most immunogenic among the 7 types of non-structural protein dengue virus. Research in vivo shows that hepatocytes are the primary target cells of the dengue virus NS1 protein. Dengue virus infection causes apoptosis and endothelial or hepatocyte cell dysfunction. Until now the mechanism of pathogenesis of hepatic dysfunction disorder by NS1 protein dengue virus cannot be explained completely⁵. The purpose of this study was to determine that the presence of dengue virus NS1 protein is a risk factor for hepatic dysfunction (SGOT and SGPT) in dengue virus infection and calculate the risk of hepatic dysfunction due to the presence of dengue virus NS1 protein.

Method

The research design used in this research is analytic observational with the cross-sectional design. Selection of the design because at the beginning of the study on the members of the sample was not known whether or not there is a disruption of hepatic function and not known also the positivity of the examination of NS1 protein dengue virus. In addition, the prevalence of hepatic dysfunction in patients with dengue infection was quite high, in some countries in Asia about 30-90%. Before conducting research the researcher first conducted a test of ethics at the Faculty of Medicine, Universitas Airlangga, Surabaya Indonesia⁶.

This study used 80 samples of patients with DD, DHF, SSD aged 12 years and above and hospitalization in the tropic room of men and women Dr. Soetomo GEeneral Hospital, Surabaya, Indonesia for 1 year and meet the inclusion criteria. Subject inclusion criteria include, 2-5 days of hot duration, No history of hepatitis, no history of abdominal typhoid pain and not alcohol drinkers. Samples who are willing to follow the research in advance fill out the informed consent sheets provided by the researchers.

DHF diagnostic criteria based on WHO criteria modification, with days of fever 2-5 days. Clinical criteria include, sudden high fever 2-5 days, for no apparent reason; presence of bleeding manifestations, including positive tourniquet test, petechiae, ecchymosis,

gum bleeding, epistaxis, hematemesis and or melena; hepatic enlargement (hepatomegaly); signs of shock, rapid and weak pulse, narrowing of pulse pressure, hypotension, cold acral, damp skin and patient looking restless. Laboratory criteria include Thrombocytopenia ($<100,000/\text{mm}^3$), Hemoconcentration, increase in hematocrit 20% or more. Diagnosis of dengue hemorrhagic fever is made when there are 2 or more clinical symptoms with thrombocytopenia and hemoconcentration. The sampling of a patient with simple random sampling⁷.

Method of data collection in this study are as follows, data on the patient's characteristic, complaints, symptoms, history of comorbidities, alcohol-related habits collected by interview using structured questionnaires, physical examination, complete blood, platelet count, hematocrit, bilirubin, widal test obtained from patient medical records, SGOT-SGPT levels, dengue virus NS1 protein obtained from the results of blood tests of patients with DD, DBD and SSD are taken as sample and hospitalization in Tropical Disease room male and female RSU. Dr. Soetomo Surabaya, Indonesia⁸.

The research material was the blood of DD, DBD and SSD from cubiti vein as much as 5 ml, then centrifuged and taken serum. Serum samples were then divided into 2 aliquots, for examination, serum SGOT levels and SGPT, dengue virus Protein NS1 with Platelia antigen NS1 dengue test. Physical examinations of hepatic physiological clinics (SGOT and SGPT) and detection of dengue virus NS1 proteins were performed in the clinical and immunological chemistry laboratory of Indonesian Center for Health Laboratory Surabaya, Indonesia⁹. Data of independent variable and dependent on nominal data scale were analyzed using Chi-square test with error rate 5%. Statistical analysis was performed using SPSS version 23.0 (SPSS, Inc., Chicago, IL). The strength of the relationship was known by calculating the contingency coefficient for Chi-square test. Odd's Ratio to calculate the magnitude of risk¹⁰.

Results

Characteristics of the Subjects: The age of the patient varies between 12 to 54 years, mean age 23.20 ± 8.10 years, at most 20 years. The age distribution of respondents does not follow the normal distribution curve. Age is then categorized into 3 groups, namely between the ages of 12 to 19 years, groups between ages

20-29 years and groups between ages 30 to 54 years. Most (40%) age group of patients 20 - 29 years. The sex of the 80 respondents (60%) is mostly male. Day fever based on the time of blood sampling, varied between day 2 and 5 days fever, mean duration of fever 3.9 days, at most 4 days (45%). Day 2 fever (3.80%), 3rd (28.80%) and 5th (22.50). Most (40.00%) sufferers of DD and patients with DBD degree II (54.55%) aged 20-29 years. There is one DHF sufferer of age III 20 years old. In Table 1 the majority (57.50%) of DD sufferers were women, whereas most dengue fever cases (78.57%), dengue II (72.73%) and dengue III (100%) were male (table 1).

Based on statistical test results shows that there was a significant relationship ($p = 0.022$) between the

presence of dengue virus NS1 protein with abnormal levels of SGPT in patients with DD, DBD. The strength of the resulting relationship is 0.272. Mean dengue virus NS1 protein is a risk factor for the occurrence of SGPT disorders in dengue infection. Odd's Ratio calculation results for SGPT disturbed obtained value of 3.460 (CI = 1.292 - 9.266; Table 2).

The result of the statistical test shows that there is a significant relationship ($p = 0.023$) between the presence of dengue virus NS1 protein with the occurrence of hepatic function disorder, with the strength of the relationship of 0.293. Means NS1 protein dengue virus as a risk factor for the occurrence of DBD. Odd's Ratio calculation results for SGOT and SGPT were disturbed obtained value 4.603 (CI = 1.127 - 18800, Table 2).

Table 1. Distribution of patients by sex and degree of clinical manifestation of dengue virus infection

Sex	Degree of Clinical Manifestations			
	DD	DHF degrees I	DHF degrees II	DHF degrees III
Male	17 (42.50%)	22 (78.57%)	8 (72.73%)	1 (100.00%)
Female	23 (57.50%)	6 (21.43%)	3 (27.27%)	0 (0.00%)

Table 2. The relationship between NS1 protein dengue virus and hepatic dysfunction

Protein NS1 dengue virus	Positive	Negative	r	p
Levels of SGOT				
Normal	3 (3.75%)	11 (13.75%)	0.223	0.040
Abnormal	34 (42.50%)	32 (40.00%)		
SGPT Levels				
Normal	8 (10.00%)	21 (26.25%)	0.272	0.022
Abnormal	29 (36.25%)	22 (27.50%)		
Hepar Disruption				
Normal	3 (3.75%)	10 (12.50%)	0.293	0.023
SGOT/SGPT	5 (6.25%)	12 (15.00%)		
SGPT & SGPT	29 (36.25%)	21 (26.25%)		

Discussion

Checking levels of SGOT and SGPT is to see the picture of hepatic cell damage (hepatocytes). GOT enzymes are present in heart cells, liver, skeletal muscle, kidney, brain, pancreas, spleen and lung. In the hepatic GOT enzymes are present in the cytoplasm and mitochondrial hepatocytes. In cytoplasmic and hepatocyte mitochondrial deficiencies, GOT enzymes will emerge from cells so that levels of SGOT will increase. The high levels of this enzyme in the blood

circulation were directly related to the amount of cell damage. Cell damage will be followed by an increase in SGOT levels within 12 hours and remain elevated for 5 days. Changes in SGOT levels in cell damage due to the acute inflammatory process are moderate, while in SGPT is highly sensitive ¹¹.

Such sensitivity occurs because the hepatocytes located closest to the central vein of each lobule normally have low oxygen tension and are highly susceptible to hypoxia. Sentrolobulus hepatocytes are

injured when arterial hypotension causes reduced blood to enter the liver or when increased back pressure from right heart failure slows the blood out of the central vein; in this hypoxic damage, SGOT and SGPT levels rise to moderate levels ¹².

GPT enzymes are present in the liver, heart, muscle, kidney and hemost liver tissue. In dengue virus infection SGOT levels rise higher than SGPT levels. The mean rate of SGOT (80.88-84.73) u/l is greater than the mean SGPT content (65.60-90.20) u/l. Dengue virus can cause dengue virus hepatitis, where SGOT levels are higher than SGPT with a ratio between SGOT and SGPT 1: 1.5 ¹³. In obstruction of acute extrahepatic bile ducts, SGPT levels rise higher than SGOT. SGOT: SGPT levels of more than 3: 1 were found in alcoholic liver disease. Increased levels of SGOT and SGPT up to 300 µg/l levels are not specific for liver disorders. Increased levels of SGOT and SGPT > 1000 u/l may be present in viral hepatitis, liver ischemic disease (due to prolonged hypotension or acute heart failure) and liver damage due to toxins or drugs ¹⁴.

The accumulation of intracellular dengue NS1 virus causes increased endocytic activity of hepatocytes and enhances the production of dengue virus after subsequent infection. This suggests that the dengue virus NS1 protein plays a role in the multiplication of dengue virus. Dengue virus replication induces synthesis of nitric oxide (NO) and RANTES and cell death by apoptosis¹³. Antibodies against the dengue virus NS1 protein cause inflammatory activation as well as endothelial cell apoptosis, whereas the severity of cytopathic effects and elevated levels of SGOT are associated with the rate of viral replication ¹⁵.

Anti-NS1 dengue virus increases endothelial cell activation and leads to increased expression and secretion of IL-6 and IL-8 proteins and result in increased vascular permeability and systemic inflammation. Activation of endothelial cells by dengue virus NS1 protein will also increase the expression of ICAM-1 which causes adhesion of PBMC (peripheral blood mononuclear cell) in endothelial cells, resulting in damage to endothelial cells³.

The dengue virus NS1 protein was immunized in mice and obtained anti-NS1 antibody deposits in endothelial cells and resulted in endothelial cell apoptosis of portal venous and central liver venous veins. SGOT and SGPT levels increased after 2 days and NO involvement was

found in endothelial cell apoptosis. In the histologic examination, hepatic tissue damage (hepatic fibrosis, hepatic fatty), mononucleosis phagocyte infiltration and cell apoptosis ¹².

Conclusion

The presence of dengue virus NS1 protein is a risk factor for SGOT disorders in dengue virus infections. The presence of dengue virus NS1 protein is a risk factor for SGPT disorders, where the risk of dengue sufferers with a positive NS1 protein for SGPT disorder is 3.46 times greater than those with dengue with a negative NS1 protein. The presence of the dengue virus NS1 protein is a risk factor for hepatic dysfunction in dengue virus infection, with the risk of dengue fever and dengue hemorrhagic dengue-positive NS1 dengue fever protein for hepatic dysfunction (SGOT and SGPT) of 4.60 times greater than with dengue fever sufferers and dengue hemorrhagic fever which is a negative NS1 protein.

Ethical Clearance: This research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence and justice.

Conflict of Interest: The author reports no conflict of interest of this work.

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References

1. Yudhastuti R, Rasjid A, Notobroto HB. Relationship of Environmental Condition, Container and Behavior with the Existence of Aedes aegypti Mosquito Larvae in an Endemic Area of Dengue Hemorrhagic Fever, Makassar. *Pakistan J Nutr.* 2016;15(3):295–8.
2. Sesulihatien WT, Kiyoki Y, Sasaki S, Safie A, Yotoproto S, Sornlertlamvanich V, et al. Building the vector-control collaborative strategy in Dengue Fever: Case surabaya, Kuala Lumpur, Bangkok. *Inf Model Knowl Bases XXVIII.* 2017;292:94.
3. Tjahjono E, Maulana TD. Prediction of the number dengue hemorrhagic fever patients in district Jombang Regency using transfer function model

- approach. In: *Journal of Physics: Conference Series*. IOP Publishing; 2019. p. 12049.
4. Suparman R, Astelia C, Purwanti E, Widiyanti P. Application Design of Dengue Hemorrhagic Fever Patients Screening Using Naive Bayes Method. In: *Journal of Biomimetics, Biomaterials and Biomedical Engineering*. Trans Tech Publ; 2017. p. 20–8.
 5. Yohan B, Wardhani P, Trimarsanto H, Sasmono RT. Production of recombinant dengue non-structural 1 (NS1) proteins from clinical virus isolates. *Protein Expr Purif*. 2017;129:53–9.
 6. Kotaki T, Yamanaka A, Mulyatno KC, Churrotin S, Sucipto TH, Labiqah A, et al. Divergence of the dengue virus type 2 Cosmopolitan genotype associated with two predominant serotype shifts between 1 and 2 in Surabaya, Indonesia, 2008–2014. *Infect Genet Evol*. 2016;37:88–93.
 7. Churrotin S, Kotaki T, Sucipto TH, Ahwanah NLF, Deka PT, Mulyatno KC, et al. Dengue virus type 1 strain isolated in Indonesia shows a close phylogenetic relationship with the strains that caused the autochthonous dengue outbreak in Japan in 2014. *Jpn J Infect Dis*. 2016;JJID-2015.
 8. Wardhani P, Aryati A, Yohan B, Trimarsanto H, Setianingsih TY, Puspitasari D, et al. Clinical and virological characteristics of dengue in Surabaya, Indonesia. *PLoS One*. 2017;12(6):e0178443.
 9. Widiyanti P. Digital Hematocrite Test, a New Breakthrough in the Medical Equipment for Non Invasive Hematocrite Level Measurement in Dengue Patients. *J Int Dent Med Res*. 2017;10(3):1038–41.
 10. Rasuna G, Sabila MP, Bramantoro T, Setijanto D, Zamzam A. Strawberry utilization empowerment program in low-temperature environment as a dental health promotion. *J Int Oral Heal*. 2019;11(7):26.
 11. Wahyuni TS, Tumewu L, Permanasari AA, Apriani E, Adianti M, Rahman A, et al. Antiviral activities of Indonesian medicinal plants in the East Java region against hepatitis C virus. *Virol J*. 2013;10(1):259.
 12. Morchang A, Lee RCH, Yenchitsomanus P, Sreekanth GP, Noisakran S, Chu JJH, et al. RNAi screen reveals a role of SPHK2 in dengue virus-mediated apoptosis in hepatic cell lines. *PLoS One*. 2017;12(11):e0188121.
 13. Dionicio CL, Pena F, Constantino-Jonapa LA, Vazquez C, Yocupicio-Monroy M, Rosales R, et al. Dengue virus induced changes in Ca²⁺ homeostasis in human hepatic cells that favor the viral replicative cycle. *Virus Res*. 2018;245:17–28.
 14. Ferreira RAX, de Oliveira SA, Gandini M, da Cunha Ferreira L, Correa G, Abiraude FM, et al. Circulating cytokines and chemokines associated with plasma leakage and hepatic dysfunction in Brazilian children with dengue fever. *Acta Trop*. 2015;149:138–47.
 15. Lang J, Vera D, Cheng Y, Tang H. Modeling dengue virus-hepatic cell interactions using human pluripotent stem cell-derived hepatocyte-like cells. *Stem cell reports*. 2016;7(3):341–54.

The Effect of Plumbum, Zinc and Zinc Ratio on Plumbum in Children's Temperament

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Abstract

Introduction: Plumbum is a heavy metal that is neurotoxic in children. Plumbum exposure in slum and densely populated environments adversely affects physical growth, nervous system development, memory disorders and learning disorders, cognitive deficits, psychological disorders and negative temperament of children that persist until adulthood. Zinc is an important trace element in the body. Increased free radical production and oxidative stress can interfere with homeostasis trace elements. Trace element zinc plays an important role in the mechanism of oxidants and antioxidants in microorganisms.

Method: This study is an analytical study with a cross-sectional design with sampling using the random sampling method in grade 3 to 6 grade BK Surabaya elementary school. Measuring plumbum and zinc levels using hair media was measured by the Atomic Absorption Spectrophotometry (AAS) and temperament measurements using the Indonesia's Children's Temperament Questionnaire.

Results and Discussions: Disorders of elemental levels and elemental imbalances will result in oxidative cellular component damage associated with the child's negative temperament which adversely affects communication with parents, siblings with peers and poor academic performance. This disorder can be sustained in adolescence with clinical manifestations of aggressiveness, behavioral disorders and substance abuse and in adulthood the negative impact of difficulty finding work and poor communication in the family.

Conclusions: Pb, Zinc, the ratio of zinc to Plumbum is significant to the child's temperament.

Keywords: Child temperament, plumbum, zinc, zinc/plumbum ratio.

Introduction

Plumbum exposure in the environment adversely affects children because plumbum is neurotoxic and affects the development of the brain area of the prefrontal

cortex, basal ganglia, hippocampus and cerebellum^(1,2). The highest target for plumbum exposure is the central nervous system area. Chronic plumbum exposure adversely affects physical growth, nervous system development, memory disorders and learning disorders, cognitive deficits, psychological disorders and behaviors and negative temperament of children. Infants and children at high risk of plumbum pollution with levels below 10µg/100ml can cause impaired fetal growth and development and cognitive deficits⁽³⁾. Temperament in children is defined as a way of thinking, behaving, or reacting which is an individual characteristic and refers to the ways a person lives⁽⁴⁻⁸⁾ Children with

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negative temper the difficult child (difficult children) are usually very active, sensitive stimulate and have irregular habits. The negative withdrawal response is a characteristic of these children and requires a more structured environment. Children become slow to adapt to new routines, people or situations. Mood expressions are usually strong and especially negative. They often cry and frustration often leads to violent tantrums (the slow-to-warm-up) child usually reacts negatively and with mild intensity to new stimuli and unless pressed, slowly adapts to repeated contact. They only respond with mild rejection but are passive to something new or foreign or changes in routine. Children are quite inactive and moody but only show moderate disorder in terms of function. Children are more susceptible to behavioral problems at the beginning and middle of childhood⁽⁷⁾. Negative temperament is associated with emotional and behavioral disorders that require clinical attention because they can be sustained until adulthood⁽⁹⁾. Given the magnitude of the impact of plumbum exposure on the negative temperament of children as an observer of mental health of children and adolescents, it is considered necessary to conduct research to prevent the risk of children's and adolescent behavioral disorders and personality disorders as adults which burden my family and the surrounding environment

Method

This study was an observational analytic study with cross-sectional design using random sampling method in grade 3 to 6 grade B K Surabaya elementary school with a sample of 44 children. Before the research was conducted, researchers with the help of the principal and class teacher met with parents and students to provide an explanation of the research procedures and provide information for consent and informed consent that must

be filled by the respondent. Inclusion criteria for research subjects were children aged 9-12 years no organic disturbances were found, mothers of children with at least junior high school education could communicate Indonesian, patients cooperatively and not experience severe psychosocial stressors. Pb and zinc examination was taken from cutting 10 pieces of children's hair in the occipital area close to the scalp, then the Atomic Absorption Spectrophotometry (AAS) method and temperament measurements were examined using the Children's Temperament Questionnaire. Sampling from hair based on growth is not invasive, provides a child's sense of comfort and the levels of plumbum and zinc in the hair stay longer so they can accurately identify Pb and Zink levels⁽¹⁰⁻¹²⁾. Pb value, Zn, Pb/Zink ratio in the form of numerical data and statistical analysis with normality test with results $p < 0.05$, which means that the distribution is not normal so that in the correlation test using the Spearman correlation test. The child's temperament questionnaire which was validated by Rini Harahap in 2013 and has been used for both research and clinical needs (Harapan, 2014) consisted of 15 questions consisting of positive and negative statements. Positive statements consist of 11 statements, namely statements with numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11. The choice form of positive statements is always valued (SL), sometimes (KK) and never (TP), with a score of 1-3. Score 1 is never, score 2 is sometimes, score 3 is always. While the negative statement consists of 4 statements on numbers 12, 13, 14 and 15. Negative statement choices are always (SL), sometimes (KK) and never (TP), with a score of 1-3. Score 1 is always, score 2 is sometimes, score 3 is never. The lowest total score is 15 and the highest score is 45. Scoring interpretation is a total score of 15-24 = difficult, a total score of 25-34 = slow and a score of 35-45 = eas.

Results and Discussions

Table 1: Demographic Data of the Childrenin BK Surabaya Elementary 2019

Variable	Category	Frequency	%
Age	≤12 years	41	93,18%
	> 12 years	3	6,82%
Gender	Female	13	29,55%
	Male	31	70,45%
Birth Order	First Child	24	54,55%
	Others	20	45,45%

Variable	Category	Frequency	%
History of violence in childhood	Never	40	90,91%
	Yes	4	9,09%
Temperament	Difficult	3	6,82%
	Slow	35	79,55%
	Easy	6	13,64%

Table 1 obtains the highest age results of less than 12 years at 93.18% with male sex at 70.54%, the order of the first high-ranking child is 54.55% and the most temperament of the child is the slow temperament of 79.55%. Pb, Zn, Pb/Zink ratios are numerical data and have been tested by normality test with the results of $p < 0.05$, which means that the distribution is abnormal so that the correlation test uses the Spearman correlation test with the following results:

Table 2: Correlation between Pb, Zink, Pb/Zink ratio with the children’s temperament in B K Surabaya Elementary 2019

Spearman Correlation	Temperament Score
	r – value
Pb	-0,078
Zn	-0,325*
Pb/Zn	0,208

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Most child respondents are slow temperament. Temperament in children is defined as a way of thinking, behaving, or reacting which becomes individual characteristics and refers to the ways a person goes through life.

The classification of temperaments in children is divided into three, namely The Easy Child, The Difficult Child, The Slow-to-warm-up child (13,14) The Easy Child (easy child) children are more relaxed and temperamental, have regular and predictable habits and have a positive approach to new stimuli. Children are more open and can adapt to changes and show the intensity of moods that are mild to moderate which are usually positive (15) The Difficult Child (difficult child) children have a difficult temper usually very

active, sensitive and have irregular habits. The negative withdrawal response is a characteristic of these children and requires a more structured environment. Children become slow to adapt to new routines, people or situations. Mood expressions are usually strong and especially negative. They often cry and frustration often leads to violent tantrums (16) The Slow-to-warm-up child usually reacts negatively and with mild intensity to new stimuli and unless pressed, slowly adapt to repeated contact. They only respond with mild rejection but are passive to something new or foreign or changes in routine. Children are not quite active and moody but only show moderate disorder in terms of function. Children are more susceptible to behavioral problems at the beginning and middle of childhood (13,17). Parenting is a process of introducing and supporting a child’s physical, emotional, social and intellectual development from a baby to an adult.. Another aspect is that parenting is the interaction between children and caregivers during care, including the process of developing appropriate knowledge and skills for children, ways to educate by giving rules and restrictions applied to their children, maintenance, instilling trust, how to get along, attitudes create an emotional atmosphere, protection and teach general behavior that can be accepted by society. Socio-economic status affects many aspects of parenting. Low income families limit the purchase of goods needed in parenting, such as educational games and books that are beneficial for child development. Poverty and economic insecurity affect the mental health of parents in relation to non-supportive childcare (18,19). Slow temperament can be caused by a lack of parental stimulation due to family economic limitations and the impact of slum environments with high air pollution.

Stressful conditions in parents can potentially damage parents’ attitudes and behavior towards children. Parental stress can come from various forms, such as financial difficulties, lack of social support and marriage problems. Stressors have a negative impact on the general well-being and health of parents and

seize their attention and emotional energy. Parental stress can reduce involvement, attention, patience and tolerance for children and increase the use of punitive practices.⁽²⁰⁾ The results of the study stated that the majority of children did not experience childhood trauma while the results of the most temperament were slow temperament. These results can explain the theory of Stella Chest that since childhood children have their own responses. Easy child child, easy to adapt to children environment difficult child difficult to adapt to environment, dissident while child slow to warm up is marked by indifference to the surrounding environment. Children also play a role in their own development. Temperament's interactions and environment are known as good and fit. The results of the study concluded that there was a significant relationship between zinc levels and the child's temperament, but no significant results were found between the plumbum level and the child's temperament. These results are not in accordance with the theory that plumbum is neurotoxic and the risk of brain damage in children with clinical manifestations of learning disorders, memory disorders and disorders of emotional control, irritability, irritability and chronic and high levels of exposure can cause death. The results of this study still require special attention considering the location of the living and living areas of slums, the pattern of care that does not provide stimulation and limited facilities and infrastructure, because the interaction of these factors negatively affects the child's growth process in the form of mental emotional disorders that can continue until adolescence and adulthood which results in a burden on the family and the environment. The ratio of Zinc to Pb in child respondents in the study showed meaningless results. Measurement of Zinc ratio to Pb is a new study that has never been done before.⁽²¹⁻²⁴⁾ The rationale of this study is based on the Pb mechanism into the body by binding to calmodulin and blocking the N-methyl-D-aspartate enzyme which will damage brain neuroplasticity and cause encephalopathy and edema in the cerebellum region, this damage is irreversible. Plumbum will inhibit tyrosine synthesis into dopamine, resulting in reduced attention function, visual motor reasoning skills and reading, numeracy and math skills.⁽²⁵⁻²⁶⁾ Plumbum also inhibits the synthesis of tryptophan into serotonin, resulting in symptoms of hyperactivity and impulsivity.⁽²⁷⁾ Zinc is an important trace element and plays a major role in the synthesis of neurotransmitters in central nervous system.⁽²⁸⁻²⁹⁾ Zinc plays a role in the synthesis of dopamine, serotonin and norepinephrine neurotransmitters and increases

GABA (amino-amino butyric acid) which functions as inhibitory/relaxation neurotransmitters.^(24,25)

Conclusions

The results showed significant results between zinc and child's temperament. Zinc plays a role in the metabolism of melatonin which is the basic ingredient of tyrosine. Melatonin is a hormone secreted by the pineal glandule and is tasked with regulating the rhythm of the circadian cycle which is responsible for regulating the human sleep cycle. Children with emotional disorders often experience sleep disorders that are thought to be caused due to melatonin deficiency^(17, 29). Zinc also acts as a precursor in the synthesis of tryptophan. High Pb levels will aggravate children's emotional disturbances characterized by increased symptoms of hyperactivity, impulsivity, motor, cognitive impairment and decreased academic performance^(28,30)

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References

1. Rodríguez-barranco M, Lacasaña M, Aguilar-garduño C, Alguacil J, Gil F, González-alzaga B, et al. Science of the Total Environment Association of arsenic, cadmium and manganese exposure with neurodevelopment and behavioural disorders in children: A systematic review and meta-analysis. 2013;455:562–77.
2. Curran EA, O'Neill SM, Cryan JF, Kenny LC, Dinan TG, Khashan AS, et al. Research Review: Birth by caesarean section and development of autism spectrum disorder and attention-deficit/hyperactivity disorder: A systematic review and meta-analysis. *J Child Psychol Psychiatry Allied Discip.* 2015;56(5):500–8.
3. Luo W, Ruan D, Yan C, Yin S, Chen J. NeuroToxicology Effects of chronic lead exposure on functions of nervous system in Chinese children and developmental rats. 2012;33:862–71.
4. Baranowska-Bosiacka I, Gutowska I, Rybicka M, Nowacki P, Chlubek D. Neurotoxicity of lead. Hypothetical molecular mechanisms of synaptic function disorders. *Neurol Neurochir Pol.*

- 2012;46:569–78.
5. Daneshparvar M. The Role of Lead Exposure on Attention-Deficit/Hyperactivity Disorder ↑ in Children : A Systematic Review. 2016;1–14.
 6. Zeng X, Xu X, Boezen HM, Huo X. Chemosphere Children with health impairments by heavy metals in an e-waste recycling area. *Chemosphere* [Internet]. 2016;148:408–15. Available from: <http://dx.doi.org/10.1016/j.chemosphere.2015.10.078>
 7. Brochin R, Leone S, Phillips D, Shepard N, Zisa D, Angerio A. The Cellular Effect of Lead Poisoning and Its Clinical Picture. *Heal Sci J*. 2008;5(2):1–8.
 8. Villagomez A, Ramtekkar U. Iron, Magnesium, Vitamin D and Zinc Deficiencies in Children Presenting with Symptoms of Attention-Deficit/Hyperactivity Disorder. *Children* [Internet]. 2014;1(3):261–79. Available from: <http://www.mdpi.com/2227-9067/1/3/261/>
 9. Elbaz F, Zahra S, Hanafy H. Magnesium, zinc and copper estimation in children with attention deficit hyperactivity disorder. *Egypt J Med Hum Genet* [Internet]. 2017;18(2):153–63. Available from: <http://dx.doi.org/10.1016/j.ejmhg.2016.04.009>
 10. Iris RFÆ, Sam MÆ. ADHD, Temperament and Parental Style as Predictors of the Child ' s Attachment Patterns. 2006;103–14.
 11. Foley M, Graham S, Castellanos FX. The relationship between attention deficit hyperactivity disorder and child temperament □. 2008;29:157-69.
 12. Hassan M KW. Daat1311P155.Pdf. *Delphi Psychiatry J*. 2013;16 no 1:155–9.
 13. McClowry SG, Rodriguez ET, Koslowitz R. Temperament-based intervention: Re-examining goodness of fit. *Int J Dev Sci*. 2008;2(1–2):120–35.
 14. Å DB, Affuso G, Trotta T. Temperament, ADHD and Peer Relations Among Schoolchildren : The Mediating Role of School Bullying. 2008;34(May):447–59.
 15. Pauw SSW De, Mervielde I. The Role of Temperament and Personality in Problem Behaviors of Children with ADHD. 2011;277–91.
 16. Zinc H, Analysis L, Micronutrients C, Growth P. Hair Zinc Level Analysis and Correlative Micronutrients. 2016;19(4):259–68.
 17. Tippairote T, Temviriyankul P, Benjapong W. Hair Zinc and Severity of Symptoms Are Increased in Children with Attention Deficit and Hyperactivity Disorder : a Hair Multi-Element Profile Study. 2017;
 18. Harahap DR. Hubungan pola asuh orangtua dengan temperamen anak usia sekolah dasar di desa tanjungrejo dusun XI kecamatan Pencut seri tuan kabupaten deli serdang. 2014.
 19. Chung D. The Eight Stages of Psychosocial Protective Development: Developmental Psychology. *J Behav Brain Sci*. 2018;08(06):369–98.
 20. Dwi Siswanto. Pengaruh Pandangan Hidup Masyarakat Jawa Terhadap Model Kepemimpinan. *J Filsafat*. 2010;20(3):7–8.
 21. Susetyo DPB, Widiyatmadi HME. Konsep Self Dan Penghayatan Self Orang Jawa. *Psikodimensia* [Internet]. 2014;13(1):47. Available from: <file:///C:/Users/User/Downloads/Documents/277-550-1-SM.pdf>
 22. Justin ST. Identity Development Throughout the Lifetime: An Examination of Eriksonian Theory. *Grad J Couns Psychol* [Internet]. 2009;1(2). Available from: <http://epublications.marquette.edu/cgi/viewcontent.cgi?article=1030 & context=gjcp>
 23. Abulizi X, Pryor L, Michel G, Melchior M, Van Der Waerden J, Annesi-Maesano I, et al. Temperament in infancy and behavioral and emotional problems at age 5.5: The EDEN mother-child cohort. *PLoS One*. 2017;12(2):1–17.
 24. Scheper FY, Majdandžić M, van de Ven PM, Jansen LMC, Doreleijers TAH, Schuengel C, et al. Temperament Traits and Psychopathology in Young Clinically Referred Children Compared to a General Population Sample. *Child Psychiatry Hum Dev*. 2017;48(6):841–50.
 25. Ruterling J, Ilmer M, Recio A, Coleman M, Vykoukal J, Alt E, et al. □□□□□□ HHS Public Access. 2016;5(6):1–8.
 26. Mervielde I, De Pauw SSW. Models of child temperament. *Handb temperament* [Internet]. 2012;(October):21–40. Available from: <http://search.ebscohost.com/login.aspx?direct=true & AuthType=ip,shib,cpid & custid=s6264444 & db=psyh & AN=2012-22484-002 & site=ehost-live & scope=site>
 27. Macedoni-luk M, Gosar D, Bjørklund G, Ora J, Kodri J. Levels of Metals in the Blood and Specific Porphyrins in the Urine in Children with Autism Spectrum Disorders. 2014;

28. Marques RC, Bernardi JVE, Dórea JG, De Fatima R, Moreira M, Malm O. Perinatal multiple exposure to neurotoxic (lead, methylmercury, ethylmercury and aluminum) substances and neurodevelopment at six and 24 months of age. *Environ Pollut.* 2014;187:130–5.
29. Levels of metals (Cd, Pb, Cu and Fe) in cow 's milk, dairy products and hen 's eggs from the West Bank, Palestine. 2012;19(3):1089–94.
30. Canli M. The relationships between heavy metal (Cd, Cr, Cu, Fe, Pb, Zn) levels and the size of six Mediterranean fish species. 2003;121:129–36.

The Studying the Adhesion Molecule P-selectin in Patients with Ischemic Heart Disease

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Abstract

Background: P-selectin is partially responsible for the adhesion of certain leukocytes and platelets to the endothelium.

Increased levels of soluble P-selectin in the plasma have also been demonstrated in a variety of cardiovascular disorders. The aim of this study is to evaluate the role of P-selectin, in development of IHD and possible use as a biomarker and to study the change in its level after introducing of angiotensin converting enzyme inhibitor (ACEI) .

Patients and Method: The study involve(49) patients with stable IHD and 51 patient with acute coronary syndrome and (50) subjects as a control.

They divided into three groups: 1st include subjects with no history of IHD not on (ACEI) as a control group. 2nd group include patients with history of stable IHD but not receiving any (ACEI)but on B-blocker therapy. 3rd group include patients with acute coronary syndrome not on ACEI therapy but most of them on B-blockers as a part of their treatment regimen. (ACEI) (captopril 25 mg twice daily) was given for 1 month duration for patients in the 2nd and 3rd group for the 2nd and 3rd group we measured the levels of p-selectin before and after the drug have been introduced

Result: There is increase in level of p-selectin in patients with acute coronary syndrome and to less extent in patient with stable IHD there is a decrease in the level of platelet P-selectin after introducing of ACEI in the 2nd and 3rd group.

Conclusion:

1. By comparing with control the level of p-selectin is greater in patients with acute coronary syndrome and to less extent in patient with stable IHD.
2. ACEI administration was associated with significant decrease of the level of p-selectin in patients with IHD & to a greater extent in patient with acute coronary syndrome.

Keywords: *Pselectin, platelets, IHD, angiotensin converting enzyme inhibitor.*

Introduction

Cardiovascular disease (CVD) is the leading cause of death for both men and women and although mortality of CVD is decreasing, CVD prevalence is increasing. More than one third of the adults currently have some form of CVD and the prevalence increases from more than 10% in those aged 20 to 39 years to more than 70%

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in those aged 60 to 79 years & about two third of men and half of women may develop CVD in their lifetime⁽¹⁾.

There are many studies focus on pathogenesis of CVD which include atherosclerosis, inflammatory process & sometimes micro embolism. these three mechanism are highly interacting with each other⁽²⁾.

Any Endothelial injury, by whatever cause, leads to Changes in platelet and endothelial cell function, these changes are considered the forerunner of the atherosclerosis of the blood vessels that occurs later which leads to many clinical conditions like acute coronary syndrome, cerebrovascular event, peripheral vascular disease and so on⁽³⁾.

These changes lead to production of certain factors from the endothelium cells and platelet. which lead to Platelet–endothelium interaction⁽⁴⁾.

Normal vascular “resting” endothelium represents a non-adhesive and non-thrombogenic surface that prevents adhesion of circulating platelet . In contrast, activated endothelial cells are pro-adhesive and promote the adhesion of circulating blood platelets⁽⁵⁾

Similar to the recruitment of leukocytes, the adhesion of platelets to the vascular endothelial surface is a multistep process, in which platelets are tethered to the vascular wall, followed by platelet rolling and subsequent firm adhesion⁽⁶⁾.

Adherent platelets release a variety of pro-inflammatory mediators that have the potential to modify signaling cascades in vascular cells, lead to release of endothelial chemo attractants. In this manner, they might mediate the adhesion and infiltration of leukocytes, in particular monocytes into the vascular wall^(7,8).

This adhesion process is mediated by many adhesion molecules, such as intercellular adhesion molecule (ICAM), vascular cell adhesion molecule (VCAM) and the selectin family of molecules (P-selectin, E-selectin and L-selectin) that play an important role in the initiation of leukocyte migration into the vascular wall^(9,10). most important one is P-selectin as the initial loose contact between circulating platelets and vascular endothelium is mediated by p- selectin, which is present on both endothelial cells and platelets. P-selectin (CD62P), the largest of the selectins, with a mass of 140kDa, extends approximately 40nm from the endothelial surface and there are about 10 000 P-selectin molecules on the surface of an activated platelet⁽¹¹⁾.

P-selectin (CD62P) is rapidly expressed on the endothelial surface in response to inflammatory stimuli by translocating from membranes of storage granules (Weibel–Palade bodies) to the plasma membrane within seconds. In addition, P-selectin is stored in platelet α -granules and can rapidly translocate on the platelet surface upon activation. Endothelial P-selectin has been demonstrated to mediate platelet adhesion in both arterioles and venules in acute inflammatory processes, such as acute coronary syndrome⁽¹²⁾.

P-selectin is also important because of its production by both platelets and endothelial cells occurring in many cardiovascular diseases as part of the disease process including coronary artery disease, hypertension and atrial fibrillation. & its level changing in response to certain drugs like angiotensin converting enzyme inhibitor and B-blockers, so can be use as a plasma predictor of adverse cardiovascular events and also as marker of drug effect.

P-selectin is present within both the endothelial cells and the platelets, so raised plasma levels of P-selectin reflect endothelial injury, platelet activation, or both⁽¹³⁾.

The Aim:

The objective of the study is:

1. To study the role of the adhesion molecule, P-selectin, in development of ischemic heart disease and possible use as a biomarker.
2. To study the change in its level after introducing of angiotensin converting enzyme inhibitor .

Patients and Method

This is a case -control and cohort study conducted at Al-Sader medical city, in Al-Najaf Al-Ashraf city, during the period from 15th of august 2014 to the 6th of January 2016. it involve (49) patients with stable IHD and 51 patients for acute coronary syndrome and (50) subjects as a control.

The study subjects divided into three groups:

1st include subjects with no history ischemic heart disease not on angiotensin converting enzyme inhibitors (ACEI) as a control group.

2nd group include patients with history of stable ischemic heart disease but not receiving any angiotensin converting enzyme inhibitor drugs but on B-blocker therapy.

3rd group include patients with acute coronary syndrome not on ACEI therapy but most of them on B-blockers as apart of their new treatment regimen.

Angiotensin converting enzyme inhibitor drugs (captopril 25 mg twice daily) was given for 1 month duration for patients in the 2nd and 3rd group .

for the 2nd and 3rd groups the levels of p-selectin were measured before and after the drug have been introduced.

The patients with ischemic heart diseases were recruited from the medicine outpatient department clinic and the cardiac center and the emergency department at Al-Sader medical city.

The control group consisted of 50 volunteers who were completely healthy with no current or previous ischemic heart diseases, their age ranging between (25-50) years.

The patients with ischemic heart diseases (stable and unstable) have an age between (30-75) years.

Out of 71 patients with stable ischemic heart disease we lost contact with 22 patient and out of 69 patient with acute coronary syndrome we lost contact with 18 patient so 49 patient for stable ischemic heart disease groups and 51 patient with acute coronary syndrome were studied and compared with a 50 patients as a control .

All the patients have a detailed history and physical examination .ECG, complete blood count, lipid profile, blood urea, serum creatinine and fasting blood sugar.

All have been measured by a standard method.

Stable ischemic heart disease diagnosed by clinical signs and symptoms correlated with ECG finding.

Unstable angina and non ST elevation myocardial infarction diagnosis depended on signs and symptoms and also positive ECG finding).

ST elevation myocardial infarction diagnosis depended clinical signs and symptoms correlated with ECG finding as a cardiac enzyme is not always available.

Exclusion criteria include any patient with thrombocytopenia, thrombocytosis, leucopenia and leucocytosis as p-selectin is released from the platelet .

also include patients with hypertension, chronic renal failure, chronic heart failure, diabetes mellitus & peripheral vascular disease as endothelial injury and even established atherosclerosis are usually expected.

Blood collected in EDTA was mixed by inversion several times and used within 30 minutes to measure p-selectin level by ELISA and the normal level of p-selectin is 20-520 ng/ml .

For fasting blood glucose, blood urea and serum creatinine Abbott architect plus C4000 autoanalyzer used.

Statistical Analysis: By using the statistical package for social sciences (SPSS) software for windows data of all participants (cases and controls) were entered and analyzed with appropriate statistical tests .

Level of significance (P .value) of <0.05 indicate a significant difference.

The Results

Demographic Characteristic: Female represent 55% of controls, 58% of patient with stable ischemic heart disease and 61% of patients with acute coronary syndrome while male represent 45%, 42% and 39% respectively.

Mean age for control is 45.32 years and for stable ischemic heart disease is 58.4 years and for acute coronary syndrome is 55.67 years as shown in figure 1:

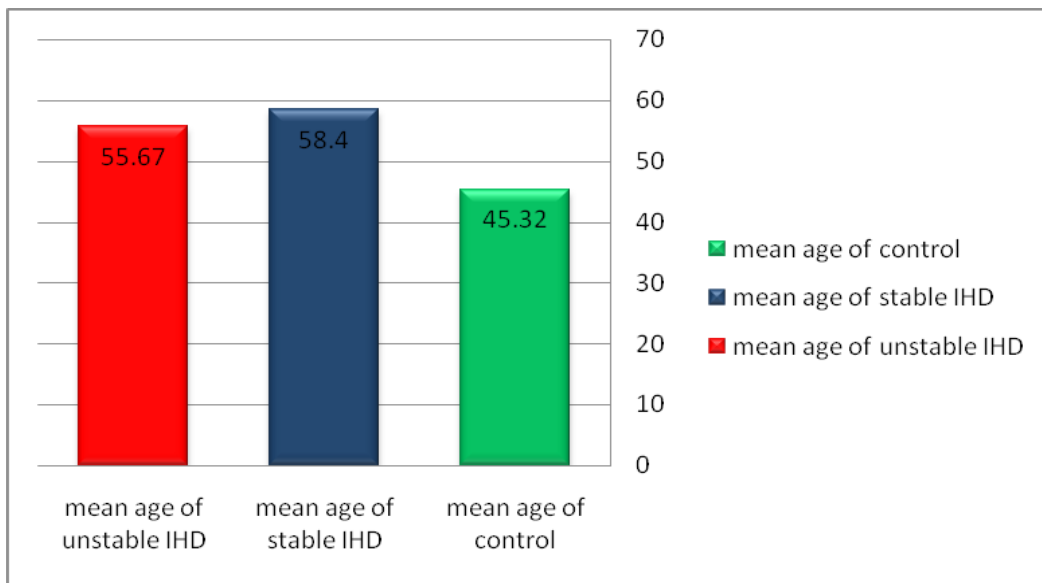


Figure 1: Showing comparison among the three groups according to age.

Comparative Measurement:

A-measurement of p-selectin in patient with IHD and control:

The level of p-selectin in patient with stable IHD in comparison with control shown in table 1:

Table 1: Show the comparison between the level of p-selectin of control subjects and stable ischemic heart disease and patient with acute coronary syndrome.

	Control Group N=50	Stable IHD Group N=49	ACS Group N=51	P value
	Mean ± SD	Mean ± SD	Mean ± SD	
P-selectin Level(ng/ml)	134.9±111.48	350.3±136.1	652±137.9	<0.05

The patient with acute coronary syndrome is divided to a29% with acute ST elevation myocardial infarction and 23% of patients withnon S Televation myocardial infarction and 48% of patients is presented with unstable angina as shown in figure 2:

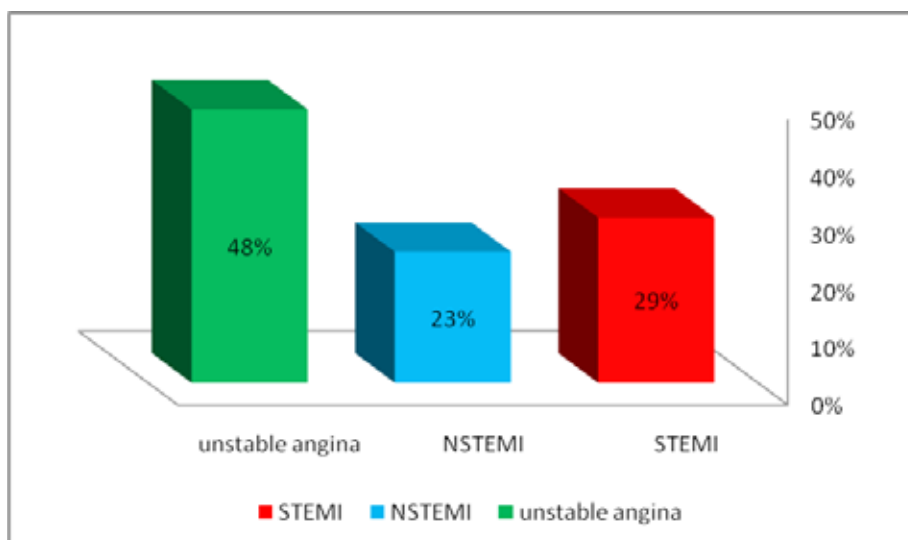


Figure 2: Show the percentage of STEMI, NSTEMI and unstable angina in acute coronary syndrome group.

The level of p-selectin in patient with stable IHD patients in comparison with ACS patients shown in table 2:

Table 2: Show the comparison between the level of p-selectin of stable IHD patients and acute coronary syndrome.

	Stable IHD Group N=49	ACS Group N=49	P value
	Mean ± SD	Mean ± SD	
P-selectin Level(ng/ml)	350.3±136.1	652±137.9	<0.05

There is a statistically significant difference in the level of p-selectin had been found between the control and stable ischemic heart disease, as well as those with acute coronary syndrome patients (p-value is <0.05).

The level of p-selectin patient with stable ischemic heart disease at presentation and after one month of introducing angiotensin converting enzyme inhibitor (captopril 25 mg twice daily) is shown in figure 4:

B- the comparative measurement of the level of p-selectin patient with IHD before and after one month of introducing ACEI:

Table 3: Show the comparison between the level of p-selectin patient with stable ischemic heart disease and patient with acute coronary syndrome at presentation and after one month of introducing ACEI.

	Stable IHD Group at presentation N=49	Stable IHD after captopril treatment Group N=49	ACS Group at presentation N=51	ACS after captopril treatment Group N=51	P-value
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
P-selectin Level (ng/ml)	350.3±136.1	216.9±111	652±137.9	464.5±130.9	<0.05

The level of p-selectin in patient with stable IHD in comparison with patient with acute coronary syndrome after one month of introducing angiotensin converting enzyme inhibitor (captopril 25 mg twice daily) as shown in table 4.

Table 4: Show comparison between patients with stable IHD and patients with ACS one month after ACEI introducing.

	Stable IHD after captopril treatment Group N=49	ACS after captopril treatment Group N=49	P-value
	Mean ± SD	Mean ± SD	
P-selectin Level (ng/ml)	216.9±111	464.5±130.9	<0.05

According to the above results there is a statistically significant decrement in the levels of p-selectin in patient with stable ischemic heart disease after one month of introducing angiotensin converting enzyme inhibitor (captopril 25 mg twice daily) .

of introducing angiotensin converting enzyme inhibitor (captopril 25 mg twice daily).

Also there is a decrease in the level of p-selectin in patient with acute coronary syndrome (changing from abnormal level to normal level) after one month

Discussion

Platelet activation resulting from vascular injury is important in the pathogenesis and clinical outcome of acute coronary syndromes^(14,15,16)

P-selectin is released from α -granules in the membrane of resting platelets that is expressed only on the platelet surface during vascular injury so surface P-selectin may be considered as a marker of platelet activation.^(17,18,19,20,21)

In the present study we measured the level of P-selectin in normal (control) subjects who have no history of ischemic heart disease, hypertension, chronic renal failure, chronic heart failure, diabetes mellitus & peripheral vascular disease and any platelets disorder and showed that the level was near the lower limit of normal value.

and also measurement the level of p-selectin in pt with chronic stable ischemic heart disease and showed that there is significant change in compare to control although not exceeding the upper normal value.

3rd group, patients with acute coronary syndrome (unstable angina, non ST elevation myocardial infarction and ST elevation myocardial infarction), showed that the level of p-selectin was significantly elevated.

We noticed that in patients with chronic stable ischemic heart disease the level of p-selectin is decrease to lower level than before captopril introducing.

While patient, with acute ischemic heart disease, the level of p-selectin is decreased to a lower level than before ACEI introducing but the decrement was greater compared with stable IHD, these decrement may be related to stabilization of vascular wall or may be due to introducing of B-blocker, which show a decremental effect on p-selectin level in many studies⁽²²⁾ or the decrement may related to captopril introducing.

But the decrement in the level of p selectin in pt with chronic stable ischemic heart disease after captopril introducing was mostly related to the drug introduced, as most of these patients is already taking B-blocker as long term treatment.

Our results suggest that platelet activation as well as vascular endothelial injury play a role in pathogenesis of atherosclerosis and atherosclerotic IHD. P-selectin may be used as a marker for occurrence and progression of IHD.

Our studies agree with many studies^(22,23,24) have shown that the increase levels of P-selectin in patients with acute coronary syndrome may be due to plaque rupture and thrombus formation, as well as to an

interaction of platelets by activated leukocytes before plaque disruption, so P-selectin level could be used as a marker of plaque destabilization in unstable angina

Besides the role of endothelial P-selectin in monocyte recruitment to the atherosclerotic lesions some other studies pointed to involvement of platelet P-selectin on progression of atherosclerosis:

Conclusion

1. By comparing the level of p-selectin is greater in patients with acute coronary syndrome and to less extent of patient with stable ischemic heart disease.
2. Angiotensin converting enzyme inhibitor administration was associated with significant decrease of the level of p-selectin even to a greater extent in patient with acute coronary syndrome

Conflicts of Interest: None of the authors have any conflicts of interest relevant to this research subject.

Ethical Clearance: The study was conducted in accordance with ethical principles that have their origin in the Declaration of Helsinki. The study protocol, care of patients and subject information were reviewed and approved by a local Ethic committee.

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Reference

1. Libby P. Inflammation in atherosclerosis. *Nature* 2002;420:868-874
2. Hansson GK. Inflammation, atherosclerosis and coronary artery disease. *N Engl J Med* 2005;352:1685-1695
3. Davi G, Patrono C. Platelet activation and atherothrombosis. *N Engl J Med* 2007;357:2482-2494
4. Borisssoff JI, Heeneman S, Kilinc E, et al. Early atherosclerosis exhibits an enhanced procoagulant state. *Circulation* 2010;122:821-830
5. Furie B, Furie BC. Mechanisms of thrombus formation. *N Engl J Med* 2008;359:938-949
6. Ruggeri ZM. Platelets in atherothrombosis. *Nat Med* 2002;8:1227-1234
7. Topol EJ. Toward a new frontier in myocardial reperfusion therapy: emerging platelet preeminence. *Circulation* 1998;97:211-8.
8. Michelson AD. Flow cytometry: a clinical test of

- plateletfunction. *Blood* 1996;87:4925–36.
9. Michelson AD, Furman MI. Laboratory markers of plateletactivation and their clinical significance. *Curr Opin Hematol* 1999;6:342–8.
 10. Ault KA, Cannon CP, Mitchell J, et al. Platelet activation inpatients after an acute coronary syndrome: results from theTIMI-12 trial. *Thrombolysis in Myocardial Infarction. J AmColl Cardiol*1999;33:634–9.
 11. Blann AD, Lip GYH. Hypothesis: is soluble P-selectin a newmarker of platelet activation? *Atherosclerosis* 1997;128:135-8.
 12. Manka D, Collins RG, Ley K, et al. Absence of P-selectin, but not intercellular adhesion molecule-1, attenuates neointimal growth after arterial injury in apolipoprotein e-deficient mice. *Circulation* 2001;103:1000–5.
 13. Huo Y, Schober A, Forlow SB, et al. Circulating activated platelets exacerbate atherosclerosis in mice deficient in apolipoprotein E. *Nat Med* 2003;9:61-67
 14. Chung I, Choudhury A, Lip GY. Platelet adhesion in congestive heartfailure. *Thromb Res* 2008;121:885-8.
 15. Monroe DM, Hoffman M, Roberts HR. Platelets and thrombin generation. *ArteriosclerThrombVasc Biol* 2002;22:1381-1389
 16. Gurbel PA, Gattis WA, Fuzaylov SF, Gauden L, Hasselblad V, Serebruany VL, et al. Evaluation of platelets in heart failure: Is platelet activity related to etiology, functional class, or clinical outcomes? *Am Heart J* 2002;143:1068-75.
 17. Gawaz M, Langer H, May AE. Platelets in inflammation and atherogenesis. *J Clin Invest*2005;115:3378-3384
 18. Massberg S, Brand K, Gruner S, et al. A critical role of platelet adhesion in the initiation of atherosclerotic lesion formation. *J Exp Med* 2002;196:887-896
 19. Weber C. Platelets and chemokines in atherosclerosis: partners in crime. *Circ Res*2005;96:612-616
 20. Gleissner CA, von Hundelshausen P, Ley K. Platelet chemokines in vascular disease. *Arterioscler Thromb Vasc Biol* 2008;28:1920-1927
 21. Rizvi M, Pathak D, Freedman JE, Chakrabarti S. CD40-CD40 ligand interactions in oxidative stress, inflammation and vascular disease. *Trends Mol Med* 2008;14:530-538
 22. Atalar E, Haznedaroglu Y, Aytemir K, et al. Circulating adhesion molecules in patients with stable coronary artery disease. *Int J Hematol*2000;72:507-11.
 23. Draz N, Hamdy MS, Gomaa Y, et al. Soluble P-selectin is a marker of plaque destabilization in unstable angina. *Egypt J Immunol* 2003;10:83-7.
 24. Dong ZM, Brown AA, Wagner DD. Prominent role of P-selectin in the development of advanced atherosclerosis in apoE-deficient mice. *Circulation* 2000;101:2290–5.

Effects of Smoking on the Level of Lipase Enzyme and Lipid Profile in Blood Serum of Young Smokers

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Abstract

Cigarette smoking is a major risk factor for heart disease and peripheral vascular disorders. The cardiovascular diseases among smokers can be predicted by the levels of lipid profile. The objective of the present study is to analyse the effects of smoking on the lipid profile and lipase levels among Iraqi smokers as well as to identify the morbidity risk among smokers and non-smokers. A cross-sectional study (n=50) was designed including smokers (n=40) and nonsmokers (n=10) as a control group. The lipid profile and lipase level tests were performed after overnight fasting. The lipid profile and lipase levels were found to be significantly ($p \leq 0.05$) increased in the smoker group as compared to non-smoker group. Total cholesterol and triglyceride (TG) levels were found to be increased 194.24 ± 37.04 mg/dl and 173.87 ± 44.96 mg/dl in the smoker group as compared to control (165.35 ± 23.6 mg/dl and 106.7 ± 43.4 mg/dl), respectively. Serum high-density lipoprotein cholesterol (HDL) concentration was decreased to 46.30 ± 7.1 mg/dl as compared to control group 64.15 ± 8.8 mg/dl. The smoker group showed significant increased in the serum LDL (103.16 ± 21.43 mg/dl) and VLDL (44.78 ± 8.9 mg/dl) levels as compared to control group (77.06 ± 20.5 mg/dl and 24.14 ± 8.8 mg/dl, respectively). Similarly, the smoker group showed decreased in serum lipase level (28.35 ± 78.3) as compared to the control group (37.65 ± 9.7). Smoking is associated with many risk factors of heart and vascular diseases which can be evaluated by the elevated levels of total cholesterol, TG, LDL and VLDL. However, preventive strategies are needed to avoid the future cardiovascular diseases and in supporting the benefits of quitting smoking.

Keywords: Smoking, Lipid profile, Lipase, Blood serum, Vascular diseases.

Introduction

Tobacco smoking is the most prevalent addictive disorder and the leading preventable cause of morbidity and mortality worldwide, which in turn causes devastating health problems including heart disease, lung disease and cancer. Smoking harms almost every organ of the body. The world has an estimated more than one billion smokers, approx. One fifth of the world's population¹. In developed countries tobacco was responsible for 24% of all male deaths and 7% of all female deaths. The average loss of life attributable to tobacco in 1990 was about 16 years². In the last years, many studies have been made to understand the addictive nature of smoking. Nicotine is the principal drug in tobacco products and tobacco smoke responsible for the dependence-producing effects of cigarette smoking. Tobacco addiction is best

considered a chronic disease. Cigarette is considered as a toxic due to its various other components but the nicotine is responsible for its addiction³.

Lipids serve as an energy source for the body. They are of various form i.e. high-density lipoproteins (HDLs), low density lipoproteins (LDLs), very low density lipoproteins (VLDL), triglycerides and cholesterol. HDL is considered as a good cholesterol. While others have harmful effects such as cardiovascular disease, narrowing of blood vessels, impair blood flow to the heart, brain and other organs etc. if their levels increased from normal^{4,5}. Nicotine responsible for increase in bad cholesterol (LDL, VLDL, triglycerides and cholesterol) and decrease HDL levels. Cigarette smoking (1-5 per day) reported to have a significant risk for a heart attack⁵.

Lipase catalyses the breakdown of triglycerides into free fatty acids and glycerol. Various kinds of lipases are secreted by various body cells viz. liver (hepatic lipases), adipocytes (hormone-sensitive lipases), vascular endothelial surface (lipoprotein lipase) and small intestine (pancreatic lipase). Understanding lipase is crucial for understanding the pathophysiology of fat necrosis and is clinically significant in the understanding of acute and chronic pancreatitis. The role of lipase is also crucial in the mechanism of some medications indicated for lowering cholesterol⁶. The lipase group of enzymes is built on alpha and beta hydrolase folds. They work by employing chymotrypsin-like hydrolysis, which uses a histidine base, a serine nucleophile and aspartic acid. Each type of Lipase serving individual functions. Hepatic lipase in the liver is responsible for degrading the triglycerides that remain in intermediate density lipoprotein (IDL). Hormone-sensitive lipase is found within fat tissue and is responsible for degrading the triglycerides that are stored within adipocytes. Lipoprotein lipase is found on the vascular endothelial surface and is responsible for degrading triglycerides that circulating from chylomicrons and VLDLs. Pancreatic lipase is found within the small intestine and is responsible for degrading dietary triglycerides⁷. Hepatic lipase plays a crucial role in the formation and delivery of LDL. LDL is formed by the modification of intermediate density lipoprotein in the peripheral tissue and liver by hepatic lipase. These LDL particles are taken up, or endocytosed, via receptor-mediated endocytosis by target cell tissue. LDL serves to ultimately transport cholesterol from the liver to peripheral tissue⁸.

Fat necrosis occurs enzymatically and non-enzymatically. In acute pancreatitis, saponification of peripancreatic fat occurs. In the traumatic events, non-enzymatic fat necrosis takes place which leads to the

lipase and fatty acids release and triglyceride breakdown. These negatively charge fatty acids, once released in the bloodstream gets bind to the positively charged calcium ions. This process of salt formation between negatively charged fatty acids and positively charged calcium ions is called saponification⁹. The present study aim to evaluate the effects of smoking on the lipid profile and lipase levels among Iraqi smokers as well as to identify the morbidity risk among smokers and non-smokers.

Materials and Method

This study was conducted on 50 samples of male subjects in the age group ranging from 19 to 23 years. 10 subjects were non-smokers of cigarette consider as control group and 40 were smokers for cigarette and shisha. All the research participants were explained about the procedures and recruited, after obtaining informed consent. We excluded from the study all Subjects with alcoholics, liver diseases, chronic renal failure, hypothyroidism and diabetes mellitus and also with other chronic illness.

About 5 ml blood samples were collected after an overnight fasting and serum was separated from the blood. The serum lipid profile was studied and the lipid levels were calculated by Freidewald's formula. Estimation of total cholesterol, triglycerides (TGs), low-density lipoprotein (LDL) and high-density lipoprotein (HDL) were done by standard method.

Statistical Analysis

The generated data were depicted as mean \pm standard deviation (SD). The means were compared using an independent sample t test. Analysis was two-tailed and a p-value ≤ 0.05 was considered as statistically significant.

Results

In the present,

Figure 1 showed lipid profile and lipase concentration in control and smoker.

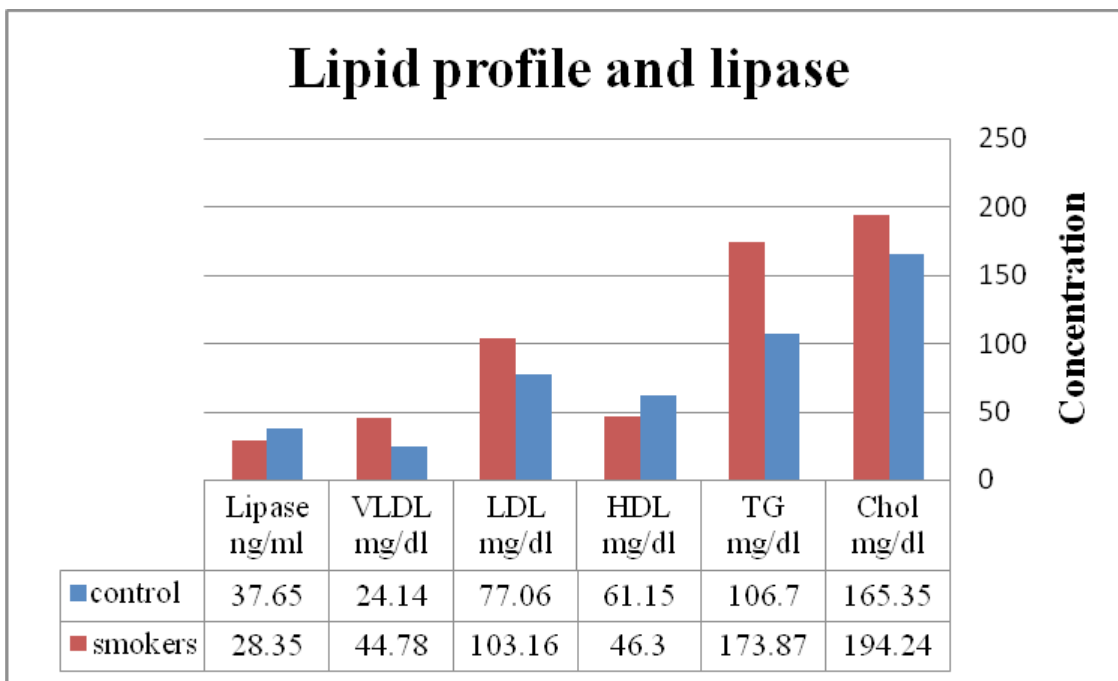


Figure 1. Lipid profile and lipase concentration

The results of the present study indicated as shown in Table 1 to significant differences were observed at $p \leq 0.05$ in the concentrations of all studied biochemical parameters, which included lipid profile and lipase enzyme concentration when comparing the concentrations of those variables with the control group of non-smokers. Where, the total cholesterol concentration was 165.35 ± 23.6 mg/dl in the control group and increased significantly to 194.24 ± 37.04 mg/dl in the group of smokers. The serum triglyceride concentration in the control group was 106.7 ± 43.4 mg/dl and increased significantly in the serum of the smokers group to 173.87 ± 44.96 mg/dl. The results also indicated a significant decrease in the concentration of high density lipoprotein cholesterol (HDL) was the concentration in the control group 64.15 ± 8.8 mg/dl and decreased

significantly to 46.30 ± 7.1 mg/dl in the group of smokers. While, the concentration of low-density lipoprotein LDL increased significantly after its concentration in the control group was 77.06 ± 20.5 mg/dl became 103.16 ± 21.43 mg/dl in the smokers group. We also observed a significant increase in the level of very low density lipoprotein (VLDL) where the level of serum in the blood of the control group 24.14 ± 8.8 mg/dl and the level of serum in the group of smokers 44.78 ± 8.9 mg/dl. As for the concentration of lipase enzyme, the results indicated a significant decrease in serum enzyme concentration. The serum enzyme concentration in the control group was 37.65 ± 9.7 mg/dl and decreased significantly to 28.35 ± 7.3 mg/dl in the serum of smokers group.

Table 1. Lipid profile and lipase concentration

Parameters	Control	Smokers
Cholesterol (mg/dl)	165.35±23.6	194.24±37.04
Triglycerides (mg/dl)	106.7±43.40	173.87±44.96
HDL (mg/dl)	64.15±08.80	46.30±07.10
LDL (mg/dl)	77.06±20.50	103.16±21.43
VLDL (mg/dl)	24.14±08.80	44.78±08.90
Serum lipase (ng/ml)	37.65±09.70	28.35±78.3

p≤0.05, Standard deviation.

Discussion

Smoking is one of the most important underlying factors that cause significant common risk of atherosclerosis, blood vessels and clinical and genetic diseases. Smoke contains oxidants, of which 4,000 compounds have been identified, causing high cholesterol and triglycerides¹⁰. These results were consistent with the results of the current study, which indicated an increase in serum lipid concentration (TC, TG, LDL and VLDL) and decreased in HDL in smokers. This may be attributed to the fact that smoking works to find different mechanisms that lead to a change in the level of fat from the most important Nicotine works to stimulate the sympathetic nerves in the adrenal gland, which leads to an increase in the secretion of hormones catecholamines, namely adrenaline and nor- adrenaline and this leads to an increase in lipase and the concentration of free fatty acids in the plasma this in turn leads to increased secretion of hepatic FFA and triglycerides in the bloodstream¹¹⁻¹⁴. Another mechanism is due to the condition of hyperinsulinaemia in smokers, this leads to increased cholesterol in the blood as a result of low activity of the enzyme lipase Lipoprotein¹⁵. Cholesterol levels are important indicators of heart health¹⁶. For high-density lipoprotein cholesterol or “beneficial” cholesterol, high levels are better. High-density lipoprotein (HDL) is known as “good” cholesterol, because it helps to get rid of other forms of cholesterol from the bloodstream. Higher levels of HDL cholesterol are associated with a lower risk of heart disease⁵. Cholesterol is a waxy substance found in all of your cells and has many useful functions, including helping to build your body’s cells¹⁷. They are transported through your bloodstream and are bound to proteins, these are called lipoproteins. High levels of Low-density lipoprotein LDL can eventually build up inside the walls of blood vessels, leading to narrowing of

passages¹⁸⁻¹⁹. Sometimes a clot can form and hang in the narrow distance, causing a heart attack or stroke^{16,20,21}. Hence, LDL is referred to as “bad cholesterol”. Cigarette smoking is associated with a decrease in the level of HDL-C by changing the critical state of fat transfer enzymes, where the activity decreases the ethyl transferase lecithin and cholesterol (LCAT) and change the protein transport cholesterol ester (CETP) and hepatic lipase activity²²⁻²⁴. In this study, the results showed that the total serum level of cholesterol, triglycerides, LDL-C and VLDL-C were significantly higher in the smoker compared to non-smokers. The serum level of HDL-C was significantly lower in smokers compared to non-smokers. Previous studies have reported the same results that smokers have a higher picture of fat than non-smokers²⁵⁻²⁷. Other studies indicated that smoking is associated with an increase in total cholesterol levels, triglycerides, LDL-C, VLDL and a decrease in the level of HDL-C²⁸⁻²⁹. Chronic smoking may be the cause of increased levels fats³⁰. Due to low lipoprotein lipase activity these studies are consistent and reinforce the results of the present study. A significant decrease in lipase concentration was observed in the smokers group and may be due to decreased secretion or disturbance of enzyme metabolism⁶. This can be attributed in part to some modifications of the acinar tissue or organs involved in lipase metabolism as a result of interaction with the cell membrane or organelles^{8,7}. The rise of smoke components can stimulate the reorganization of the lipid membrane There is evidence to suggest that the membrane disorder is caused by a specific type of interaction of smoke components with lipid protein components. Thus, the cell membrane is the main site of action of smoke components and any small changes in the membrane arrangement can produce significant changes in membrane function³¹⁻³³.

Conclusion

Cigarette smoking causes a change in lipid profile which includes increased levels of total cholesterol, triglycerides, LDL-C, VLDL-C with a decrease in HDL-C level. Increased smoking intensity led to a greater increase in the concentration of harmful lipoproteins that contribute to atherosclerosis with a decrease in anti-atherosclerotic lipoprotein (HDL-C). Mild smoking is enough to reduce the anti-atherogenic lipoprotein level to the risk of morbidity, an important indicator for predicting the risk of coronary heart disease among smokers. All the above results support the need for an educational program on the dangers of cigarette smoking. In addition, health policy makers should actively promote awareness of the health risks of smoking, clarify the role and risk of smoking in atherosclerosis and implement an effective smoking cessation strategy that is an important factor in reducing the risk of CVD among smokers.

Ethical Clearance: Ethical clearance taken from Iraqi University.

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Conflict of Interest: Nil

References

- Berlin I, Robert A. Monoamine oxidases and tobacco smoking. *Int J Neuropsychoph*,2001,4:33-42.
- Peto R, Lopez AD, Boreham J, Thun M, Heath C, Doll R. Mortality from smoking worldwide. *Br Med Bull*,1996,55: 12-21.
- Neal L, Benowitz MD. Neurobiology of nicotine addiction. Implications for smoking cessation treatment. *Am J Med*,2008,121(4A):S3-S10.
- Arjun S.S, Vijay K, Jaishree G. Effect of smoking on serum lipid levels: A hospital-based study. *J Med Sci*,2015,2(1):13-15.
- Li X.X, Zhao L.X, Huang H.X, Xu X.Y, Liu J.J, Yong P.J, Zhang Y.H Effect of smoking and alcohol consumption on lipid profile in male adults in northwest RURAL CHINA. *Int. J. Public Health*,2018,157:7-13.
- Cerk IK, Wechselberger L, Oberer M. Adipose triglyceride lipase regulation: An overview. *Curr. Protein Pept. Sci.*;2018,19(2):221-233.
- Waldmann E, Parhofer KG. Apheresis for severe hypercholesterolaemia and elevated lipoprotein (a). *Pathology.*; 2019,51(2):227-232.
- Lotta LA, Stewart ID, Sharp SJ, Day FR, Burgess S, Luan J, Bowker N, Cai L, Li C, Wittemans LBL, Kerrison ND, Khaw KT, McCarthy MI, O'Rahilly S, Scott RA, Savage DB, Perry JRB, Langenberg C, Wareham NJ. Association of genetically enhanced lipoprotein lipase-mediated lipolysis and low-density lipoprotein cholesterol-lowering alleles with risk of coronary disease and type 2 diabetes. *JAMA Cardiol.*,2018,3(10):957-966.
- Aloysius TA, Carvajal AK, Slizyte R, Skorve J, Berge RK, Bjørndal B. Chicken Protein Hydrolysates Have Anti-Inflammatory Effects on High-Fat Diet Induced Obesity in Mice. *Medicines (MDPI)*,2018;6(1):1-15.
- Malgorzata S, Anna J, Beats K, Artur K, Jacek K, Elzbieta G. Influence of cigarette smoking on hormone e and lipid metabolism in women in late reproductive stage. *Clin Interv Aging*. 2019,13:109-115.
- Linda K.G, Heather M.J, Megan E.P, Michael C.F, Timothy B.B, James H.S. Smoking Intensity and lipoprotein abnormalities in active smoking. *J. Clin. Lipidol.*,2009,3:372-378.
- Beenakumari R, Balachandran J. A study of dose dependent effect of cigarette smoking on lipid profile. *JEvo Med Dentsci.*,2015,4(7):1221-1229.
- Amit D.S, Shyliaja T.V, Asmab M, Zahoorunissa D. Study of lipid profile among healthy smokers and non-smokers. *InterJ Biotechnol Biochem*,2017,13(1):87-94.
- Olaniru O.B, Ochalefu D.O, Obeta M.U, Ibanga I.E, Flyaktu Y.B, Jwanse R.I, Orelajo H.A. Assessment of serum lipid profile among male cigarette smokers in JOS Metropolis. *AJBSR*,2019,3(6):531-533.
- Chandrashekar VK, Hemalatha D.N. A study of serum lipid profile in smokers and non-smokers: Evaluation or role of smoking on lipid profile. *Int J Res Med Sci*,2019,7(4):1016-1021.
- Habib N, Rashid M, Afzal F, Roy B, Tahmina A. Effect of smoking on serum lipid profile amongst stroke patients: A Descriptive study from Dhaka, Bangladesh. *J. Biomed. Sci.*, 2017,4(2):11-15.
- Ram B.J, Alan D. Associations between smoking and lipid lipoprotein concentrations among US adults aged ≥ 20 years. *J. Circ. Biomark.* 2018,7:1-10.
- Abdullah A, Wali MM, Israr AA, Ikram DU,

- Muhammad F. Effect of chronic cigarette smoking on lipid profile. *PJMHS*, 2007, 1(1):35-37.
19. Poonam K, Mehar B, Govind J.S. Effect of diet and body mass index on the serum lipid profile in healthy premenopausal, per menopausal, and postmenopausal tribal women of India. *International Journal of Medical Science and Public Health*. 2018, 8 (2):120-125.
 20. Naser M.E, Zaid M.J, Alyaadi M.J. Effect of cigarette smoking on lipid profile. *Lebdmedical Journal*. 2018, 4:137-139.
 21. Sydne I.D, Mohammad A.J, Rajat S.B, John A.A. Enviromental tobacco smoke and cardiovascular diseases. *International Journal of Environmental Research and Public health*. 2018, 16:1-12.
 22. Ali F.H, Abdullah S, Alshreef M., Mohamed A. Study of effect of cigarette smoking on hemoglobin and blood lipid profile in males in Black Alshati. Libya. *Research Journal of Medical Sciences*, 2018, 12(6):90-92.
 23. Uday B.N, Jinzy M.G, Naveen P.T.V. Serum lipid profile and electrocardiographic changes in young smokers. *International Journal of Public Health Science*. 2013, 2 (1):33-38.
 24. Radha A.R, Anjana S.B. Comparison of lipid profile levels in tobacco chewers with and without Leukoplakia-A hospital based study. *Annals of Medical and Health Sciences Research*. 2017, 7:341-345.
 25. Elhashimi EH, Haala MG, Zakya A, Abdalla E.A. Effect of cigarette smoking on lipid profile in male collage of police and low Khartom, Sudan. *Journal Asian of Biomedical and Pharmaceutical Sciences*., 2013, 3(26):28-31.
 26. Ritienne A, Philip D, Carine J.N, Karen C, Rosienne F, Stephanie R.W. The Impact of passive and active smoking on inflammation, lipid profile and the risk of myocardial infraction. *Journal Cardic Risk Factors and Prevention*. 2017, 4:1-11.
 27. Anuja S, Deepa D, Bhaki S. Comparison of the effect of various tobacco habits on the lipid profile in a population of middle-aged Individual: A cross sectional Analytical study. *J Contemp Dent.*, 2018, 8(3):115-119.
 28. Haragopal H, Anuna BM. Effects of tobacco chewing on serum lipid profile in south India population. *IJSS*, 2016, 4(4):9-11.
 29. Ram B, Baboo J. Lipid distribution differentials among smokers, non-smokers and within various types of smokers. *Ann. Clin. Lab. Res.* 2017, 5(2):168-181.
 30. Shatha Hameed Chuweed. A comparison between the effect of Shisha and cigarette smoking on serum lipid profile of males in Nasiriyah city. *Med J Babylon*. 2018, 15: 39-42.
 31. Raghu B, Venkatesan P. Relationship between cigarette smoking and novel risk factors for cardiovascular disease. *J. Biomed. Sci.* 2012, 1(4): 1-4.
 32. Mohammed A, Omar TH, Hayder A, Abdul Razzaq and Mohamed A.H. The Impact of cigarette smoking on lipid profile among Iraqi smokers. *IJCRIMPH*. 2016, 8(8): 491- 500.
 33. Mahshid A, Mahmoud Y, Mostafa H, Alireza O, Gholam Reza H, Mehdi K-O, Hoonan S, Zahra H and Maryam H. Effect of active and passive exposure to cigarette smoke on lipid profile of children and adolescents: A systematic Review and Meta-analysis. *Inter J Pediati.*, 2018, 6(5):7575-7588.

Viability Test of Lemongrass Extract (*Cymbopogon Citratus*) on BHK-21 Fibroblast Cell Culture

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Abstract

Background: Lemongrass are found in Indonesia thus it lemongrass can be used as an alternative in healing inflammation by conducting a preliminary study in the form of BHK-21 fibroblast cell viability test after 24 hours of extract lemongrass.

Objective: To determine the viability of extract lemongrass against BHK-21 fibroblast cell cultures. **Method:** BHK-21 fibroblast cells were taken from neonatal hamsters' kidneys and planted in 96 well plates. Extracts lemongrass with concentrations of 100%, 50%, 25%, 12.5%, 6.25%, 3.13% and 1.56% were included in each well prepared and incubated for 24 hours. MTT Assay was performed to see the viability of extract lemongrass on fibroblast cells.

Results: Extract lemongrass viable against BHK-21 fibroblast cells at a concentration of 100%. There is a decrease in viability at concentrations of 50% to 1.56%.

Conclusion: The 100% concentration showed the highest viability of BHK-21 fibroblast cells and extract lemongrass had potential in wound healing.

Keywords: *Extract lemongrass, BHK-21 fibroblast cells, viability.*

Introduction

Periodontal disease is a chronic bacterial infection characterized by persistent chronic inflammation, connective tissue damage and bone destruction. Periodontal disease has characteristic multifactors, because interaction of plaque, microbial and host will increase host inflammatory response. The prevalence of periodontal disease is 10-60% in adults in the world^{1,2}. The Javanese are the largest ethnic group in Indonesia. There are 87.84% of Indonesia's population who

suffer from dental disease also experience periodontal abnormalities^{3,4}.

Periodontal tissue damage can be caused by a variety of factors, one of the most common causes is gingivitis. Gingivitis is a periodontal disease caused by plaque. Gingivitis has clinical symptoms such as redness, bleeding on probing, contour changes and the presence of calculus or plaque without evidence of loss of radiography in the alveolar bone⁵.

Injuries are defined as damage or loss of continuity in skin or tissue integrity⁶. Injuries that occur in the gingiva can heal clinically within a few weeks, but complete healing and formation of gingival fibers take several months⁵. The wound healing process can be seen from several parameters, namely epithelialization, the number of polymorphonuclear cells (PMN) which increases in the inflammatory phase and the increase in fibroblast cell counts and density of collagen fibers⁷. Fibroblast cells

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are very important to indicate that the healing process is ongoing. Fibroblast cells will start to look a lot on the second day. Fibroblast cells are an important component because they stimulate the formation of collagen⁸. Baby Hamster Kidney-21 (BHK-21) is a cell culture derived from the main culture of the kidney tissue of neonatal hamsters, sheia. BHK-21 was first used in 1960. BHK-21 is widely used in research, especially in the biomedical field⁹.

The plants used for the healing process are lemongrass or other names *cymbopogon citratus*. Lemongrass phytochemical test results shows that it contains alkaloids, carbohydrates, saponins, tannins, glycosides, proteins and terpenoids¹⁰. Lemongrass are also one of the plants used for anti-bacteria¹¹. Lemongrass have several ingredients that can speed up the healing process of inflammation. Lemongrass also have several uses, among others, as antifungal, antiseptic, antibacterial, antipyretic, antidepressant, antimicrobial and anti-carcinogenic¹².

Lemongrass must be tested first about the viability and composition of the lemongrass. This is needed to find out what content is contained in it and whether it is suitable for use in experimental animals or not. Based on the description of the background, the researchers would like to conduct further research on the viability of lemongrass extracts against BHK-21 fibroblast cell cultures.

Materials and Method

This type of research was an experimental laboratory. This research was conducted at the Veterinaria Fatma Center (PUSVETMA) and the Industrial Research and Consultation Center (BPKI) Laboratory. The implementation of this research begins August - October 2018.

The ingredients used were: lemongrass extract (*cymbopogon citratus*), BHK-21 culture cell lines from PUSVETMA, culture media containing Eagle's minimum essential medium (MEM), Dimethyl Sulfoxide (DMSO), MTT, Phosphate Buffer Saline (PBS) (50 mg MTT and 10 mL, PBS), 96% ethanol and aquadest. Tools used: filter paper, scales, blenders, pumpkin glass, Rotatory evaporators, test tubes, shelves, beaker glass, ovens, scales, plastic warp, shakers with magnetic stirrers, BIOH-T Proline micro-pipets 20-200 µL, small tubes, 96-well plate Falcon 3072, conical tube ep. T.I.P.S 200µL, roux bottle, incubator, micro microscope

and ELISA reader

Extract Lemongrass: Lemongrass were dried in an oven with a temperature of 50°C. Dried lemongrass milled using a blender. Lemongrass powder was weighed. Lemongrass were put into a glass beaker and added ethanol to 2.5 L. Lemongrass in beaker glass are rotated using a shaker. Filtering was completed, the pulp was inserted into the beaker glass. Given an ethanol solution of 2.5 L, then rotated using a shaker. Filtered, the filter results were combined with the first filter results. The filter results were inserted into the rotatory evaporator. Evaporated used waterbath.

MTT Test on BHK-21 Fibroblast Cell Culture

The MTT test was performed by using BHK21 fibroblast cells. Extraction of lemongrass were made at BPKI. The MTT test was conducted in accordance with the PUSVETMA laboratory procedure. After that, the samples used in this study were divided into nine groups, cells treated with lemongrass extract 100%, 50%, 25%, 12.5%, 6.25%, 3.13%, 1.56%, cell control containing BHK-21 fibroblast cells and media controls containing MEM. Viability, number of living cells, were then observed by calculating CD90 with MTT assay (3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyltetrazolium bromide). Their absorption was indicated by purplish blue from formazan read using immunosorbent assays enzyme-linked assay (ELISA) with a wavelength of 550-620 nm. The percentage of live cells was measured using the following formula :

$$\% \text{ of live cells} = \frac{\text{Treatment} + \text{Media}}{\text{Cell} + \text{Media}}$$

Note: % of live cells = Percentage of live cell count after the test
Treatment = Optical density value of formazan in each sample after the test
Media = Optical density value of formazan on media
Cell = Optical density value of formazan on control cells. Control cell as a positive control in the culture medium is considered to have a live cell percentage of 100%.

Results

The average optical density (OD) of cell control, media control and each concentration to be tested were in accordance with table 1.

Table 1 Optical density mean values for BHK-21 fibroblast cells in the treatment and control groups

Group	n	Mean
Control media	4	0.06
Control sel	4	0.426

Group	n	Mean
100%	4	0.428
50%	4	0.309
25%	4	0.192
12.5%	4	0.128
6.25%	4	0.08
3.13%	4	0.076
1.56%	4	0.099

Table 2. The percentage value of live BHK-21 fibroblast cells with concentrations of lemongrass extract.

Lemongrass Extract	n	% of live cells
100%	4	100.41%
50%	4	75.93%
25%	4	51.85%
12.5%	4	38.68%
6.25%	4	28.89%
3.13%	4	27.98%
1.56%	4	32.72%

It was known that the percentage of living cells from a concentration of 100% lemongrass extract up to 1.56% according to table 2.

Statistical Analysis: The research data was tested by using the Kolmogorov-Smirnov Test with the results of all groups having a value greater than 0.05. The research data was tested by using Levene's Test with the results of 0.006. The research data was tested by using the Kruskal Wallis Test with the results of 0,000. The results of the research data were tested by the Mann-Whitney test between the two groups. All groups had significant differences except the concentration of 25% with a concentration of 1.56%, concentration of 12.5% with a concentration of 1.56%, concentration of 6.25% with a concentration of 3.13%, concentration of 6.25% with media control and concentration of 3.13% with media control.

Discussion

This study aims to determine the effect of lemongrass extract on the viability of BHK-21 fibroblast cells. It is known that lemongrass are medicinal plants that are easily found in Indonesia. The use of medicinal plants especially those used in the oral cavity must have minimal side effects, biocompatible and low toxicity¹³. This study uses lemongrass because lemongrass are often used to cure inflammation due to pathology

¹⁴. Making lemongrass extract is done by maceration method and identified. The active ingredients contained in lemongrass extract are other flavonoids: 3.66%, tannins: 1.06%, saponins: 2.16%, essential oils 2.05% and geraniol: 8.13%.

Moreover, cultured BHK21 fibroblast cells in the MTT assay were used due to several reasons; first, their passage can be 50-70 times; second, their cell growth rate is high; and third, their cell integrity can be maintained. BHK21 has been widely used in dentistry field for the viability test¹⁵. MTT assay is absorbed into living cells then broken down through a reduction reaction by reductase enzymes in the mitochondrial respiration chain into formazan soluble in a purple solvent. DMSO is added to stop the enzymatic reaction and dissolve the formazan so that the purple color of the formazan can be read its absorbance spectrophotometrically with ELISA reader. The absorbance represents the number of living cells. The stronger the purple color intensity is, the higher the absorbance will be. In other words, this suggests that the more MTT assay is absorbed into living cells can lead to more formazan formation. Consequently, this absorbance can be used to calculate the percentage of living cells as cell response¹⁶.

In addition, a substance, according to Heravi *et al.*,¹⁷ on the toxicity parameters of CD90, can be said to be toxic if the percentage of living cells after exposure to the substance is <90%. The viability percentage of fibroblasts after the administration of extract lemongrass was 100.41%, higher than 90% in this research. As a result, the extract lemongrass can be considered as a non-toxic substance.

Lemongrass extracts have concentrations of flavonoids, tannins, saponins, essential oils and geraniols which do not reach 10%. When flavonoids, tannins, saponins and geraniols are given at low concentrations, they can stimulate the viability of BHK-21 fibroblast cells. Flavonoids and geraniol will have antioxidant effects on cells so that cells will become viable^{18,19}. Tanin will have a high affinity effect with proteolytic enzymes thus the tannin will be bound to proteolytic enzymes. This causes proteolytic enzymes to be unable to lysis a cell and cause the cell to become viable⁶. Saponins have natural anti-microbial properties thus saponins can neutralize proteolytic enzymes. The absence of proteolytic enzymes results in no component to destroy the fibroblast cell extracellular matrix, hence the cell becomes viable²⁰.

Conflict of Interest: There is no conflict interest

Source of Funding: This study is self-funded

Ethical of Clearance: This study was approved by Ethical Commission of Health Research Faculty of Dental Medicine Universitas Airlangga

Conclusion

The conclusion of this study is that lemongrass extract at a concentration of 100% can maintain the viability of BHK-21 fibroblast cells.

References

1. Siyam SNL, Nurhapsari A, Benyamin B. Pengaruh Stimulasi Permainan Ular Tangga tentang Gingivitis terhadap Pengetahuan Anak Usia 8-11 Tahun Studi terhadap Siswa SD Negeri Kuningan Kuningan 04, Kecamatan Semarang Utara. *Odonto Dent J.* 2015;2(1):25–8.
2. GrønkJær LL. Periodontal disease and liver cirrhosis: A systematic review. *SAGE open Med.* 2015;3:2050312115601122.
3. Palupi R, Juzika O, Romadhoni SF. Impact of social support on the periodontal health among population of pregnant women in Javanese ethnic group. *Indian J Public Heal Res Dev [Internet].* 2019;10(10):1046–50. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85078016031> & doi=10.5958%2F0976-5506.2019.02962.0 & partnerID=40 & md5=d5de094bbc21c03a8a9cbd676cb53e37
4. Susanto H, Nesse W, Kertia N, Soeroso J, Van Reenen YH, Hoedemaker E, et al. Prevalence and severity of periodontitis in Indonesian patients with rheumatoid arthritis. *J Periodontol [Internet].* 2013;84(8):1067–74. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84882287325> & doi=10.1902%2Fjop.2012.110321 & partnerID=40 & md5=a23857c6c55c93d2f1daedc14085acfc
5. Newman MG, Takei H, Klokkevold PR, Carranza FA. *Carranza's clinical periodontology.* Elsevier health sciences; 2011.
6. Radafshar G, Ghotbizadeh M, Saadat F, Mirfarhadi N. Effects of green tea (*Camellia sinensis*) mouthwash containing 1% tannin on dental plaque and chronic gingivitis: a double-blinded, randomized, controlled trial. *J Investig Clin Dent.* 2017;8(1):e12184.
7. Andreasen JO, Andreasen FM, Andersson L. *Textbook and color atlas of traumatic injuries to the teeth.* John Wiley & Sons; 2018.
8. Junqueira LCU, Carneiro J. *Histologia básica* 12th Edn. 2015;
9. Johnson KC, Yongky A, Vishwanathan N, Jacob NM, Jayapal KP, Goudar CT, et al. Exploring the transcriptome space of a recombinant BHK cell line through next generation sequencing. *Biotechnol Bioeng.* 2014;111(4):770–81.
10. Devianna T, Purnama A, Purnomo Y, Rizqiawan A. Effects of lemongrass leaf on macrophages after tooth extraction of wistar rat. *Biochem Cell Arch [Internet].* 2019;4867–70. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85079398942> & doi=10.35124%2Fbca.2019.19.S2.4867 & partnerID=40 & md5=8322989623530406e9f616380efeb7e6
11. Ewansiha JU, Garba SA, Mawak JD, Oyewole OA. Antimicrobial Activity of *Cymbopogon citratus* (Lemon Grass) and Its Phytochemical Properties. 2012;
12. Feriyanto YE, Sipahutar PJ, Mahfud M, Prihatini P. Pengambilan Minyak Atsiri dari Daun dan Batang Serai Wangi (*Cymbopogon winterianus*) Menggunakan Metode Distilasi Uap dan Air dengan Pemanasan Microwave. *J Tek ITS.* 2013;2(1):F93–7.
13. Kaomongkolgit R, Jamdee K, Pumklin J, Pavasant P. Laboratory evaluation of the antibacterial and cytotoxic effect of alpha-mangostin when used as a root canal irrigant. *Indian J Dent.* 2013;4(1):12–7.
14. Francisco V, Costa G, Figueirinha A, Marques C, Pereira P, Neves BM, et al. Anti-inflammatory activity of *Cymbopogon citratus* leaves infusion via proteasome and nuclear factor- κ B pathway inhibition: Contribution of chlorogenic acid. *J Ethnopharmacol.* 2013;148(1):126–34.
15. Riss, L T, A R, L A, D S, A H, et al. *Cell Viability Assays,* Bethesda (MD): Eli Lilly & Company and the National Center for Advancing Translational Sciences. 2016. 69–84 p.
16. Stockert JC, Blázquez-Castro A, Cañete M, Horobin RW, Villanueva Á. MTT assay for cell viability: Intracellular localization of the formazan product is in lipid droplets. *Acta Histochem.* 2012;114(8):785–96.

17. Momen-Heravi F, Balaj L, Alian S, Mantel P-Y, Halleck AE, Trachtenberg AJ, et al. Current method for the isolation of extracellular vesicles. *Biol Chem.* 2013;394(10):1253–62.
18. Panche AN, Diwan AD, Chandra SR. Flavonoids: an overview. *J Nutr Sci.* 2016;5.
19. Cho M, So I, Chun JN, Jeon J-H. The antitumor effects of geraniol: Modulation of cancer hallmark pathways. *Int J Oncol.* 2016;48(5):1772–82.
20. Ashafa AOT, Nafiu MO. Antidiabetic activity and free radicals modulatory potentials of saponin-rich extract of *Cochlospermum planchonii* (Hook Fx. Planch) root in vitro. *Comp Clin Path.* 2018;27(2):313–20.

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