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Demographical factors Affecting multiple sclerosis in Basrah province- Iraq

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Abstract

The aim of this study was to determine role of demographical factors to effect on multiple sclerosis in Basrah province. A case-control study included 86 confirmed multiple sclerosis patients and 86 individuals as a control group. This study shows the effect of demographical factors (age, sex, residency, occupational status, marital status, family history, smoking and obesity,) in patients with multiple slerosis. The age of patients was between 15-55 years; the maximum number of multiple sclerosis was found within the age group >30 years (37.2%). The present study showed very high percentage among females (72.10%) in comparison with males (27.90%). In this study most MS cases were recorded among patients their occupation 29 (33.7 %) worker versus 57 (66.3 %) non worker, while residence in centrally 40 (46.5%) versus 46 (53.5%) peripherally, followed by marital status of patients 16(18.6%) single versus 70 (81.4%) married, smoking 16(18.6%) versus 70(81.4%) nonsmoking, and obesity 8(9.3%) versus 78 (90.7%) non obesity patients from total study patients 86 (100.0%), Statistically and differences were not significant. In this study the number of cases which attacked with MS were only two (2.3%) within family history of MS from total study patients 86 (100.0%), Statistically the (P-value=0.48) and differences were not significant.

Keywords: Demographical factors ;multiple sclerosis ; Basrah province; Iraq

Introduction

Multiple sclerosis (MS) is a chronic persistent neurological disorder of autoimmune etiology involving the white matter of the central nervous system (CNS) (Ghasemi *et al.*,2017). Typically, the disease usually starts at the age of 20-40, It is the second most common neurological disability which is occurred among young adult with the sex ratio of 2: 1 (women: men) (Simonsen *et al.*,2020).

Multiple sclerosis has an increasing prevalence worldwide (Cotsapas *et al.,* 2018). It is one of the most common causes of non-traumatic disability among young and middle aged individuals (Leray *et al.,* 2016 and Mandia *et al.,* 2014).

The characteristic pathological hallmark of MS is perivenular inflammatory lesions, leading to demyelinating plaques (Karussis,2014). These plaques which occur due to unknown etiology leading eventually to an inflammatory process with focal destruction of myelin sheath vary in their number, size, distribution and activity (Mahad *et al.*, 2015).

This demyelination process is accompanied by autoimmune inflammatory reactions mediated mainly by T cells, B cells, and macrophages. Primary targets are the myelin sheaths and oligodendrocytes, but axons, nerve cells, and astrocytes are also affected (Trapp & Nave, 2008). The characteristic pathological changes in these lesions include inflammation, reactive gliosis, demyelinating, and neuroaxonal degeneration with loss of the myeline-producing oligodendrocyte cells (Salem *et al.*,2021). Although the etiology of MS is still not clear, genetic, epidemiological, and immunogenetics studies have characterized it as a multifactorial autoimmune disease.

Environmental factors such as viral infections, obesity, smoking and low levels of vitamin D or its metabolites have reported being involved in the pathogenesis of MS (Abdollahzadeh *et al.,* 2018).

The study aimed to determine demographical factors (Sex, Age, Marital status, Occupational status, Residency, smoking, obesity and Family history) affecting MS.

Materials and methods

Multiple Sclerosis cases-control study was designed to collected in Basrah province from Multiple Sclerosis Center in Basrah Teaching hospital during November 2021 to May 2022. All patient's information which involved in the study were recorded in questionnaire form that included age, sex, residency, occupational status, marital status, smoking, obesity and family history. Both patients and control samples that investigated in this study have age ranged between 15 to 60 year. Most of Multiple Sclerosis patients suffering from fatigue, weakness, decrease in visual acute, urine incontinence, numbness of the extremities and ataxia. All cases were diagnosing and approve by MS committee of basrah MS center.

Statistical analysis

Statistical analysis was carried out by using SPSS (VER.23) and student's T-test and chi-square was applied to find out the statistical differences between all variables. probability less than 0.05 is significant ($P<0.05$).

Results

MS patients and controls distribution within sex

Figure (1) documented that most MS cases were recorded among female groups 62 (72.10 %) versus 24 (27.90%) for male group from total study patients 86 (100.0%). Statistically the (P-value=0.5) and differences were non-significant.

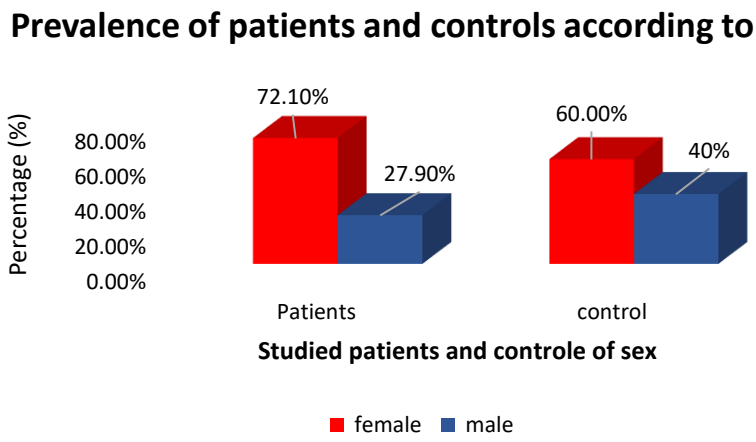

Figure (1) Distribution of studied groups according to sex, P= 0.5,

*Fisher's Exact Test,

**Mann Whitney-U Test

MS patients and controls distribution within age and sex groups

Table (1) The distribution of age within MS patients showed that high number were within Group (thirty or younger) years counting 32 (37.2%) patients, while the lowest number of patients were found in group (fifty-one or old) years counting 6 (7.0%) patients from total study patients 86 (100.0%), Statistically the (P-value=0.96) and differences were non- significant.

Table (1) the distribution of age and sex in study groups, * Fisher's Exact Test

Sex	Age groups	Category		Total	P-value*
		Case	Control		
Male	Thirty or younger	9	9	18	1.00
		37.5%	26.0%	31.0%	
	From 31 to 40	8	16	24	
		33.3%	48.0%	41.4%	
	From 41 to 50	5	9	14	
		20.8%	26.0%	24.1%	
	Fifty one or older	2	0	2	
		8.3%	0.0%	3.5%	
	Total	24	34	58	
		0.28%	0.39%	0.34%	
Female	Thirty or younger	23	17	40	0.73

		37.1%	33.0%	35.1%	
	From 31 to 40	17	9	26	
		27.4%	17.0%	22.8%	
	From 41 to 50	18	17	35	
		29.0%	33.0%	30.7%	
	Fifty one or older	4	9	13	
		6.5%	17.0%	11.4%	
	Total	62	52	114	
		0.72%	0.61%	0.66%	
Total	Thirty or younger	32	26	58	0.96
		37.2%	30.0%	33.7%	
	From 31 to 40	25	26	51	
		29.1%	30.0%	29.7%	
	From 41 to 50	23	26	49	
		26.7%	30.0%	28.5%	
	Fifty one or older	6	8	14	
		7.0%	10.0%	8.1%	
	Total	86	86	172	
		100.0%	100.0%	100.0%	

Sociological characteristics of patients and controls distribution

Table (2) Show distribution sociological characteristics of patients and controls, documented that most MS cases were recorded among patients their occupation 29 (33.7 %) worker versus 57 (66.3 %) non worker, while residence in centrally 40 (46.5%) versus 46 (53.5%) peripherally, followed by marital status of patients 16(18.6%) single versus 70 (81.4%) married, smoking 16(18.6%) versus 70(81.4%) nonsmoking, and obesity 8(9.3%) versus 78 (90.7%) non obesity according to:

$$\text{BMI} = \frac{weight(kg)}{(height(m))2}$$

While:

No :1- under weight

2- average

3- marginal

Yes :1- over

2-severely over

from total study patients 86 (100.0%), the only variable which had significant statistical difference, when its distribution was compared among patients and controls was the occupation.

Table (2): Sociological characteristics of patients and controls, * Fisher's Exact Test.

Characteristic	Category		Total	P-value*
	Patient	Control		
Occupation				
Worker	29	77	106	0.001 ODD Ratio= 0.057
	33.7%	89.5%	61.6%	
Non-worker	57	9	66	
	66.3%	10.5%	38.4%	
Residence				
Centrally	40	26	66	0.50
	46.5%	30.2%	38.4%	
Peripherally	46	60	106	
	53.5%	69.8%	61.6%	
Marital status				
Single	16	26	42	0.41
	18.6%	30.2%	24.4%	
Married	70	60	130	
	81.4%	69.8%	75.6%	
Smoking				
Yes	16	0	16	0.21
	18.6%	0.0%	9.3%	
No	70	86	156	
	81.4%	100.0%	90.7%	
Obesity				
Yes	8	0	8	0.59
	9.3%	0.0%	4.7%	
No	78	86	164	
	90.7%	100.0%	95.3%	
Total	86	86	172	
	100.0%	100.0%	100.0%	

Family history status

Table (3) documented that the number of cases which attacked with MS were only two (2.3%) within family history of MS from total study patients 86 (100.0%), Statistically the (P-value=0.48) and differences were non- significant.

Table (3): Comparison of the presence of MS family history among males and females

Family history of MS	Sex		Total	P-value*
	Male	Female		
Yes	1	1	2	0.48
	4.2%	1.6%	2.3%	
No	23	61	84	
	95.8%	98.4%	97.7%	
Total	24	62	86	
	100.0%	100.0%	100.0%	

* Fisher's Exact Test

Discussion

A case control study was carried on all cases of MS patients were (86), their age was around (15 - 55) years. In addition to (86) persons observed as control group, in this investigation the highest age group of patients with MS was (thirty or younger) year`s subgroups (37.2 %) of total patients, which shows that this disease is mainly affecting young age group. while lowest cases of MS appeared at the age (fifty-one or older) were (7.0%) from total study cases. Similar finding was reported by (Al-Shamssie, 2001) and (Al-Araji & Mohammed, 2005) in their studies on Iraqi MS patients. Moreover, these findings are in agreement with nearby countries` studies, like from Lebanese, Kuwaiti, Jordanian, Libyan, Saudi, Palestinian, Omani and Iranian populations (Etemadifar & Abtahi, 2012; Benamer *et al.,* 2009 and Yamout *et al.,* 2008;) as well as from other countries (Kampman *et al.,* 2013 and Trojano *et al.,* 2012). Thus, the risk of first development of this disease has a peak between the third and fourth decades.

The current study of MS patients demonstrated increasing in the female to male ratio, which came in agreement with previous studies (Westerleind *et al.,* 2014; Holmbrg *et al.,* 2013 and Alonso & Hernan, 2008). In this study, the female to male ratio was 2.6:1, since 0.72% of the patients were females and 0.28% were males. These findings are agreed with the previous studies (Wallin, *et al,* 2012; Ahlgren *et al.,* 2011 and Orton *et al.,* 2010). And that was in nearly agreement with Iraqi studies (Auda, 2012). This female predominance which is a phenomenon shared with several other autoimmune diseases (Ahlgren *et al*., 2011), may arises from the interaction between the gonadal hormones, genetic differences, immune system as well as different environmental exposures and modern lifestyle in men and women (Greer & McCombe, 2011).

In this study most cases of MS recorded among non-worker groups 57 (66.3 %) versus 29 (33.7 %) for worker group according to results. which came in agreement with studies (Ellenberger *et al.,* 2022), where shown the people with multiple sclerosis suffer from an increased risk of unemployment during the course of the disease. And other study (Lunde *et al.,* 2014) was the clear difference in employment rate in the various subtypes of MS.

In this investigation most number of cases which attacked with MS were residence in Basrah center 40 (46.5 %) versus 46 (53.5 %) in Bashra periphral, Statistically the differences were non-significant compared with control group.

In this study documented that most MS cases were recorded among patients their marital status of patients 16(18.6%) single versus 70 (81.4%) married, Statistically the differences were non-significant compared with control group. The result of this study is nearly identical with the Iraqi study of (Hameed & Abdulla, 2021), where shown single patients (20%) versus (80%) married of MS but it was high significance differences compared with control group. In other study (Harrison *et al.,* 2004) in which it was shown married of MS higher percentage versus non married patients of MS, and was shown results for men and women combined, marital status was related to a person's acceptance of disability. Those who remained married had a higher acceptance of disability compared to those not consistently married; and all acceptance scores increased over time. At no time did the acceptance scores of the not consistently married reach the level of those who were consistently married. There was not, however, an interaction between marital status and acceptance. This indicates that being consistently married is associated with a higher level of acceptance over time.

in this study 16 (18.6%) of cases are smokers versus 70(81.4%) nonsmokers from total patients 86(100.0%). Statistically the differences were non-significant compared with control group. (Makkawi *et al.,* 2022 and Healy *et al.,* 2009) not agree with this study by shown that Cigarette smokers are at higher risk of developing MS compared with never-smokers.

in this study 8 (9.3%) of cases are obesity versus 78(90.7%) non obesity from total patients 86(100.0%). Statistically the differences were non-significant compared with control group. Not agree with several studies have shown an increased risk of developing MS if you are obese, (Schreiner & Genes, 2021 and Gianfrancesco & Barcellos,2016).

This indicates that smoking and obesity are risk factors and may increase the incidence of infection, but they are not the main cause of multiple sclerosis, as there is a large proportion of people with multiple sclerosis who are not obese.

Other risk factor was family history status that infected with MS, in this study 2 (2.3%) of cases are presence of MS family history versus 84(97.7%) non presence of MS family history from total patients 86(100.0%). Statistically the differences were non-significant compared with male and female patients group. In other studies, (Al-Wutayd *et al.,* 2018) was shown the MS risk was 5.8 times greater when there was family history of MS. one studies in Saudi Arabia that reported approximately 20% of MS patients have a family history of MS (Jumah *et al.,* 2011). Two additional studies conducted in Kuwait reported that a larger number of patients had a family history of MS compared to controls (Al-Afasy *et al.,* 2013) (Al-Shammri *et al.,* 2015).

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