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RESEARCH ARTICLE

Demographical Study of *H. pylori* Associated Gastritis

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ABSTRACT

To study correlation between gastritis and different topics (gender, age, type of gastritis, duration of disease, RUT results, RDT results, susceptibility to other infectious diseases and smoking).This study was carried out in College of Medicine, University of Basrah, during the period from 17th of April 2009 to 15th of July 2010. A total of 100 patients (41 males and 59 females and a total of 30 controls (18 males and 12 females) were included in this study. Gastric biopsies were collected from gastritis patients attending endoscopy unit in Al-Sadder Teaching Hospital in Basrah city/ Iraq and were subjected to rapid urease test. Also blood samples were drawn from gastritis patients and controls for rapid diagnostic test. An increased frequency of females in gastritis patients was statistically significant (P< 0.05; OR= 2.12) when compared with controls. No significant difference between males and females in (RUT&RDT) results. Also there was no correlation between RUT results and type of gastritis. Results indicated that the increased frequency of gastritis patients with (+ ve RDT) was statistically significant (P< 0.05; OR= 2.12) when compared with controls. No significant correlation was observed between smoking and presence of other infectious diseases but there was strong association (OR= 3.48). The correlation between smoking and +ve RUT results were statistically not significant, but the association was strong (OR= 3.24). The frequency of smokers with +ve RDT was statistically significant with strong association (P < 0.05; OR= 2.89).

INTRODUCTION

Gastritis has been classified based on time course (acute vs. chronic), histological features, and anatomical distribution or proposed pathologic mechanism. Correlation between the histological findings of gastritis, the clinical picture of abdominal pain or dyspepsia, and endoscopic findings noted on gross inspection of the gastric mucosa is poor. Therefore, there is no typical clinical manifestation of gastritis [1]. The etiologic factors leading to gastritis are broad and heterogeneous. It may be caused by certain medications, alcohol, eating or drinking corrosive substances, extreme stress, bacterial or viral infections, and many other conditions, which increase the risk of gastritis [2]. The most common causes of acute gastritis are infectious. Acute infection with *Helicobacter pylori (H. pylori)* induces gastritis, if not treated, this picture will involve into one of chronic gastritis. Other types of infectious gastritis may occur in immuno-compromised individuals such as AIDS patients, herpetic or CMV gastritis [1]. *Helicobacter pylori* represent the most common bacterial infection worldwide. It colonized human stomachs for over 58.000 years. *H. pylori* can send and receive signals from gastric epithelium, allowing host and bacteria to participate in a dynamic equilibrium. However, there are biological costs to this long-term relationship [3].

MATERIALS AND METHODS

A total of 100 patients (41 males and 59 females with age groups from (15-66) years, with various gastritis symptoms attending endoscopy unit at Al-Sadder Teaching Hospital in Basrah, were underwent endoscopic (Olympus, Japan) examination. The endoscopic examinations and findings were done and recorded under supervision of a gastroenterologist. Gastric biopsies were collected from gastritis patients and were subjected to rapid urease test. Also blood samples were drawn from gastritis patients and subjected to rapid diagnostic test. The study was carried out during the period from (17th of April 2009 to 15th of July 2010).

A total of 30 controls (18 males and 12 females), with age groups from (15-61) years, without any symptoms of gastritis, were selected randomly. Blood samples were drawn from all these individuals

and were subjected to rapid diagnostic kit. Stomach biopsies were obtained only from gastritis patients for rapid urease test. From each patient and control, above 5ml of venous blood was drawn, 2ml for serological test (rapid diagnostic Test) was collected in plain tube and centrifuged (Janetzki T24, Germany) for 10 minutes (1500 rpm/min), then serum used for rapid diagnostic kit in screening for the presence of antibodies against *H. pylori*.

Rapid Urease Test (RUT)

This test used for identifying the presence of *H. pylori* urease enzyme in gastric biopsy [4].

Rapid Diagnostic test for *H. pylori* (RDT)

A rapid one step test **(Maysiak–Budnik and Megraud, 1994),** was done for the qualitative detection of IgG antibodies to *H. pylori* in human serum by using Rapid Diagnostic Test Kit, ACON Laboratories, Inc, USA.

RESULTS

Results of Endoscopic Examination

Out of 100 patients with various dyspeptic symptoms and subjected to upper gastrointestinal endoscopic examination, 70 (70%) showed abnormal endoscopic findings; 29 (41%) males and 41 (58.57%) females, while 30 (30%) showed normal endoscopic examination; 12 (40%) males and 18 (60%) females (Figure 1).

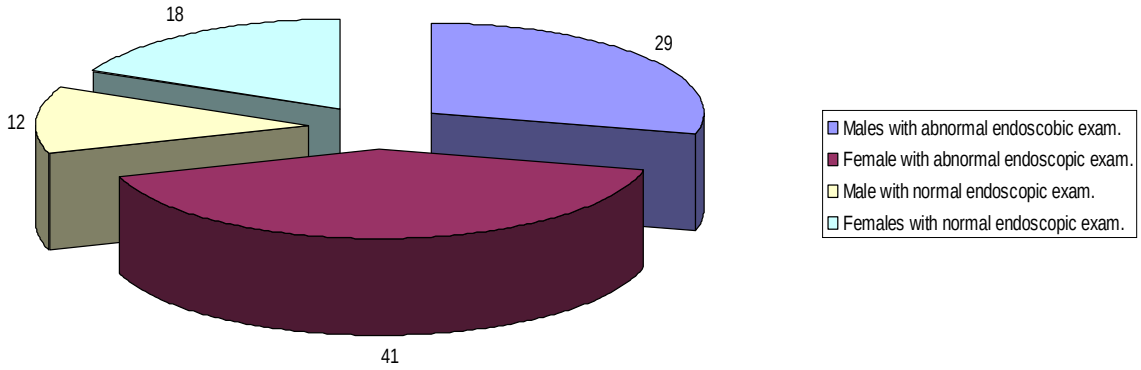

Figure 1 Distribution of total patient underwent endoscopic examination.

Clinical Status of Patients Group

Out of 70 patients, 55 (79%) were diagnosed as acute gastritis and 15 (21%) as chronic gastritis (Figure 2).

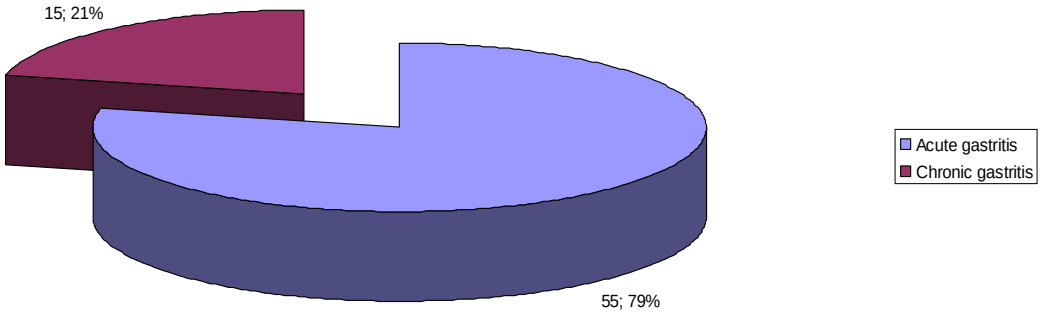

Figure 2 Frequencies of patients according to types of gastritis.

Determination of Association with *H. pylori*

The presence of association with *H. pylori* was determined by biopsy rapid urease test and rapid diagnostic test (detection of anti *H. pylori* antibodies in patient's serum). Table.1 showed that out of 70 gastritis patients, 52 (74.29%) were positive rapid urease test (RUT) and 18 (25.71%) were negative (RUT) and out of 70 gastritis patients, 61 (87.14%) were positive rapid diagnostic test (RDT) and 9 (12.86%) were negative RDT. The increased frequencies of positive results in both tests indicated significant association with *H. pylori* infection ($\chi 2 = 5.91$; $P < 0.05$; OR= 2.12 ; 95% CI= 0.89 – 8.07). Patients were considered to be infected with *H. pylori* associated gastritis if they were positive in one or both tests. According to that all 70 patients were considered as *H. pylori* associated gastritis patients.

Distribution of gastritis patients and controls according to gender

Results in Table.2 showed that out of 70 patients with *H. pylori* associated gastritis, 29 (61.70%) were males and 41 (77.36%) were females. For controls groups, out of 30 healthy controls, 18 (38.30%) were males and 12 (22.64%) were females. The increased frequency of females in gastritis patients was statistically significant when compared with controls ($\chi 2 = 2.91$; $P < 0.05$; OR= 2.12; 95% CI= 0.89 – 5.07).

Distribution of Patients with Acute and Chronic *H. pylori* associated Gastritis according to Gender

As shown in Table.3, out of 29 males, 23 (79.31%) were diagnosed as acute gastritis and 6 (20.69%) were diagnosed as chronic gastritis. Also results in table.3 indicated that out of 41 females, 32 (78.05%) were diagnosed as acute gastritis and 9 (21.95%) were diagnosed as chronic gastritis patients. These results showed no significant differences between males and females in the type of gastritis **($\chi 2$** = 0.02 ; P= NS ; OR= 1.08 ; 95% CI= 0.34-3.45).

Distribution of Gastritis Patients According to Age Groups

Results shown in table.4 indicated that out of 47 patients from (15 > 45) age group, 38 (80.85%) were diagnosed as acute gastritis and 9 (19.15%) were diagnosed as chronic gastritis patients. Also results in table.4 showed that out of 23 patients from (> 45) age group, 17 (73.91%) were diagnosed as acute gastritis and 6 (26.09%) were diagnosed as chronic gastritis patients. These results showed that there was no significant difference between gastritis patients in the two age groups according to type of gastritis ($\chi 2 = 0.44$; P = NS ; OR= 1.49 ; 95% CI= 0.46 – 4.85).

Results of Rapid Urease Test:

Distribution of Gastritis Patients with Positive and Negative (RUT) According to Gender

As shown in table.5, out of 29 gastritis patients (males), 21 (72.41%) were (+ ve RUT) and 8 (27.59%) were (- ve RUT). Also results in table.5 indicated that out of 41 females, 31 (75.61%) were (+ ve RUT) and 10 (24.39%) were (- ve RUT). These results showed no significant differences between gastritis patients (males and females) in RUT results ($\chi 2 = 0.09$; P= NS; OR= 0.85; 95% CI= 0.29 – 2.49).

Distribution of Gastritis Patients with Positive and Negative (RUT) According to Age Groups

Results shown in table.6 indicated that out of 47 patients from (15 > 45) age group, 35 (74.47%) were (+ ve RUT) and 12 (25.55%) were (- ve RUT). Also results in table.6 showed that out of 23 patients from (> 45) age group, 17 (73.91%) were (+ ve RUT) and 6 (26.09%) were (- ve RUT). These results showed no significant differences between gastritis patients in these two age groups according to RUT results ($\chi 2 = 0.002$; P= NS; OR= 1.03; 95% CI= 0.33 – 3.21)**.**

Distribution of Gastritis Patients with Positive and Negative (RUT) According to Type of Gastritis:

Results shown in table.7 indicated that out of 52 patients with (+ ve RUT), 41 (78.85%) were diagnosed as acute gastritis patients and 11 (21.15) were diagnosed as chronic gastritis patients. Also results in table.7 showed that out of 18 gastritis patients with (- ve RUT), 14 (77.78) were diagnosed as acute gastritis patients and 4 (22.22%) were diagnosed as chronic gastritis patients. These result showed no significant differences between the two groups according to types of gastritis ($\chi 2 = 3.11$; P= NS; OR= 0.56; 95% CI= 0.67 – 0.98).

Results of Rapid Diagnostic Test:

Distribution of Individuals (patients+controls) with Positive and Negative (RDT) According to Gender

As shown in table.8, out of 47 individuals (males), 34 (72.34%) were (+ ve RDT) and 13 (27.66%) were (- ve RDT). Also results in table.8 indicated that out of 53 females, 36 (67.92%) were (+ ve

RDT) and 17 (32.08%) were (- ve RDT). These results showed no significant differences between Individuals (males and females) in RDT results ($\chi 2 = 0.23$; P = NS; OR= 1.24; 95% CI= 0.52 – 2.92).

Distribution of Individuals (patients+controls) with Positive and Negative (RDT) According to Age Groups:

Results shown in table.9 indicated that out of 71 individuals from (15 > 45) age group, 45 (63.38%) were (+ ve RDT) and 26 (36.62%) were (- ve RDT). Also results in table.9 showed that out of 29 individuals from (> 45) age group, 25 (86.21%) were (+ ve RDT) and 4 (13.79%) were (- ve RDT). These results showed no significant differences between individuals in these two age groups according to RDT results ($\chi 2 = 5.11$; P= NS ; OR= 0.28 ; 95% CI= 0.09 – 0.88).

Distribution of Gastritis Patients and Controls According to RDT Results:

Results shown in table.10 indicated that out of 70 individuals with (+ ve RDT), 61 (87.41%) were gastritis patients and 9 (12.86%) were controls. Also results in table.10 indicated that out of 30 individuals with (- ve RDT), 9 (30%) were gastritis patients and 21 (70%) were controls. These results indicated that the increased frequency of gastritis patients with (+ ve RDT) was statistically significant when compared with controls ($\chi 2 = 2.91$; P< 0.05; OR= 2.12; 95% CI= 0.89 – 5.07).

Distribution of Gastritis Patients with Positive and Negative (RDT) According to Type of Gastritis

Results shown in table.11 indicated that out of 61 patients with (+ ve RDT), 48 (78.69%) were diagnosed as acute gastritis patients and 13 (21.31%) were diagnosed as chronic gastritis patients. Also results in table.11 showed that out of 9 gastritis patients with (- ve RDT), 7 (77.78) were diagnosed as acute gastritis patients and 2 (22.22%) were diagnosed as chronic gastritis patients. These result showed no significant differences between the two groups according to types of gastritis ($\chi 2 = 4.13$; P= NS; OR= 0.26; 95% CI= 0.67 – 0.68).

Correlation of Duration of Gastritis with Other Topics

Duration of Gastritis in Patients According to Age Group:

Results shown in Table 12 indicated that out of 47 gastritis patients within age group (15>45), 22 patients were with duration of gastritis (< Year) and 25 patients were with duration of gastritis (> Year) with frequencies of 46.81 and 53.19 respectively. Also results in Table 4.35 showed that out of 23 gastritis patients within (>45) age group, 5 were with duration of gastritis (< Year) and 18 patients were with duration of gastritis (> Year) with frequencies of 21.74 and 78.26 respectively.

The duration of gastritis (> Year) in gastritis patients within (>45) age group was statistically significant ($\chi 2 = 4.10$; P< 0.05 ; OR= 3.17 ; 95% CI= 1.01 – 9.95) when compared with patients within (15>45).

Duration of Gastritis According to Gender:

Results shown in Table 13 indicated that out of 29 gastritis patients (males), 10 were with duration of gastritis (< Year) and 19 with duration of gastritis (>Year) with frequencies of 34.48 and 65.52 respectively. Also results in Table 13 showed that out of 41 gastritis patients (females), 17 were with duration of gastritis (<Year) and 24 with duration of gastritis (>Year) with frequencies of 41.46 and 58.54 respectively. No significant difference was observed between gastritis patients (males and females) in duration of gastritis.

Presence of other infectious disease:

Presence of other infectious disease according to age groups

Results in (Table 14) showed that out of 71 individuals (patients & controls) within 15 > 45 age group, 6 (8.45%) were infected with other infectious diseases and 65 (91.55%) had no other infectious diseases. Also (Table 14) showed that out of 29 individuals (patients & controls) within > 45 age group, 6 (20. 69%) were infected with other infectious diseases and 23 (79.3%) no other infectious diseases. No significant difference was observed between individuals (patients & controls) within 15 > 45 and > 45 age groups in presence of other infectious diseases ($\chi 2 = 2.92$; P = NS; OR= 0.35; 95% CI= 0.10 – 1.21).

Presence of other infectious disease according to gender

Results shown in Table 15 indicated that out of 47 males, 4(8.51%) were infected with other infectious diseases and 43 (91.49%) had no other infectious diseases. Also results in Table 15 showed that out of 53 females, 8(15.09%) were infected with other infectious diseases and 45(84.91%) had no other infectious diseases. No significant difference was observed between males and females in presence of other infectious diseases ($\chi 2 = 1.02$; P = NS; OR= 0.52; 95% CI= 0.15 – 1.87).

Correlation between marital status and duration of gastritis

Results shown in (Table 16) indicated that out of 11 single gastritis patients, 7(63.64%) were with duration of gastritis of < Year and 4 (36.36%) were with duration of gastritis of > Year. The frequency of married patients with duration of gastritis of > Year was statistically not significant, but there was strong association between marital status and duration of gastritis ($\chi 2 = 3.46$; P = NS; OR= 3.41; 95% CI= 0.89 – 13.05)**.**

Frequencies of patients with acute &chronic gastritis in correlation with smoking

Results shown in Table 17 indicated that out of 17 patients (smoking), 15 (88.24%) were diagnosed as acute gastritis patients and 2 (11.76%) were diagnosed as chronic gastritis patients. Also results in (Table 17) showed that out of 53 patients (not smoking), 40 (75.47%) were diagnosed as acute gastritis patients and 13 (24.53%) were diagnosed as chronic gastritis patients. These results showed that correlation between type of gastritis and smoking was statistically not significant but there was strong association ($\chi 2 = 1.25$; P= NS; OR= 2.43; 95% CI= 0.49 – 12.11).

Frequencies of gastritis patients and controls in correlation with smoking

Results shown in Table 18 indicated that out of 20 smokers, 17 (85%) were gastritis patients and 3 (15%) were controls. Also results in (Table 18) showed that out of 80 patients non smokers, 53 (66.25%) were gastritis patients and 27 (33.75%) controls. These results showed that there was no correlation between gastritis and smoking ($\chi 2 = 2.68$; P= NS; OR= 0.34; 95% CI= 0.93 – 1.29).

Correlation between smoking &duration of gastritis

Results shown in Table 19 indicated that out of 17 gastritis patients (smokers), 5 (29.41%) were with duration of gastritis of < Year and 12 (70.59%) were with duration of gastritis of >Year. Also results in (Table 19) showed that out of 53 gastritis patients (non smokers), 22 (41.51%) were with duration of gastritis of < Year and 31 (58.49%) were with duration of gastritis of >Year. These results showed that there was no correlation between gastritis and smoking ($\chi 2 = 0.79$; P =NS; OR= 0.59; 95% CI= 0.18 – 1.91)**.**

Correlation between smoking and susceptibility to other infectious diseases

Results shown in Table 20 indicated that out of 20 smokers, 5 (25%) were infected with other infectious diseases and 15 (75%) had no other infectious diseases. Also results in Table 20 showed that out of 80 non smokers, 7 (8.75%) were infected with other infectious diseases and 73 (91.25%) had no other infectious diseases. No significant difference was observed between smokers and non smokers in presence or absence of other infectious diseases but the association was very strong between smoking and presence of other infectious diseases ($\chi 2 = 4.00$; P= NS; OR= 3.48; 95% CI= 0.01 – 12.44).

RUT results in correlation to smoking

Results showed in (Table 21) indicated that out of 17 gastritis patients (smokers), 15 (88.24%) were +ve RUT and 2 (11.76%) were –ve RUT. Also (Table 21) showed that out of 53 gastritis patients (non smokers), 37 (69.81%) were +ve RUT and 16 (30.19%) were –ve RUT. Although the correlation between smoking and +ve RUT results were statistically not significant, but the association was strong ($\chi 2 = 2.29$; P = NS; OR= 3.24; 95% CI= 0.69 – 15.89).

RDT in correlation to smoking

Results showed in (Table 22) indicated that out of 20 (smokers), 17 (85%) were +ve RDT and 3 (15%) were –ve RDT. Also (Table 22) showed that out of 80 (non smokers), 53 (66.25%) were +ve RDT and 27 (33.75%) were –ve RDT. These results showed that the frequency of smokers with +ve RDT was statistically significant with strong association ($\chi 2 = 2.68$; P < 0.05; OR= 2.89; 95% CI= 0.77 – 10.72).

Table.1 Diagnostic tests used for 70 dyspeptic patients

Tests	**+ ve cases**	**- ve cases**	**Total cases**
	N (%)	**N (%)**	**N (%)**
RUT	**52 (74.29)**	**18 (25.71)**	**70 (100)**
RDT	**61 (87.14)**	**9 (12.86)**	**70 (100)**

($\chi 2 = 5.91$; P< 0.05; OR= 2.12; 95% CI= 0.89 – 8.07**)**

Table.2: Distribution of gastritis patients and controls according to gender.

Gender	Gastritis patients	Controls	Total N= 100
	N (%)=70	N (%)=30	
Male	29 (61.70)	18 (38.30)	47
Female	41 (77.36)	12 (22.64)	53

($\chi 2$ = 2.91; P< 0.05; OR= 2.12; 95% CI= 0.89 – 5.07)

Table.3 Frequencies of males and females with acute & chronic gastritis

Gender	Type of gastritis		Total N=70
	Acute	Chronic	
	N (%) 55	N (%) 15	
Male	23 (79.31)	6(20.69)	29
Female	32(78.05)	9(21.95)	41

($\chi 2$ = 0.02; P= NS; OR= 1.08; 95% CI= 0.34-3.45)

Table.4 Distribution of patients with acute & chronic gastritis according to age groups

Age group	Acute gastritis	Chronic gastritis	Total N= 70
	N (%) 55	N (%) 15	
15 > 45	38 (80.85)	9 (19.15)	47
> 45	17 (73.91)	6 (26.09)	23

($\chi 2$ = 0.44; P = NS; OR= 1.49; 95% CI= 0.46 – 4.85)

Table.5 Frequencies of gastritis patients with positive & negative RUT according to gender.

Gender	Gastritis patients with (+ ve RUT)	Gastritis patients with (- ve RUT)	Total N= 70
	N (%) 52	N (%) 18	
Male	21 (72.41)	8 (27.59)	29
Female	31 (75.61)	10 (24.39)	41

(χ^2 = 0.09; P= NS; OR= 0.85; 95% CI= 0.29 – 2.49)

Table.6 Distribution of gastritis patients with positive &negative RUT according to age groups.

Age group	Patients with +ve RUT	Patients with -ve RUT	Total N=70
	N (%) 52	N (%) 18	
15 > 45	35 (74.47)	12 (25. 55)	47
> 45	17 (73.91)	6 (26.09)	23

(χ^2 = 0.002; P= NS; OR= 1.03; 95% CI= 0.33 – 3.21)

Table.7: Frequencies of gastritis patients (chronic & acute) according to RUT results.

Rapid Urease Test (RUT)	Gastritis patients		Total
	Acute gastritis	Chronic gastritis	
	N (%) 55	N (%) 15	N (%)
Positive RUT	41 (78.85)	11 (21.15)	52 (100)
Negative RUT	14 (77.78)	4 (22.22)	18 (100)

(χ^2 = 3.11; P= NS; OR= 0.56; 95% CI= 0.67 – 0.98)

Table. 8: Frequencies of individuals (patients+ controls) with positive & negative RDT according to gender.

Gender	Individuals with (+ ve RDT	Individuals with (- ve RDT)	Total N= 100
	N (%) 70	N (%) 30	
Male	34 (72.34)	13 (27.66)	47
Female	36 (67.92)	17 (32.08)	53

(χ2 = 0.23; P = NS; OR= 1.24; 95% CI= 0.52 – 2.92)

Table.9: Distribution of individuals (patients+controls) with positive &negative RDT according to age groups.

Age group	Individuals with +ve RDT	Individuals with -ve RDT	Total N=100
	N (%) 70	N (%) 30	
15 > 45	45 (63.38)	26 (36.62)	71
> 45	25 (86.21)	4 (13.79)	29

(χ2 = 5.11; P= NS; OR= 0.28; 95% CI= 0.09 – 0.88)

Table.10: Distribution of gastritis patients and controls according to RDT results

RDT	Gastritis patients	Controls	Total
	N (%) 70	N (%) 30	N (%) 100
+ ve RDT	61 (87.14)	9 (12.86)	70 (100)
- ve RDT	9 (30)	21 (70)	30 (100)

(χ2 = 2.91; P< 0.05; OR= 2.12; 95% CI= 0.89 – 5.07)

Table.11: Frequencies of gastritis patients (chronic & acute) according to RDT results.

Rapid Diagnostic Test (RDT)	Gastritis patients		Total 70
	Acute gastritis	Chronic gastritis	
	N (%)	N (%)	N (%)
Positive RDT	48 (78.69)	13 (21.31)	61(100)
Negative RDT	7 (77.78)	2 (22.22)	9 (100)

($\chi 2$ = 4.13; P= NS; OR= 0.26; 95% CI= 0.07 – 0.68)

Table 12: Duration of gastritis according to age groups

Age group	Duration of gastritis		Total N=70
	< Year	> Year	
	N (%) 27	N (%) 43	
15 > 45	22 (46.81)	25 (53.19)	47
> 45	5 (21.74)	18 (78.26)	23

($\chi 2$ = 4.10; P< 0.05; OR= 3.17; 95% CI= 1.01 – 9.95)

Table 13: Frequencies of gastritis patients (males & Females) according to duration of gastritis

Gender	Duration of gastritis		Total N= 70
	< Year	> Year	
	N (%) 27	N (%) 53	
Male	10 (34.48)	19 (65.52)	29
Female	17 (41.46)	24 (58.54)	41

($\chi 2$ = 0.35; P= NS; OR= 0.74; 95% CI= 0.28 – 1.99)

Table 14: Frequencies of individuals (patients &controls) with presence of other infectious disease according to age groups

Age group	Presence of other infectious disease	Absence of other infectious disease	Total N= 100
	N (%) 12	N (%) 88	
15 > 45	6 (8.45)	65 (91.55)	71
> 45	6 (20.69)	23 (79.31)	29

($\chi 2$ = 2.92; P = NS; OR= 0.35; 95% CI= 0.10 – 1.21)

Table 15: Frequencies of individuals (patients & controls) with presence of other infectious disease according to gender

Gender	Presence of other infectious disease	Absence of other infectious disease	Total N= 100
	N (%) 12	N (%) 88	
Male	4 (8.51)	43 (91.49)	47
Female	8 (15.09)	45 (84.91)	53

(χ2 = 1.02; P = NS; OR= 0.52; 95% CI= 0.15 – 1.87)

Table 16: Correlation between marital status and duration of gastritis

Marital status	Duration of gastritis		Total N= 70
	< Year	> Year	
	N (%) 27	N (%) 43	
Single	7 (63.64)	4 (36.36)	11
Married	20 (33.90)	39 (66.10)	59

(χ2 = 3.46; P = NS; OR= 3.41; 95% CI= 0.89 – 13.05)

Table 17: Frequencies of patients with acute &chronic gastritis in correlation with smoking

Smoking	Type of gastritis		Total N= 70
	Acute	Chronic	
	N (%) 55	N (%) 15	
Smoking	15 (88.24)	2 (11.76)	17
Not smoking	40 (75.47)	13 (24.53)	53

(χ^2 = 1.25; P= NS; OR= 2.43; 95% CI= 0.49 – 12.11)

Table 18: Frequencies of gastritis patients and controls in correlation with smoking

Smoking	Gastritis patients	Controls	Total N= 100
	N (%) 70	N (%) 30	
Smoking	17 (85)	3 (15)	20
Not smoking	53 (66.25)	27 (33.75)	80

(χ2 = 2.68; P= NS; OR= 0.34; 95% CI= 0.93 – 1.29)

Table 19: Correlation between smoking &duration of gastritis

Smoking	Duration of gastritis		Total N= 70
	< Year	> Year	
	N (%) 27	N (%) 43	
Smoking	5 (29.41)	12 (70.59)	17
Not smoking	22 (41.51)	31 (58.49)	53

($\chi 2$ = 0.79; P =NS; OR= 0.59; 95% CI= 0.18 – 1.91)

Table 20: Correlation between smoking and susceptibility to other infectious diseases in (patients + controls)

Smoking	Presence of other infectious diseases	Absence of other infectious diseases	Total N= 100
	N (%) 12	N (%) 88	
Smoking	5 (25)	15 (75)	20
Not smoking	7 (8.75)	73 (91.25)	80

($\chi 2$ = 4.00; P= NS; OR= 3.48; 95% CI= 0.01 – 12.44)

Table 21: Frequencies of gastritis patients with positive &negative RUT in correlation to smoking.

Smoking	Gastritis patients with +v RUT	Gastritis patients with -v RUT	Total N= 70
	N (%) 52	N (%) 18	
Smoking	15 (88.24)	2 (11.76)	17
Not smoking	37 (69.81)	16 (30.19)	53

($\chi 2$ = 2.29; P = NS; OR= 3.24; 95% CI= 0.69 – 15.89)

Table 22: Frequencies of gastritis patients with positive & negative RDT in correlation to smoking.

Smoking	individuals with +v RDT	individuals with +v RDT	Total N= 100
	N (%) 70	N (%) 30	
Smoking	17 (85)	3 (15)	20
Not smoking	53 (66.25)	27 (33. 75)	80

($\chi 2$ = 2.68; P < 0.05; OR= 2.89; 95% CI= 0.77 – 10.72)

DISCUSSION

Out of 100 patients with various dyspeptic symptoms and subjected to upper gastrointestinal endoscopic examination, 70 (70%) showed abnormal endoscopic findings; 29 (41%) males and 41 (58.57%) females, while 30 (30%) showed normal endoscopic examination; 12 (40%) males and 18 (60%) females (Figure 1). Out of 70 patients, 55 (79%) were diagnosed as acute gastritis and 15 (21%) as chronic gastritis (Figure 2). The presence of association with *H. pylori* was determined by biopsy rapid urease test and rapid diagnostic test (detection of anti *H. pylori* antibodies in patient's serum). Table.1 showed that out of 70 gastritis patients, 52 (74.29%) were positive rapid urease test (RUT) and 18 (25.71%) were negative (RUT) and out of 70 gastritis patients, 61 (87.14%) were positive rapid diagnostic test (RDT) and 9 (12.86%) were negative RDT. The increased frequencies of positive results in both tests indicated significant association with *H. pylori* infection ($\chi 2 = 5.91$; $P< 0.05$; OR= 2.12 ; 95% CI= 0.89 – 8.07). Patients were considered to be infected with *H. pylori* associated gastritis if they were positive in one or both tests. According to that all 70 patients were considered as *H. pylori* associated gastritis patients. Results in Table.2 showed that out of 70 patients with *H. pylori* associated gastritis, 29 (61.70%) were males and 41 (77.36%) were females. For controls groups, out of 30 healthy controls, 18 (38.30%) were males and 12 (22.64%) were females. The increased frequency of females in gastritis patients was statistically significant when compared with controls ($\chi^2 = 2.91$; $P< 0.05$; OR= 2.12; 95% CI= 0.89 – 5.07). These results disagree with studies reported that males and females are infected at the same rate [5-9] also results disagree with studies performed by [10,11] in which a significant increased frequency of males were reported. As shown in Table.3, out of 29 males, 23 (79.31%) were diagnosed as acute gastritis and 6 (20.69%) were diagnosed as chronic gastritis. Also results in table.3 indicated that out of 41 females, 32 (78.05%) were diagnosed as acute gastritis and 9 (21.95%) were diagnosed as chronic gastritis patients. These results showed no significant differences between males and females in the type of gastritis **(**$\chi 2 = 0.02$; P= NS; OR= 1.08; 95% CI= 0.34-3.45). Results shown in table.4 indicated that out of 47 patients from (15 > 45) age group, 38 (80.85%) were diagnosed as acute gastritis and 9 (19.15%) were diagnosed as chronic gastritis patients. Also results in table.4 showed that out of 23 patients from (> 45) age group, 17 (73.91%) were diagnosed as acute gastritis and 6 (26.09%) were diagnosed as chronic gastritis patients. These results showed that there was no significant difference between gastritis patients in the two age groups according to type of gastritis ($\chi 2 = 0.44$; P = NS; OR= 1.49; 95% CI= 0.46 – 4.85). These results was compatible with a study performed by (Al-Dhaher, 2001) who reported high prevalence of *H. pylori* infection in the age group (> 60). The high prevalence rate in the age group (> 45) may be due to high exposure to *H. pylori* in the past [12]. The prevalence rate of infection varies according to the socioeconomic status [13, 14] and the sample size of the population studied. In the future studies, larger sample size is needed to compare the prevalence rate of infection in different age groups. Gastric biopsy samples were collected for rapid urease test from 70 gastritis patients from the antral region of the stomach. Low acidity in this region because of the decreased number of parietal cells [15] also presence of many receptors for *H. pylori* in this region, increases the chance for detection of the metabolic activity of the organism such urease enzyme [16,17]. The test was considered positive when a red or pink color developed in the inoculated media as shown in Figure 3.1. Most of cases showed positive results after few minutes. Patients, who showed negative RUT, Clinically showed a picture of *H. pylori* gastritis, also they were seropositive (positive RDT). The negative RUT results for these patients may be due to the sample size, at least 10^5 per ml bacteria are needed for a positive result and the use of two biopsies increase the sensitivity of the test [18,19]. Also negative results may be due to the irregular distribution of the organism in the gastric mucosa [20, 21], the use of antibiotics or acid-suppression at the time of endoscopy could theoretically decrease the sensitivity of the RUT by diminishing urease activity. Lee *et al*, [22] did not find these factors to be reliable predictors of patients who would have a false negative RUT. Increased likelihood of sampling error in older patients who are more likely to have gastric mucosal changes which are associated with a reduced *H. pylori* density (atrophic gastritis and intestinal metaplasia), is also a possibility. One group has recently reported that a mixture of blood, gastric juice, and bile decreased the sensitivity of three different RUTs in an *in-vitro* setting suggesting that the exposure of the gastric mucosa to a combination of factors, including blood, may be the explanation for this clinically important observation. The study indicated that the use of biopsy urease test in the endoscope unit will be sensitive and convenient. The importance of this test during

endoscopy is to confirm the presence of *H. pylori*, so that no patient will be treated unnecessarily, also it will help the physician in taking the right choice for treatment. As shown in table.5, out of 29 gastritis patients (males), 21 (72.41%) were (+ve RUT) and 8 (27.59%) were (-ve RUT). Also results in table.5 indicated that out of 41 females, 31 (75.61%) were (+ve RUT) and 10 (24.39%) were (-ve RUT). These results showed no significant differences between gastritis patients (males and females) in RUT results ($\chi 2$ = 0.09; P= NS; OR= 0.85; 95% CI= 0.29 – 2.49). Results shown in table.6 indicated that out of 47 patients from (15>45) age group, 35 (74.47%) were (+ve RUT) and 12 (25.55%) were (- ve RUT). Also results in table.6 showed that out of 23 patients from (> 45) age group, 17 (73.91%) were (+ve RUT) and 6 (26.09%) were (-ve RUT). These results showed no significant differences between gastritis patients in these two age groups according to RUT results ($\chi 2$ = 0.002; P= NS; OR= 1.03; 95% CI= 0.33 – 3.21)**.** Studying the distribution of gastritis patients with positive and negative (RUT) according to type of gastritis, results shown in table.7 indicated that out of 52 patients with (+ ve RUT), 41 (78.85%) were diagnosed as acute gastritis patients and 11 (21.15) were diagnosed as chronic gastritis patients. Also results in table.7 showed that out of 18 gastritis patients with (-ve RUT), 14 (77.78) were diagnosed as acute gastritis patients and 4 (22.22%) were diagnosed as chronic gastritis patients. These result showed no significant differences between the two groups according to types of gastritis (χ^2 = 3.11; P= NS; OR= 0.56; 95% CI= 0.67 – 0.98).

Serological tests used for diagnosis of *H. pylori*, are fast and non invasive, also these tests are capable of reducing the endoscope workload.

In the present study a rapid one step test was done for the qualitative detection of IgG antibodies to *H. pylori* in human serum by using (Rapid Diagnostic Test) Kit. As shown in table.8, out of 47 individuals (males), 34 (72.34%) were (+ ve RDT) and 13 (27.66%) were (-ve RDT). that was compatible with a study performed by Maysiak–Budnik and Megraud, [23]. The test has been tested for interference from visibly hemolysed as well as specimens containing high bilirubin levels. In addition, no interference was observed in specimens containing hemoglobin up to 1.000 ug/ dL, bilirubin, and up to 2.000 um/ dl human serum albumin [4, 24]. This evidence indicated that test is sensitive, fast and convenient and should be used in screening for anti *H. pylori* antibodies. Also results in table.8 indicated that out of 53 females, 36 (67.92%) were (+ve RDT) and 17 (32.08%) were (-ve RDT). These results showed no significant differences between Individuals (males and females) in RDT results ($\chi 2$ = 0.23; P = NS; OR= 1.24; 95% CI= 0.52 – 2.92). Results shown in table.9 indicated that out of 71 individuals from (15 > 45) age group, 45 (63.38%) were (+ve RDT) and 26 (36.62%) were (-ve RDT). Also results in table.9 showed that out of 29 individuals from (> 45) age group, 25 (86.21%) were (+ve RDT) and 4 (13.79%) were (-ve RDT). These results showed no significant differences between individuals in these two age groups according to RDT results ($\chi 2$ = 5.11; P= NS; OR= 0.28; 95% CI= 0.09 – 0.88)**.** These results agree with a study performed by Loffeld *et al*, [25] who observed that the prevalence of *H. pylori* increases with age. Results shown in table.10 indicated that out of 70 individuals with (+ve RDT), 61 (87.41%) were gastritis patients and 9 (12.86%) were controls. Also results in table.10 indicated that out of 30 individuals with (-ve RDT), 9 (30%) were gastritis patients and 21 (70%) were controls. These results indicated that the increased frequency of gastritis patients with (+ve RDT) was statistically significant when compared with controls ($\chi 2$ = 2.91; P< 0.05; OR= 2.12; 95% CI= 0.89 – 5.07). Results shown in table.11 indicated that out of 61 patients with (+ve RDT), 48 (78.69%) were diagnosed as acute gastritis patients and 13 (21.31%) were diagnosed as chronic gastritis patients. Also results in table.11 showed that out of 9 gastritis patients with (-ve RDT), 7 (77.78) were diagnosed as acute gastritis patients and 2 (22.22%) were diagnosed as chronic gastritis patients. These result showed no significant differences between the two groups according to types of gastritis ($\chi 2$ = 4.13; P= NS; OR= 0.26; 95% CI= 0.67 – 0.68). Many factors such as socioeconomic status, ethnic group, different populations, geographical location and the type of the trouble associated with the infection also contribute to the observed variations in prevalence in the present study. Asymptomatic and untreated patients continue to test IgG seropositive as long as the *H. pylori* organisms are presents, even after histological resolution. These results showed that humoral immunity was present throughout the spectrum, but does not seem to provide protection in patients, Although controls showed (+RDT), but they have no symptoms of gastritis, this might be explained as in such individuals, the genetic factors may control host immune responses to the infectious agents and provide protection [26]. Results shown in Table 12 indicated that out of 47 gastritis patients within age group (15>45), 22 patients were with duration of gastritis (<

Year) and 25 patients were with duration of gastritis (> Year) with frequencies of 46.81 and 53.19 respectively. Also results in Table 4.35 showed that out of 23 gastritis patients within (>45) age group, 5 were with duration of gastritis (< Year) and 18 patients were with duration of gastritis (> Year) with frequencies of 21.74 and 78.26 respectively. The duration of gastritis (> Year) in gastritis patients within (>45) age group was statistically significant (χ^2 = 4.10; P< 0.05; OR= 3.17; 95% CI= 1.01 – 9.95) when compared with patients within (15>45). Results shown in Table 13 indicated that out of 29 gastritis patients (males), 10 were with duration of gastritis (<Year) and 19 with duration of gastritis (>Year) with frequencies of 34.48 and 65.52 respectively. Also results in Table 13 showed that out of 41 gastritis patients (females), 17 were with duration of gastritis (<Year) and 24 with duration of gastritis (>Year) with frequencies of 41.46 and 58.54 respectively. No significant difference between gastritis patients (males and females) in duration of gastritis. Results in (Table 14) showed that out of 71 individuals (patients & controls) within 15 > 45 age group, 6 (8.45%) were infected with other infectious diseases and 65 (91.55%) had no other infectious diseases. Also (Table 14) showed that out of 29 individuals (patients & controls) within > 45 age group, 6 (20. 69%) were infected with other infectious diseases and 23 (79.3%) no other infectious diseases. No significant difference between individuals (patients & controls) within 15 > 45 and > 45 age groups in presence of other infectious diseases (χ^2 = 2.92; P = NS; OR= 0.35; 95% CI= 0.10 – 1.21). In studying correlation between gender and susceptibility of infection with other infectious diseases, results shown in Table 15 indicated that out of 47 males, 4(8.51%) were infected with other infectious diseases and 43 (91.49%) had no other infectious diseases. Also results in Table 15 showed that out of 53 females, 8(15.09%) were infected with other infectious diseases and 45(84.91%) had no other infectious diseases. No significant difference between males and females in presence of other infectious diseases (χ^2 = 1.02; P = NS; OR= 0.52; 95% CI= 0.15 – 1.87). Studying correlation between marital status and duration of gastritis, results shown in (Table 16) indicated that out of 11 single gastritis patients, 7(63.64%) were with duration of gastritis of < Year and 4 (36.36%) were with duration of gastritis of > Year. The frequency of married patients with duration of gastritis of > Year was statistically not significant, but there was strong association between marital status and duration of gastritis (χ2 = 3.46; P = NS; OR= 3.41; 95% CI= 0.89 – 13.05)**.** In studying correlation between smoking and type of gastritis, results shown in Table 17 indicated that out of 17 patients (smokers), 15 (88.24%) were diagnosed as acute gastritis patients and 2 (11.76%) were diagnosed as chronic gastritis patients. Also results in (Table 17) showed that out of 53 patients (non smokers), 40 (75.47%) were diagnosed as acute gastritis patients and 13 (24.53%) were diagnosed as chronic gastritis patients. These results showed that correlation between type of gastritis and smoking was statistically not significant but there was strong association (χ^2 = 1.25; P= NS; OR= 2.43; 95% CI= 0.49 – 12.11). Results shown in Table 18 indicated that out of 20 smokers, 17 (85%) were gastritis patients and 3 (15%) were controls. Also results in (Table 18) showed that out of 80 patients non smokers, 53 (66.25%) were gastritis patients and 27 (33.75%) controls. These results showed that there was no correlation between gastritis and smoking (χ2 = 2.68; P= NS; OR= 0.34; 95% CI= 0.93 – 1.29). These results agree with a study performed by [27, 28]. These results disagree with a study performed by [11,9,30] who reported that there is a correlation between gastritis and smoking. Results shown in Table 19 indicated that out of 17 gastritis patients (smokers), 5 (29.41%) were with duration of gastritis of <Year and 12 (70.59%) were with duration of gastritis of >Year. Also results in (Table 19) showed that out of 53 gastritis patients (non smokers), 22 (41.51%) were with duration of gastritis of <Year and 31 (58.49%) were with duration of gastritis of >Year. These results showed that there was no correlation between gastritis and smoking (χ^2 = 0.79; P =NS; OR= 0.59; 95% CI= 0.18 – 1.91)**.** Results shown in Table 20 indicated that out of 20 smokers, 5 (25%) were infected with other infectious diseases and 15 (75%) had no other infectious diseases. Also results in Table 20 showed that out of 80 non smokers, 7 (8.75%) were infected with other infectious diseases and 73 (91.25%) had no other infectious diseases. No significant difference between smokers and non smokers in presence or absence of other infectious diseases but the association was very strong between smoking and presence of other infectious diseases (χ^2 = 4.00; P= NS; OR= 3.48; 95% CI= 0.01 – 12.44). Results showed in (Table 21) indicated that out of 17 gastritis patients (smokers), 15 (88.24%) were +ve RUT and 2 (11.76%) were –ve RUT. Also (Table 21) showed that out of 53 gastritis patients (non smokers), 37 (69.81%) were +ve RUT and 16 (30.19%) were –ve RUT. Although the correlation between smoking and +ve RUT results were statistically not significant, but the association was

strong (χ^2 = 2.29; P = NS; OR= 3.24; 95% CI= 0.69 – 15.89). Results showed in (Table 22) indicated that out of 20 (smokers), 17 (85%) were +ve RDT and 3 (15%) were –ve RDT. Also (Table 22) showed that out of 80 (non smokers), 53 (66.25%) were +ve RDT and 27 (33.75%) were –ve RDT. These results showed that the frequency of smokers with +ve RDT was statistically significant with strong association (χ^2 = 2.68; P < 0.05; OR= 2.89; 95% CI= 0.77 – 10.72).

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