



Relation of Blood Group, Crowding Index and Family History of Dyspepsia with *Helicobacter pylori* Infection

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Abstract

Background: Dyspepsia is a common problem that frequently associated with gastritis. The risk of acquiring *Helicobacter pylori* is related with living conditions and the family's socioeconomic status. Thus, a relation between the *H. pylori* infection and group O blooded individuals was discovered. Currently, no published data available regarding the association of blood group, crowding index and family history of dyspepsia with *H. pylori* infection in Kurdistan region. So this study aims to assess the blood group, crowding index and family history of dyspepsia among patients with *H. pylori* infection.

Patients and methodology: Exactly One hundred dyspeptic patients with anti *H. pylori* Immunoglobulin G (IgG) positive underwent gastroscopy and 75 apparently healthy individuals with no dyspepsia and negative *H. pylori* IgG antibodies (escorts of patients) using Enzyme-Linked Immuno Sorbent Assay tests (NovaLisa, NovaTec). The samples were collected from Kurdistan Teaching Center for Gastroenterology & Hepatology and Ali Kamal Consultation Clinic in Sulaimani city from December 2012 to March 2014. ABO Blood groups were determined using standardized hemagglutination methods.

Results: About 48% of the patients complained of dyspepsia between 1 to 5 years. A significant correlation was found between duration of dyspepsia and the titer of anti *H. pylori* IgG. The maximum level was found among patients with longer duration (5-15years) of dyspepsia. The most common presentation was epigastric pain (78%) followed by decreasing appetite (39%) and GI bleeding (26%). The most common OGD finding in patients was antral gastritis (59%) followed by duodenal ulcer (21%). Most of the patients had either blood group O (44%) or A (30%) than controls (17.3%, 20%). There was statistically significant ($p < 0.01$), OR = 3.5 (1.3 – 5.2) relation between blood group and *H. pylori* infection. The majority (70%) of patients had positive family history of dyspepsia than controls (17.3%), with OR=10.5 (2.9 – 37.3). There was significant relation between crowding index and *H. pylori* infection. The mean crowding index among patients and controls were (4.4 ± 2.3) , (2.1 ± 0.9) respectively, with OR= 3.0 (1.9 - 4.9). No significant difference was found between patients and control group regarding age, gender, and marital status.

Conclusions: We realized that there was significant association between *H. pylori* infection and family history of dyspepsia, crowding index and ABO blood group.

Introduction

Dyspepsia is defined as pain or discomfort in the upper abdomen such as epigastric pain, postprandial fullness, early satiation, belching, nausea and vomiting, upper abdominal bloating, heartburn and regurgitation [1, 2].

H. pylori are Gram-negative bacteria, transmitted by fecal-oral route [3]. The clustering of infection (often with genetically identical strains of *H. pylori*) Within-family, supports person-to-person transmission [4]. Risk factors for *H. pylori* infection include poor socioeconomic conditions, and family overcrowding [5]. *H. pylori* infection is discovered to be associated with blood groups A and O through blood group antigen binding adhesin, which facilitate the adhesion of the organism to the epithelial cells [6], while other study shows no relation between *H. pylori* infection and ABO blood group [7]. No enough data available regarding the relation of blood group, crowding index and family history of dyspepsia with *H. pylori* infection in Kurdistan region. The aim of this study was to evaluate the relation of blood group, crowding index and family history of dyspepsia with *H. pylori* infection.

Patients and methods

This is a cross sectional study .100 patients with dyspepsia and positive *H. pylori* IgG antibodies and 75 apparently healthy volunteer subject, who were apparently normal with no history of dyspepsia and negative for *H. pylori* IgG antibodies were included. The studied population (patients and controls) were matched and comparable in age and gender distribution, they were collected from Ali Kamal Consultation clinic, Kurdistan Teaching center for Gastroenterology & Hepatology. This study conducted from Dec. 2012 to March 2014. Pregnants, smokers, those who received antibiotics, proton pump inhibitors or bismuth compounds in the preceding 4 weeks were excluded.

This study was approved by the Ethical Committee of the Faculty of Medical science, University of Sulaimani and Directory of Health in Sulaimani. Prior to study participation, informed consent was obtained from each participant.

A questionnaire form used to collect demographic data; name, age, gender and number of family members, number of bed rooms. Five ml of venous blood aspirated and ABO Blood groups were tested using standardized hemagglutination methods at Sulaimani Central laboratory, then the blood centrifuged at 4000 rpm for 5 minutes. Sera were tested for anti *H. pylori* IgG using ELISA tests (NovaLisa, NovaTec, Germany), with sensitivity of 97% and a specificity of 98.8%.

After overnight fasting, upper endoscopy was performed under conscious sedation giving midazolam 2.5-5 mg) using Olympus videoscope (Olympus OEV203/ Japan).

Crowding index (CI) was calculated according to $CI = \text{Number of family members} / \text{Number of bed rooms}$ [8]. Statistical analyses applied with SPSS version 18.0. Students T test and chi square test has been used. $P \leq 0.05$ regarded as statistically significant.

Results

Most of the patients (48%) complained of dyspepsia between 1 to 5 years, Figure 1.

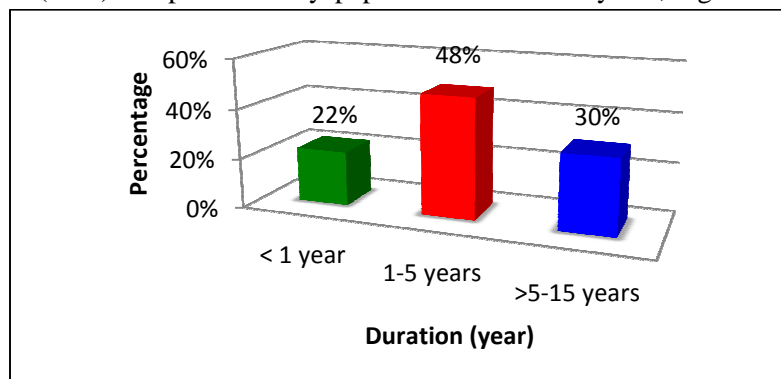


Figure 1. Duration of dyspepsia in the patients.

A significant($p < 0.05$) correlation was found between duration of dyspepsia and the *H. pylori* IgG level, the highest level of *H. pylori* IgG found among patients with longer duration (5-15y) of dyspepsia, Table 1.

Table 1. *H. pylori* IgG level and duration of dyspepsia in patients.

Duration(year)	Number (%)	<i>H. pylori</i> IgG* (Au/ml) Mean \pm SD
<1	22	54.91 \pm 44.4
1-5	48	65.67 \pm 32.8
\geq 5	30	82.50 \pm 35.8

* p value < 0.05.

The most common presentation was epigastric pain (78%) followed by decreasing appetite (39%) and GI bleeding (H&M) (26%), Figure 2.

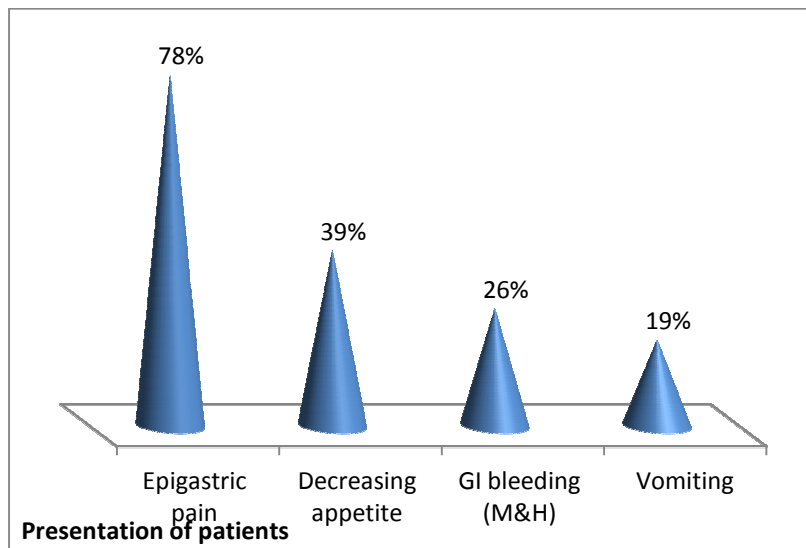


Figure 2. Presentation of the patients.

The most common endoscopic findings in patients were antral gastritis (59%) and duodenal ulcer (21%), Figure 3.

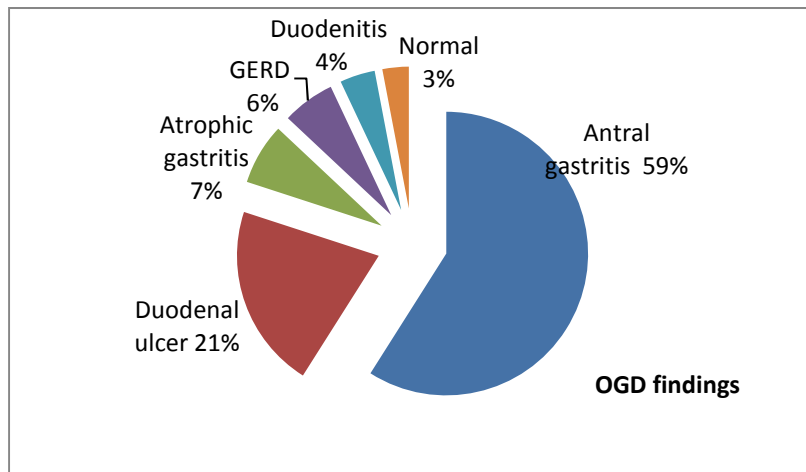


Figure 3. Endoscopic findings in *H. pylori* positive patients.

Risk factors associated with *H. pylori* infection like: blood group, family history of dyspepsia, crowding index, gender and age are shown in Table 2. A higher percentage of patients had blood group O, A (44%, 30%) than controls (17.3%, 20%), there was statistically significant ($p < 0.01$), OR = 3.5 (1.3 – 5.2) association between blood group and *H. pylori* infection.

Family history of dyspepsia (70%) was significantly higher in patients than controls (17.3%), with OR=10.5 (2.9 – 37.3), Table 2.

The mean crowding index among patients (4.4 + 2.3) was significantly higher than controls were (2.1 + 0.9), with OR= 3.0 (1.9 - 4.9), Table 2.

No statistically significant difference ($p > 0.05$) was found between patients and controls regarding age, gender, and marital status, Table 2.

Table 2. Selected risk factors in *H. pylori* infected patients and controls.

Risk factors	Patients(100) No. (%)	Controls(75) No. (%)	Odds ratio (95% CI*)	p value
Blood group:				
Group O	44 (44)	13 (17.3)	3.5 (1.3 – 5.2)	<0.01
Group A	30 (30)	15(20)		
Group B	10 (10)	26 (34.7)		
Group AB	16 (16)	21(28)		
Family history of dyspepsia:				
Yes	70 (70)	13 (17.3)	10.5 (2.9 -37.3)	< 0.01
No	30 (30)	62 (82.7)		
Crowding index: (mean ± SD)	4.4 ±2.3	2.1 ± 0.9	3.0 (1.9 -4.9)	< 0.01
Age (mean ± SD)	34.2±8.5	30.1 ± 9.7	0.3 (0.9 –0.7)	N.S
Gender:				
Male	54 (54)	39 (52)	1.3 (0.7 –9.8)	N.S
Female	46 (46)	36 (48)		
Marital status:				
Yes	75 (75)	51 (68)	1.02 (0.6 -10.9)	N.S
No	25 (25)	24 (32)		

*CI= Confidence Interval

Discussions

In this study, 48% of the patients complained of dyspepsia for 1 to 5 years, this was similar to other study conducted in Al Mosul [9].

A significant correlation ($P < 0.05$) was found between duration of dyspepsia and the *H. pylori* IgG concentration, the highest level of *H. pylori* IgG found among patients with duration of dyspepsia(5-15y), which might be explained by repeated exposure with prolong *H. pylori* infection and increasing age increases the exposure to the infection [10] . Other studies reported that focal aggregates of Cluster designation 8 (CD8)+ T cells decrease in CD4+ T cells, and increased macrophages surrounding the duodenal crypts persisted for months after the acute infection, suggesting impaired termination of the inflammatory response

even after adequate removal of the pathogen. Epidemiological data indicates that these changes can persist for 8 years or more [11, 12].

The most common presentation was epigastric pain (78%) followed by decrease appetite (39%) and GI bleeding (H&M) (26%), these results are similar to the results from other studies [13 - 16]. This can be explained by continuous effect of *H. pylori* on inducing hypergastrinemia, increase acid secretion, antral gastritis followed by peptic ulceration [1].

In this study, OGD revealed abnormalities in (97%) of the patients, which is comparable to (94%) in Saudi Arabia [17], while in Nigeria they noted (66%) [18]. The most common OGD finding in patients was antral gastritis (59%) which is comparable to the finding (50%) by Abood (2007) [19]. In the current study, duodenal ulcer found in (21%) of patients, which is close to (25.5%) in Baban and Mohammed, (2003) and (31%) in Jeje *et al.*, (2013) [20, 21]. These differences may be related to the differences of sample size, type of endoscopes and the personal experience. Also majority of the infected patients develop acute gastritis [22], the main etiological factor for antral gastritis, Duodenitis, and duodenal ulcer are *H. pylori* infection [23-25]. The main etiological factor of Gastroesophageal reflux disease and atrophic gastritis was not attributed to *H. pylori* infection [23, 26]. Normal OGD may represent functional dyspepsia. The relation of GERD and functional dyspepsia with *H. pylori* is controversial [22].

In the present study, risk factors associated with *H. pylori* infection were family history of dyspepsia and higher crowding index. One of the important factor of spreading *H. pylori* infection was socioeconomic status [27], crowding, sharing a bed, and increasing household contact have been identified as risk factors for *H. pylori* infection [28, 29]. Torres and colleagues (1998) found that density of living conditions is an important determinant in the acquisition of *H. pylori* [29]. In childhood, crowded living status affect current *H. pylori* infection and the number of children in the family increases the infection risk for the adult family members [30, 31].

The number of siblings and overcrowding during childhood reflect the probability of close contacts with infected persons and has also been associated with *H. pylori* infection [32, 33].

No statistically significant difference was found between patients and controls regarding marital status ($P > 0.05$), this finding was in line with Minocha *et al.*, (2006) [34], but disagree with other study conducted in Sulaimani [35].

The current study showed a strong association of blood group O, A with *H. pylori* infection which is consistent with other studies [36, 37], while blood group B, AB patients were less prone to *H. pylori* infection than other blood groups and this finding is supported by a previous studies [36, 38], Boren *et al* (1993) demonstrated that an antigen Leb, of the Lewis blood group system, acts as a receptor for *H. pylori* to bind [39]. This antigen is frequently found on blood group O as compared to other groups. This finding was also supported by Alkout (2000) study which demonstrated that the H-antigen, expressed on the gastroduodenal cells, acts as a receptor for *H. pylori* [40], which enhances colonization of *H. pylori* bacteria [38].

Conclusions

There was a significant association between *H. pylori* infection with family history of dyspepsia and higher crowding index. Individuals with blood group O and A were more susceptible to *H. pylori* infection.

The authors disclose that they have no conflict of interest.

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