EFFECT OF AGE, GENDER, BLOOD GROUP AND SOCIAL STATE ON THE SERO-PREVALENCE OF HELICOBACTER PYLORI INFECTION AMONG ASYMPTOMATIC SUBJECTS IN SULAIMANI

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ABSTRACT

Background

It is known that blood group antigens are related to the development of peptic ulcer and gastric carcinoma. Infections due to *H. pylori* are most widespread among the developing regions due to poor standard of public health.

Objectives

This study sought to determine the seroprevalence *of H. pylori* in asymptomatic individual in Sulaimani and to correlate such prevalence with age, gender, blood group and Socioeconomic state.

Methods

This study conducted in Ali Kamal Consultation clinic, Kurdistan Teaching center of Gastroenterology & Hepatology (escorts of patients) and students from University of Sulaimani, from the 1st of January to the 20th of November 2013. Serum samples from 188 apparently healthy subjects were tested for the presence of IgG and IgA antibody to *H. pylori* by use of ELISA test. ABO blood grouping was also done by hemagglutination test.

Results

Of the 188 subjects, there were 92(48.9%) males and 96 (51.1%) females. The age range was 20 to 49 years. The overall prevalence of *H. pylori* infection in our study was 68.1%. *H. pylori* antibodies were positive in 73(79.4%) males and 55(57.3%) females, showing no significant difference P=0.079. The overall seroprevalence was found in 57.1% subjects between 20-29 years of age, 75.8% in subjects between 40-49 years of age showing significant difference P=0.045. Distribution of ABO blood groups in *H. pylori* positive group were, A=70.2%, B=32.4%, AB=57.1% and O=86.1%, with a statistically significant link for blood group O (p=0.001). *H. pylori* sero-positivity was higher in low social state 59(93.7%), moderate social state 47(87%) then lowest in high social state 22(31%), $P = 0.032$.

Conclusions

This study demonstrated that *H. pylori* infection can be related to ABO blood group, age and social state. People of blood group O, 40-49 years of age and low social state are more prone to develop this infection.

Keywords: *H. pylori- Gender- Age- Blood group - Socioeconomic state, Sulaimani.*

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INTRODUCTION

Helicobacter pylori have a strong association with a variety of gastric pathologies, including type B antral gastritis, peptic ulcer, gastric MALT lymphoma, and gastric adenocarcinoma [1].

Several studies have documented a high prevalence of *H. pylori* infection among healthy and non-healthy individuals in different places [2, 3]. It is the most common chronic bacterial infection around the world [4]. Epidemiological studies strongly suggested that more than 50% of the world's populations are infected by *H. pylori* [5, 6], but there are large differences in the prevalence of infection which depends on many factors such as economic development of each country [7, 8]. In addition to that age, race and lower socioeconomic status (crowded living conditions) may also contribute significantly to the rate of *H. pylori* infection [7, 9].

In developing countries, for instance, the prevalence of *H. pylori* antibodies was found in more than 70% of populations [10, 11]. On the contrary, in developed countries, *H. pylori* infection is less common in young children and increases with age and reaches 50% by adulthood [12, 13]. Studies have discovered a blood group antigen binding adhesin (BabA), which help the organism to adhere to the epithelial cells [14]. *H. pylori* infection is asymptomatic in most patients, the symptomatic clinical diseases associated with *H. pylori* infection are well defined, but the implications of asymptomatic infection remain unknown [4]. However, among this prevalence data, little information is available on the seroprevalence of *H. pylori* in healthy asymptomatic population. Therefore, the current study was designed to determine the seroprevalence *of H. pylori* in asymptomatic individual in Sulaimani and to correlate such prevalence with the, gender, blood group and Socioeconomic state.

MATERIALS AND METHODS

This study enrolled 188 apparently healthy individuals, the group comprised of 92 males and 96 females volunteered subject (escorts of patients) who were apparently normal with no history of dyspepsia collected from Ali Kamal consultation clinic, Kurdistan Teaching center of Gastroenterology & Hepatology (KCGH) and students from University of Sulaimani.

This study conducted between the 1st of January to the 20th of November 2013. Those who were pregnant, chronic dyspeptic, previously treated for *H. pylori* infection or who had received antibiotics, proton pump inhibitors or bismuth compounds in the preceding 4 weeks were excluded.

A form designed to collect demographic data; name, age, gender, number of individuals, number of bed rooms, occupation and monthly family income to evaluate socioeconomic status [15]. Five milliliters of venous blood aspirated and ABO Blood groups were determined using standardized hemagglutination methods [16] at Sulaimani Central lab, then the blood centrifuged at 5 000 r/min for 5 minutes. Sera were tested for *H. pylori* IgG & IgA antibodies using ELISA tests (NovaLisa, NovaTec, Germany), according to the standard operating procedures. That has a sensitivity of 97% and a specificity of 98.8% [17].

Statistical Analysis

Computerized statistical analysis were performed using SPSS (statistical package of social science), version 17.0. Results were presented as mean± standard deviation for quantitative variables and number (percentages) for qualitative variables. The differences in such level was considered as significant when $P<0.05$.

RESULTS

A total of 188 apparently healthy asymptomatic individuals residing in different regions of the Sulaimani city were enrolled in the study. Of these, 92(48.9%) were males and 96 (51.1%) were females. The age ranged from 20-49 years. The overall prevalence of *H. pylori* infection was 68.1%, (figure 1).

H. pylori-specific IgG antibodies were positive in 123(65.4%) while only 60 (31.9%) positive for *H. pylori*-specific IgA (which represent recent infection) showing significant difference P=0.0000 (Figure 2).

H. pylori antibodies were positive in 73 (79.4%) males and 55(57.3%) females, showing no significant difference P=0.079 (figure 3).

The overall seroprevalence was found to increase with age, subjects between 20-29 years of age showed 57.1% seroprevalence while those between 30-39 years of age showed higher increase 71.2% with age and reached up to 75.8% in subjects between 40-49 years of age showing significant difference P=0.045 (Table 1).

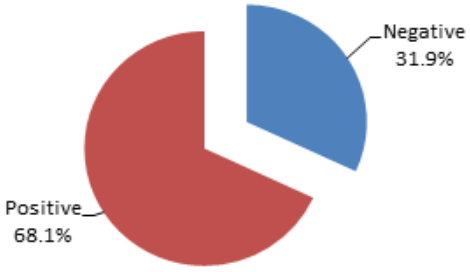

Figure 1. The seroprevalence of *H. pylori* infection.

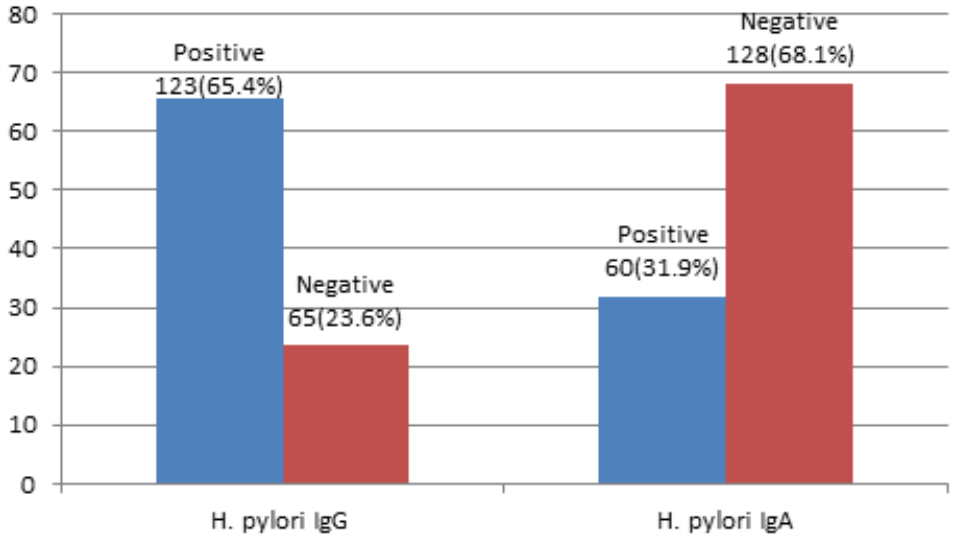

Figure 2. The sero-prevalence of *H. pylori* by different antibodies classes.

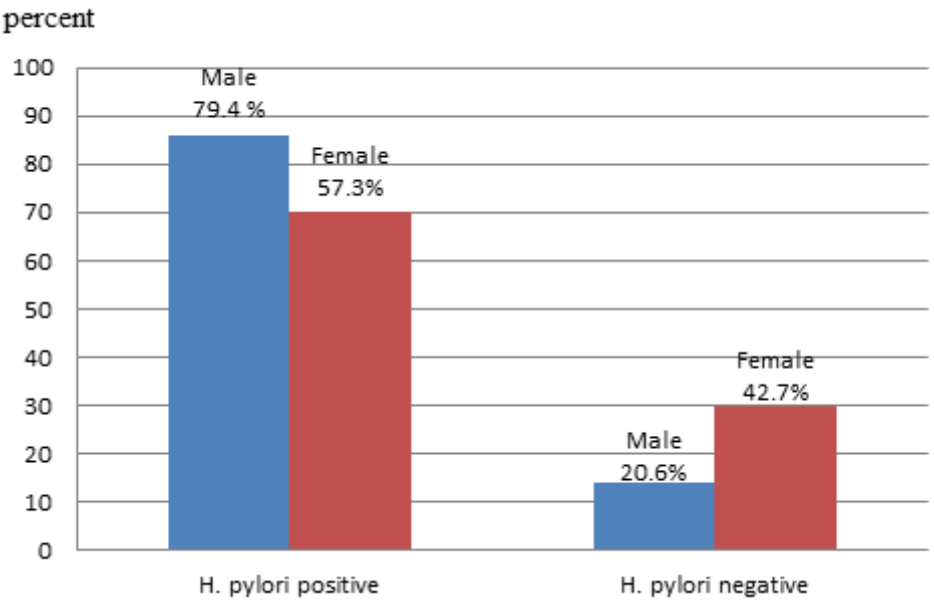

Figure 3. Relationship between gender and *H. pylori*.

Table 1. Relation of Sero-prevalence of *H. pylori* infection & Age.

	H. pylori infection			
Age group (Years)	**Negative No.(%)**	**Positive No.(%)**	**Total No**	**P value.**
20-29	27 (42.9 %)	36 (57.1%)	63	0.2689
30-39	17 (28.8%)	42 (71.2%)	59	0.0400
40-49	16 (24.2%)	50 (75.8%)	66	0.0004

The seropositevity in blood groups O and A were 86.1%, 70.2% respectively showing significant difference P<0.05 when compared to the same groups in negative *H. pylori* (Table 2).

Subjects with blood groups O was more prone to *H. pylori* infection (P = 0.001) while subjects in the A, AB and B blood groups were less prone to *H. pylori* infection compared with subjects in the other blood groups (P = 0.236, 0.655 and 0.090) respectively (Figure 4).

Prevalence of *H. pylori* sero-positive was higher in low social state 59 (93.7%) then moderate social state 47 (87%), and lowest in high social state 22 (31%). Subjects in low social state were more prone to *H. pylori* infection than other socioeconomic states (P = 0.032) (Figure 5).

Table 2. Relationship between *H. pylori* antibodies and blood groups.

Blood Group	No.	*H. pylori* infection		P value
		Negative No. %)	Positive No. (%)	
O	79	11 (13.9%)	68(86.1%)	0.0000
A	47	14(29.8%)	33(70.2%)	0.0136
B	34	23(67.6%)	11(32.4%)	0.0618
AB	28	12(42.9%)	16(57.1%)	0.4636

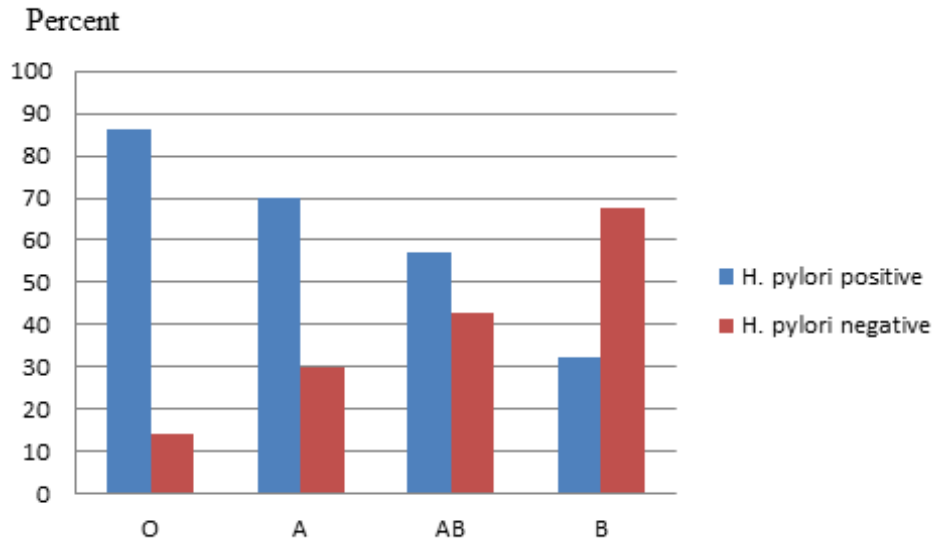

Figure 4. Relationship between *H. pylori* positive and blood groups.

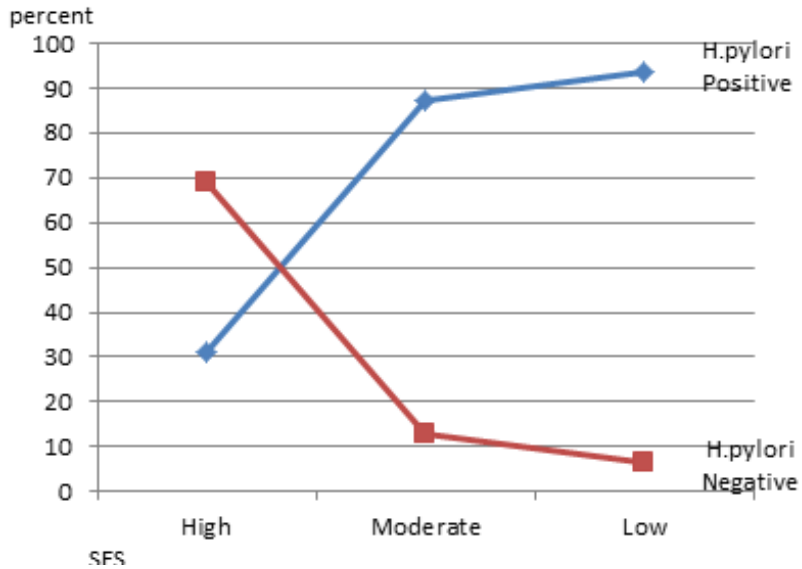

Figure 5. Relationship between *H. pylori* antibodies and Scioeconomic state (SES).

DISCUSSION

Up to the author`s knowledge, there is no study conducted in Sulaimani to investigate the prevalence of *H. pylori* infection among apparently healthy non dyspeptic individuals. The overall prevalence of *H. pylori* infection in the present study was 68.1% which is nearly similar results were shown in a study from Oman, where 69.5% asymptomatic subjects were seropositive for *H. pylori* antibodies [18].The rate of *H. pylori* sero-positivity in this study was lower when compared to studies obtained in other countries in comparable age group such as Libya (94%), Ethiopia (89%) and Uganda (87%)[19-21], which might be explained by the difference in socio-demographic characteristics of the studied populations and improvement in standards of living in Sulaimani. While *H. pylori* sero-positivity in this study was much higher than reports from developed countries, such as United State (36.3%) and United Kingdom (27.6%) [22, 23]. The lower rate in these two countries, might be due to their high socioeconomic status and improved personal hygiene compared with the developing countries.

The mucosal CagA-specific IgA antibodies are produced during the acute phase of gastric inflammation (Bhat *et al*., 2005) and are of poor sensitivity. Nearly all infected individuals (>90%) exhibit *H. pylori*-specific IgG antibodies and these can be used for diagnosis of infection [24, 25].

H. Pylori infection is more prevalent in male than female [18, 26], while Kanbay *et al* [4] concluded that male gender function considered as one protective factores against *H pylori* infection. Whereas other studies conducted in the region and other locations did not find any significant gender difference for aquision of *H. pylori* [19, 27] and this agrees with our results.

In the current study the seroprevalence was found to increase with age which can be explained by the combined effect of a decreased exposure rate in childhood (associated with improved living standards) and acquisition of infection with age [4].

The prevalence of the infection varies according to different ages, socioeconomic strata and geographical regions. In developing countries the prevalence of *H. pylori* is higher in children, likely due to lower socioeconomic status, poor hygiene, overpopulation and lack of safe drinking water [11], whereas in developed countries the prevalence increases with age, probably as a cohort effect of an earlier generation exposed to poor sanitation, Indeed, the infection persists throughout life, unless treated [28]. The similar phenomenon was found in other studies where asymptomatic subjects >40 years of age have shown 75%-85% seropositivity for *H. pylori*. This finding may propose that infection with *H. pylori* is enduring chronic infection [18].

The present study shows that there is a strong association of blood group O with *H. Pylori* infection which can be explained by demonstration of an antigen Leb, of the Lewis blood group system, acted as a receptor for *H. Pylori* to bind. This antigen is most frequently found on blood group O as compared to other groups. This evidence was further supported by another study which demonstrated that the H-antigen, expressed on the gastroduodenal cells, acted as a receptor for *H. Pylori* [29]. A separate study by other group of researchers reported that the H antigen expression in the duodenal mucosa using type II oligosaccharide precursor. This fucosylated antigen is not modified to A or B antigens in blood group O, which points to the fact that there is a positive correlation between this blood group and the infection caused by *H. Pylori*. However, it is also shown that blood group A is found to be related with *H. pylori* infection [30], as Kanbay *et al* demonstrated that *H. Pylori* infection is related with both O and A blood group types and reported negative relation with AB group [4]. Wu *et al.* did not show a relation between the ABO blood group and *H. Pylori* infection [5]. While, a study in Iran, reported a partial influence on the prevalence of *H. Pylori* infection with ABO blood groups [31].

The *H. pylori* sero-prevalence was higher in low social state compared to the high social state ($P < 0.05$). It indicates that the higher social class groups are potentially protected from or are less susceptible to infection and this agree with Moayyed *et al* whom concluded that poor adult socioeconomic condition are associated with increased risk *H. pylori* infection [23]. This may be explained by *H. pylori* transmitted by faeco-oral rout [32]. Within-family clustering of infection (often with genetically identical strains of *H. pylori*) supports person-to-person transmission. The risk of acquiring *H. pylori* is associated with living conditions and the family's socioeconomic status during one's childhood [33] . Housing density, crowded conditions in the home, number of siblings, sharing a bed, and lack of hot or running water and poor hygiene level have been linked to higher rates of infection [23, 34].

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