Original Article

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Seroprevalence of Helicobacter pylori infection in adolescents and adults in Babol

M. Zamani [1], A. Vahedi [2], V. Zamani (MD)[3], A. Bijani (MD)[4], J. Shokri-Shirvani (MD)*[5]

1. Cancer Research Center, Health Research Center, Babol University of Medical Sciences, Babol, I.R.Iran
2. Student Research Committee, Babol University of Medical Sciences, Babol, I.R.Iran
3. Deputy of Health, Babol University of Medical Sciences, Babol, I.R.Iran
4. Research Center for Social Factors Affecting Health, Health Research Center, Babol University of Medical Sciences, Babol, I.R.Iran
5. Research Center for Infectious Diseases and Tropical Medicine, Health Research Center, Babol University of Medical Sciences, Babol, I.R.Iran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Helicobacter pylori is an important causative factor for chronic gastritis, peptic ulcer and gastric cancer. Based on the reports, about half of the world population are infected with this bacterium. The present study was designed with the purpose of investigation of H. pylori infection rate in adolescents and adults of Amirkola in Babol

METHODS: This cross-sectional study was performed on individuals who referred to the health and treatment center of Amirkola, Babol, for the premarital counseling during December 2015 and January 2016. The blood sample of subjects was assessed for H. pylori status using enzyme-linked immunosorbent assay. The demographic data were collected.

FINDINGS: Of 207 participants, 100 (48.3%) were male and others were female. The mean age was 25.35±5.82 (14-46) years. Rate of H. pylori was 43%, seen more frequently in the age group 21-25 years (37.2%). The infection rate was 49% and 37.4% in males and females, respectively, but the difference was not significant. The age group more than 30 was associated with increased risk of infection (odds ratio [OR]=5.25, 95% confidence interval [CI]: 1.86-14.78). There was also a significant correlation between the infection and level of education (p=0.041) and higher diploma was inversely associated with the infection (OR=0.4, 95% CI: 0.18-0.91). No significant relation was found between the infection and blood groups and residency.

CONCLUSION: The results of study indicated a considerable rate of H. pylori infection in adolescents and adults of Amirkola. Also, it was determined that higher education can have a protective role against H. pylori infection.

KEY WORDS: *Helicobacter Pylori, Prevalence, Infection, Adolescent, Adult*.

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* **Corresponding author: J. Shokri-Shirvani(MD)**
Address: Rohani Hospital, Babol University of Medical Sciences, Ganjafrooz Street, Babol, Mazandaran, I.R.Iran
Tel: +98 11 32199592
E-mail: javadshokri121@gmail.com

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Introduction

Helicobacter pylori is an anaerobic bacterium that can cause chronic gastritis, peptic ulcer and gastric cancer, and is commonly found in childhood. The prevalence of infection in the world is estimated to be around 50%, and according to age and socioeconomic conditions, this is different in different regions (1-4). The prevalence of this disease is more developed in developing societies than in developed societies (5). Various studies in Iran have reported the prevalence of Helicobacter Pylori infection between 19% and 82% (6, 7). In the study of Jafarzadeh et al. in Rafsanjan, which occurred on a population of 1 to 60 years old, the prevalence of infection was reported as 75.33% (8). Also, a study by Arj et al. in Kashan indicated that 66% of the samples were infected (9). The epidemiological study of Helicobacter Pylori infection is very useful in understanding the prevalence and spread of this disease as well as the success rate of treatment in different populations.

Although the results of studies over the past few years have shown a decrease in the prevalence of this infection in the world, further research is still needed. According to the research, Northern regions of Iran have a high prevalence of Helicobacter pylori infection (10). In a study in Babol, the prevalence of Helicobacter Pylori was 70% among 30-80-year-old persons (11). A study by Sotuneh et al. on people over the age of 60 in Amirkale, Babol, Northern Iran, who entered the Amirkola Health and Ageing Project for the years 2011 and 1391, and then for the infection Serologic examination showed that out of 1,300 elderly, 991 (76.2%) were infected (12). However, there is still no study on Babol's adolescent and adult population. Therefore, the present study aimed to determine the rate of Helicobacter pylori infection in adolescents and adults referred to Amirkalai Health Center in Babol.

Methods

This cross-sectional study was conducted in December 2012 on people referred to the Amirkola Health Center for marriage counseling after approval by the Ethics Committee of Babol University of Medical Sciences with the code MUBABOL.REC. 99.1395 Individuals were entered the study using simple non-random method. All subjects' information including age, sex, educational level, blood group and place of residence were collected by a questionnaire. Informed consent was received from participants. Blood samples were collected and transferred to the Immunology Laboratory of Babol University of Medical Sciences to investigate Helicobacter pylori infection by ELISA (Anti-HPIgG Anti-Helicobacter Pylori Antibody). Data were analyzed by SPSS software using descriptive analyzes, chi-square and logistic regression and $p<0.05$ was considered significant.

Results

A total of 207 people were enrolled in the study, of which 100 (48.3%) were male and 107 (51.6%) were female. The mean age of the subjects was 25.35 ± 5.82 (14 to 46) years, which was 26.46±19.5 and 26.32±6.2 years in men. Most of the blood groups were O (50.7%). In addition, the majority of participants had positive RH (97.1%). About 55.6% of the residents were in the city and most (52.7%) had high school diploma (table 1).

Table 1. Participants' demographic information

Variable	N(%)
Gender	
man	100(48.3)
woman	107(51.7)
Age	
≤20	39(18.8)
21-25	77(37.2)
26-30	61(29.5)
>30	30(14.5)
Address	
City	115(55.6)
Village	92(44.4)
Blood group ABO	
A	34(16.4)
B	58(28)
AB	10(4.9)
O	105(50.7)
Blood group Rh*	
+	201(97.1)
-	6(2.9)
Level of Education	
Under the diploma	50(24.1)
Diploma	48(23.2)
above the diploma	109(52.7)

*** Rhesus**

The rate of infection with Helicobacter Pylori was 43% (95% -I / 8-49 / 95%), which was 49% in men and 37.4% in women, but this difference was not

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statistically significant. There was a significant relationship between age and infection (p=0.007). The highest rate of infection was observed in people over the age of 30 years (70%). The results of logistic regression analysis showed that age over 30 years old was associated with an increased risk of infection (95/1-14/78%), (OR=5.25), (Fig 1). It was also observed that high school diploma had a negative association with infection (95-23/0: 90: 95% CI, OR = 0.45). Between infection and other variables included blood groups and place of residence there was no significant relationship (table 2).

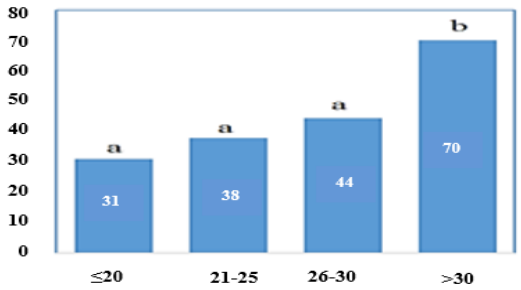


Figure 1. Helicobacter pylori infection in different age groups. * Different letters on each column indicate a significant difference.

Table 2. Relationship between participants' demographic characteristics and Helicobacter Pylori infection

Variable	Positive N(%)	Negative N(%)	p-value	Odds ratio (CI-95%*)
Gender				
man	49(49)	51(51)	0.092	1
woman	40(37.4)	67(62.6)		0.62(0.35-1.08)
Address				
city	45(39.2)	70(60.9)	0.209	1
village	44(47.8)	48(52.2)		1.42(2.48-0.81)
ABO blood group				
A	12(35.3)	22(64.7)	0.364	1
B	22(38)	36(62.1)		1.12(0.64-2.7)
AB	6(60)	4(40)		2.75(0.64-11.69)
O	49(46.7)	56(53.3)		1.6(0.72-3.75)
Rh blood group**				
+	85(42.3)	116(57.7)	0.235	1
-	4(66.7)	2(33.3)		2.73(0.49-15.24)
Level of education				
Under diploma	27(54)	23(46)		1
Diploma	24(50)	24(50)	0.041	0.85(0.38-1.88)
Above the diploma	38(34.9)	71(65.1)		0.45(0.23-0.90)

Discussion

The results showed that nearly half of the participants (43%) were infected with the bacterium. Studies in different regions of Iran show a regional difference in the prevalence of Helicobacter Pylori infection. In the study of Ghasemi Kebria et al., The prevalence of bacterial infection was calculated to be 66.4% in individuals 1 to 83 years old in Golestan province (13). In the study of Nouraie et al., which was carried out on subjects aged 18-65 years in Tehran province, the prevalence of this disease was reported as 69% (14). The study of Jafarzadeh et al. also outlined the prevalence of infection in the population aged 20-60 in Rafsanjan (67.5%) (8). The prevalence rate in countries around Iran, such as the United Arab Emirates, was 78.4% (industrial workers) and Turkey was 82.5% (15).

This prevalence is 39.49% (16) in Japan, 54.4% in Korea (17), and 17% in Denmark (18) and 88% in Russia (19). The reason for these regional differences can be attributed to differences in lifestyle and socio-economic conditions of people in each area. In the present study, the highest rate of infection was seen in people over 30 years of age. It was also found that there is a meaningful positive correlation between age and infection. In the Jafarzadeh et al study, the highest rates of infection were in the range of 51-60 years old people (8).

The highest prevalence of infection in the study of Ghasemi Kebria et al. among adults was observed in individuals aged 15-24 years (72.92%), although the majority of the patients were belonged to the age group of 55-64 (75.43%) (13). The study of Nouraie et al. in Tehran province also showed that the highest prevalence was in 46 to 55 years old adults (79.2%). In addition, in the mentioned study, the infection was associated with an increase in age (14).

Previous studies have suggested that Helicobacter pylori infection is predominantly found in childhood, and its prevalence increases with age (20-23). This is probably due to the improved health conditions of the countries. In our study, there was no significant relationship between Helicobacter pylori infection and gender. Although there has been controversy in this regard as to which sex is more susceptible to infection, recent study of meta-analysis by Ibrahim and colleagues showed that infection with men was more than that of women (24). The reason for the lack of significant correlation between infection and sex in the present study can be related to the low number of

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samples. Based on the results, there was no significant association between infection and place of residence. In some studies, this relationship has been mentioned. Although there is still a difference in the incidence of infection in urban residents or in rural areas, most studies indicate that the infection is most common among villagers (6,25,26). This could be related to a lower level of health and socioeconomic status of villagers. However, more studies are needed to better understand this issue.

The findings of this study indicated that the infection was not associated with different blood groups. Various reports have shown the results of heterogeneity. In the past years, there have been links between gastric cancer and A and B blood groups, as well as peptic ulcers and the O blood group, and it has also been stated that those with a blood type O have a higher proportion of Helicobacter pylori receptors than people with other blood groups and also have higher colonization rates of this pathogen (27-30).

It has been argued that glycans carrying antigens of blood groups A, B, or H and the Lewis-B blood group can play the role of a ligand for binding of Helicobacter pylori to gastric mucus (31). The results also showed that the blood group antigen binding adhesin (BabA), which is a surface protein of Helicobacter pylori, is associated with cancer and gastric ulcers, binds to the Lewis-B antigen and ultimately binds to the mucosal level of the stomach (32-34). Reports about the association between Helicobacter pylori infection and ABO and Rh blood groups are inconsistent. Some confirm it (29,35), and some reject it (36,37). Therefore, further investigation is needed in this regard. The present study demonstrated that the level of education for high school diploma students could have preventive effects against Helicobacter pylori infection. This result is consistent with previous reports (14,15,38).

Of course, there were some studies that did not reach this point of view (26). The preventive effect of education against infection may be due to the fact that higher literate individuals are more concerned with health issues. The findings of the present study showed that a significant percentage of adolescent and adult population in Amirkola were infected with Helicobacter Pylori. In addition, it has been shown that higher education can play a proactive role against the Helicobacter Pylori infection.

It is suggested that in future studies that will examine the prevalence of Helicobacter pylori infection in residents of Babol, the more population and other possible factors such as the level of education of parents and the condition of water and food consumption should be assessed.

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