Indian Journal of Science and Technology

The Prevalence of *Helicobacter pylori* among University Students in Iraq

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Abstract

Background and Objectives: The prevalence of *Helicobacter pylori* (*H. pylori*) varies according to the human population and countries. Our objective was to determine the prevalence of *H. pylori* infection among students in Hawler Medical University, Erbil, Iraq.

Methods and Material: 311 students (57.8% female and 42.2% male) in four colleges (Medicine, Dentistry, Pharmacy and Nursing) at Howler Medical University were recruited in the study. The diagnosis was based on seroepidimeologic method. *H. pylori* antigen cassette which is a qualitative immunochromatographic assay contains monoclonal antibodies was used.

Results: Among 311 students 173 (55.8%) students were infected with *H. pylori*. *H. pylori* infection was more common in final year students of each college (61.7%) comparing with other classes (46.6%).

Conclusions: *H. pylori* are highly prevalent among university students in our region. Higher prevalence found in older students and those from low social class.

Keywords: *H. pylori*, Gastritis, Peptic Ulcer, Proton Pub Inhibitor, Gastric Cancer.

1. Introduction

Helicobacter pylori are the commonest bacterial infection worldwide. This gram negative bacterium infects human gastric mucosa causing long term colonization and inflammation. It has a helix shape, which thought to have evolved to penetrate the mucoid lining of the stomach [1].

Colonization with *H. pylori* is not a disease by itself but a condition associated with a number of disorders of the upper gastrointestinal tract [2]. It is linked with the development of duodenal ulcers and stomach cancer [3]. However, over 80 percent of individuals infected with this bacterium are asymptomatic [4].

The way of transmission of *H. pylori* is unclear [5]. Recent studies showed transmission via either faecal-oral or oral-oral route. It may be directly related to the source of drinking water [6]. Infection with *H. pylori* is related to many diseases e.g. iron deficiency anemia, migraine and coronary heart disease [7]. Epidemiological studies demonstrated that H. pylori infection increases with age. It is higher in developing countries and among population with low socioeconomic status. This may be due to poor hygiene, crowded living conditions and absence of sanitation [8].

In developed countries, children and adolescents are only infrequently infected, while in adults over 50 years of age the infection ranges from 30–60% [8]. In USA, serologic evidence of *H. pylori* is rarely found before age of 10y but increases to 10% in those between 18–30y of age and to 50% in those > 60y [9]. The rate of infection with this bacterium differs in different countries e.g. in Kuwait 81% [10], in Jordan 82% [11] and in Turkey 63% [12].

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Our objective was to determine the prevalence of *H. pylori* infection among university students.

2. Methods and Materials

The study was carried out at Hawler Medical University, including all four colleges (Medicine, Dentistry, Pharmacy and Nursing).

The study has been approved by the Ethics Committee of Medical Research Centre, Hawler Medical University. The students were free to participate in the study or to withdraw at any stage. Students were given complete information about the infection with *H. pylori* and its consequences. At the end of the study, students infected with *H. pylori* given treatment against the infection.

2.1 Subjects

400 students (100 from each college) were included in the study but only 311 students were fulfilled the inclusive criteria. The rest were missing or did not fill the questionnaire or did not agree about the blood test.

2.2 Blood Collection

Fresh blood collected by lancet stick from the right thumb of each student under fully aseptic condition. A blood drop was taken from each student and placed on special kit for detection of *H. Pylori*. The test was performed through one step by antigen cassette test (Linear chemicals, S.L, Barcelona, Spain). It is a qualitative immunochromatographic assay using monoclonal antibodies.

2.3 Questionnaire

A specially designed questionnaire was used for this study. It assessed participant's health status, social and demographic characteristics. The first part of the questionnaire contained questions regarding the demographic data (age, gender, blood groups and family income). The second part referred to selected features relating to the students' lifestyle such as living conditions, smoking, alcohol, caffeine consumption and the presence of gastric symptoms. The last part of the questionnaire was related to the family history and hygienic behaviors. The questionnaire was filled by the students themselves after short introduction about the study, *H. Pylori* prevalence and it is effect on our health.

2.4 Statistics

Data were analyzed using SPSS (Statistical Package for Social Science, V 20.0) chi-square test to determine the prevalence of *H. pylori* infection in the participants, and the difference in the prevalence across gender and stages. The differences between means were considered significant when P≤0.05.

3. Results

Our study showed that *H. pylori* was positive in 173 (55.8%) students, 104 (58.1%) of them were female and 69 (52.7%) were male (Table 1). *H. pylori* infection was higher (67.5%) among students aged (24–30) years than those students aged 18–20 year (47.0%) and those aged 21–23 year (59.1%) (Table 2).

226 students living in urban (Erbil) and 57 from rural (living in hostel in Erbil City), and no significant difference found between them (Table 3). Regarding the income level, most of the sero-positive participants (83.3%) were from low income social class (P value 0.043) (Table 4). Helecobacter positivity and student class, college and blood group were not significant (Table 5, 6). In addition, when *H. pylori* positivity was compared with cola, tea, coffee consumption, drinking water source (natural or minerals) and physical activity (playing sports, lye after meals and daily sleeping) no significant difference was found (Table 7, 8). Decreased appetite was related to Helecobacter positivity (P value 0.027) Table 9.

4. Discussion

The prevalence of *H. pylori* infection among students in Hawler Medical University was 55.8%, which is lower than in neighboring countries e.g. Kuwait 81% [10], Jordan 82%

Table 1. Gender and *H. pylori*

Gender	*H. pylori* test		Total	P*
	Negative	Positive		
Female	75 (41.9%)	104 (58.1%)	179 (57.7%)	
Male	62 (47.3%)	69 (52.7%)	131 (42.3%)	0.34
Total	137 (44.2%)	173 (55.8%)	310 (100%)	

Table 2. *H. pylori* infection in relation to age

Age of students	*H. pylori* test		Total	P*
	Negative	Positive		
18–20	62 (53.0%)	55 (47.0%)	117 (37.6%)	.038
21–23	63 (40.9%)	91 (59.1%)	154 (49.5%)	.037
24–30	13 (32.5%)	27 (67.5%)	40 (12.9%)	.011
Total	138 (44.4%)	173 (55.6%)	311 (100%)	

Table 3. *H. pylori* infection rates in relation to the residency

Residence of students	*H. pylori* test		Total	P*
	Negative	Positive		
Urban	100 (44.2%)	126 (55.8%)	226 (79.9%)	0.958
Rural	25 (43.9%)	32 (56.1%)	57 (20.1%)	
Total	125 (44.2%)	158 (55.8%)	283 (100%)	

Table 4. *H. pylori* infection in relation to the income level

Income level	*H. pylori* test		Total	P*
	Negative	Positive		
Low	3 (16.7%)	15 (83.3%)	18 (6.0%)	0.043
Good	122 (45.7%)	145 (54.3%)	267 (88.4%)	
High	9 (52.9%)	8 (47.1%)	17 (5.6%)	
Total	134 (44.4%)	168 (55.6%)	302 (100.0%)	

Table 5. *H. pylori* infection in relation to stage of the study

Class of student	*H. pylori* test		Total	P*
	Negative	Positive		
1st class	39 (53.4%)	34 (46.6%)	73 (23.2%)	0.211
2nd class	27 (45.8%)	32 (54.2%)	59 (18.7%)	
Third class	32 (36.8%)	55 (63.2%)	87 (27.6%)	
Forth class	18 (50.0%)	18 (50.0%)	36 (11.4%)	
Fifth class	23 (38.3%)	37 (61.7%)	60 (19.0%)	
Total	139 (44.1%)	176 (55.9%)	315 (100.0%)	

Table 6. *H. pylori* infection rates in relation to colleges

Name of the colleges	*H. pylori* test		Total	P*
	Negative	Positive		
Medicine	38 (40.9%)	55 (59.1%)	93 (29.5%)	0.361
Dentistry	43 (49.4%)	44 (50.6%)	87 (27.6%)	
Pharmacy	36 (48.0%)	39 (52.0%)	75 (23.8%)	
Nursing	22 (36.7%)	38 (63.3%)	60 (19.0%)	
Total	139 (44.1%)	176 (55.9%)	315 (100.0%)	

[11] and Turkey 63% [12]. This difference may be due to the design of our study in which we screened only medical students and because of their medical background they might have a different life style from the rest of the society. In another word they may take more precautions about their life and try to have healthier life style.

Female students were more infected with *H. pylori* than the male students (*P value*: 0.34). This was in contrary to others [13]. It may be due cultural reason that women take care of food preparation more than men and spend more time in the kitchen. Others found no gender-related difference in the prevalence of *H. pylori* infection [14].

Infection with *H. pylori* increased with age (higher rates 67.5% among students aged 24–30Y (*P value*: 0.011), which is in agreement with others [15–18]. This may be due to more exposure to this infection.

H. pylori is highly prevalent in low income students (*P value*: 0.043) in our country which may be due to more sedentary life and bad quality of food.

Crowded living conditions especially high number of children at home increased the risk [19, 20] but our data did not show or support this data.

There was no association between drinking-water and *H. pylori* infection (*P vale*: 0.738). This was in contrary to others[6] especially in places where untreated water was used [21]. This may be due to recent improvements in the water basic systems and services.

There was significant association between appetite and *H. pylori* infection (*P value*: 0.027) which is in agreement with others [22, 23]. *H. pylori* infection leads to chronic active gastritis in all infected individuals and thereby interferes with the release of gastric hormones, which are involved in the regulation of appetite and food intake. *H. pylori* infection leads to a decrease in circulating ghrelin through a reduction in ghrelin-producing cells in the gastric mucosa and to an increase in gastric leptin. Ghrelin

Table 7. *H. pylori* infection rates in relation to drinks

Drinks		*H. pylori* test		Total	P*
		Negative	Positive		
Cola consumption	Yes	67 (41.4%)	95 (58.6%)	162 (52.9%)	0.363
	No	67 (46.5%)	77 (53.5%)	144 (47.1%)	
	Total	134 (43.8%)	172 (56.2%)	306 (100.0%)	
Tea consumption	Yes	120 (44.9%)	147 (55.1%)	267 (85.9%)	0.828
	No	19 (43.2%)	25 (56.8%)	44 (14.1%)	
	Total	139 (44.7%)	172 (55.3%)	311 (100.0%)	
Coffee consumption	Yes	59 (46.1%)	69 (53.9%)	128 (41.7%)	0.662
	No	78 (43.6%)	101 (56.4%)	179 (58.3%)	
	Total	137 (44.6%)	170 (55.4%)	307 (100.0%)	
Drinking water source	Natural	108 (43.2%)	142 (56.8%)	250 (82.5%)	0.738
	Minerals	25 (49.0%)	26 (51.0%)	51 (16.8%)	
	both	1 (50.0%)	1 (50.0%)	2 (0.7%)	
Total		139 (44.1%)	176 (55.9%)	315 (100.0%)	

Table 8. *H. pylori* infection rates in relation to physical activity

Drinks		*H. pylori* test		Total	P*
		Negative	Positive		
playing sports	No	71 (40.6%)	104 (59.4%)	175 (57.8%)	
	Yes	62 (48.4%)	66 (51.6%)	128 (42.2%)	.173
	Total	133 (43.9%)	170 (56.1%)	303 (100.0%)	
lye after meals	No	48 (48.5%)	51 (51.5%)	99 (33.6%)	
	Yes	81 (41.3%)	115 (58.7%)	196 (66.4%)	.242
	Total	129 (43.7%)	166 (56.3%)	295 (100.0%)	
Daily sleeping	No	29 (47.5%)	32 (52.5%)	61 (20.3%)	
	Yes	101 (42.1%)	139 (57.9%)	240 (79.7%)	.442
	Total	130 (43.2%)	171 (56.8%)	301 (100.0%)	

Table 9. *H. pylori* infection rates in relation to appetite

Lack of appetite	*H. pylori* test		Total	P*
	Negative	Positive		
Yes	21(31.8%)	45 (68.2%)	66 (21.6%)	
No	113 (47.1%)	127 (52.9%)	240 (78.4%)	.027
Total	134 (43.8%)	172 (56.2%)	306 (100.0%)	

is an important factor in appetite and satiety regul-ation and after successful eradication of *H. pylori*, the number of ghrelin-positive cells in the gastric mucosa turns to normal.

5. Conclusion

H. pylori are highly prevalent among university students in our region. The seroprevalence of *H. pylori* is increasing with age. Higher frequency found in students from low income social status.

6. Acknowledgements

This study was sponsored by Hawler Medical University. Thanks to the Deans of the colleges (Medicine, Dentistry, Pharmacy and Nursing) for their cooperation. Thanks for the participants. Thanks to Mr. Rebwar J., Mr. Abdulla A., Mrs Ashti M. Said and Mrs. Chiman Hamid for their cooperation.

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