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Full Length Research Paper

Seroprevalence of *Helicobacter pylori* among Healthy Medical Students in Al-Basrah Province

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Background: *Helicobacter pylori* is a type of bacteria that causes endemic problem of gastritis B and peptic ulcer.

Aim: to determine the seroprevalence of *H. pylori* among medical students in Al-Basrah governorate.

Method: this study was done on 55 medical students in Basrah medical college, during April of 2014. Blood samples were collected from students and tested for *H. pylori* IgG antibodies, by using rapid diagnostic kit.

Results: from 55 students 28 males (50.9%) and 27 females (49.1%), 31 students (56.36%) showed +ve results for *H. pylori* antibodies. This study showed a relationship between blood group, no. of meals/day, and smoking with *H. pylori* infection.

Conclusion: *H. pylori* infection is endemic among Basrah medical students, O blood group, +ve smoking students and who eat frequent meals/day are more susceptible.

Keywords: *H. pylori*, basrah, seroprevalence

INTRODUCTION

Helicobacter pylori is a Gram-negative, spiral rods, microaerophilic bacterium found in the stomach. It was identified in 1982 by Australian scientists Barry Marshall and Robin Warren, who found that it was present in patients with chronic gastritis and gastric ulcers, it is also linked to the development of duodenal ulcers and stomach cancer. However, over 80 percent of individuals infected with the bacterium are asymptomatic^[1]. More than 50% of the world's population harbor *H. pylori* in their upper gastrointestinal tract. Infection is more prevalent in developing countries.

H. pylori's helix shape (from which the generic name is derived) is thought to have evolved to penetrate the mucoid lining of the stomach.^{[2][3]} As many as half of the world's population is infected with *H. pylori*. Those living in developing countries or crowded, unsanitary conditions are most likely to contract the bacterium, which is passed from person to person.

H. pylori only grows in the stomach, and is usually contracted during childhood.^{[4][5]} Interestingly, many people have this organism in their stomach, but don't get an ulcer or gastritis. Coffee drinking, smoking, and drinking alcohol increase the risk for an ulcer from *H. pylori*.^{[4][5]} If you are a carrier of *H. pylori*, you may have no symptoms. If you have an ulcer or gastritis, you may have some of the following symptoms:^{[4][5]}

- Abdominal pain
- Bloating and fullness
- Dyspepsia or indigestion
- Feeling very hungry 1 to 3 hours after eating
- Mild nausea (may be relieved by vomiting)

Patients who have *H. pylori* and also have an ulcer are most likely to benefit from being treated. Patients who only have

heartburn or acid reflux and *H. pylori* are less likely to benefit from treatment. The treatment does not work in all patients.^{[4][5]} Treatment must be taken for 10 to 14 days. Medications may include:^{[4][5]}

- Two different antibiotics, such as clarithromycin (Biaxin), amoxicillin, tetracycline, or metronidazole (Flagyl)
- Proton-pump inhibitors, such as omeprazole (Prilosec), lansoprazole (Prevacid), or esomeprazole (Nexium)
- Bismuth subsalicylate (Pepto-Bismol), in some cases.

Once the *H. pylori* bacteria are gone from your body, the chance of being infected again is very low. *H. pylori* infection is linked to stomach cancer and ulcer disease. A clean and germ-free environment may help decrease your risk of *H. pylori* infection. To avoid the acidic environment of the interior of the stomach (lumen), *H. pylori* uses its flagella to burrow into the mucus lining the stomach to reach the epithelial cells underneath, where there is a more neutral pH.^[6] *H. pylori* is able to sense the pH gradient in the mucus and move towards the less acidic region (chemotaxis). This also keeps the bacteria from being swept away into the lumen with the bacteria's mucus environment, which is constantly moving from its site of creation at the epithelium to its dissolution at the lumen interface.^[7] In addition to using chemotaxis to avoid areas of low pH, *H. pylori* also neutralizes the acid in its environment. It does this by producing large amounts of urease, which breaks down the urea present in the stomach to carbon dioxide and ammonia. The ammonia, which is basic, then neutralizes stomach acid.^[11]

The present study was aimed to determine the seroprevalence rate of antibodies against *H. pylori* (anti-HP) in medical students. And determine the role of various predisposing factors associated with prevalence of *H. pylori*.

MATERIAL AND METHODS

Students: A total of 55 healthy students attended to the microbiology lab. at university of Basrah, college of medicine, and were enrolled to take blood samples from them. The average age of the students was 21 yrs (28 males, 27 females). The study was done through January to April 2014.

Diagnosis of *H. pylori*: Blood samples were collected from the students. The blood either allowed to be clotted and the serum separated, or centrifuged (400xg for 5 mins.) to separate the serum. Then the serum was immediately examined by the rapid diagnostic *H. pylori* kit—Abon Biopharm (Hangzhou) Co., Ltd. P.R.China—.

Principle of the test: The one step *H. pylori* test device (serum/plasma) is a qualitative membrane based immunoassay for the detection of *H. pylori* antibodies in serum or plasma. In this test procedure, anti-human IgG is immobilized in the test line region of the test. After the specimen is added to the specimen well of the device, it reacts with *H. pylori* antigen coated particles in the test. This mixture migrates chromatographically along the length of the test and interacts with immobilized anti-human IgG. As illustrated in Figure 1

Questionnaire: All the students were asked about age, sex, stage, family no., address, blood group, smoking, eating (diet) habits, soft drinks, disease history, drug history, family history of infectious diseases, family history of infection with *H. pylori* and family history of peptic ulcer.

The current study was carried out with the approval of the student to collect blood and take the special history.

Statistical Analysis: SPSS (statistical program for social sciences) ver. 17 and Chi – square were used to find statistical relationship. (Between the variants, probability, $P < 0.05$ significant, while $P \geq 0.05$ wasn't significant)

RESULTS

From 55 healthy medical students, 28 males (50.9%) and 27 females (49.1%). Table 1.

The students were asked about the number of family members they were living with, and the results were 2 of them live with (2 – 3) family members (3.64%), 29 of them live with (4 – 6) family members (52.73%), and 24 of them live with (more than 7) family members (43.64%). There is no statistical relationship with a number of family members ($P > 0.05$). Table 2.

The educational level of the students' parents were, 1 parent with no education (0.9%), 6 parents finished the primary school (5.45%), 8 parents finished the secondary school (7.27%), 18 parents with academic level (16.36%), 60 parents finished the university (54.55%), and 17 parents are of higher educational level (15.45%). Table 3.

All the 55 students are living in urban areas (100%). Table 4.

We asked the students about blood group, 14 students are A blood group (25.45%), 15 students are B blood group (27.27%), 3 students are AB blood group (5.45%), and 23 students are O blood group (41.82%). There is a significant relationship with various ABO groups ($P < 0.05$) Table 5.

The disease history of the students' family shows, 7 of them have an infectious disease in their family (12.72%), 23 of the students told us that at least of their family members developed peptic ulcer (41.81%), 27 of them told us that there are no disease in their family (49.09%), and no one of the family members of the students has *H. Pylori* or probably they don't know as they didn't test for the bacteria. Table 6.

All students asked about special personal history, about the diet 2 (3.64%) are vegan, 1 (1.82%) eats meat only, and the other 52 (94.55%) students eat both meat and vegetables. There is a relationship with the type of diet ($P < 0.05$) Table 8. About the meals per day, 3 (5.45%) students eat 1 meal/day, 42 (76.36%) eat between 2 – 3 meals/day, and 10 (18.18%) students eat more than 3meals/day. There is a significant relationship with no. of meals/day ($P < 0.05$) Table 8.

About the soft drinks, 9 (16.36%) students drink 1 weekly, 16 (29.09%) drink between 2 – 3 times/week, 16 (29.09%) students drink more than 3 times/week, and 14 (25.45%) students don't drink soft drinks. Table 8.

About the smoking, 6 (10.9%) students are smokers. There is a significant relationship with smoking ($P < 0.05$) Table 8.

The disease history of students shows, 4 (7.27%) students have allergies, 32 (58.18%) students were having infectious diseases, 3 (5.45%) students have peptic ulcer, 14 (25.35%) have other diseases, and 17 (30.9%) students have no

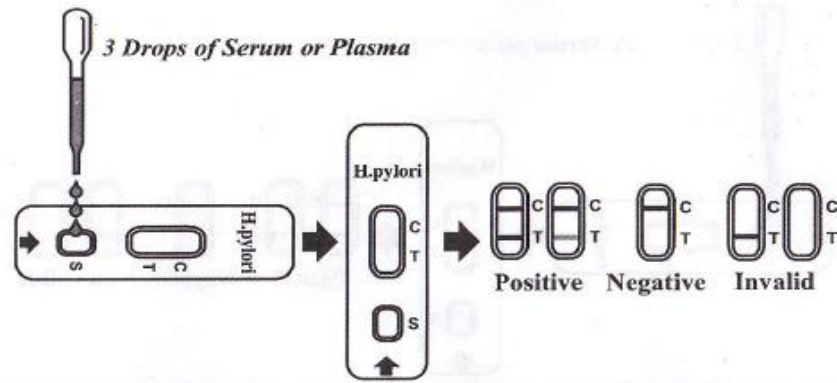


Figure 1: one step *H. pylori* test device (serum/plasma)

Seroprevalence of *H. pylori* Among Medical Student in Basrah

Case no. :

- Name: _____ gender: male female
- Age: _____ Stage: _____
- Family no.:
- Parents education:
- Address:
- Blood group:
- Test for anti-*H. pylori* antibody: +ve -ve
- Disease history:

- Drug history:
- Smoking: +ve -ve No. of cigarettes per day: _____
- Eating (diet) habits:
- Soft drinks: daily days per week No
- Family history for infectious diseases: +ve -ve
- Family history for infection with *H. pylori*: +ve -ve
 - If positive
 - what's the no. of infected persons: _____
 - what's the relationship (kinship) of infected person: _____

- Family history of peptic ulcer: +ve -ve
 - If positive
 - what's the no. of affected persons: _____
 - what's the relationship (kinship) of affected person: _____

Figure 2: Questionnaire paper that included all criteria that mentioned in the study.

Table 1. Distribution of medical students according to gender and seropositive rate for both sexes.

GENDER	NO.	PERCENTAGE	+VE	PERCENTAGE
Male	28	50.9 %	16	51.61%
Female	27	49.1 %	15	48.38%
Total	55	100 %	31	100%

*There is no significant relationship with both sexes.

Table 2. Relation between family members and seropositively rate of H. pylori

NO. OF FAMILY MEMBERS	NO.	PERCENTAGE	+VE	PERCENTAGE
1-3	2	3.64 %	1*	3.22%
4-6	29	52.73 %	12	38.7%
>= 7	24	43.64 %	18	58.06%
Total	55	100 %	31	100%

*P > 0.05

Table 3. Parents' education of medical students

EDUCATION LEVEL	NO.	PERCENTAGE
No education	1	0.9 %
Primary	6	5.45 %
Secondary	8	7.27 %
Academic	18	16.36 %
University	60	54.55 %
M.SC. & Ph. D	17	15.45 %
Total of both parents	110	100 %

*P < 0.05 there are statistical differences

Table 4. Living area of medical students

LIVING AREA	NO.	PERCENTAGE
Urban	55	100 %
Rural	0	0 %
Total	55	100 %

Table 5. Blood grouping of medical students

BLOOD GROUP	NO.	PERCENTAGE	+VE	PERCENTAGE
A	14	25.45 %	4*	12.9%
B	15	27.27 %	10	32.25%
AB	3	5.45 %	3	9.67%
O	23	41.82 %	14	45.16%
Total	55	100 %	31	100%

*P<0.05

Table 6. Family history of diseases for medical students

TYPE OF DISEASE	NO.	PERCENTAGE
Infectious	7	12.28 %
History of <i>H.pylori</i>	0	0 %
Peptic ulcer	23	40.35 %
No disease	27	47.36 %
Total	57	100 %

Table 7. Results of *H. pylori* among medical students

GENDER	+VE	PERCENTAGE	-VE	PERCENTAGE
female	15	27.27 %	12	21.82 %
male	16	29.09 %	12	21.82 %
Total	31	56.36 %	24	43.64 %

*P > 0.05 no significant relationship with both sexes.

Table 8. Personal history of medical students

		NO.	PERCENTAGE	+VE	PERCENTAGE	STATICS
Diet type	Vegan	2	3.64 %	1	3.22 %	P < 0.05
	Meat	1	1.82 %	1	3.22 %	
	Mixed	52	94.55 %	29	93.35 %	
	Other	0	0 %	0	0 %	
Meals / day	1	3	5.45 %	2	6.45 %	P < 0.05
	2-3	42	76.36 %	26	83.87 %	
	>3	10	18.18 %	3	9.67 %	
Soft drinks	1 weekly	9	16.36 %	4	12.9 %	P > 0.05
	2-3 weekly	16	29.09 %	10	32.25 %	
	>3 weekly	16	29.09 %	8	25.8 %	
	Never	14	25.45 %	9	29.03 %	
smoking	+ve	6	10.9 %	4	12.9 %	P < 0.05
	-ve	49	89.09 %	27	87.1 %	
Disease history	Allergy	4	7.27 %	1	3.22 %	P < 0.05
	Infection	32	58.18 %	14	45.14 %	
	Peptic ulcer	3	5.45 %	3	9.67 %	
	Other	14	25.45 %	4	12.9 %	
	No disease	17	30.9 %	9	29.03 %	
Recent drug history	Antibiotic	22	40 %	13	41.93 %	P < 0.05
	Anti – allergic	3	5.45 %	1	3.22 %	
	Other	21	38.18 %	7	22.58 %	
	No drugs	23	41.81 %	15	48.38 %	

disease. There is a relationship with personal disease history (P < 0.05) Table 8.

Concerning the drug history of the students, 22 (40%) students take antibiotics, 3 (5.45%) students take anti – allergic drugs, 21 (38.18%) students take other drugs, and 23 of them didn't take drugs. There is relationship with drug history of the students. Table 8.

The results for *H. pylori* antibodies that we did for the students revealed, 31 (56.36%) students show +ve results 15 (27.27%) females, and 16 (29.09%) males. Table 7. 18 (58.06%) students of +ve results live with more than 7 of family members. Table 2

And 14 (25.45%) of students are O blood group. Table 5.

2 (6.45%) of students who showed +ve results eat one meal daily, 26 (83.87%) students eat (2 – 3) meals daily, and 3 (9.67%) students eat more than 3 meals daily. Table 8.

4 (12.9%) of students who show +ve results are smokers, while 27 (87.1%) students are nonsmokers. Table 8.

DISCUSSION

The results of this study did not show a significant relationship between the number of family members and infection with *H. pylori* (P > 0.05). And this may be due to accommodation of

students, they have isolated rooms and so. In this study regarding the living area of the students, it's of no importance, because all students live in urban areas. Concerning the blood groups, this study revealed that there is a relationship between blood group and infection with *H. pylori* ($P < 0.05$), a finding which is reinforced by data obtained from many other studies.^{[8],[9]} Majority of infection with *H. pylori* is in students with O blood group (45.16%). While students with A blood group are the minimum ratio for infection with *H. pylori*. About the eating habits this study shows a relationship between meals per day and infection with *H. pylori* ($P < 0.05$). Students that eat 2 – 3 meals per day are more prone to infection. Soft drinks didn't show relationship with *H. Pylori* infection ($P > 0.05$). Smoking also related to the infection with *H. pylori*, as this study show relationship between smoking and *H. pylori* infection.^{[10] [12][13][14]} There is a relationship between disease history of the student and *H. pylori* infection ($P < 0.05$), all students with peptic ulcer are infected with *H. pylori*.^[15] Also, recent drug history showed relationship ($P < 0.05$), 13 (41.93 %) students who are using antibiotics give +ve result for *H. pylori*, this may be due to the development of resistance. In this study there's no relationship between gender and *H. pylori* infection. ($P > 0.05$).

CONCLUSION

From this study, which was done in Al-Basrah medical college, on medical students of different stages. It can be concluded:

1. *H. pylori* infection is an endemic problem, which should be dealt with by improving sanitation and purified water supply and also should be investigated for and eradicated.
2. O blood group students are more susceptible for *H. pylori* infection. and/or they have more cellular and immunological response to it (expressed by seropositivity) than other ABO blood groups (group A in particular).
3. Students who eat more than 1 meal per day are more prone to infection and this may be due to increase in the activity of the stomach to secrete more HCl, more acidity.
4. Smokers are more susceptible for *H. pylori* infection.

5. All students who develop peptic ulcer showed +ve results for *H.pylori*, so it should investigate for *H. pylori*, if there are symptoms of peptic ulcer, for eradication.
6. Antibiotics have a role for emergence of resistance, so they should be used carefully, and for full course.

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