Screening for *Helicobacter Pylori*IgG among Undergraduate Student of Hawler Medical University/ College of Health Sciences

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Abstract:

Background: *Helicobacter pylori* is a significant pathogen of the gastrointestinal tract infection connected with gastritis, peptic ulcers, and gastric carcinoma. Its infection influences more than half of the world's inhabitants.

Objective: To reveal the prevalence rate of *H. pylori* infection and linked factors (age, gender, residency, blood group, sources of drinking water and type of food) among students in College of Health Sciences, Erbil, Iraq.

Material and Methods: 141 students (73.75% female and 26.24% male) in Colleges of Health Sciences at Hawler Medical University were taken on. Seroepidemiologic method used for detection of *H. pylori*IgG antigens using rapid immune chromatographic assay (Camp Medica Group, Bucharest, Romania). A questionnaire sheet was prepared and used for each study subject.

Results: Among 141 students, 33(23.40%) were infected with *H. pylori*. The infection was more prevalent in female students (26%) of total female participant comparing with male students (7%) of total male participant. The higher rate of infected showed in age 20 (29.78%) and high rate of infected students showed no symptoms.

Conclusions: *H. pylori* are highly prevalent among University students in our region. The great prevalence of *H. pylori* was found in the students with O blood group, elder age groups, urban area, and females.

Keywords: Prevalence, *Helicobacter pylori*IgG, Gastroenteritis, Immunochromatographic assay.

Introduction:

Helicobacter pylori (H.pylori) is a Gram-negative bacilli shaped bacterium which lives in the human stomach circumference. *H. pylori* Colonizing the stomach and threatens local inflammation in almost all host, a continuous action increases the risk of developing atrophic gastritis, intestinal metaplasia, and non-cardia gastric adenocarcinoma [1, 2, 3]. The fourth most common cancer is stomach cancer caused by *H. pylori* and it is the second cause of death-rate due to cancer in the world. About (50%) of the world population are infected by *H. pylori* and this rate of infection is higher in underdeveloped countries than in developed countries [4].

Diagnosis of stomach infection with *H. pylori* bacteria usually involves Endoscopy. However, serological methods have reached adequateexactnessin pre-endoscopic examination tests or serological epidemiological investigations where people infected with *H. pylori* have antibodies extremely related to histologically confirmed *H. pylori* infection [5].

Helicobacter pylori infection can cause stomach and peptic ulcer disease and is a cofactor in stomach cancer [6].

Seroepidemiologicinvestigations have shown that (50%) of adults in the developed countries and nearly (90%) of adults in the developing countries are positive for serum antibodies against *H. pylori* [7]. However many conditions are known to be related to chronic *H. pylori* infection. Among these are gastric mucosa [8], peptic ulcer disease, primary gastric lymphoma and gastric adenocarcinoma [9].

There sponsibility of morbidity and mortality diseases related to *H. pylori* is massive in both developing and developed countries. The infection cans constant for periods in most untreated persons [10] and spontaneous extirpation rarely (1% or less) appear [11]. The epidemiology of *H. pylori* infection has been investigated with the development of sensitive and specific serologic test [12].

The aim of this study was to find the prevalence of *H. pylori* among under graduated students in College of Health Sciences, Hawler Medical University by using rapid test detection of IgG in the serum and it is relation with various socio-demographic factors.

Material and Methods:

Study Design and Setting

The present study was carried out in the college of Health Sciences at Hawler Medical University in Erbil Governorate, Northern Iraq. The total number of students in the college of Health Sciences at Hawler Medical University, Erbil, is 612 students of both genders divided into 3 departments. The study was carried out between January and February 2019.

Random samples of 141 students of both genders (male and female), who were studying at Hawler Medical University, Erbil, from different departments (Medical microbiology, Clinical biochemistry and Physiotherapy) were invited to participate in the study. The objectives and the significance, for both, the University community and Public health of the study, were explained for the participants and formal consent was obtained.

Collection of Blood Specimens and Serum Extraction

Blood specimens were collected from the participants, in clean, sterile, test tubes (without anticoagulants). A specific numeric code was used for each sample, Blood samples were allowed to clot at room temperature. The clotted blood then centrifuged at 2000 rpm for 10 min. After centrifugation, the clear supernatant serum was collected by micropipette and dispensed in a clean, sterile 1.5 mL capacity microcentrifuge tubes and immediately tested by immunological assay to detect IgG*H.pylori* antibodies.

Detection of Anti-*H.pylori* Antibodies

*H. pylori*IgG antibodies rapid immunochromatographic test (Camp Medica Group, Bucharest, Romania) was used for the qualitative detection of anti-*H. pylori*IgG antibodies in the sera of the participants. The test is a one-step rapid chromatography immunoassay.

Design of Questioner and Data Collection

A closed-ended questionnaire was designed including information on the participants; age, gender, residency, blood group, Rhesus factor, sources of drinking water (tap water, bottled water or both), type of meals (homemade, restaurant or both), and history of clinical manifestations (abdominal pain, diarrhea, flatulence, nausea, heartburn and asymptomatic). The data were collected through direct interviews with

the students who agreed to participate in the study after a short introduction about the study, *H. pylori* seroprevalence and it is an effect on our health.

Statistical analysis:

The results were analyzed using Statistical Package for the Social Sciences (SPSS). The proportion and their frequencies were checked by chi-square (x2) test. The *p* value ≤ 0.05was considered as significant.

Results:

The result of this study revealed that among 141 students of College of Health Sciences at Hawler medical University seroprevalence was positivein 33(23.4%)of students with *H. pylori* as shown in table (1).

In table (2) it noticed that the highest percentageof *H. pylori* was found in females 26(25%) with highly significant difference (*p* value ≤0.5, asshown in table (2).

The result of the current study showed the highest prevalence of *H. pylori* 14(29.78%) among students in the age 20years with highly significant difference (*p* value ≤ 0.5), as revealed from table (3).

The prevalence of H. *pylori* was (21.97%) in the urban community and (26%) in rural (village) residents with highly significant difference statistically (p ≤ 0.05) as shown in table (3).

The frequency of the ABO blood groups among positive patients was as follow (A = 20.51%, B = 24.24%, AB = 50%, O = 22.22% as revealed in table (5), the results of this study proposed that ABO blood groups influence Serological positivity for *H. pylori* infection (*p* v In this study a total of 33 seropositive students 5 male and 22 females were taking food in both restaurant and homemade. The highest percentage of *H. pylori* infections were among females with history of mixed type of food eating (81.48%) while among male the highest percentage was in those with history of homemade food eating with high significant difference statistically (*p* value≤0.5)

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Regarding the source of water drinking: in table (7) showed that those drinking bottle water among female have more incidence of seropositive result than tap water while in the male the highest percentage of seropositive result was among those drinking tap water with high significant difference statistically (*p* value≤ 0.05)

Regarding the clinical presentation: the result of this study discovered that the (100%) of infected males complained from diarrhea and nausea while (100%) of females were complain of abdominal pain table (8)**.**

Table (1): Distribution of *H. pylori* infection.

Number of students	Result		Total
	Positive (%)	Negative (%)	141
	33 (23.40%)	108 (76.59%)	(100%)

Table (2): Distribution of *H. pylori* infection in relation with gender.

Gender	Result		Total
	Positive (%)	Negative (%)	
Male	7 (18.91%)	30 (81.08%)	37 (26.24%)
Female	26 (25 %)	78 (75%)	104 (73.75%)
Total	33 (23.40%)	108(76.59%)	141
p value ≤ 0.5			

Table (3): Distribution *of H. pylori* infection in relation with age groups.

Age Groups (Years)	Result		Total
	Positive (%)	Negative (%)	
17	2 (22.22%)	7 (77.77%)	9 (%)
18	6 (22.22%)	21 (77.77%)	27 (%)
19	11 (18.96%)	47 (81.03%)	58 (%)
20	14 (29.78%)	33 (70.21%)	47 (%)
Total	33	108	141
p value ≤0.5			

Table (4): Distribution of *H. pylori* infection in relation to the residency.

Residency	Result		Total
	Positive (%)	Negative (%)	
Urban	20 (21.97%)	71(78.02%)	91
Rural	13 (26.00%)	37 (74.00%)	50
Total	33	108	141
p value ≤0.5			

Table (5): Distribution of *H. pylori* infection in relation with blood group.

Blood group	Result		Total
	Positive (%)	Negative (%)	
A	8 (20.51%)	31 (79.48%)	39
B	8 (24.24%)	25 (75.75%)	33
AB	3 (50%)	3 (50%)	6
O	14 (22.22%)	49 (77.77%)	63
Total	33	108	141
p value ≤0.5			

Table (6): Distribution of *H. pylori* infection in relation with meal type.

Feeding habits	Result		Total
	Number of Positive male (%)	Number of positive female (%)	
Homemade	1(50%)	1 (50%)	2
Restaurant	1 (25%)	3 (75%)	4
Both	5 (18.51%)	22 (81.48%)	27
Total	7	26	33
p value ≤0.5			

Table (7): Association of drinking water sources and *H. pylori*infection.

Source of drinking water	Result		Total
	Number of Positive male (%)	Number of positive female (%)	
Tap water	1 (25%)	3 (75%)	4
Bottle water	0 (0%)	3 (100%)	3
Both	6 (23.07%)	20 (76.92%)	26
Total	7	26	33
p value ≤0.5			

Table (8): Clinical manifestations experienced by positively reacted students to anti-*H. pylori* test.

Clinical manifestations	Result		Total
	Number of Positive male (%)	Number of positive female (%)	
Diarrhea	1 (100%)	0 (0%)	1
Abdominal pain	0 (0%)	4 (100%)	4
Flatulence	1(25%)	2 (75%)	3
Nausea	1 (100%)	0 (0%)	1
Heartburn	1 (50%)	1 (50%)	2
Asymptomatic	3 (13.63%)	19 (86.36%)	22
Total	7	26	33
p value ≤0.5			

Discussion:

Helicobacter pylori is a major causative agent of several gastrointestinal diseases like chronic gastritis and peptic ulcer disease [13]. Furthermore, *H. pylori* plays a pivotal role in the pathogenesis stomach cancer, which is the fifth most common incident cancer and the third leading cause of death worldwide. Additionally, mucosa-associated lymphoid tissue (MALT) lymphoma [14]. So the epidemiological studying about *H. pylori* is essential because it provides necessary information regarding its prevalence rate, also help in establishing public health action that could halt transmission and then acquirement of the infection, beside aid the therapeutic programs to eradicate the bacterium. The result of this study revealed that among 141 students of College of Health Sciences at Hawler Medical University seroprevalence was (23.4%) rate of *H. pylori*. The prevalence observed in our study was lower compared with those reported in previous study (55.8%) which done by [15] the difference is may be due to students background, they might have a different life style from the rest of the society.

From table (2) it is noticed that the highest percentage of frequency of *H. pylori* showed in females (25%), while the lowest rate of occurrence was found in male (18.9%). Statistically, the differences in the *H. pylori*serotypic test between male and female were highly significant (p≤ 0.05) our result was compatible with [16], in turkey, who found that the female was more exposed to infection with *H. pylori*.In assay of merging between sex and infection rate using serology, in contrast [17] showed that *H. pylori* infection has no significant combination with sex (p>0.05). Interestingly, some studies

showed that there was no significant difference in the prevalence rate of *H. pylori* infection between male and female using the same method of (Eusebi*et al*andJahan*etal)* [18, 19]. This is not compatible with our results that propose that females tend to be more exposed to infection with H. pylori.

The result from table (3) showed that the prevalence of *H. pylori* among students according to age between (17-20) years (18-29.78%) and the higher rate of infection showed in age 20(29.78%) this may be due to more exposure to this infection. The result was agree with result found by (AL-Mashhadany*et al)* [20], they determined (27, 3%) positive result with age from (21-30) years. The results obtained by (Khedmat*etal)* [15] found that (47%) of *H. pylori* infection in age between (18-20), and (59.1%) with age between (21-23), and (67.5%) in age (24-30) which is agreed with present result.

The prevalence of *H. pylori* was (21.97%) in the urban community and (26%) in rural (village) residents (p value $\leq$ 0.05) table (4). The result demonstrated that infection in the stomach juice of a rural community maybe due to difference in social and economic conditions, such as lack of proper hygiene practices and very limited sanitation. The same result obtained by (Contreras *et al*.) [21].

The prevalence of the ABO blood groups among seropositive patients was (A = 20.51%, B = 24.24%, AB = 50%, O = 22.22%). The results of this study proposed that ABO blood groups affect Sero-positivity for *H. pylori* infection. The same result recorded by (Jaff, 2011) [22], who supposed that blood group (O) individuals are more sensible to *H. pylori* infection and its symptomatic gastrointestinal complications, and/or they have more cellular and immunological response to it.

In current study a total of (33) seropositive students 5 male and 22 female shave been served food in both restaurant and homemade. *Helicobacter pylori* infection is directly associated with food. Poor food hygiene is one of the causes for *H. pylori* infection. 26 of infected were drinking tap and bottle water whereas 4 were drinking tap water and 3 of infected students were drinking bottle water. Our finding is agreeing with (Jahan, *etal*) [19], who illustrated thesero-prevalence of *H. pylori* in both groups of students (those who consume food at home and in restaurants). We can say that the student's antibody status of *H. pylori* was not usually affected on campus food. Total of 22 showed no symptoms or specific clinical signs have been described in patients with *H pylori* infection. Only four showed abdominal discomfort.

Conclusion:

Among 141 students 33 showed positive results with *H. pylori* infection, female showed higher infected rate than male, the infection of *H.pylori* showed in all blood groups and (O) blood group students showed higher rate, result of present study indicates that hygiene is one of the important factors in infectious diseases.

References:

[1]. Alkout AM, Blackwell CC, Weir DM, Poxton IR, Elton RA, Luman W, Palmer K. Isolation of a cell surface component of *Helicobacter pylori* that binds H type 2, Lewis a and Lewis b antigens. Gastroenterology. 1997;112(4):1179–1187.

[2]. Alkout AM, Blackwell CC, Weir DM. Increased inflammatory responses of persons of blood group O to *Helicobacter pylori*. J Infect Dis. 2000;181:1364–1369.

[3]. Akbar DH, El Tahawy AT. *Helicobacter pylori* infection at a university hospital in Saudi Arabia, prevalence, comparison of diagnostic modalities and endoscopic findings. Indian journal of pathology and. Microbiology. 2005;48(2):181–185.
[4]. Fock KM, Ang TL. Epidemiology of *Helicobacter pylori* infection and gastric cancer in Asia. J GastroenterolHepatol. 2010;25: 479–486.
[5]. Lepper PM, Möricke A, Vogt K, Bode G, Trautmann M. Comparison of different criteria for interpretation of immunoglobulin G immunoblotting results for diagnosis of *Helicobacter pylori* infection. ClinDiagn Lab Immunol. 2004;11(3): 569-576. doi:10.1128/CDLI.11.3.569-576.2004
[6]. Sasidharan S, Ghayethry B, Ravichandran M, Latha LY, Lachumy SJ, Leng KM, Rao SG. Prevalence of *Helicobacter pylori* infection among patients referred for endoscopy: Gender and ethnic differences in Kedah, Malaysia. Asian Pacific Journal of Tropical Disease. 2012 Feb 1;2(1):55-9.
[7]. Chi H, Bair MJ, Wu MS, Chiu NC, Hsiao YC, Chang K. Prevalence of *Helicobacter pylori* infection in high-school students on Lanyu Island, Taiwan: risk factor analysis and effect on growth. J Formos Med Assoc. 2009; 108(12): 929-36.
[8]. Kusters JG, Van Vliet AH, Kuipers EJ. Pathogenesis of *Helicobacter pylori* infection. ClinMicrobiolRev. 2006; 19 (3): 449-90.
[9]. Zhang L, Eslick GD, Xia HH, Wu C, Phung N, Talley NJ. Relationship between alcohol consumption and active *Helicobacter pylori* infection. Alcohol 2010; 45(1): 89-94.
[10]. Blaser MJ. *Helicobacter pylori* and the pathogenesis of gastroduodenal inflammation. J Infect Dis. 1990; 161: 623–33.
[11]. Kuipers EJ, Pena AS, Pels NF, Kurz-Pohlmann E, Meuwissen SG, van Kamp G, Uyterlinde AM, Pals G. Seroconversion for *Helicobacter pylori*. The Lancet. 1993 Aug 7;342(8867):328-31.
[12]. Taylor DN, Blaser MJ. The epidemiology of Helicobacter pylori infection. EpidemiolRev. 1991; 13: 42–59.
[13]. Rauws EA and Tytgat GN. Cure of duodenal ulcer associated with eradication of *Helicobacter pylori.* Lancet; 1990; 335(8700):1233-5.
[14]. Asghar RJ and Parsonnet J. *Helicobacter pylori* and risk for gastric adenocarcinoma. Seminars in gastrointestinal disease.2001; 12: 203-8.
[15]. Khedmat H, Karbasi-Afshar R, Agah S, and TaheriS.*Helicobacter pylori* Infection in the general population: A Middle Eastern perspective. Caspian J Intern Med. 2013; 4(4): 745–753.
[16]. Yucel T, Aygin D, Sen S and Yucel O. The Prevalence of *Helicobacter pylori* and Related factors among University students in Turkey, Japanese J. of Infectious Diseases. 2008; 61 (3):179-183.
[17]. Nwodo EN, Yakubu SE, Jatau ED, Yabaya A Seroprevalence of *Helicobacter pylori* Infection in Patients with Gastritis and Peptic Ulcer Disease in Kaduna, African Journal of Basic and Applied Sciences. 2009; 1(5-6): 123-128.
[18]. Eusebi LH, Zagari RM, Bazzoli F Epidemiology of *Helicobacter pylori* Infection. Helicobacter. 2014; 19(1): 1-5.
[19]. Jahan H, Chowdhury A, Uddin J. *Helicobacter pylori* infection on medical students: A study on MAG Osmani Medical College, Bangladesh, International Journal of Medi-cine and Medical Sciences. 2010; 2(11), 354–358.
[20]. AL-Mashhadany DA, Ismael LQ, Zaki AM. Seroprevalence of *Helicobacter pylori* among human in Erbil governorate, Kurdistan region, Iraq. Research journal of life science, Bioinformatics, Pharmaceutical and Chemical Sciences. 2018; 4(2): 268.
[21]. Contreras M, Fernández-Delgado M., Reyes N, García-Amado M., Rojas H, and Michelangeli F. *Helicobacter pylori* Infection in Rural and Urban Dyspeptic Patients from Venezuela. Am J Trop Med Hyg. 2015 Oct 7; 93(4): 730–732.
[22]. JaffMS. Relation between ABO blood groups and *Helicobacter pylori* infection in symptomatic patients. ClinExpGastroenterol. 2011; 4: 221–226.