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Prevalence and Risk Factors of Helicobacter Pylori Infection in Misan, Iraq: A Cross-Sectional Screening Study Using Stool Antigen Test

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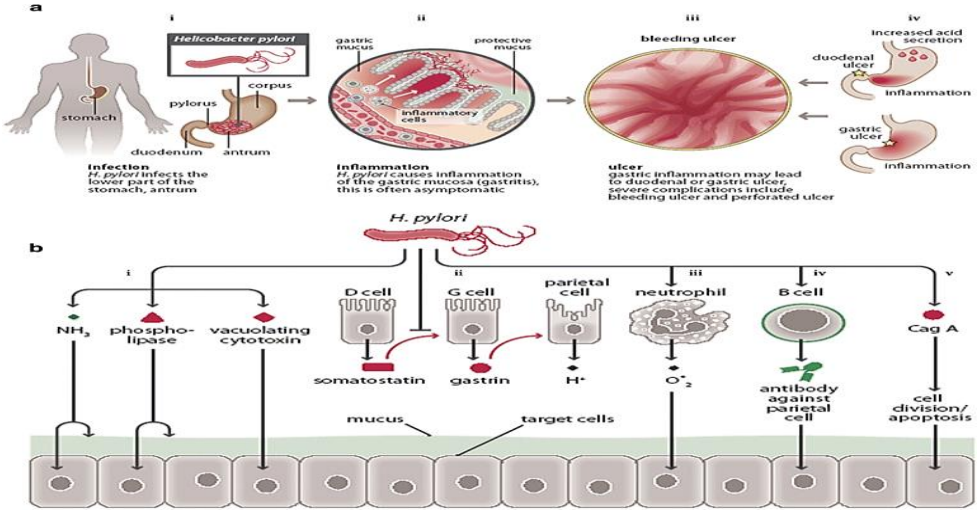
ABSTRACT

Helicobacter pylori infection is one of the major causes of persistent bacterial infection known to human. It is found to be directly or indirectly responsible for a variety of human diseases, the most frequent of which are chronic gastritis and peptic ulcer diseases. It has a high prevalence in both genders and all age groups. The purpose of this study is to find out the prevalence of active Helicobacter pylori (H. pylori) infection by employing a stool antigen test as a screening technique. This study enrolled a total of 389 subjects, with a mean age of 36 (±16) years, and of them 225 were women. The participants' personal data and lifestyle practices were recorded, as well as fecal sample was taken and sent for serology study as an evidence of H. pylori infection. The results show that, Helicobacter pylori infection was found in 54% (210) of the participants. Regarding risk factors, age, gender, residence, and educational background have no impact on the prevalence of the infection. On the other hand, the infection has a substantial link to the personal and family economy and fast food consumption. Conclusion, H. pylori infection is common in our community (albeit slightly less so in our research) among people of all ages and genders, and it appears that certain lifestyle choices play a crucial role in the disease transmission.

GRAPHICAL ABSTRACT



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Introduction

Helicobacter pylori (H. pylori) infection is the most prevalent cause of persistent bacterial infection [1,2]. The organism is most commonly seen in the Gastric antrum and sites of gastric metaplasia in the duodenum [3]. It has been implicated as the primary cause of chronic gastritis, gastric and duodenal ulcers, gastric B-cell lymphoma, and distal gastric cancer [3]. There are many hematological, immunological illnesses as well as the phenomena of insulin resistance syndrome have been linked to the infection at least in theory [4-6].

H. Pylori is widespread in all age groups and all parts of the world, with current estimates indicating that half of the world population is afflicted [2]. In low-income countries, it is quite common, with some studies suggest a prevalence of about (80-95%) [7]. The typical transmission mode is unknown; however, household clustering implies that it spreads primarily from person to person at a young age [8]. The prevalence rate varies among researchers; in the middle east and north Africa, the prevalence was 36.8–94% in adults [9], whereas in Taiwan, the prevalence of stool-antigen positive H. pylori infection in patients with dyspepsia was 37.9 [10]. The prevalence was lowest reported at Switzerland of about 18.9% and highest in Nigeria of About 87.7% [7].

In low-income countries, the illness was thought to infect people earlier than in industrialized nations [11]. According to recent data, the prevalence of H. pylori has decreased in Saudi Arabia during the last ten years (12). In Egypt, the illness is widespread in healthy, asymptomatic persons, in people of all ages (13-15). In Egyptian research, poverty, developmental problems, living in the periphery, and lower educational levels were all considered risk factors for H. pylori infection (14).

Several risk factors are tied to getting the infection, including social circumstances, economic status, educational level, overcrowding and hygiene practices, running water, sewage system, and consumption of fast food. This study uses a stool antigen test to evaluate the prevalence of Helicobacter pylori infection in a sample of people with different gastrointestinal complaints, and to assess certain risk factors linked to the infection.

Method and Materials

At Al Sadder Teaching Hospital in Misan, Iraq, cross-sectional observational research was conducted. Before being enrolled in the study, all subjects gave their written permission. The study was authorized by Misan Medical College's Ethical Committee.

Data Collection

From December 2018 to May 2020, 389 subjects aged 18 and above were recruited randomly for the research. Exclusion criteria include: use of proton pump inhibitor in the last 14 days, use of antibiotics in the last one month, lower gastrointestinal bleeding, and history of gastric surgery, pregnancy, chronic kidney disease and Heart failure. There were 225 females and 134 males in the research.

Before enrolling in the study, each subject pass through a simple randomization method, in which the individual had to choose a random paper from a basket; each paper had a written number from 1-10, and any subject who had an even number was enrolled in the study, and those with odd number excluded. A basic closed-ended questionnaire was then used to obtain data on the participant's age and gender, home location (urban vs. rural), educational background, and earnings. Then we provided each subject with a plain tube and sampling stick and asked them to collect a sample of their stool after teaching them how to collect. Then the samples were processed for evidence of H. pylori antigen using a quick antigen test-based immunoassay cassette. The test is a rapid, qualitative, one-step H. pylori card test used to detect helicobacter pylori in the stool.

Statistical Analysis

Microsoft Access and Excel were used to enter and match data, subsequently analyzed using IBM SPSS Statistics for Windows, version 26.0. The data was expressed using univariate and multivariate analysis with the mean, standard deviation, or frequency (percent). A p-value of

0.05 was declared statistically significant in the research.

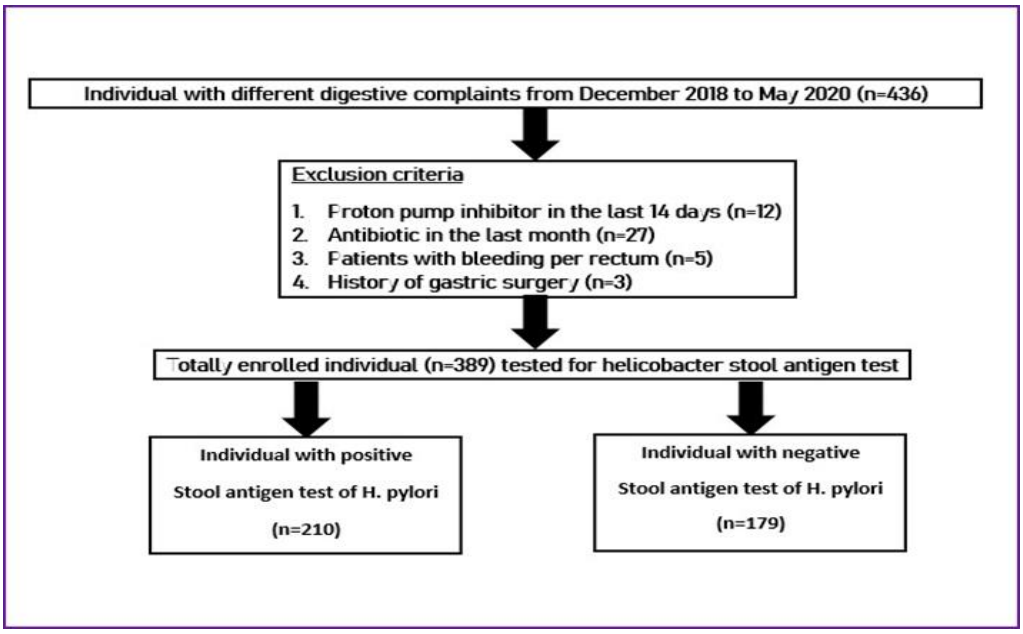

Figure 1: Flowchart of the study

Results

Women comprise 225 of the 389 participants in our research, while males make up 134. The participants are 36 (±16) years old on average. Two hundred ten people tested positive for H. pylori (54 %).

The participants' age, sex, residence, and educational qualification revealed no significant relationship with H. pylori infection. As indicated in table 1, there is a statistically significant (P value less than 0.05) link between H. pylori infection and income and junk food consumption.

Table 1: Prevalence and epidemiological characteristics of H. pylori infection in a sample of 389 of randomly selected subjects

Variables		H.pylori stool Ag test		P-value
		Ag (+ve)	Ag (-ve)	
Total number of subjects (n = 389)		210 (54%)	179 (46%)	
Age (mean ± standard deviation) years		37.8 ± 15	35.6 ± 17	0.2
Gender - n (%)	Women (n=255)	140 (54.9)	115 (45.1)	0.61
	Men (n=134)	70 (52.2)	64 (47.8)	
Residence - n (%)	Urban (n=288)	148 (51.4)	140 (48.6)	0.08
	Rural (n=101)	62 (61.4)	39 (38.6)	
Education - n (%)	Uneducated (n=142)	76 (53.5)	66 (46.5)	0.603
	Primary (n=130)	74 (56.9)	56 (43.1)	
	Secondary (n=79)	42 (53.2)	37 (46.8)	
	College (n=38)	18 (47.4)	20 (52.6)	
Income - n (%)	Low (n=141)	86 (61)	55 (39)	0.044**
	Average (n=210)	106 (50.5)	104 (49.5)	
	High (n=38)	18 (47.7)	20 (52.6)	
Fast Food – n (%)	No fast food consumption (n=125)	57 (45.6)	68 (54.4)	0.034**
	Infreq. consumption (n=91)	52 (57.1)	39 (42.9)	
	Freq. consumption (n=173)	101 (58.4)	72 (41.6)	

Discussion

Since first recognized more than a decade ago, infection with helicobacter pylori continues to be among the most common form of chronic infection Known to humankind [2]. Since then, Helicobacter pylori has been tied to many pathologies, and the list of diseases continues to expand [3,5,6], however the full range of implications is not entirely acknowledged.

The prevalence of positive H. pylori infection using stool antigen test was 54% among the participants of this study, which is lower than the expected figures reported in other parts of our country (67%) [12], and bordering countries [13,14]. This survey's lower prevalence might be attributed to a better standard of life, higher income, enhanced health awareness, and improved sanitation.

According to this study, the prevalence is slightly higher in women than in men (54.9 % vs. 52 %). Male predominance has been seen in numerous parts of the world, according to a recent meta-analysis of 184 research published in 2018 [15]. The higher prevalence of the infection among the women in our study might be due to cultural factors since women do most of the housekeeping and cooking, and food preparation.

Even though persons from rural areas had a greater frequency of H. pylori infection, the outcome was statistically insignificant (p-value 0.09). Many studies have found a link between where you live and the infection [16-18]. This might be due to inadequate sanitation, a lack of health knowledge, or water supply issues. The study found no link between educational attainment and the frequency of H. pylori infection (p-value 0.6). On the other hand, several studies suggest a link [19]. Our study's lack of a relationship might be due to limited sample size or increased public health awareness.

Our research found a statistically significant relationship between family and personal earnings and H. pylori infection (p-value 0.044). This finding has been confirmed in several investigations [19,20]. Overcrowding, sharing a bed, poor sanitation, and a lack of running water have all been associated with a greater risk of H. pylori infection in those with low income. The study also found a significant link between illness and fast food consumption (P-value 0.034), with daily out-of-door fast food intake being greater [21,22]. This link might be explained by improper food handling and person-to-person transfer.

There are many limitations to this study. First, our results are mainly based on a small sample size (389 individuals). These findings could be different if a more generous sample size or multicenter study were performed. Second, all individuals enrolled in this study are symptomatic. So the prevalence does not truly reflect the overall prevalence of H. pylori in the population since it does not include asymptomatic individuals. Another pitfall to be mentioned is that the test we use in this study is less sensitive and specific than the currently recommended ELIZA test or urea breath test. Our result may overestimate or underestimate the prevalence of the infection with H. pylori.

Conclusion

H. pylori infection is common in our community (albeit slightly lower in our research) among people of all ages and genders. Several epidemiological and lifestyle factors appear to be crucial in disease transmission.

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Authors' contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

Conflict of Interest

There are no conflicts of interest in this study.

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References

[1]. Watari J., Chen N., Amenta P.S., Fukui H., Oshima T., Tomita T., Miwa H., Lim K.J., Das K.M., Helicobacter pylori associated chronic gastritis, clinical syndromes, precancerous lesions, and pathogenesis of gastric cancer development, *World journal of gastroenterology*, 2014, **20**:5461 [Crossref], [Google Scholar], [Publisher]

[2]. Bravo D., Hoare A., Soto C., Valenzuela M.A., Quest A.F., Helicobacter pylori in human health and disease: Mechanisms for local gastric and systemic effects, *World journal of gastroenterology*, 2018, **24**:3071 [Crossref], [Google Scholar], [Publisher]

[3]. Ansari S., Yamaoka Y., Survival of Helicobacter pylori in gastric acidic territory, *Helicobacter*, 2017, **22**:e12386 [Crossref], [Google Scholar], [Publisher]

[4]. Hasni S.A., Role of Helicobacter pylori infection in autoimmune diseases, *Current opinion in rheumatology*, 2012, **24**:429 [Crossref], [Google Scholar], [Publisher]

[5]. Robinson K., Atherton J.C., The Spectrum of Helicobacter-Mediated Diseases, *Annual Review of Pathology: Mechanisms of Disease*, 2021, **16**:123 [Crossref], [Google Scholar], [Publisher]

[6]. Franceschi F., Zuccalà G., Roccarina D., Gasbarrini A., Clinical effects of Helicobacter pylori outside the stomach, *Nature reviews Gastroenterology & hepatology*, 2014, **11**:234 [Crossref], [Google Scholar], [Publisher]

[7]. Hooi J.K.Y., Lai W.Y., Ng W.K., Suen M.M.Y., Underwood F.E., Tanyingoh D., Malfertheiner P., Graham D.Y., Wong V.W.S., Wu J.C.Y., Chan F.K.L., Sung J.J.Y., Kaplan G.G., Ng S.C., Global Prevalence of Helicobacter pylori Infection: Systematic Review and Meta-Analysis, *Gastroenterology*, 2017, **153**:420 [Crossref], [Google Scholar], [Publisher]

[8]. Kienesberger S., Perez-Perez G.I., Olivares A.Z., Bardhan P., Sarker S.A., Hasan K.Z., Sack R.B., Blaser M.J., When is Helicobacter pylori acquired in populations in developing countries? A birth-cohort study in Bangladeshi children, *Gut Microbes*, 2018, **9**:252 [Crossref], [Google Scholar], [Publisher]

[9]. Alsulaimany F.A.S., Awan Z.A., Almohamady A.M., Koumu M.I., Yaghmoor B.E., Elhady S.S., Elfaky M.A., Prevalence of Helicobacter pylori Infection and Diagnostic Methods in the Middle East and North Africa Region, *Medicina*, 2020, **56**:169 [Crossref], [Google Scholar], [Publisher]

[10]. Chen M.J., Fang Y.J., Wu M.S., Chen C.C., Chen Y.N., Yu C.C., Kuo C.C., Chiu M.C., Hu W.H., Tsai M.H., Hsieh C.L., Chen H.H., Bair M.J., Liou J.M., Consortium H., Application of Helicobacter pylori stool antigen test to survey the updated prevalence of Helicobacter pylori infection in Taiwan, *Journal of Gastroenterology and Hepatology*, 2020, **35**:233 [Crossref], [Google Scholar], [Publisher]

[11]. Mitchell H., Katelaris P., Epidemiology, clinical impacts and current clinical management of Helicobacter pylori infection, *The Medical Journal of Australia*, 2016, **204**:376 [Crossref], [Google Scholar], [Publisher]

[12]. Hussein R.A., Al-Ouqaili M.T.S., Majeed Y.H., Detection of Helicobacter Pylori infection by invasive and non-invasive techniques in patients with gastrointestinal diseases from Iraq: A validation study, *PloS one*, 2021, **16**:e0256393 [Crossref], [Google Scholar], [Publisher]

[13]. Ozaydin N., Turkyilmaz S.A., Cali S., Prevalence and risk factors of Helicobacter pylori in Turkey: a nationally-representative, cross-sectional, screening with the ^{13}C-Urea breath test, *BMC Public Health*, 2013, **13**:1215 [Crossref], [Google Scholar], [Publisher]

[14]. Salehi M., Ghasemian A., Shokouhi Mostafavi S.K., Najafi S., Rajabi Vardanjani H., Sero-prevalence of Helicobacter pylori Infection in Neyshabur, Iran, During 2010-2015, *Iranian journal of pathology*, 2017, **12**:183 [Google Scholar], [Publisher]

[15]. Zamani M., Ebrahimtabar F., Zamani V., Miller W.H., Alizadeh-Navaei R., Shokri-Shirvani J., Derakhshan M.H., Systematic review with meta-analysis: the worldwide prevalence of Helicobacter pylori infection, *Alimentary Pharmacology & Therapeutics*, 2018, **47**:868 [Crossref], [Google Scholar], [Publisher]

[16]. Contreras M., Fernández-Delgado M., Reyes

N., García-Amado M.A., Rojas H., Michelangeli F., Helicobacter pylori Infection in Rural and Urban Dyspeptic Patients from Venezuela, *The American Journal of Tropical Medicine and Hygiene*, 2015, **93**:730 [Crossref], [Google Scholar], [Publisher]

[17]. Ito M., Sugiyama A., Mino M., Kodama M., Nagaoki Y., Abe K., Imada H., Ouoba S., E B., Ko K., Akita T., Harakawa T., Sako T., Chayama K., Tanaka J., Prevalence of Helicobacter pylori infection in the general population evaluated by a resident-register-based epidemiological study, *Journal of Gastroenterology*, **2022** [Crossref], [Google Scholar], [Publisher]

[18]. Ito M., Sugiyama A., Mino M., Kodama M., Nagaoki Y., Abe K., Imada H., Ouoba S., E B., Ko K., Akita T., Harakawa T., Sako T., Chayama K., Tanaka J., Prevalence of Helicobacter pylori infection in the general population evaluated by a resident-register-based epidemiological study, *Journal of Gastroenterology*, **2022** [Crossref], [Google Scholar], [Publisher]

[19]. Shiferaw G., Abera D., Magnitude of Helicobacter pylori and associated risk factors among symptomatic patients attending at Jasmin internal medicine and pediatrics specialized private clinic in Addis Ababa city, Ethiopia, *BMC Infectious Diseases*, 2019, **19**:118 [Crossref], [Google Scholar], [Publisher]

[20]. Al-Hussaini A., Al Jurayyan A., Bashir S., Alshahrani D., Where are we today with Helicobacter pylori infection among healthy children in Saudi Arabia? *Saudi journal of gastroenterology: official journal of the Saudi Gastroenterology Association,* 2019, **25**:309 [Crossref], [Google Scholar], [Publisher]

[21]. Assaad S., Chaaban R., Tannous F., Costanian C., Dietary habits and Helicobacter pylori infection: a cross sectional study at a Lebanese hospital, *BMC gastroenterology*, 2018, **18**:48 [Crossref], [Google Scholar], [Publisher]

[22]. Xia Y., Meng G., Zhang Q., Liu L., Wu H., Shi H., Bao X., Su Q., Gu Y., Fang L., Yu F., Yang H., Yu B., Sun S., Wang X., Zhou M., Jia Q., Zhao H., Song K., Niu K., Dietary Patterns are Associated with Helicobacter Pylori Infection in Chinese Adults: A Cross-Sectional Study, *Scientific Reports*, 2016, **6**:32334 [Crossref], [Google Scholar], [Publisher]

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