



Article

Prevalence of Helicobacter Pylori among Patients Attended Private Clinic in Kirkuk-Iraq

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Abstract:

Background: Helicobacter pylori is one of important gastrointestinal microorganism in which more than half the world's population was infected including Iraq.

Patients and Methods: The study was carried out in Kirkuk private clinic for period from June 2022 until April 2023. Three hundred participants included in this study, of both sexes. The age of participants were ranging from below 10 up to 70 years old. H. pylori was detected in both blood serum and feces.

Results: The present study found that among 300 participants attended Kirkuk private clinic, examined for detection H. pylori among them, using both blood serum and stools. Results showed that the overall rate of positive H. pylori antibody was (57.95%) while H. pylori antigen was (28.0%). The rate of both antibody and antigen in female were greater than males. The highest rate of infection was among 21-30 years followed by 31-40 and 41-50 years. Regarding occupations, the highest rate was among house wives, followed by students and employee and the lowest was among free business.

Conclusions: It is concluded that the prevalence of H. pylori among private clinic in Kirkuk is high, and infection occurred in different age groups and occupations.

Keywords: Helicobacter pylori, Private Clinic, Kirkuk-Iraq

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1. Introduction

Helicobacter pylori is microaerophilic gram negative bacteria, common in Iraq. The prevalence of infection is high in overcrowding and low socioeconomic countries (1 & 2). It is one of abdominal discomfort which may lead to abdominal pain mainly in chronic cases. In addition to its effect on gastrointestinal system it may lead to extra-intestinal diseases such as cardiovascular neurodegenerative, allergic conditions, hematological disorders and atherosclerosis (3). *H. pylori* is associated with several intra-gastric and extra gastric diseases such as gastroesophageal reflux, functional dyspepsia and chronic cholecystitis and cholelithiasis (4).

Any inflammation of digestive system lead to serious diseases in the body (5). *H. pylori* is transmitted easily between family members, it is transmitted through oral-oral, fecal-oral or via sexual routes especially among children (6&7). Several studies indicate

that it is present in dental plaque and salivary gland of ill persons and it is highly prevalent in unhygienic community (8).

In Kirkuk it has been shown that the overall frequency of *H. pylori* was (28.4%), with highest rate of infection was among 10-19 and 20-29 years old (50%), followed by 40-49 (33.3%), 50-59 (30.9%) and 60 and above (21.6%) respectively. The rate of infection in males was (28.2%) while in females (29.0%) (1). Another study carried on in Kirkuk City to show the role of *H. pylori* in the causation of laryngopharyngeal disorder in Kirkuk Allergic Center, they found out of 56 cases, 36 (72%) were positive for serum test and 20 (35.7%) cases were positive for both serum and stool (9).

In Erbil City, a study carried out to show seroprevalence of *H. pylori* infection among gastrointestinal troubles (10) they found the overall rate of infection was (53.3%) with rate of infection in male (43.75%), and in female (59.72%), the highest infection rate was found among the age group over 50 years.

In Erbil (11), carried on a study on *H. pylori* on 310 blood samples, they found the prevalence of infection in total cases were (39.4%). The rate of infection among females were (40.7%), while in males (38.2%). They also reported the highest rate of infection among the age 41-50 years (51.2%) followed by >61 years (46.5%), 31-40 years (44.4%), 1-10 years, 51-60 years (35.6%), 11-20 years (31.1%) and lowest among 21-30 years (27.3%).

Regarding the distribution of *H. pylori*, it is shown that *H. pylori* is scattered widely in developing countries including Iraq. In Iraq, 59.2% in Baghdad (12), 55.8% in Erbil (13), 49.62% in Kirkuk (1), 61.32% in Mosul city (14), 51.11% in Misan (15), 58% in Basra city (16). The prevalence is high in people suffer from pain in the stomach and abdomen 58% with discomfort, depending on blood samples tests (16).

In neighboring countries, it was reported that the prevalence of infection was 53% in Yemen (17), 49.7% in Kuwait (18), 71.33% in Saudi Arabia (19), 41% in the United Arab Emirates (20), 61.87% in Iran (21), In Turkey 29.6% by antigen test and 69.0% by gG test (22).

According to epidemiological studies that *H. pylori* ranging from 20-50% in adults of developed world but higher in developing countries may be as high as 90% in some countries. Higher rate of infection is common in low socioeconomic, overcrowding, poor sanitary condition and urban regions (23, 11).

Helicobacter pylori is mainly transmitted by saliva to human beings. Integration of dense population, untreated water and poor hygiene lead to higher infection in developing countries. The most popular mode of transmission of infection is iatrogenic, followed by fecal-oral routes water polluted by feces which is an important source of infection, as many studies reported interaction between infection and absence of hot running water (24). In children the higher risk of infection was observed among those who swam in river, streams or swimming pool and who drank water from local stream (25). The other important route of transmission is oral-oral of uncooked food (26).

A study on *H. pylori* by 27 and 28, suggested a relationship between *H. pylori* and malabsorption of essential malnutrition and reported dietary factor has an important role in *H. pylori* infection. According to several researches that an adequate and balanced diet, particularly high fruit and vegetable consumption play a protective role against the effect of *Helicobacter pylori* (8).

The aim of this study is to show the prevalence of *Helicobacter pylori* among patients attended private clinic in Kirkuk of different gender and age groups.

2. Materials and Methods

A cross sectional study was carried on 300 patients (50 males, 250 females), their age were ranging from 20-70 years old. for period from June 2022 until April 2023 attended private clinic in Kirkuk City. The participant (attendants) were complaining from gastro-duodenal disorders, epigastric pain, abdominal pain, backache, abdominal and renal pain, epigastric burning.

H. pylori Ag Rapid Test is a lateral flow chromatographic immunoassay for the qualitative detection of *H. pylori* antigen in human fecal specimen. The detection of *H. pylori* antibody in blood sera using serological test using enzyme-linked immunosorbent assay according to manufacturer's instruction (CTK Biotech, 13855 Stowe Drive), was used.

About 5 ml of blood sample was taken from 300 participants, centrifuged and sera were used for detection of *H. pylori*. The diagnosis was performed using serological test of *H. pylori* specific immunoglobulin; using a rapid test kit. In feces *H. pylori* Ag Rapid Test is performed Cassette (Fecal Specimen).CTK Biotech, Inc. 13855 Stowe Drive. Poway, CA 92064, USA.

A special questionnaire form was arranged for each attendant to obtain demographic, clinical, previous infection, and environmental data.

Statistical analysis was carried on using statistical package for social science (SPSS) software version 18. Chi-squared test was used to show significant difference between groups. P value= <0.05 was considered as significant (29).

3. Results

As shown in table 1, in 300 participants the number of females 250 (83.33) were greater than males 50(16.66%). The age of participants were ranging from below 10 years up to 70 years, the highest age of attendants were 31-40 years. Regarding the occupation, the greatest number of attendants were housewives 190(63.33%).

Table 1. Distribution of participants according to gender, age and occupation

Gender	Number	Percentage
Male	50	16.66
Female	250	83.33
Total	300	
Age		
<10-20	40	13.33
21-30	62	20.66
31-40	87	29.00
41-50	73	24.33
51-60	29	9.66
61-70	9	3.00
Total	300	
Occupation		
Houswives	190	63.33
Officials	50	16.66
Students	48	16.00
Employee	12	4.00
Total	300	

Table 2 shows that the seroprevalence of *H. pylori* antibody in females 131(58.22%) was greater than males 22(56.41), statistically there was no significant difference between sexes with a P-value=0.832.

Table 2. Seroprevalence of *H. pylori* antibody according to gender.

Gender	Test No. (%)		Total	P-value
	Positive (%)	Negative (%)		
Male	22 (56.41%)	17 (43.59%)	39 (14.77%)	0.832
Female	131 (58.22%)	94 (41.78%)	225 (85.23%)	
Total	153 (57.95%)	111 (42.04%)	264 (100%)	

*Chi-square were used

DF=1

P-value>0.05 not significant, P-value <0.05 significant, P-value <0.01 highly significant

Table 3, shows that *H. pylori* antigen in females 18(50%), was greater than males 6(42.85%) but the difference was not significant statistically.

Table 3. Seroprevalence of *H. pylori* antigen according to gender.

Gender	Test No. (%)		Total	*-value
	Positive (%)	Negative (%)		
Male	6 (42.85%)	8 (57.14%)	14 (28%)	0.649
Female	18 (50.0%)	18 (50.0%)	36 (72.0%)	
Total	24 (48.0%)	26 (52.0%)	50 (100%)	

*Chi-square were used

DF=1

P-value>0.05 not significant, P-value <0.05 significant, P-value <0.01 highly significant

No significant difference was found among male and female regarding the *H. pylori* antibody.

Table 4 shows the seroprevalence of *H. pylori* according to age groups. The highest rate of seropositivity was among 21-30 age group 41(13.6%), followed by both 31-40 and 41-50 years 35(11.6%) for each, below 10-20 years 22(7.3%) and the lowest was among 61-70 years 5(1.6%) respectively.

Table 4. Seroprevalence of *H. pylori* according to age groups.

Age group	Negative No. (%)	Positive No. (%)	Total	*p-value-
<10-20	15 (5%)	22 (7.3%)	37 (12.3%)	0.910
21-30	26 (98.6%)	41 (13.6%)	67 (22.3%)	0.620
31-40	25 (8.3%)	35 (11.6%)	60 (20%)	0.961
41-50	31 (10.3%)	35 (11.6%)	66 (22%)	0.290
51-60	12 (4%)	22 (7.3%)	34 (11.3%)	0.440

61-70	4 (1.3%)	5(1.6%)	9 (3%)	0.850
Total	113 (37.6%)	160 (53.3%)	273 (91%)	

*Chi-square were used

DF=1

P-value>0.05 not significant, P-value <0.05 significant, P-value <0.01 highly significant

No significant difference was found among male and female regarding the *H. pylori* antibody according to age.

Regarding the occupation, Table 5 shows the prevalence of *H. pylori* antibody in housewives 56.4%, followed by students 55.2%, employee 54.5% and free business 45.0%. In both (Ag and Ab) according to occupation. The percentage of both Ag and Ab was highest among house wives (63.6%), followed by students (62.1%) and employee (61.8%) and free business 55.0%.

Table 5. Prevalence of *H. pylori* (Ab and Ag) according to occupation.

Occupation	Number examined	Antibody positive	Positive percentage	Antigen positive	Positive percentage	Antibody & Antigen
House wife	140	79	56.43%	10	7.14%	89 (63.6%)
Free business	20	9	45.0%	2	10.0%	11 (55.0%)
Students	58	32	55.2%	4	6.89%	36 (62.1%)
Employee	55	30	54.5%	4	7.27%	34 (61.8%)
Total	273	150	54.9%	20	7.32%	170 (62.3%)

4. Discussion

Helicobacter pylori is one of common infection in the world, it is estimated that the prevalence of infection in the world is 4.4 billion (30), it can be transmitted from one person to another via contaminated food and drinking water (7).

In the current study the overall seroprevalence rate of infection is 53.3%, which is high among patients attended private clinic in Kirkuk. The high rate of infection is in agreement with several studies as (31) in Erbil (52%), 10 in Erbil (53.3%) and (16) in Basrah (%58.0%) but lower rate were reported by 10 in Erbil (39.4%).

Comparing the results of this study with Jordan are lower than study done in Jordan (32), who showed the prevalence of infection was (82%). In other countries, it is reported the highest burden of infection were found in Nigeria, Pakistan, Kazakhstan, Estonia, and Portugal, while the lowest burden was in Switzerland (30). It was also reported high prevalence in Russia, China, Canada, Latin America and Iran (33).

The variation in the prevalence of *H. pylori* could be due to poor social and economic development, poor hygiene practices, educational status, source of drinking water, crowded families, improper food handling and sample size (31). The prevalence of infection differs not only from country to country but also among different regions of the

same Country (34). While (35) found the rate of infection is similar in males and females in patients undergone antrum biopsy.

The frequency of infection in both serum and stool in females was greater than males is in agreement with that reported in Erbil (31) and with (36) in Turkey who showed that the female was more exposed to infection than male by using monoclonal *H. pylori* stool antigen.

The increase in rate of infection with age may be explained by weakened immune response in elderly comparing with younger age and able to eliminate the infection with stronger immunity or it may be due to exposure to risk factors as poor sanitation, poor hygiene and contact with contaminated water and food. In Erbil (31) showed the infection rate in patients 16-45 years greater than 15-16 and 55-65 years.

The highest rate of infection was among 21-30 years old (13.6 %) followed by 31-40 years (11.6%). This could be due to these two age groups, spend their time outside and exposed to infection. The infection rate decreased at age 51-60 (7.3%) and the lowest rate at 61-70 years (1.6%).

Concerning the occupation, it is shown that there are several occupational groups are at risk of *H. pylori*, such as health professionals, especially those working at gastrointestinal units, agricultural, forestry and sewage workers and so on (37). In the present study the highest prevalence of infection was among house wives (63.6%), followed by students (62.1%), and employee (61.8%), this could be explained that they are more exposed to environmental pollution, waste and agricultural products as employee can carry on any work required for living.

5. Conclusion

From the results of this study it is concluded that there is a relationship between *H. pylori* with age and occupations of participants. It is recommended to carry on further epidemiological study to show the real prevalence of infection using further advance techniques for detection *H. pylori* such as such as culture for isolation of organism, antibiotic sensitivity test.

References

1. Sulyman MA, Kadir, MA and Tahir SS (2022). Correlation between Helicobacter pylori and Type 2 Diabetes in Kirkuk-Iraq. World Bulletin of Public Health, 9: 24-28.
2. Saber FO, and Ali MK (2022). Isolation and identification of H. pylori among Iraq patients with chronic gastric inflammation. J. Faculty Medicine, Baghdad, 64(2): 102-108.
3. Gunji T, Matsushashi N, Sato H, Fujibayashi K, Okumura M, Sasabe N, Urabe A (2009). Helicobacter pylori infection significantly increases insulin resistance in the asymptomatic Japanese population. Helicobacter, 14: 144-150.
4. Wang Z, Liu Y, Peng Y, Peng L, Fujibayashi K, Okumura M, Sasabe N, Urabe A. (2022). Helicobacter pylori infection –A risk factor for irritable bowl syndrome ? An updated systemic review and meta analysis. Medicine 58(8): 1035; <https://doi.org/10.3390/medicina58081035>.
5. Abdul Razaq AA, Pambuk A, and Salman YJ (2017). Role vof Helicobacter pylori in gastrointestinal tract disorders (GITDs) among patients in Kirkuk City, Iraq. Biosci Biotech. Res. Asia. 14(3): 1159-1164.

6. Mehata S, Parajuli KR, Pant ND, Rayamajhee B, Yadav UN, Mehta RK. et al. (2016). Prevalence and correlates of *Helicobacter pylori* infection among under-five children, adolescent and non-pregnant women in Nepal: Further analysis of Nepal national micronutrient status survey, *PloS Negl. Trop. Dis*, 15, e0009510. (Cross Ref).
7. Zamani M, Vahedi A, Maghdouri Z, Shokri-Shirvanni J. (2017). Role of food in environmental transmission of *Helicobacter pylori*. *Casp. J. Intern. Med.*, 8, 146-152.
8. Silva DG, Steven RH, Macedo JM., Albano RM. (2010). Presence of *Helicobacter pylori* in supragingival dental plaque of individual with periodontal disease and upper gastric diseases. *Arch Oral Biol.*, 55: 896-901.
9. Majeed DM and Tahir SS. (2022). The role of *Helicobacter pylori* in the causation of laryngopharyngeal disorder in specialized Allergic Center/ Kirkuk-Iraq. *Al-Kitab J. Pure Sciences*, 3(2): 201-207.
10. Majeed PD and Koshnaw KJ (2020). Seroprevalence of *Helicobacter pylori* infection among patients with gastrointestinal disorders in Erbil City. *Diyala J. Medicine*, 18(1): 91-101.
11. Al-Mashhadany DA, Ismael LQ, Zaki AM.(2018). Seroprevalence of *Helicobacter pylori* among human in Erbil Governorate, Kurdistan region, Iraq. *Life Science Information Publications* 4(2): 269-272.
12. Al-Mossawei MT, Razooqi WH, and Abdulrazzaq S (2016). Detection of *Helicobacter pylori* IgG and IgM Antibodies In Iraqi Dyspeptic patients. *J. Biotechnology Research Center*, 10(1): 5-9.
13. Bashdar M, Saleem SQ Ahmed HF (2013). The prevalence of *Helicobacter Pylori* among university students in Iraq. 0974-5645. Cited in Abdul Razaq AA, et al. 2017.
14. Ali A J (2018). Prevalence of *Helicobacter pylori* infection in patients complaining of epigastric pain and dyspepsia , Mosul, Iraq. *Sci . J. Med. Res.*, 2(8): 187-188.
15. AlHashimi RAH, Alsaad RKA, Alhilfi HSQ and Althaalibi SMJ (2017). *Helicobacter pylori* infection. Epidemiology , Endoscopic findings and associated socio-demographic factors in uninvestigated dyspepsia in the people of Misan, Iraq. *J. Gastrointest Disord. Liver Func*, 3(2): 109-113.
16. Alatbee, AHD (2019). High prevalence of *helicobacter pylori* in Basra city Southern of Iraq. *IOP Conf. Series: Journal of Physics: Conf. Series*, 1279, 012073.
17. A-Ameri GA and Alkadasi MN (2013). The prevalence of *Helicobacter pylori* and risk factors infection associated in Taiz city, Yemen. *Int J. Curr Microbiol. App Sci*. 2(8): 226-233.
18. Alazmi WM, Siddique I, Alateeqi N and Al-Nakib B (2010). Prevalence of *Helicobacter pylori* infection among new outpatients with dyspepsia in Kuwait. *B.M.C. Gastroenterology*, 10(4): 1-4.
19. Alhussaini MS (2016). Prevalence of *Helicobacter pylori* among patients with different gastrointestinal disorders in Saudi Arabia. *Med J Indones*, 25(4): 214-20.
20. Khoder G, Muhammad J S, Mohmoud I, Soliman SSM, Buruoca C. (2019). Prevalence of *Helicobacter pylori* and its associated factors among healthy asymptomatic residents in the United Arab Emirates . *Pathogens*, 8(2): 1-14. doi. 10.3390.
21. Reisi S, Shahi H, Shahi S and Damavandi MS (2017). Determination of ABO/Rh blood group, sex and age with severity of *Helicobacter pylori* infection in Iranian gastrointestinal patients. *I.J. M.M.* 11(2): 81-86.
22. Alim A, Atas M, Gunes T, Ozkan S, Dundar N.. (2010). Comparison of antigen and antibody detection tests used for diagnosing the *Helicobacter pylori* infection in symptomatic patients. *Basic Clin. Sci*, 1(4): 61-70.
23. Vale FF and Vitor JMB (2010). Transmission of pathway of *Helicobacter pylori*: Does food play a role in rural and urban areas?. *Inter. J. Food Microbiology*, 138: 1-12.
24. Mladenova I, Durazzo M, Pellicano R. (2006). Transmission of *Helicobacter pylori*: are there evidences for a fecal-oral route?. *Minerva Med*, 97(1): 15-8.
25. Goodman KJ, Correa P, Tengana AUX HJ, Ramirez H, Delany JP, Guerrero Pepinosa O et al., (1996). *Helicobacter pylori* infection in Colombian Andes: a population-based study of transmission paths. *Am. J. Epidemiology* , 144(3): 290-299.

26. Megraud FI (1995). Transmission of *Helicobacter pylori*: fecal-oral versus oral-oral route. *Aliment Pharmacol Ther*, 9(2): 85-91.
27. Franceschi F, Annalisa T, Teresa DR, Giovanna DA, Ianiro G, Franco S. et al. (2014). Role of *Helicobacter pylori* infection on nutrition and metabolism. *World J. Gastroenterol*, 20(36): 12809-12817. (Cross Ref).
28. Oztekin M, Yilmaz B, Agagubduz D and Capasso R (2021). Overview of *Helicobacter pylori* infection: Clinical features, treatment and nutritional aspects. *Diseases*, Dec. 9(4): 66. Published on line.
29. Daniel WW. (2014): *Biostatistics A foundation for analysis in the Health Science*. 5 th edition, John Wiley and sons, USA.
30. Haji HO, Anwer SS, Zaki SM, Mustafa BB, Abdulla AA, Hassan GJ. (2020). Prevalence And detection of *Helicobacter pylori* among patients in Rizgary hospital using stool antigen test-Erbil City. *J. Kirkuk Medical College*, 8(1): 142-148.
31. Bani-Hani K and Hamouri S. (2001). Prevalence of *Helicobacter pylori* in Northern Jordan Endoscopic based study. *Saudi Medical J.*, 22(10): 843-7.
32. Mezmale, L, Coelho LG, Bordin D, Leja M. (2020). Review: Epidemiology of *Helicobacter pylori*. 25 suppl. 1, e 12734.
33. Vilachone RK, Mahachai V, Shiota S, Uchida T, Ratanachu-ek T, Tshering L. et al. (2013). Extremely high prevalence of *Helicobacter pylori* infection in Bhutan. *World J. Gastroenterol.*, 19, 2806-2810. (Cross Ref.)
34. Uyanikoglu A, Coskun M, Binici DN, Siir U, Kibar YI, Ahmet T. (2012). Frequency of *Helicobacter pylori* in patients underwent endoscopy. *Dicle Tip Derg.* 39: 197-200.
35. Yucl T, Aygin D, Sen S and Yucl O. (2008). The prevalence of *H. pylori* and related factors among university students in Turkey. *Japanese J. Infectious Diseases*, 61(3): 179-183.
36. Kheyree H, Morais S, Ferro A, Rute Costa A, Norton P, Lunet N, Paleteiro B. (2018). The occupational risk of *Helicobacter pylori* infection: A systematic review. *Int Arch Occup Environ Health*, 91(6): 657-674.