DOI: https://doi.org/10.53350/pjmhs22166926

ORIGINAL ARTICLE

Association between Iron Deficiency Anemia with Helicobacter Pylori Infection

FARAH BASHIR[1], HEFSA QAMAR[2], SAHIL SARDANA[3], SYED ALI RAZA[4], MEENA BAI[5], FAYAZ AHMED MEMON[6]
[1]*Emergency Medical Officer Gomal Medical College / Khyber medical university*
[2]*Assistant Professor hematology Poonch medical college rawalakot*
[3]*Medical Officer Deptt of Medicine, Dayanand Medical College, Ludhiana, Punjab*
[4]*Assistant Professor Deptt of Medicine Dr Ziauddin Hospital, North Nazim Abad, Karachi*
[5]*Doctor Deptt of Medicine PUMHSW Nawabshah*
[6]*Professor Department of Medicine Muhammed Medical College & Hospital, Mirpurkhas, Sindh.*
Correspondenting author: Hefsa Qamar, Email: hefsaqamar69@gmail.com

ABSTRACT

Objective: The purpose of this research is to examine the link between helicobacter pylori infection and iron deficiency anaemia (IDA).

Study Design: Retrospective study

Place and Duration: Poonch Medical College Rawalakot and Dr. Ziauddin Hospital, North Nazim Abad, Karachi, during from July, 2021 to Dec, 2021.

Methods: Eighty-six patients aged 18-55 were presented. All patients gave written informed permission that included age, sex, BMI, education, and citizenship. All study participants had helicobacter pylori. Participants' blood samples were tested for serum iron, transferrin saturation, ferritin, and total iron-binding capacity. A urea breath test, stool antigen testing, a fast urease test, or histopathology was used to detect H. pylori. Data was analyzed using SPSS 19.0.

Results: Majority of the patients 43 (50%) were aged between 31-40, followed by 25 (29.1%) patients of age 18-30 years and 18 (20.9%) were aged 41-55 years. Among 86 cases, 55 (63.9%) had body mass index <25kg/m^2 and 31 (36.1%) had body mass index >25kg/m^2. Frequency of males was higher 50 (58.1%) as compared to females 36 (41.9%). Stomach pain, nausea, loss of appetite, frequent burping and bloating was the most common symptoms among all cases. The frequency of IDA was found in 38 (44.2%) in which majority of the patients were aged between 35-5 years and females were higher in number among them.

Conclusion: In this study, we found that the prevalence of iron deficiency anemia was considerably greater among patients with helicobacter pylori infection, and that the majority of adult patients were females.

Keywords: Symptoms, Iron Deficiency Anemia (IDA), Adult Patients, H.pylori infection, Association

INTRODUCTION

Studies have shown that more than half of the global population carries the bacterium Helicobacter pylori, making it one of the most widespread chronic bacterial illnesses in humans. In general, the incidence is much higher in third world nations [1]. While H. pylori infection is commonplace in many parts of the world, its incidence varies by region [1, 2]. Infection with H. pylori often occurs in early childhood and, if untreated, can persist into adulthood [3]. Most persons infected with the virus never show any symptoms, and just a minority become ill [4]. It has been shown that H. pylori increase the risk of gastric cancer and other diseases of the upper digestive tract [5]. In research done on children, risk factors for infection have been identified as boys, being older, being shorter, smoking, being overweight, and having parents with less education [6].

Helicobacter pylori are a gram-negative, micro-aerophilic curled bacterium that is able to make close contact with the gastric mucosal cells and so consistently colonizes the human stomach. [7] The parasite can only live on primates, including humans, and is thus an obligatory one. Nearly half of the world's population7 is colonized with Helicobacter pylori, although only a small percentage of those people ever acquire clinical illness from it. The virus has a lengthy dormant phase after being contracted; hence it is most often acquired in childhood. [8] In most people, there are no outward signs of illness, and the infection might last for years with no signs of progression. But only around 10% to 20% of those who become infected ever acquire serious illnesses. As a matter of fact, certain epidemiological studies have labelled it a class 1 carcinogen for stomach cancer. [9] Evidence shows that it is the single greatest cause of stomach cancer in humans (those not arising from cardiac end of the stomach). [10] Some of the proteins found on the outer membrane of H. pylori are the cagA, vacA, urease, babA, sabA, oipA, alpA, and iceA. There has been a lot of research on the correlation between vacA and cagA expression and the clinical outcome of H. pylori infection [11].

In most cases, H. pylori stomach colonization can last for decades and needs lifelong maintenance of growth conditions [13]. Evidence suggests that H. pylori is linked to iron deficiency anemia even in individuals with celiac disease, as shown by Rostami-Nejad et al.[14]. However, this finding is not widely reflected in clinical practice. The link between H. pylori infection and anemia is supported by data from a variety of epidemiological and clinical research. However, the processes behind the link between anemia and H. pylori infection remain unknown, and data from different regions and nations are inconsistent.

One meta-analysis [15] concluded that most prior studies on anemia and H. pylori was flawed. Most previous studies on H. pylori infection and anemia concentrated on specialized groups (women and children, especially pregnant women) rather than the whole population. Most individuals ignored the severity and cause of anemia. In large-sample research, a lack of information meant numerous confounding variables couldn't be accounted for. To our knowledge, no large-scale investigation has studied the relationship between H. pylori and anemia in adults. We used data from the physical population registration system to examine the connection between H. pylori and anemia.

MATERIAL AND METHODS

This retrospective study was conducted at Poonch Medical College Rawalakot and Dr. Ziauddin Hospital, North Nazim Abad, Karachi, during from July, 2021 to Dec, 2021 and comprised of 86 patients. Age, sex, BMI, education level, and where they lived were collected in addition to written informed permission from all patients. Patients with gastrointestinal cancer, hematologic abnormalities, iron supplementation for at least 30 days, erythropoietin injection, overt/occult gastrointestinal haemorrhage, malnutrition, a history of gastrectomy, and recent hospitalisation due to acute illnesses were not included.

Only individuals with dyspepsia who needed an upper GI endoscopy were evaluated at first. Medical history and exam results were recorded on the standard data sheet. Two weeks after quitting a proton pump inhibitor, antibiotic, or bismuth drug, patients should undergo an endoscopy. Following a lengthy conversation, individuals who were chosen for upper GI endoscopy and biopsy gave written approval. Endoscopy was done at

BSMMU's Gastroenterology Department using an Olympus forward-facing video endoscope and topical lignocaine anaesthesia. Patients with atrophic or erosive gastritis were studied with healthy controls. The endoscopy yielded two biopsies: one from the body and one from the stomach antrum. 24 hours after doing a rapid urease test (CLO) on biopsy tissues to identify H. pylori, the test medium changed from straw to pink or reddish.

Blood samples were analyzed to determine levels of iron, transferrin saturation, ferritin, and total iron-binding capacity. Infection with Helicobacter pylori found through quick urease test, urea breath test, stool antigen testing, or histopathology. The full dataset was analyzed using SPSS version 19.0. Laboratory results were expressed as means with standard deviations.

RESULTS

Majority of the patients 43 (50%) were aged between 31-40, followed by 25 (29.1%) patients of age 18-30 years and 18 (20.9%) were aged 41-55 years.(Fig 1)

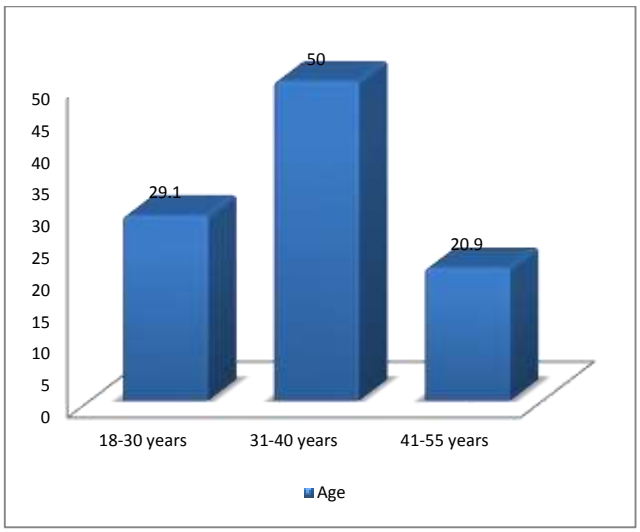

Figure-1: Age distribution of all cases

Frequency of males was higher 50 (58.1%) as compared to females 36 (41.9%). Among 86 cases, 55 (63.9%) had body mass index <25kg/m^2 and 31 (36.1%) had body mass index >25kg/m^2. Stomach pain, nausea, loss of appetite, frequent burping and bloating was the most common symptoms among all cases.

Table 1: Demographically detailed of enrolled cases

Variables	Frequency	Percentage
Gender		
Male	50	58.1
Female	36	40.9
BMI		
<25kg/m^2	55	63.9
>25kg/m^2	31	36.1
Symptoms		
stomach pain/burn	35	40.7
nausea	22	25.6
loss of appetite	13	15.1
frequent burping	10	11.6
bloating	6	6.9

Laboratory findings of all patients included hemoglobin, serum iron and serum ferritin was presented in table 2.

Table 2: Included patients with Lab results

Lab Results	Standard	Deviation
hemoglobin (g/dl)	13.4	2.43
serum iron (ug/dl)	49.6	10.21
serum ferritin (ng/ml)	121.9	48.69

The frequency of IDA was found in 38 (44.2%) in which majority of the patients were aged between 35-55 years and females were higher in number among them.(table 3)

Table 3:

Variables	Frequency	Percentage
Iron Deficiency		
Yes	38	44.2
No	48	55.8
Gender		
Female	22	25.6
Male	16	18.6
Age Group (years)		
36-55	17	18.6
26-35	14	16.3
18-25	7	8.1

DISCUSSION

Iron deficiency is a leading cause of anaemia, an illness that is particularly prevalent in the world's poorest regions. Several [16] recognised and researched factors contribute to the widespread occurrence of this condition, while other factors are more novel and have yet to be well researched despite their potential importance. Bleeding from peptic ulcers or stomach cancer can lead to iron deficiency, however the vast majority of H. pylori-infected people do not have these conditions. They frequently suffer from chronic gastritis, which is not linked to gastrointestinal bleeding. [17] However, in many cases, the reasons of IDA remain unclear despite extensive inquiry. Recently, researchers have been examining H. pylori's potential role in the aetiology of extra intestinal disorders such iron deficiency anaemia.

In our study 86 patients of H.pylori infection were presented. Age of the patients were 18-55 years. Majority of the patients 43 (50%) were aged between 31-40, followed by 25 (29.1%) patients of age 18-30 years and 18 (20.9%) were aged 41-55 years. Among 86 cases, 55 (63.9%) had body mass index <25kg/m^2 and 31 (36.1%) had body mass index >25kg/m^2. Frequency of males was higher 50 (58.1%) as compared to females 36 (41.9%). These findings were comparable to the studies conducted in past.[18,19] The frequency of IDA was found in 38 (44.2%) cases. Our result is in line with prior results from Ethiopia (53% [20]) and Kuwait (49.7% [21]). Possible causes for the discrepancies include different diagnostic approaches to H. pylori, sample sizes, socioeconomic status, and other contextual variables.

The current study also found a non-significant (P = 0.16) variation in the prevalence of H. pylori infection across genders (25.6% among females versus 18.6% among males). This study contradicts other research that revealed women to be at increased risk for H. pylori infection. [22,23] Our results, however, are consistent with previous research showing that H. pylori infection rates do not differ by gender. [24]

The prevalence of H. pylori infection was greater in older age groups (P 0.004), suggesting a link between age and infection. Similar findings were found in prior research conducted in South Africa [23], Ethiopia , and Kuwait [22]. More specifically, a study done in Addis Abeba, Ethiopia [25] found that the frequency of H. pylori infection peaked in individuals aged 54 to 61. The most likely explanation is that H. pylori infection, once acquired at a younger age, might remain latent and potentially produce illness at a later age. A greater frequency of H. pylori infection in younger age has been reported, however. The maximal frequency of H. pylori infection was reported in individuals within the age range of 20-39 in Nigeria [24], while a research done in Iran demonstrated that younger patients were more impacted [26].

There is a lot of curiosity about the mechanism by which H. pylori infection disrupts iron metabolism. However, despite the significance of this, not much study has been conducted as of yet. Mean ferritin levels were observed to be considerably lower in the H. pylori positive group compared to the H. pylori negative group in the current research. These results back up a previous research [27]. Based on our findings, individuals with H. pylori had lower

levels of serum iron and total iron-binding capacity compared to those without the bacteria. This finding jibes with what other researchers have found [28]. Infection with H. pylori was associated with reduced iron absorption, the findings revealed. This function may be connected to interfering with the host's ability to acquire iron, either directly or indirectly.

CONCLUSION

In this study, we found that the prevalence of iron deficiency anaemia was considerably greater among patients with helicobacter pylori infection, and that the majority of adult patients were females.

REFERENCES

1 Hunt RH, Xiao SD, Megraud F, Leon-Barua R, Bazzoli F, van der Merwe S, Vaz Coelho LG, Fock M, Fedail S, Cohen H, Malfertheiner P, Vakil N, Hamid S, Gohl KL, Wong BC, Krabshuis J, Le Mair A: World Gasteroenterology Organization Global Guide line: Helicobacter pylori in Developing Countries. World Gasteroenerology Organization, 2010. http://www.world gastroenterology.org/assets/downloads/en/pdf/guidelines/11_helicob acter_ pylori_developing_countries_en.pdf

2 Suerbaum S, Michetti P: Helicobacter pylori infection. N Engl J Med 2002, 347:1175–1186.

3 Torres J, Perez-Perez G, Goodman KJ, Atherton JC, Gold BD, Harris PR, La Garza AM, Guarner J, Muñoz O: A comprehensive review of the natural history of Helicobacter pylori infection in children. Arch Med Res 2000, 31:431–469.

4 Cover TL, Blaser MJ: Helicobacter pylori in health and disease. Gastroenterology 2009, 136:1863–1873.

5 Egan BJ, O'Connor HJ, Morain CAO: What is new in the management of Helicobacter pylori? Ir J Med Sci 2008, 177:185–188.

6 Ford AC, Axon ATR: Epidemiology of Helicobacter pylori infection and Public Health Implications. Helicobacter 2010, 15:1–6

7 Chiarini A, Cala C, Bonura C, Gullo A, Giuliana G, Peralta S, et al. Prevalence of virulence-associated genotypes of Helicobacter pylori and correlation with severity of gastric pathology in patients from western sicily, Italy. Eur J Clin Microbiol Infect Dis 2009; 28: 437-46.

8 Warburton VJ, Everett S, Mapstone NP, Axon ATR, Hawkey P, Dixon MF. Clinical and histological associations of cagA and vacA genotypes in Helicobacter pylori gastritis. J Clin Pathol 1998; 51: 55-61.

9 Pounder RE. The prevalence of Helicobacter pylori in different countries. Aliment Pharmacol. Ther 1995; 9: 33–40.

10 Ahmed MM, Rahman M, Rumi AK, Islam S, Huq F, Chowdhury MF et al. Prevalence of Helicobacter pylori in asymptomatic population- a pilot serological study. Bangladesh Journal of Epidemiology 1997; 7:251-54.

11 Dunn BE, Cohen H, Blaser MJ: Helicobacter pylori. Clin Microbiol Rev 2006; 19: 449-90

12 Zhuang XQ, Lin SR. Study on the relationship between Helicobactr pylori and gastric cancer. Shijie Huaren XiaoHuaZazhi 2000; 8: 206-07.

13 McLean, E., Cogswell, M., Egli, I., Woidyla, D. & de Benoist, B. Worldwide prevalence of anaemia, WHO Vitamin and Mineral Nutrition Information System, 1993–2005. Public Health Nutrition 12, 444–454 (2009).

14 Rostami-Nejad, M., Aldulaimi, D., Livett, H. & Rostami, K. H.pylori associated with iron deficiency anemia even in celiac disease patients; strongly evidence based but weakly reflected in practice. Gastroenterol Hepatol Bed Bench 8, 178–182 (2015).

15 Hudak, L., Jaraisy, A., Haj, S. & Muhsen, K. An updated systematic review and meta-analysis on the association between Helicobacter pylori infection and iron deficiency anemia. Helicobacter 22 (2017).

16 Ali NS, Zuberi RW. Association of iron deficiency anaemia in children of 1-2 years of age with low birth weight, recurrent diarrhoea or recurrent respiratory tract infectiona myth or fact? J Pak Med Assoc 2003; 53: 133-36.

17 Milman N, Rosenstock S, Andersen L, Jorgensen T, Bonnevie O. Serum ferritin, hemoglobin, and Helicobacter pylori infection: a seroepidemiologic survey comprising 2794 Danish adults. Gastroenterology 1998; 115: 268-74

18 Rahman, A., Raihan, A., Ahmed, D. S., Karim, M. E., Saeed, A., Siddique, A. R., & Sadat, S. A. (2020). Association between Helicobacter Pylori Infection and Iron Deficiency Anemia: A Cross Sectional Study. Journal of Bangladesh College of Physicians and Surgeons, 38(2), 68–78.

19 Kibru et al.: Helicobacter pylori infection and its association with anemia among adult dyspeptic patients attending Butajira Hospital, Ethiopia. BMC Infectious Diseases 2014 14:656.

20 Taddesse G, Habteselassie A, Desta K, Esayas S, Bane A: Association of dyspepsia symptoms and Helicobacter pylori infections in private higher clinic, Addis Ababa, Ethiopia. Ethiop Med J 2011, 49:109–116.

21 Seo JK, Ko JS, Choi KD: Serum ferritin and Helicobacter pylori infection in children: a sero-epidemiologic study in Korea. J Gastroenterol Hepatol 2002, 17:754–757.

22 Alazmi WM, Siddique I, Alateeqi N, Al-Nakib B: Prevalence of Helicobacter pylori infection among new outpatients with dyspepsia in Kuwait. BMC Gastroenterol 2010, 10:1–

23 Tanih NF, Okeleye BI, Ndip LM, Clarke AM, Naidoo N, Mkwetshana N, Green E, Ndip RN: Helicobacter pylori prevalence in dyspeptic patients in the Eastern Cape province – race and disease status. S Afr Med J 2010, 100:734–737.

24 Moges F, Kassu A, Mengistu G, Adugna S, Andualem B, Nishikawa T, Ota F: Seroprevalence of Helicobacter pylori in dyspeptic patients and its relationship with HIV infection, ABO blood groups and life style in a university hospital, Northwest Ethiopia. World J Gastroenterol 2006, 12:1957–1961.

25 Taddesse G, Habteselassie A, Desta K, Esayas S, Bane A: Association of dyspepsia symptoms and Helicobacter pylori infections in private higher clinic, Addis Ababa, Ethiopia. Ethiop Med J 2011, 49:109–116

26 Shokrzadeh L, Baghaei K, Yamaoka Y, Shiota S, Mirsattari D, Porhoseingholi A, Zali MR: Prevalence of Helicobacter pylori infection in dyspeptic patients in Iran. Gastroenterol Insights 2012, 4:24–27

27 Zakaria Nh. Ahmed EA. Investigation of a possible association between refractory iron deficiency anaemia to an underlying remote helicobacter pylori infection. J Egypt public Health Assoc. 2009;84:141–68

28 Dufour C, Brisigotti M, Fabretti G, Luxardo P, et al. Helicobacter pylori gastric infection and sideropenic refractory anemia. J Pediatr Gastroenterol Nutr. 1993;17:225–7