DOI: https://doi.org/10.53350/pjmhs2023171482

ORIGINAL ARTICLE

Frequency of Anemia and Iron Deficiency Anemia in Patients with Helicobacter Pylori Infection: A Cross-Sectional Study

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ABSTRACT

Objective: To determine the frequency of anemia and iron deficiency anemia in patients with Helicobacter pylori infection.
Study design: Cross-sectional study
Place and Duration: Department of Medicine, Liaquat University Hospital, Hyderabad from May to November 2019
Methodology: We included a total of 140 patients with anemia, either inpatients or outpatients at Liaquat University Hospital in Hyderabad's department of medicine. We acquired demographic information, such as name, gender, and age. The study involved everyone who meets the inclusion requirement. Anemia's brief history, its duration, the colour of the stools (melena black faeces), and the ferritin level were all noted. The cubital vein of either upper arm was used to collect 10 ml of blood, which was then sent to the lab for analysis of anaemia, ID, and H. Pylori detection. A multiparameter cell counter Sysmex k 1000 hematology analyzer was used to determine the amounts of haemoglobin (Hb) and hematocrit (Hct) in the CBC (Tao electronics, Japan). Serum iron levels were evaluated using a Hitachi 917 biochemistry automated analyzer, and ferritin concentrations were determined using a Cobas e411 hormones auto-analyzer from Roche Diagnostics GmbH in Mannheim, Germany (Roche Diagnostics GmbH, Mannheim, Germany). The researcher himself entered all the data on a proforma that had been previously created.
Results: Patients' average ages ranged from 40.44± 14.268 years, and their haemoglobin levels were 8.77 ± 3.14. Patients' serum ferritin levels were 10.5 ±63.21 and their BMI was 24.5 ±3.21 respectively. Of the H. pylori patients, there were 70 (50%) anaemic patients and 70 (50%) with normal Hb levels. In this study, 102 individuals (72.9%) had normal serum profiles while 38 patients (27.1%) had iron deficiency anemia.
Conclusion: According to our research, treating H. pylori infection may help IDA patients who are infected with the parasite especially those who have moderate to severe anaemia. Individuals with H. pylori infection had a significant prevalence of anaemia and IDA, and both conditions were linked to patients' ages and several behavioural traits
Keywords: H. pylori infection, anemia, iron deficiency anemia

INTRODUCTION

A spiral-shaped bacteria called H. pylori, which is driven by flagella, is thought to inhabit the small intestine and stomach of 40% of the world's population. Even though patients often complain of symptoms associated with H. pylori infection, such as stomach or epigastric pain, nausea, acid reflux, intestinal discomfort, and halitosis, most doctors still fail to consider testing for this bacteria. [1] Despite significant improvements in gastroenterology critical care, H. pylori infection continues to be the most frequent cause of burning and pain in the upper stomach as well as anaemia, ulcers, and cancer. Men and postmenopausal women most frequently get anaemia as a result of blood loss from the G.I.T. [2]

Since H. pylori need iron to survive, it is one of the few microbes that can obtain it both directly from hemoglobin's heme and indirectly from lactoferrin, which is present in human secretions such saliva, tears, G.I. fluids, mother's milk, and vaginal and seminal fluids. In order to liberate iron from meals and maintain iron in a soluble ferrous state, gastric acid is necessary. Patients with H. pylori infection may experience iron deficiency and IDA due to hypochlorhydria in the elderly or from medications like PPIs (Proton Pump Inhibitors) [3]. According to certain research, H. Pylori colonization of the stomach mucosa may hinder iron intake, increase iron loss, and possibly cause IDA. [4, 5]

Studies have reportedly demonstrated the advantages of H. pylori treatment for IDA. For instance, after H. pylori were eradicated, iron insufficiency symptoms were found to be better. [6.7] According to a study by Malik et al., H. pylori infection in pregnant women with IDA leads to a considerably greater response to iron supplementation. [8]. Another study by Huang, CT, et al. showed that iron administration combined with H. pylori eradication therapy is more powerfully effective than iron administration alone for the treatment of IDA. [9] In individuals with H. pylori infection, anaemia was present in 30.9% of the time. Overall 48% of H. pylori patients had anaemia, while 23% of those with the infection had IDA. [10]

More than half of the world's population has been shown to have Helicobacter pylori infection, one of the most prevalent chronic bacterial diseases in humans. Although H. pylori infection is a problem over the world, the prevalence varies from nation to country. The overall frequency is high in developing countries. When treating anaemic patients, it's critical to comprehend the severity of H. pylori infection and how it relates to anaemia. A treatment plan will be developed specifically for these patients if the findings of my research indicated an increased incidence of anaemia and iron deficiency anaemia in patients with Helicobacter pylori infection. My study's findings will also provide baseline information that will be useful to other healthcare experts.
Practical Implication: This study assessed the prevalence of IDA in H. Pylori-infected anaemic patients. Numerous studies suggest a relationship between H. Pylori infection and anaemia brought on by iron deficiency. The evidence is still lacking among Pakistani people, nevertheless. The findings of this study will help clinicians identify patients who are more likely to experience anaemia as a result of iron deficiency. As a result, patients will avoid anaemic heart failure, which is a complication of chronic anaemia, thanks to its early detection and appropriate management. Reducing anemia's signs and symptoms, such as lethargy and easily becoming fatigued, would help improve the patients' quality of life.

METHODOLOGY

This cross-sectional study was conducted at the Department of Medicine, Liaquat University Hospital, Hyderabad from May to November 2019. A total of 140 H. pylori-infected patients were collected, based on the reported prevalence of IDA in patients with H. pylori of 23% [12] and a 7% margin of error. The study included individuals aged 15 to 60 years, of either gender, who had

Helicobacter pylori infection for more than 6 weeks and were receiving therapy.

Patients having chronic renal failure (BUN > 60, Cr: > 4), Hemolytic anemia, thalassemia, aplastic anemia Known alcoholism, Cirrhosis of the liver, Regular use (> 3 weekly) of NSAIDS, Prior gastric resection, Celiac disease, G.I or hematological malignancies and Inflammatory bowel disease were excluded from the study.

We acquired demographic information, such as name, gender, and age. Everyone who met the criteria for inclusion was included in the study; everyone else was excluded. To prevent confounding variables, careful adherence to the exclusion criteria was required. A brief history of anaemia, the length of the anaemia, the colour of the faeces (black stools), and the ferritin level were assessed. To test for anaemia, ID, and the presence of H. Pylori, 10 ml of blood were drawn from the cubital vein of either upper arm and transmitted to a lab in a disposable syringe.

A multiparameter cell counter Sysmex k 1000 hematology analyzer was used to determine the amounts of haemoglobin (Hb) and hematocrit (Hct) in the CBC (Tao electronics, Japan). Utilizing accepted laboratory quality control procedures, this analyzer has been calibrated and is under control. Serum iron levels were tested using a Hitachi 917 biochemistry automated analyzer, and ferritin concentrations were determined using a hormones auto-analyzer Cobas e411 (Roche Diagnostics GmbH, Mannheim, Germany) (Roche Diagnostics GmbH, Mannheim, Germany). The researcher personally recorded all the data on a pre-designed proforma.

SPSS version 20.00 was used to analyse every piece of data. Age, Hb level, serum ferritin level, BMI, and disease duration are quantitative variables for which mean and standard deviation were computed. For each of gender, smoking status, anaemia, and iron deficiency anaemia, frequency and percentage were computed. Age, gender, obesity, length of illness, and smoking status are effect modifiers. The 95% confidence interval post-stratification chi-square test was used, and a p-value of 0.05 was regarded as statistically significant.

RESULTS

A total of 40 patients met the inclusion criteria for this study. Patients' average ages ranged from 40.44 ±14.268 years, and their haemoglobin levels were 8.77 ±3.14. Patients' serum ferritin levels were 10.56±3.21 and their BMI was 24.5±3.21 respectively. (As shown in Table 1). There were 85 males (60.7%) and 55 females (39.3%), respectively. In this study, 80 individuals (57.1%) with obesity and 55 patients (39.3%) who did not smoke were both participants. In this study, 60 subjects (42.9%) were not obese. (As shown in Table 2). Of the H. pylori patients, there were 70 (or 50%) anaemic patients and 70 (or 50%) with normal Hb levels. In this study, 102 individuals (72.9%) had normal serum profiles while 38 patients (27.1%) had IDA. (As shown in Table 3).

Age, gender, smoking status, and duration of H. pylori were used to stratify patients for anaemia. The results showed that gender, smoking status, and age had significant results with p-values of 0.001, 0.04, and 0.01 respectively, while obesity and duration of H. pylori had non-significant results with p-values of 0.17 and 0.10, respectively. (As shown in Table 4)

With regard to gender, smoking status, obesity, age, and duration of H. pylori, stratification for iron deficiency anaemia was done. The results showed that gender, smoking status, obesity, age, and duration of H. pylori had significant results with (p-value=0.001), (p-value=0.001), (p-value=0.01), (p-value=0.03), and (p-value=0.001) respectively. (As shown in Table 5)

Table 1: Descriptive statistics (n=140)

Variables	N	Mean	Std. Deviation
Age	140	40.44	14.268
Hb level;	140	8.77	3.14
Serum ferritin level	140	10.56	3.21
BMI	140	24.5	3.21
Duration of H.pylori (weeks)	140	8.9	4.5

Table 2: Distribution of qualitative variables (n=140)

Variables		Frequency	Percent
Gender	Female	55	39.3
	Male	85	60.7
	Total	140	100.0
Smoking	No	55	39.3
	Yes	85	60.7
	Total	140	100.0
Obesity	Yes	80	57.1
	No	60	42.9
	Total	140	100

Table 3: Distribution of outcome variables (n=140)

Outcomes		Frequency	Percent
Anemia	Yes	70	50.0
	No	70	50.0
	Total	140	100.0
IDA	Yes	38	27.1
	No	102	72.9
	Total	140	100

Table 4: Stratification for anemia with respect to effect modifiers (n=140)

Variables		Anemia		Total	P-value
		Yes	No		
Gender	Female	40	15	55	0.001*
	Male	30	55	85	
	Total	70	70	140	
Smoking	No	22	33	55	0.04*
	Yes	48	37	85	
	Total	70	70	140	
Obesity	Yes	44	36	80	0.17
	No	26	34	60	
	Total	70	70	140	
Age	<30 yrs.	21	36	57	0.01*
	>30 yrs.	49	34	83	
	Total	70	70	140	
Duration	>10 wks.	18	27	45	0.10
	<10wks.	52	43	95	
	Total	70	70	140	

Table 5: Stratification for iron deficiency anemia with respect to effect modifiers (n=140)

Variables		IDA		Total	P-value
		Yes	No		
Gender	Female	27	28	55	0.001*
	Male	11	74	85	
	Total	38	102	140	
Smoking	No	24	14	55	0.001*
	Yes	31	71	85	
	Total	38	102	140	
Obesity	Yes	15	65	80	0.01*
	No	23	37	60	
	Total	38	102	140	
Age	<30 yrs.	10	47	57	0.03*
	>30 yrs.	28	55	83	
	Total	38	102	140	
Duration	>10 wks.	22	23	45	0.001*
	<10wks.	16	79	95	
	Total	38	102	140	

DISCUSSION

In this study, the prevalence of anemia and iron deficiency anemia among patients with H. Pylori was 50% and 27.1% respectively. A similar study found that anaemia, ID, IDA, and H. pylori infection were all more common than expected at 65.08%, 31.47%, 25.65%, and 80.88%, respectively. Hemoglobin, hematocrit, and ferritin mean values were all considerably lower in H. pylori-infected patients (P = 0.01, 0.04, and 0.03, respectively). [11] A total of 112 patients with H. pylori infection and anaemia were enrolled in a local study. A total of 53 (47.3%) men and 59 (52.7%) women, with a mean age of 38.4 ±9.00 years, were present. Overall 42 individuals (37.5%) had iron deficiency anaemia. [12] According to findings revealed in the published literature, a study conducted in the paediatric age group found a substantial correlation between

H. pylori infection and iron-deficiency anaemia and iron deficiency in children. Prevention is one of the first steps that must be taken when dealing with a resistant moderate to severe iron deficiency anaemia, particularly when combined with gastrointestinal symptoms, even though the precise nature of their association is still unclear. [13]

According to another study patients with unexplained or refractory iron deficiency anaemia had a higher prevalence of H. pylori infection (61.5%). Only the H. pylori infection and mean corpuscular volume were significantly correlated among the several hematological parameters examined (p-value 0.046). [14]

We found a correlation between age and H. pylori infection, the prevalence was higher in older age groups. In a similar study, 646 subjects' data were examined. The study cohort's average age was 79.4 ± 8.9 years. A total of 35.3% of people had H. pylori infection overall. The prevalence of anaemia was higher in the H. pylori positive group (5.3% vs. 2.2%, P =.033) than in the negative group. [15] Our conclusion is consistent with earlier research from Kuwait [16], South Africa [17], and Ethiopia [18]. Additionally, a study done in Addis Ababa, Ethiopia, revealed a high prevalence of H. pylori infection in individuals who were older, namely in the 54–61 age range [19]. The most likely explanation is that H. pylori infection can be contracted at a young age, last throughout the patient's lifetime, and still result in disease at an advanced age. There are data, though, that indicate that H. pylori infection is more common in children. For instance, a study from Iran revealed that patients who were younger were more affected [20] and that patients in Nigeria had the highest prevalence of H. pylori infection.

In this study cigarette smoking was significantly associated with H. pylori infection (P = 0.01). As opposed to other studies, which found no correlation between current cigarette use and any significant outcomes [21]. Some have suggested that smoking may have an impact on how well a treatment works [22]. These inconsistent findings could be the consequence of unchecked confounding variables like social status or varying antibiotic use.

Adults in Mexico with intestinal parasitic infections and higher IgE levels had a lower prevalence of H. pylori, which may indicate that intestinal parasites have an impact on H. pylori persistence [23]. The existence of a correlation in our study may be attributed to the unfavourable hygienic conditions that support a high rate of parasite infection and an H. pylori-specific route of transmission. Cohort studies, however, are still needed to fully understand the mechanism of interaction.

CONCLUSION

According to our research, treating H. pylori infection may help IDA patients who are infected with the parasite, especially those who have moderate to severe anaemia. According to this study, individuals with H. pylori infection had a significant prevalence of anaemia and IDA, and both conditions were linked to patients' ages and several behavioural traits. Patients with H. pylori infection have a high frequency of anaemia.

Recommendations and limitations: From this study, it can be suggested that intervention programmes focusing on behavioural traits and the avoidance of intestinal parasite diseases be implemented. The study's cross-sectional design makes it difficult to demonstrate cause-and-effect relationships, so a cohort study is required to examine the relationship between H. pylori infections and anaemia and IDA.

Funding source: None

Conflict: No conflict of interest

Permission: It was taken from the ethical review committee

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