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ORIGINAL ARTICLE

Frequency of Iron Deficiency Anemia (IDA) Among Patients with Helicobacter Pylori Infection

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ABSTRACT

Objective: The purpose of this study is to identify the prevalence of iron deficiency anaemia (IDA) in helicobacter pylori-infected patients.

Study Design: Prospective/cross-sectional study

Place and Duration: This study was conducted at Benazir Bhutu Hospital Rawalpindi during the period from July, 2022 to September, 2022.

Methods: Total 105 patients of Helicobacter pylori infection, who ranged in age from 18 to 65 years included. All patients gave their informed written consent after being asked about their age, sex, body mass index, level of education, and place of residence. Blood samples from the subjects were analysed to determine their levels of serum iron, transferrin saturation, ferritin, and total iron-binding capacity. H. pylori infection can be found by histopathology, stool antigen testing, a fast urease test, or a urea breath test. The entire data set was analyzed using SPSS 24.0.

Results: Among all there were majority females. Majority of the patients were illiterate and were from rural areas. 60 (57.1%) had poor socio-economic status. Mean Hemoglobin level was 12.1±0.6 (g/dl) mean serum iron level was 49.8 ±10.33(ug/dl) and mean serum ferritin level was 121.7±42.87 (ng per ml).Frequency of iron deficiency anemia was found in 43 (40.95%) patients. Among 43 cases of IDA, majority of the patients had age >35 years.

Conclusion: In this research, we found that patients with helicobacter pylori infection, the majority of whom were adult female patients, had a considerably greater frequency of iron deficiency anaemia.

Keywords: Prevalence, H.pylori infection, Iron Deficiency Anemia (IDA), Females

INTRODUCTION

At least 500 million individuals are thought to suffer from iron deficiency anaemia (IDA), the most prevalent nutritional condition in the world, which is caused by iron deficiency (ID). [1] There are significant ramifications for human health as well as social and economic development, and it is a serious worldwide public health issue that both developing and wealthy countries are affected by. Inadequate iron intake, ongoing blood loss, and poor iron absorption are some of the factors that contribute to ID anaemia. The main source of ID in postmenopausal women and men is blood loss from the gastrointestinal system. [2] The upper and lower gastrointestinal tract should be examined in patients with confirmed IDA in order to rule out lesions that can lead to chronic gastrointestinal blood loss, such as carcinoma, large adenomas, severe mucosal erosions, ulcer disease, vascular lesions, or other occult bleeding sources like celiac disease. A well-known cause of IDA, particularly in people from Northern Europe[3], where 2-3% of IDA patients have celiac disease, is iron malabsorption. About 35% of IDA cases are still unsolved despite this endoscopic evaluation. [4]

The relationship between Helicobacter pylori (H. pylori) infection and IDA has been the subject of several investigations. [5] Approximately 50% of the world's population is infected with the gram-negative bacteria H. pylori, which is more prevalent in poor nations (up to 80%) than in industrialised ones (20–50%). 9 Atrophic gastritis, chronic gastritis, peptic ulcer disease, mucosa-associated-lymphatic tissue (MALT-lymphoma), and gastric cancer are all disorders of the upper gastrointestinal tract that are etiologically linked to H. pylori. It has been established how IDA may be produced by H. pylori in order to reduce iron absorption and increase iron loss. [6] The development of IDA can result from peptic ulcer disease and cancers brought on by H. pylori infection. However, H. pylori infection is typically associated with chronic gastritis, not gastrointestinal bleeding, in patients. [7] Although gastroenteritis is not linked to gastrointestinal bleeding, it can develop into chronic atrophic gastroenteritis, which is linked to hypo- or achlorhydria. [8] Atrophic gastritis can result in malabsorption of iron and IDA because gastric acid is essential for iron absorption. [9]

The link between Helicobacter pylori and vitamin deficiency was originally revealed in 1991, when a 15-year-old kid with IDA had better haematological markers following H. pylori eradication. The processes underlying the link between H. pylori infection and iron insufficiency are not entirely known. The most obvious way for H. pylori to produce IDA would be by competing for iron in the diet. H. pylori requires larger quantities of inorganic iron and zinc for in vitro growth than other pathogens, however there is no indication that H. pylori possesses more iron- or zinc-dependent enzymes than other bacteria[10].

Several studies have been conducted to evaluate the impact of H. pylori infection on the growth of children. A French research identified H pylori in more than half of the youngsters investigated due to their low height. [11] Another European investigation found that H pylori infection was only connected with subnormal growth in older girls around puberty. A recent Italian study discovered that a decrease in height exhibited in older children aged 8.5 to 14 years was linked to H pylori infection. [12] According to the findings of this study, H. pylori may be one of the environmental elements capable of influencing development. The mechanism behind this connection is unknown.

The goal of this study is to determine the prevalence of iron deficiency anaemia (IDA) in individuals with helicobacter pylori infection.

MATERIAL AND METHODS

This prospective/cross-sectional study was conducted at Benazir Bhutu Hospital Rawalpindi during the period from July, 2022 to September, 2022 and comprised of 105 patients. All patients provided written informed consent that included information about their age, sex, body mass index, level of education, and place of residence. Patients with gastrointestinal cancer, hematologic abnormalities, iron supplementation for at least 30 days, erythropoietin injection, overt or covert gastrointestinal

hemorrhage, malnutrition, a history of gastrectomy, and recent hospitalization for acute illnesses were excluded.

First included were patients who visited the gastrointestinal department with dyspepsia and required an upper GI endoscopy. Their clinical history and physical findings were noted on the customary data sheet. Patients on bismuth compounds, antibiotics, or proton pump inhibitors were advised to get an endoscopy at least two weeks after stopping their medications. After receiving a full explanation, the patients who were selected for upper GI endoscopy and biopsy provided signed informed consent. A skilled endoscopist used an Olympus forward-looking video endoscope while the patients were under topical lignocaine anaesthesia at the BSMMU Gastroenterology Department. Patients with endoscopic atrophic or erosive gastritis as well as normal individuals made up the research sample. During the endoscopy, two biopsy specimens were obtained: one from the body and one from the antrum of the stomach. When biopsy tissues were subjected to a rapid urease test (CLO) to identify H. pylori, the test medium's colour changed from straw to pink or reddish. This colour change could last for up to 24 hours.

Blood samples from the participants were analysed to determine their levels of ferritin, serum iron, total iron-binding capacity, transferrin saturation, and ferritin. Detection of H. pylori infection by histopathology, stool antigen testing, urea breath testing, or rapid urease testing. The full set of data was analysed using SPSS 24.0. For lab results, mean standard deviation was used.

RESULTS

We found that the mean age was 32.17±4.19 years with mean BMI 25.7±5.43 kg/m^2. Majority of the patients were illiterate and were from rural areas. 60 (57.1%) had poor socio-economic status. (table 1)

Table 1: Characteristics demographics of enrolled cases

Characteristics	Frequency	Percentage
Mean age (years)	32.17±4.19	
Mean BMI (kg/m^2)	25.7±5.43	
Residency		
Urban	35	33.3
Rural	70	66.7
Education Status		
Literate	40	38.1
Illiterate	65	61.9
Socio-economic status		
Poor	60	57.1
Good	45	42.9

There were 63 (60%) females and 42 (40%) males among all cases.(figure-1)

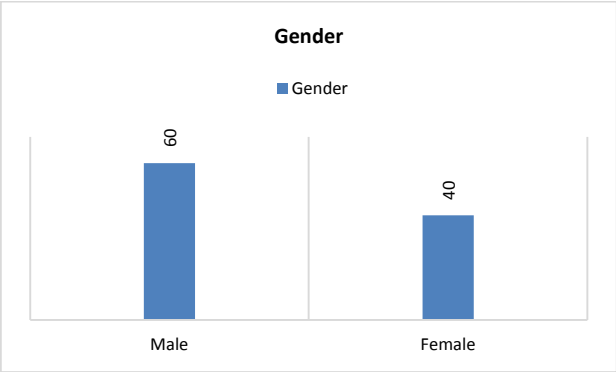

Figure-1: Gender of the presented cases

Mean Hemoglobin, iron and serum ferritin level was 12.1±0.6 (g/dl), 49.8 ±10.33(ug/dl),121.7±42.87 (ng per ml).table 2)

Table 2: Laboratory findings of enrolled cases

Variables	Standard	Deviation
Lab Results		
Mean hemoglobin (g/dl)	12.1	0.6
mean serum iron (ug/dl)	49.8	10.33
mean serum ferritin (ng/ml)	121.7	42.87

Frequency of iron deficiency anemia was found in 43 (40.95%) patients. Among 43 cases of IDA, majority of the patients 28 had age >35 years.(table-3)

Table-3: Prevalence of IDA among all cases

Variables	Frequency	Percentage
IDA		
Yes	43	40.95
No	62	59.05
Age (years)		
>35 years	28	26.7
<35 years	15	14.3

DISCUSSION

Although H pylori infection appeared to have an impact on growth when the population was studied only on the basis of infection, our results demonstrate that this is actually a consequence of the link between H pylori infection and iron deficiency anaemia. As several other research have revealed, it is doubtful that a H pylori infection by itself causes children to develop less quickly. H pylori infection may cause short stature in four different ways, according to Perri et al. [13] The possibility that it could result in symptoms of dyspepsia. A second possibility is that the virus could cause malnutrition and a lack of energy. Third, persistent infection results in low-grade chronic stomach inflammation and the production of cytokines that may have an impact on growth. Last but not least, it has been suggested that H pylori may be linked to a poor economic class, malnutrition, and susceptibility to other chronic conditions, all of which may have an impact on growth. However, our results show that H pylori infection with concurrent iron deficiency is linked to subnormal development at puberty, which is notably linked to height.

In our study 105 cases were presented. Among all there were majority females. Majority of the patients were illiterate and were from rural areas. 60 (57.1%) had poor socio-economic status. The findings from the present study are comparable to those from earlier ones. [14] Iron deficiency is the most typical cause of anaemia, which is a widespread disease in underdeveloped nations. [15] The high prevalence of this condition in contemporary culture may be attributed to a number of factors; some of them are well-known and well-researched, while others are more recent and untested. Although peptic ulcers and stomach malignancies linked to H. pylori can result in bleeding and iron shortage, the majority of people with H. pylori infection do not have ulcers or cancer. Typically, they do not experience gastrointestinal bleeding along with their chronic gastritis. [16] In many cases, the causes of IDA are still unknown despite extensive investigations. Recent years have seen an increase in research into the part H. pylori plays in the emergence of extra-gastrointestinal illnesses like iron deficiency anemia.

There are few published studies focusing on ID and anaemia status in relation to H. pylori infection or information on the regularity of H. pylori infection as the cause of IDA in the nation, despite the high prevalence of H. pylori infection in Cameroon and its role in gastric ulcer as well as gastro - intestinal malignancies, which can bleed and ultimately lead to IDA.

In our study mean Hemoglobin, iron and serum ferritin level was 12.1±0.6 (g/dl), 49.8 ±10.33(ug/dl),121.7±42.87 (ng per ml). In our recent study, we found that H pylori infection contributed to iron deficiency anaemia, and that infection should be suspected when iron deficiency anaemia is refractory to iron administration.[17[Treatment of H pylori infection was associated with a more rapid response to oral iron treatment than the use of iron alone, and it led to an enhanced iron absorption even in those who did not receive oral iron supplementation. We hypothesised that iron

deficiency anaemia coupled with H pylori infection occurs most frequently in rapidly growing pubescent children. Adolescents are particularly susceptible to iron deficiency because of the high amounts of iron needed to sustain their growth, dietary deficiency, and menstrual blood loss in girls.[18] Infection withH pylori might affect iron absorption metabolism in the stomach and exacerbate the iron deficit in children whose iron is supplied marginally, with anaemia ensuing promptly. Therefore, when adolescents have iron deficiency anaemia, it is recommended that they should be evaluated for H pylori infection. If they are found to have both, the iron deficiency anaemia should be treated by the eradication of H pylori along with iron supplementation. It is hypothesised that when children who have been suffering from chronicH pylori infection are affected with iron deficiency anaemia, especially during adolescence, their growth can be affected. Although the mechanisms by which H pylori infection might lead to iron deficiency anaemia are still unclear, a recent study ruled out gastrointestinal bleeding or iron malabsorption and suggested that H pylorigastritis could act as a sequestering focus for iron.[19]

Frequency of iron deficiency anemia was found in 43 (40.95%) patients. Among 43 cases of IDA, majority of the patients 28 had age >35 years [20] Comparable research was conducted in Karachi, Pakistan, where this study was conducted. Fast urease testing revealed that H. pylori was present in 92 percent of duodenal ulcer patients in Faisalabad, India. [22] A rapid urease test was used in a previous study on Korean children, and it revealed that only 23.6% of patients had H. pylori. [23] This divergence may be explained by variances in H. pylori prevalence between industrialised and underdeveloped countries as well as variations in prevalence with ageing.

CONCLUSION

In this research, we found that patients with helicobacter pylori infection, the majority of whom were adult female patients, had a considerably greater frequency of iron deficiency anaemia.

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