

ORIGINAL ARTICLE

Improvement in Refractory Iron Deficiency Anemia after Successful Eradication of H-PyloriANIQ FAYYAZ¹, ABID ALI², RAFIA WAJID³, SALMAN JAVED²¹Department of Gastroenterology, Bahawal Victoria Hospital, Bahawalpur-Pakistan.²Department of Gastroenterology, Services Hospital, Lahore-Pakistan³Department of Hematology, Test Zone Diagnostic Centre, Lahore-PakistanCorrespondence to Dr. Aniq Fayyaz; Email: aniqfayyaz@gmail.com Tel: +92-321-6810995**ABSTRACT****Background:** Helicobacter pylori has caused gastritis leading to bleeding and iron deficiency anemia. H-pylori eradication results in better response to oral iron treatment.**Aim:** To determine the frequency of improvement in refractory iron deficiency anemia after successful eradication of H-pylori.**Study design:** Descriptive, case series.**Methodology:** Patients (n=89) of refractory iron deficiency anemia, 15-55 years of either gender were included. After this taking relevant history, urea breath test was done for H-Pylori. After this, 10 days of PPI, bismuth, tetracycline and nitromidazole was given to the positive patients. Improvement in iron deficiency anemia was noted after 3 months of H-pylori eradication therapy. SPSS v.26 analyzed the data. Mean and standard deviation were calculated for age, duration of iron deficiency anemia and BMI. Stratification of improvement in refractory iron deficiency anemia was done with respect to age, gender and BMI. Post stratification Chi-Square test was applied with P-value ≤ 0.05 was taken as significant.**Results:** Mean age was 35.90 ± 9.89 years. Improvement in refractory iron deficiency anemia after eradication of h pylori was found in 54 (60.67%) patients, whereas there was no improvement in 35 (39.33%) patients.**Practical Implication:** This study provided the local stats of the problem and helped the clinicians to design a protocol for eradication of H pylori in these particular patients thus improving refractory IDA.**Conclusion:** It was concluded that frequency of improvement in refractory iron deficiency anemia after eradication of H-pylori was very high.**Keywords:** H-Pylori, Eradication and Refractory Iron Deficiency Anemia.**INTRODUCTION**

H-pylori is slowly growing but highly mobile gram negative bacterium¹. It resides in the deeper mucus gel coating gastric mucosa and affects almost half of the world². The complication associated with this infection include chronic stomach inflammation, duodenal ulcer, gastric cancer and orogastric malt lymphoma³. Clinical picture of patients having peptic ulcer disease is variable and usually present with pain (epigastric, post-prandial, nocturnal), anaemia, weight-loss due to reduced appetite caused by fear of pain and vomiting⁴.

It usually affects middle and old age patients⁵. According to an estimate, almost 500,000 new cases/year of peptic ulcers are reported in US. Unfortunately, its prevalence (85.1%) due to H-pylori in Pakistan is high thus causing gastritis and ulcers⁶. Among humans spontaneous iron excretion is minimum and common cause of iron deficiency anemia (IDA) among them is nutritional deficiency followed by an abnormal blood loss¹. However, literature review have suggested that IDA and H pylori infection are closely inter linked.² One study suggested that atrophic changes in the gastric body among H-pylori-positive IDA patients were significantly high while remaining patients had chronic superficial gastritis extending to the fundic mucosa³.

There are different H-pylori eradication therapies nowadays. However, first-line therapy for H-pylori infection is a combination of proton pump inhibitors (omeprazole) plus two antibiotics (clarithromycin and amoxicillin) administered for 7–14 days. Metronidazole is as an alternative to amoxicillin^{6,7}. Other treatment option is sequential therapy⁸.

Literature review showed that triple therapy has a serious decline in its efficacy attributed by increased antibiotic resistance of H. pylori especially to clarithromycin⁸⁻¹⁰. Other reasons include serious side effects of this combination of drugs such as nausea, vomiting, headache, dizziness and yeast infection in women^{11,12}. Due to this reason, it has been suggested extending the duration of treatment or using the four drug treatment such as sequential therapy will improve efficacy of drugs for H-pylori eradication.

Received on 24-06-2022

Accepted on 16-10-2022

One study reported that majority of patients enrolled had unexplained refractory IDA due to active H pylori infection¹³. This study provided the local stats of the problem and helped the clinicians to design a protocol for eradication of H pylori in these particular patients.

The objective of the study was to determine the frequency of improvement in refractory iron deficiency anemia after successful eradication of H-pylori.

METHODOLOGY

Study design was descriptive, case series. Present study involved Gastroenterology Department, General Hospital, Lahore. Sample size was 89 and population was Patients having refractory iron deficiency anemia. Patients from 15-55 years of age with either gender were included. Non-probability, consecutive sampling was done. After getting permission from IRB and taking relevant history, urea breath test was done for H-Pylori. After this, 10 days of PPI, bismuth, tetracycline and nitromidazole was given to the positive patients. Improvement in iron deficiency anemia was noted after 3 months of H-pylori eradication therapy. Written informed consent was taken. Patients with h/o gastrointestinal hemorrhage, pregnant females, peptic ulcer disease, CLD and CRF were excluded.

Statistical analysis: SPSS v.26 analyzed the data. Mean and standard deviation were calculated for age, duration of iron deficiency anemia and BMI. Frequency and percentage were calculated for gender and improvement in iron deficiency anemia. Stratification of improvement in refractory iron deficiency anemia was done with respect to age, gender and BMI. Post stratification Chi-Square test was applied with P-value ≤ 0.05 was taken as significant.

RESULTS

Males were 63(70.79%) while 26(29.21%) were females. Other demographic parameters like age, BMI of enrolled subjects were shown in table-1.

Data for improvement in refractory iron deficiency anemia was stratified for age, gender and BMI to see the modifier effect as shown in Table-2.

Data for improvement in refractory iron deficiency anemia was stratified for duration of disease, place of living and socioeconomic status to see the modifier effect as shown in Table-3.

Table-1: Baseline Parameters (n=89)

Characteristics	Categories	Study Sample
Age (years)	15-35	43 (48.31%)
	36-55	46 (51.69%)
	Mean \pm SD	35.90 \pm 9.89
Gender	Male	63 (70.79%)
	Female	26 (29.21%)
Duration Of Disease (months)	2-4	57 (64.04%)
	>4	32 (35.96%)
	Mean \pm SD	4.02 \pm 1.48
BMI (in kg/m ²)	\leq 30	51(57.30%)
	>30	38 (42.70%)
	Mean \pm SD	39.35 \pm 1.92
Improvement in Refractory Iron Deficiency	Yes	54(64.67%)
	No	35 (39.33%)

Table-2: Stratified Data for Age, Gender and BMI

Age (years)	Improvement in refractory iron deficiency anemia		P-value
	Yes	No	
15-35	19 (44.19%)	24 (55.81%)	0.002*
36-55	35 (76.09%)	11 (23.91%)	
Gender			
Male	39 (61.90%)	24 (38.10%)	0.711
Female	15 (57.69%)	11 (42.31%)	
BMI (kg/m²)			
\leq 30	37 (72.55%)	14 (27.45%)	0.008*
>30	17 (44.74%)	21 (55.26%)	

*Statistically significant

Table-3: Stratified Data for disease duration, place and socioeconomic status

Duration of disease (months)	Improvement in refractory iron deficiency anemia		P-value
	Yes	No	
2-4	33 (57.89%)	24 (42.11%)	0.474
>4	21 (65.63%)	11 (34.37%)	
Place of living			
Rural	39 (72.22%)	15 (27.28%)	0.006*
Urban	15 (42.86%)	20 (57.14%)	
Socioeconomic status			
Poor	22 (62.86%)	13 (37.14%)	0.794
Middle	20 (62.50%)	12 (37.50%)	
Upper	12 (54.55%)	10 (45.45%)	

*Statistically significant

DISCUSSION

Most common nutritional deficiency is iron deficiency causing micro-cytic, normo-chromic anemia thus results in impairment of immune, cognitive, reproductive functions and decreased work performance.¹⁴ This anemia causes almost 40% maternal deaths in the developing countries according to one estimate^{15,16}.

Our results showed that almost 60% patients had improved refractory iron deficiency anemia. Similarly, other studies reported that eradication of H-pylori resulted in complete recovery of IDA even with or without iron supplementation among children who were infected with H. Pylori^{17,18}. Thus their findings were in line with our results.

One study reassessed iron status at 01, 02 and 14 months after H-pylori eradication therapy. They initially concluded that eradication therapy for H-pylori did not correct IDA upto 14 months after treatment initiation. However, they reassessed them at 40 months after end of treatment. This time they re-concluded that H-pylori eradication at 40 months modestly improved iron deficiency thus lowered its prevalence¹⁹. Again their findings were in line with our findings. However, one study concluded after 90 days of follow-up that H. Pylori infection was neither a cause of IDA nor a reason for the treatment failure of iron²⁰. Thus their findings were

paradoxical to our findings. According to our findings H-pylori was strongly associated with IDA.

One study held at Texas reported that eradication of H-pylori after therapy improved serum ferritin levels among their enrolled patients thus anemia resolved²¹. These findings were similar to our results that showed improvement in anemia status among patients after H-pylori therapy. One previous study showed that oral iron supplementation showed better response among pregnant females who underwent eradication H-pylori therapy. Their anemia settled and ferritin improved.²²

One previous study concluded that H. pylori eradication therapy combined with iron administration was more effective than iron administration alone for the treatment of iron deficiency anemia.^{23,24} Their patients showed better response to bismuth based triple therapy with increased hemoglobin and serum ferritin concentrations than proton pump inhibitor based triple therapy. Thus their results supported our findings that showed improvement in anemia when treatment was given.

CONCLUSION

It was concluded that frequency of improvement in refractory iron deficiency anemia after eradication of H-pylori was very high. Hence, there should be proper screening and eradication of H-pylori infection in patients with refractory iron deficiency anemia in order to reduce the morbidity of these particular patients.

Limitations: Single centre study with financial constrains. No endoscopy was done for enrolled patients.

Author's contribution: AF&AA: Overall supervision, write up and literature review, RW: Statistics application, analysis literature review, help in write up, SJ: Literature review help in write-up.

Acknowledgements: I am thankful to Allah and all my colleagues for their help.

Conflict of interest: None

Funding: None

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