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SERUM IRON LEVEL;
PATIENTS WITH HELICOBACTER PYLORI INFECTION

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ABSTRACT…Objective: To determine the serum iron level in Helicobacter pylori infected patients. **Patients and methods:** This cross sectional descriptive study was conducted at Liaquat University Hospital (a tertiary care teaching hospital) Hyderabad from July 2013 to December 2013. All the patients with history of presented with acute abdominal pain, dyspepsia, bloating and epigastric discomfort were evaluated for Helicobacter pylori infection by serology. Thereafter the Helicobacter pylori positive individuals were further evaluated for serum iron level. The data was collected, saved and analyzed in SPSS version 11.00. **Result:** During six month study period total one hundred patients of H. pylori infection was recruited, of which sixty three (63%) were males and thirty seven were females. Sixty six (66%) patients belonged to urban areas while thirty four (34%) were rural population. The mean age ±SD for overall population was 37.35±14.0 where as the mean age ±SD of male and female population was 38.88±6.77 and 35.67±8.87 respectively. The serum iron was low in 68% Helicobacter pylori infected patients, of which 48 were males and 20 were females (p=0.02). The overall mean ±SD for serum iron level in study population was 49.17±37.86 mmol/L whereas the mean ±SD of serum iron for male and female Helicobacter pylori infected population was 42.69±34.15 and 60.18± 41.66 (p=0.03). **Conclusions:** An association was identified between Helicobacter pylori and iron deficiency

Key words: Iron, Helicobacter pylori, anemia

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INTRODUCTION

Iron deficiency is a common problem and develops through iron depletion, iron deficient erythropoiesis and iron-deficiency anemia (IDA). Studies observed that Helicobacter pylori infection interferes the iron metabolism and is associated with iron deficiency[1,2]. Barabino, et al found that the H pylori-infected antrum may be sequestering locus for thru outer membrane receptors of the bacterium[1]. The iron deficiency prevalent areas also has Helicobacter pylori infection simultaneously worldwide,[3-5]. It has been found an association between iron deficiency and H pylori infection in Alaska Natives[6-9]. The reported prevalence of iron deficiency in Helicobacter pylori infected patients was 38%[10].

The aim of this study was to determine the iron deficiency in patients with Helicobacter pylori infection which leads to evaluation of possible interaction between H.pylori and iron deficiency. The evaluation of the infection can saves the subjects to adapt severe complications caused by H. pylori.

PATIENTS AND METHODS

This study was conducted in the department of medicine & department of anesthesia, intensive care and pain management at Liaquat University Hospital Hyderabad. All relevant patients, of either gender came with history of nausea, vomiting, recurrent abdominal pain, dyspepsia or abdominal discomfort, heartburn; bloating and halitosis were admitted and evaluated. All the routine investigations were advised and then the Helicobacter pylori infection was evaluated by taking 2cc venous blood sample in a disposable syringe and send to laboratory for analysis. The helicobacter pylori infection was identified through serology by quantitative enzyme linked immunosorbent assay (ELISA) method. The H. pylori infection was considered to be positive when

the antibodies (IgG) ≥20 U/mL in the serum. The diagnosed (known) cases of Helicobacter pylori infection who visited the outpatient department and the referral patients from different units of the hospital had H. pylori infection were also included in the study. Thereafter the positive cases (Helicobacter pylori infected patients) were further evaluated for serum iron level by taking the 3cc venous blood sample in a 5ml disposable syringe and send to laboratory for analysis. The normal reading of serum iron for female subjects: 37–145 µg/dL and for male subjects: 59-158 µg/dl, the value <59ug/dl (cut off) was considered low / deficient (in males) and >158 was considered as raised whereas the value <37 µg/dL (cut off) was considered low / deficient (in females) and >145 was considered as raised. The informed consent was taken and the data was collected through predesigned proforma and demographical parameter was also recorded. Following subjects were considered in exclusion criteria of the study (1). Patients who were already on iron therapy, (2) Known cases of haemochromatosis, (3) Known cases of thalassemia (4) patients had history of repeated blood transfusions, (5) known cases of chronic renal failure. (6) History of hemolytic anemia, thalassemia, aplastic anemia (7) non-gastrointestinal (GI) cause of blood loss (8) patients with chronic renal failure (9) Known alcoholism or cirrhosis of the liver (10) Regular use of NSAIDS (11) prior gastric resection (12) patients with malabsorption syndrome (13) Known GI or hematologic malignancy (14) Known inflammatory bowel disease (15) patients already on Helicobacter pylori eradication therapy (15) Patients with GI microbial infection (16) Non cooperative patients who refused and did not have interest to participate in the study. The data was analyzed in SPSS version 11.00. The frequency and percentage of low serum iron in patients with Helicobacter pylori infection and gender distribution was calculated. The chi-square test was applied while the mean ±SD was calculated for quantitative variables and the difference between means was compared through t-test. The statistical significance was considered when p-value =0.05.

RESULTS

Total one hundred patients of H. pylori infection was recruited, of which sixty three (63%) were males and thirty seven were females. Sixty six (66%) patients belonged to urban areas while thirty four (34%) were rural population. Regarding the sign and symptoms, the pain in epigastrium was observed in all hundred patients, nausea and vomiting in sixty (60%) patients, loss of appetite in forty (40%) patients, heartburn in seventy five (75%) patients, belching in sixty five (65%) patients, indigestion in eighty nine (89%) patients and dyspepsia in ninety five (95%), bloating in ninety (90%), Fatigue in sixty five (65%), pallor in sixty two (62%), hair loss in twenty (20%), irritability in eighteen (18%), tired and weakness in forty five (45%), pica in five (05%), brittle or grooved nails in forty two (42%), pagophagia in four (04%), tongue become sore, smooth, shiny and reddened in forty seven (47%), tachycardia in forty two (42%), headache in thirty seven (37%), shortness of breath in twenty five (25%), angular cheilitis in forty five (45%), spleenomegaly in thirty (30%) and disturbed sleep in thirty two (32%) patients. The mean age ±SD for overall population was 37.35±14.0 where as it was 38.88±6.77 and 35.67±8.87 in male and female populations respectively. The frequency of iron deficiency in Helicobacter pylori infection patient as far as age and gender is concerned shown in Table I and II. The overall mean ±SD for serum iron level in study population was 49.17±37.86 mmol/L whereas the mean ±SD of serum iron in male and female population is shown in Table III.

DISCUSSION

Formerly, the association between H. pylori infection and iron deficiency was identified in a 15-yearold girl with active hemorrhagic gastritis along with positive H. pylori infection[11]. Dufour et al[12] reported chronic antral gastritis refractory to iron administration and recovered after H. pylori treatment. Similarly, other studies also observed improvement of iron profile and anemia after eradication of H. pylori infection[13-16].

In our study we identified 68% prevalence of iron deficiency in patients with H. pylori infection

		IRON		Total	P-value
		Low	Normal		
Age	12-19	7 (10.3%)	2 (6.3%)	9 (9.0%)	0.04*
	20-29	5 (7.4%)	7 (21.9%)	12 (12.0%)	
	30-39	31 (45.6%)	7 (21.9%)	38 (38.0%)	
	40-49	5 (7.4%)	7 (21.9%)	12 (12.0%)	
	50-59	13 (19.1%)	4 (12.5%)	17 (17.0%)	
	60-69	5 (7.4%)	3 (9.4%)	8 (8.0%)	
	70+	2 (2.9%)	2 (6.3%)	4 (4.0%)	
Total		68 (100%)	32 (100%)	100 (100%)	

Table-I. Age distribution of helicobacter pylori infected patients serum in context to serum iron
Chi-square with six degree of freedom = 12.53
**p-value is statistically significant*

Gender	Serum iron		Total	P-value
	Low	Normal		
Male	48 (70.6%)	15 (46.9%)	63 (63%)	0.02*
Female	20 (29.4%)	17 (53.1%)	37 (37%)	
Total	68 (100%)	32 (100%)	100 (100%)	

Table-II. Gender distribution of helicobacter pylori infected patients in relation to gender H.pylori (n=100)
Chi-square with one degree of freedom = 5.24
**p-value is statistically significant*

Gender	n=100	Mean±SD (μg/dl)	t-value	P-value
Male	63	42.69±34.15	2.277	0.03*
Female	37	60.18±41.66		

Table-III. Mean serum iron level in helicobacter pylori infected patient
** P-value is statistically significant*

and is related with the study by Ciacci, et al[17]. In current series we evaluate the serum iron level in Helicobacter pylori infected adult population and observed a positive association whereas the majority of the former studies conducted on children population but also had positive association in relation to iron and H. pylori infection[18]. Sugiyama, et al also studied an adult population and shown the improvement of iron status after Helicobacter pylori eradication therapy[19]. It had been found that the impact of H. pylori infection may vary in different countries and according to their socioeconomic status[20,21]. The New Zealand study had shown decrease serum iron in H. pylori infected subjects regardless of serum ferritin[22]. The study of Korea shown the eradication of H. pylori, with or without iron preparation leads to rises in haemoglobin level[23]. Yasunga, et al suggested that the increase in iron absorption was possibly involved in improvement of IDA after H. pylori eradication therapy[24].

In our study the male gender was predominant with significant difference (p=0.02) and is related to the study by Cardenas, et al[20].

In current study the male gender (48%) and urban population was predominant (66%) which is related to the study by Fraser, et al.25 H. pylori infection is a confirmed public health issue responsible for gastrointestinal disease which leads to iron deficiency, peptic ulceration and gastric malignancy.

In present study we observed the association of H. pylori infection and iron deficiency anemia. Additional, advance and extensive local studies are needed to determine the role of eradication of H pylori infection in the resolution of anemia.

CONCLUSIONS

The H. pylori infection is linked to iron deficiency in adult population. In future, new advance initiatives should be conducted to decrease the prevalence of iron deficiency by addressing the eradication infection.

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Even if you are on the right track,
you'll get run over if you just sit there.

Will Rogers