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ASSOCIATION OF IRON DEFICIENCY AND HELICOBACTER PYLORI INFECTION IN THE KHARTOUM STATE -2018

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ABSTRACT
Background: Iron deficiency defined as decrease total body iron content, is more the most common nutritional deficiency in the world, iron deficiency related to impairment in immune infection, such as H. pylori **Aim:** The study was aimed to assessment serum iron among patient with helicobacter pylori infection in Khartoum state **Method:** One hundred and twelve blood samples were included in the present study, 61 from patients with H.pylori as case group and 51 from healthy individual as control group collect 2.5ml of blood in lithium heparin container and separated serum was transferred into plain container and analyzed by spectrophotometer. **Results:** The mean result of serum iron in H.pylori patient was significant decreased in case group (66.13) than control group (98.07) with (p.value=0.03) **Conclusion:** The study showed that there is significant decrease in serum iron among H. pylori patients (p-value= 0.03).

KEYWORDS: Iron deficiency, anemia, *H.pylori* infection,

INTRODUCTION
Helicobacter pylori are gram-negative urease producing organisms that are found throughout the world. Infection with *H.pylori* produces chronic gastritis. It may also predispose patients to develop duodenal ulcers, gastric lymphoma or carcinoma.1,2 Many studies postulated that *H.pylori* may disturb normal biochemistry like increase in plasma fibrinogen a modification of the serum lipid profile.3,4 Recent evidence suggests that *H.pylori* is associated with iron deficiency and anemia. Several cross-sectional studies have found an association between *H.pylori* and low body iron stores and iron deficiency anemia and a reduced response to iron supplementation.5-11 Weyermann et al found that pregnant women infected with *H.pylori* had lower mean hemoglobin (Hb) level at the beginning of pregnancy and a greater decrease in the mean Hb level at the end of pregnancy.12 In Kenya, anemic children had a 2.5-fold higher proportion of elevated IgM antibody titers against *H.pylori* than non-anemic children.13.

Iron deficiency, defined as decreased total body iron content, is among the most common nutritional deficiencies in the world. Iron deficiency results in impairments in immune, cognitive, and reproductive functions, as well as decreased work performance. Iron deficiency develops through three stages: 1) iron depletion, 2) iron-deficient erythropoiesis, and 3) iron-deficiency anemia (IDA).1 Although the mechanisms remain unclear, clinical and epidemiologic studies suggest that infection with *H.pylori* is associated with iron deficiency and IDA.14 Barabino hypothesized that gastritis increased levels of neutrophil-derived lactoferrin, and since *H.pylori* has a lactoferrin-binding protein receptor, the infection would result in increased iron losses related to bacterial turnover.15 A study of children in Alaska showed that anemia responded to oral iron replacement but recurred when iron therapy was discontinued, suggesting that mild chronic bleeding was involved.16 It seems likely that the pathogenesis is multifactorial, including combinations of reduced iron absorption related to decreased acid secretion, increased iron loss from microbleeding, and utilization by bacteria. The purpose of this study is to investigate the role of *Helicobacter pylori* gastritis in iron-deficiency (ID) in some Iraqi patients.

MATERIALS AND METHODS
The patients were referred to al shakh specialized hospital where *H.pylori* infection was diagnosed

Sample Collections

Five milliliters (ml) venous blood was obtained from the subjects. All blood samples were dispensed into dry glass test tubes for clotting and retraction to take place. Sera were obtained after samples were centrifuged at 2000 g for five minutes and stored at -20°C until assayed for laboratory investigations.

Laboratory Investigation

Serum iron concentration were investigated by direct enzymatic method; after dissociation of iron- transferring bound in acid medium, ascorbic acid reduces Fe+3 iron into Fe+2 iron. The absorbance measured at 600 nm is directly proportional to the amount of iron in the specimen. The normal rang of iron as recommended by BIOLABO is 11.6-31.1 µmol/L for male and 9.0-30.4 µmol/L for female.

Statistical Analysis

All values were expressed as mean ± SD. Statistical analyses were done using the Student's t-test to assess differences among study groups. The level of significance was set at P <0.05.

RESULTS

One hundred and twelve blood samples were included in the present study, 61 from patients with H.pylori as case group and 51 from healthy individual as control group. The mean result of serum iron in H.pylori patient was significant decreased in case group (66.13) than control group (98.07) with p.value=0.03.

Table 4.1: Mean of serum iron in case and control.

	N	Mean	p. value
Case	61	66.13	0.03
Control	51	98.07	

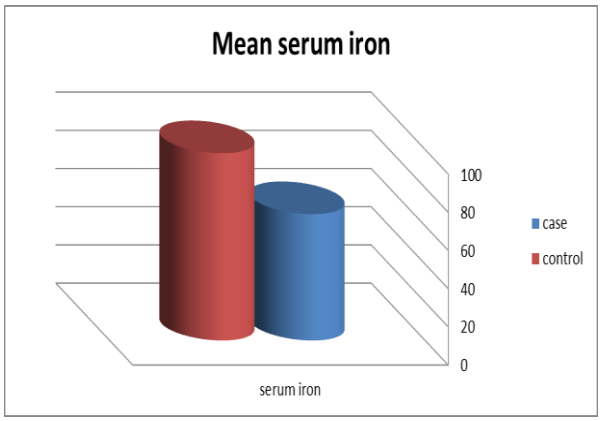

Figure 4.1: Mean of serum iron in case and control.

The mean result of serum iron in H.pylori patient in correlated to age group [1-20y (71.54), 21-40y (66.73), and 41-60y (62.25)] was insignificant compared to control group with p.value=0.2, 0.4, respectively.

Table 4.2: Mean of serum iron in case and control with age.

Age	Case		Control	
	N	Mean	N	Mean
1-20y	11	71.54	5	89.40
21-40y	30	66.73	32	97.84
41-60	20	62.25	14	101.7
p. value	0.2		0.4	

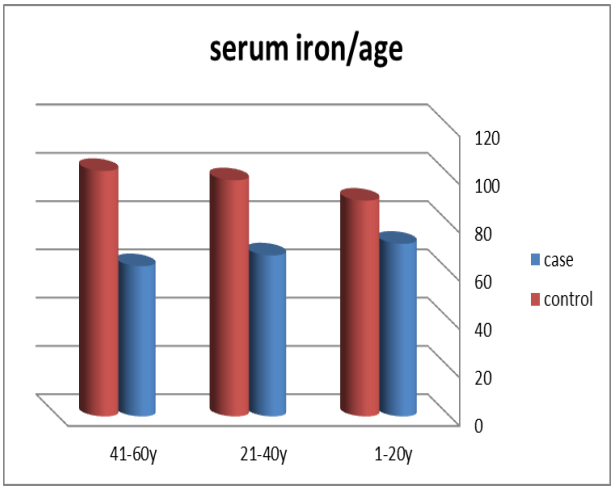

Figure 4.2: Mean of serum iron in case and control with age.

The mean result of serum iron in H.pylori patient in correlated to gender [male and female] was insignificant compared to control group with p.value=0.1, 0.4, respectively.

Table 4.3: Mean of serum iron in case and control with gender.

Gender	Case		Control	
	N	Mean	N	Mean
Male	22	72.09	16	102.6
Female	39	62.76	35	96.00
p.value	0.1		0.4	

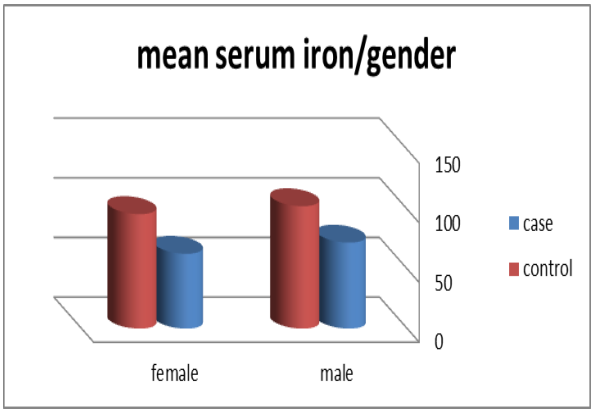

Figure 4.3: Mean of serum iron in case and control with gender.

The mean result of serum iron in H.pylori patient in correlated to treatment (yes or no) was significant different with p.value=0.02, the mean result of serum

iron in H.pylori patient in correlated to bloody stool (yes or no) was insignificant different with p.value=0.2.

Table 4.4: Mean of serum iron in case with treatment and bloody stool.

		Serum iron		p. value
		N	Mean	
Treatment	Yes	19	52.94	0.02
	No	42	72.09	
Bloody stool	Yes	8	58.12	0.2
	No	53	67.33	

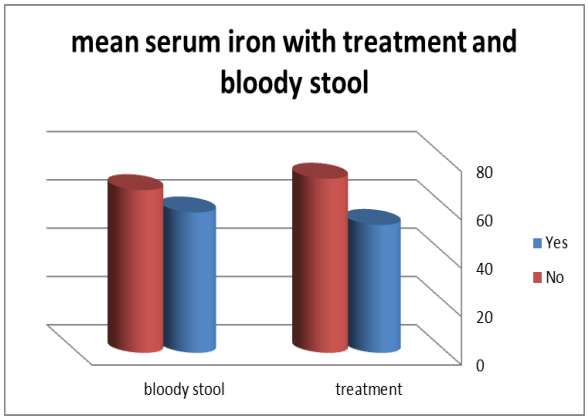

Figure 4.4: Mean of serum iron in case with treatment and bloody stool.

The mean result of serum iron in H.pylori patient in correlated to duration of disease [<1y (70.36), 1-3y (54.15), and >3y (46.50)] was significant slightly decreased with duration of disease with p.value=0.01.

Table 4.5: Mean of serum iron in case with duration

Duration	serum iron	
	N	Mean
<1y	46	70.36
1-3y	13	54.15
>3y	2	46.50
p. value	0.01	

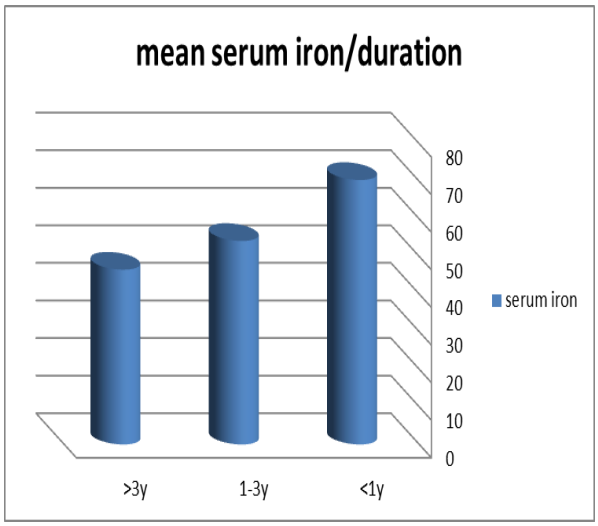

Figure 4.5: Mean of serum iron in case with duration.

The mean result of serum iron in H.pylori patient in correlated to other disease [shistosoma (109), DM (82), hypertension (70.75), and DM+hypertension (63)] was insignificant slightly decreased with other disease with p.value=0.06

Table 4.6: Mean of serum iron in case and control with other disease.

Other disease	serum iron	
	N	Mean
DM	5	82.00
Hypertension	8	70.75
DM+hypertension	2	63.00
Shistosoma	1	109.0
Non	45	62.73
p. value	0.06	

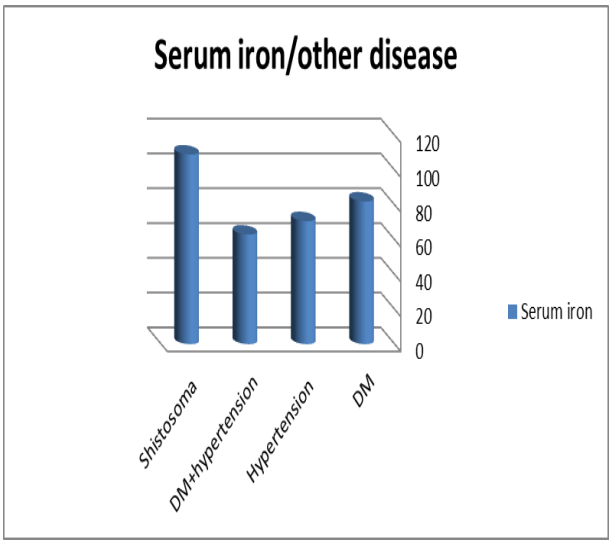

Figure 4.6: Mean of serum iron in case with other disease.

DISCUSSION

One hundred and twelve blood samples were included in the present study, 61 from patients with H.pylori as case group and 51 from healthy individual as control group. The mean result of serum iron in H.pylori patient was significant decreased in case group (66.13) than control group (98.07) with p.value=0.03.

That agrees with previous study done by (Durdi Qujeq etal, 2011) was conducted in Shahid Beheshti Hospital of Babol University of Medical Sciences, Babol, Iran from August 2007 to July 2008. The study group consisted of 35 patients with H. pylori and healthy subjects as the control group. The serum iron in H. pylori positive group was lower than in the control group (89.67±31.26 vs. 110.92±28.45 µg/dL, p=0.04). also corresponding to another previous study done by (Y. Wenzhen et al, 2010) Sixteen randomized controlled trials totaling 956 patients were included. The meta-analysis showed that the difference from baseline to endpoint of serum iron (SI) was statistically significantly different between H.

pylori patient when compared to control group (I 11.5 in case and 143 in control group; p<0.05.

Also agrees with study done by (Asha N Valiyaveettil etal, 2005) Of 52 patients, 32 (61.5%) had *H. pylori* infection the serum iron was lower in case group than in control groups (19 mcg/dL vs. 41 mcg/dL; p=0.019).

CONCLUSION

The present study showed that serum iron in H.pylori patient was significant decreased in case group compared to control group (p-value= 0.03).

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