

Association of Helicobacter Pylori Infection and Serum Ferritin Levels in Sudan

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Abstract

Background: Helicobacter pylori (*H. pylori*) is a type of bacteria responsible for widespread infections. Iron enters the stomach from the esophagus. Iron is oxidized to the Fe³⁺ state no matter its original form when taken orally. *H. pylori* infection may disturb some function of mucosa and leads to decrease in iron absorption.

Objective: The purpose of this study was to determine the association of Helicobacter pylori infection and Serum Ferritin levels.

Materials and Methods: One hundred and twenty samples were included (60 samples of *H. pylori* infected individuals and 60 samples of healthy individuals to be used as control) all of them were evaluated to determine serum ferritin levels. *H. Pylori* of the study participants was determined by using an immunochromatographic rapid test for the qualitative detection of *H. pylori* in human serum.

Results: there were no significant differences in the haematological values and s.ferritin level between the study group and controls.

Conclusion: The findings indicate that there was no association between *H. Pylori* and serum Ferritin.

Keywords: *H. pylori*, Serum ferritin, Sudan.

I. Introduction

Helicobacter pylori (*H. pylori*) is a type of bacteria responsible for widespread infection with more than 50% of the world's population infected, even though 80% of those infected have no symptoms. Infection with *H. pylori* has been recognized as a public health problem worldwide and more prevalent in developing than the developed countries. [1] Infection with *H. pylori* is a co-factor in the development of duodenal or gastric ulcers (reported to develop in 1 to 10% of infected patients), gastric cancer (in 0.1 to 3%) and gastric mucosa associated lymphoid tissue (gMALT) lymphoma (in <0.01%). [2]

Many proteins have been identified playing roles in iron metabolism. Some proteins such as ferritin or Tf are the main cargos of blood iron, whereas peptides such as iron regulatory proteins (IRPs), hepcidin, and matriptase (Mt2) are key determinants of iron regulation at different physiological levels. A set of different proteins, notably divalent metal transporter-1 (DMT1), ferroportin (FPN1), and transferrin receptors (TfRs) in association with ferroxidases such as duodenal cytochrome B, ceruloplasmin (Cp) and heme carrier protein (HCP1), are involved in the cellular membrane transportation of iron. Iron enters the stomach from the esophagus. Iron is oxidized to the Fe³⁺ state no matter its original form when taken orally. Gastric acidity as well solubilizing agents such as ascorbate prevent precipitation of the normally insoluble Fe³⁺. Intestinal mucosal cells in the duodenum and upper jejunum absorb the iron. The iron is coupled to transferrin (Tf) in the circulation which delivers it to the cell of body [3]. *H. pylori* infection may disturb some function of mucosa and leads to decrease in iron absorption. This study aimed to determine the association between *H. pylori* infection and S. ferritin level.

II. Materials and Methods

This is a case-control study, conducted in Khartoum, Sudan. 120 samples were included (60 sample from *h. pylori* infected individuals, the other 60 sample from healthy individuals to be used as control) all of them were evaluated to determine serum ferritin levels.

Five ml of blood was collected from each subject by clean venous puncture, 3ml of which was placed into a plain container for the detection of ferritin levels, 2ml was placed in an EDTA container for complete blood count. This study was approved by ethical committee of ministry of health, and informed consent was obtained from each participant before sample collection. *H. Pylori* of the study participants was determined by

using an immunochromatographic rapid test for the qualitative detection of h.pylori in human serum, S. ferritin level was determined by ELSA. Data were analyzed by SPSS.

III. Results

Descriptive statistics of quantitative variable (mean±SD) showed that the mean ages are comparable in the study group and control group(35.9±12.7) and (37.4±11.0) respectively (P-value 0.360). table 1 showed the comparison of the S. ferritin level between the males and females. table 2 showed the comparison of the S. ferritin level and the haematological values between the study group and controls.

Table 1. comparisons of S.Ferritinlevel amongmales and females.

	Male	Female	P value
Gender	25(42%)	35(58%)	
S.ferritin (Mean±SD)	123.85±83.15	72.96±79.46	0.019

Table 2.comparisons of S.Ferritinlevel andhaematologicalvalues among cases and controls.

Parameters	Control (Mean±SD)	Case (Mean±SD)	P-value
Hb%	13.40±0.90	13.11±1.58	0.221
HCT	40.52±3.08	42.91±5.57	0.636
RBCs	4.07±0.44	4.73±0.71	0.707
MCV	86.62±4.35	87.78±5.35	0.195
MCH	28.55±1.58	28.38±3.09	0.710
MCHC	37.95±5.12	31.87±3.28	0.239
WBCs	6.54±1.78	6.25±1.81	0.386
Plt	275.75±72.04	272.20±76.24	0.794
S.ferritin	105.55±81.99	99.25±84.67	0.680

P-value < 0.05 consider as significant

There was no significant difference in the mean S. ferritin level and the haematological values between the cases and controls.

IV. Discussion

H.pylori infection may disturbs some function of mucosa and leads to decrease in iron absorption causing iron deficiency anaemia, this study aimed to determine the association between H.pylori infection and S. ferritin level. The study included 60 H.Pylori infected patients their S. ferritin level and haematological parameters were determined and compared with 60 apparently healthy subjects as controls. We found that the mean of ferritin was significantly lower in female H. pylori positive group than male H. pylori positive group. These data confirm an earlier study done by Konno M et al [4]that found serum ferritin is significantly lower in female patients.The study found that there was no significant difference in the S.ferritin level and haematological values between the study group and control group. Guidelineson iron deficiency anemia have confirmed the etiological roleof H. pylori, but the relationship remains controversial.Our finding is in agreement with previous report [5].A study done by Zakaria NH et al[6]doesn't agree with our study. They found that serum ferritin is significant lower in patient with H,pylori than healthy control.Low serum ferritin and H. pylori infections may be a coincidence because bothof the diseases are highly prevalent. Moreover, there are many causes that lead to low serum ferritin and iron deficiency anemia, such as malnutrition, vitamin deficiencies, chronic disorders, infections, and conditions associated with chronic blood loss.

V. Conclusion

The findings indicated that S.Ferritinlevel is not associated with H.pylori infection.

Acknowledgment

Special thanks to the staff of Hematology Department, Faculty of Medical Laboratory Sciences, Alnelain University ,Sudan

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