

ORIGINAL ARTICLE

Study The Relationship Between Helicobacter Pylori Infection And The Level Of Serum Ferritin Using Immunofluorescence Assay Method

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1 Introduction

Helicobacter pylori is one of the bacterial species that infects the digestive system of more than half of the world's population [1]. These bacteria are aerobic and Gram-negative, infecting both sexes, children and adults alike [2], and their complications lead to ulcers and cancer in the digestive system, in addition to inflammation of the lymph nodes [3].

The method by which *H. pylori* infection is transmitted is still not clearly understood yet. It has been suggested that house flies are sufficiently large

Abstract

The Aim of the study was determine the relationship between the presence of Helicobacter pylori infection and the level of S. ferritin using Immunofluorescence assay method.

Methods The study was conducted between (November) 2023 and (February) 2024, where the study was conducted on (100) patients both males 58% and females 42% in the city of Samawah, Iraq, suffering from symptoms of *H. pylori*.

Results showed that 81 patients were confirmed to be infected with *H. pylori* 54.32% male and 45.67% female. The study also showed that 74.07% of the patients with *H. pylori* infection suffered from a ferritin deficiency anemia the levels of S. ferritin was between 2.77 - 18.85 ng/ml for male and 0.5 - 12.79 ng/ml for female, and 25.92% of patients they have *H. pylori* infection but with normal levels of S. ferritin 34.11 - 218.73 ng/ml for male and 22.61 – 81.57 ng/ml for female. This decrease in S. ferritin levels is due Upper Gastrointestinal Bleeding which is due to necrosis and ulceration of the wall lining the upper part of the digestive system by *H. pylori*. Other 19 patients had no bacterial infection identified in their serum their levels of S. Ferritin was 30.63 – 310.25 ng/ml for male and 15.01 – 124.14 ng/ml for female therefore, this levels within the normal rang.

Keywords: Serum Ferritin; *Helicobacter pylori*; FDA, Anemia.

to transmit bacteria, especially in areas that do not have good sanitation infrastructure [4]. *H. pylori* infection can occur in all countries of the world, but its spread varies widely between countries and between cities and regions of a same country [5]. According to statistics published by the World Health Organization, the prevalence of the disease in developing countries is about 80%, while in industrialized countries it is between 20%-50% [6]. It is often possible to eliminate this type of bacteria in childhood, simply by giving the patient the appropriate antibiotics [7].

WHO has indicated that a deficiency in iron levels and iron stores (serum ferritin) is a major cause of anemia in both sexes and all ages. Therefore, in this study, I am working on studying people infected with *H. pylori* and their iron and ferritin deficiency levels.

The 1930s saw the discovery of serum ferritin, and the 1970s saw its development as a clinical test. A deficiency or increase in iron levels is directly linked to many disorders [8,9]. The diagnosis and follow-up of these disorders frequently involve the use of serum ferritin test.

Ferritin has a molecular weight of 440 kD, depending on the iron content, and consists of a protein shell (Apo-ferritin) that is composed of 24 subunits and an iron core containing an average of 2500 Fe³⁺ ions [10]. Latent iron deficiency is defined as a fall below the 12 ng/mL ferritin threshold. The two values are diagnostic even when the blood picture is still morphologically normal. A depressed ferritin level accompanied by hypochromic, microcytic anemia indicates manifest iron deficiency [11].

Elevated ferritin values are also encountered with the following tumors: acute leukemia, Hodgkin's disease and carcinoma of the lung, colon, liver, and prostate. Ferritin determination have also proved to be of value in liver metastasis. Reasons for the elevated values could be cell necrosis, blocked erythropoiesis or increased synthesis in tumor tissue [12].

2 Materials and methods

The cross-sectional study was conducted in the city of Samawah-Iraq between (November) 2023 and (February) 2024, Consent was obtained from the patients' families to conduct this study based on the results obtained. Where the study was conducted on (100) patients both males 58% and females 42% and with different age 7 – 15 years old, suffering from symptoms of *H. pylori* infection which includes vomiting may be accompanied by blood and a feeling of wanting to vomit, in addition to dizziness and diarrhea, pain in the upper part of the stomach, Frequent burping, a burning pain, or sometimes a sharp pain symptoms vary from one patient to another [13,14].

Ferritin levels were measured in the blood serum of all patients suffering from symptoms of *H. pylori* infection Taking into account the patient's medical history, such that he does not take any type of iron supplement.

3 Serum Ferritin and *H. pylori* test

Samples were collected from the patients' veins and placed in SSD tube brand: TRUST LAB mead in

USA, After that, the sample was inserted into the centrifuge at a speed of 6000 rpm for 5 minutes to separate the blood components and obtain the blood serum. S. Ferritin was determined by fast test kit (Immunofluorescence assay) brand: GP-Getein, model: GP-1100 Origin: China Immunofluorescence Quantitative Analyzer is an advanced on-site diagnostic analyzer. Normal Rang for male: 30 – 400 ng/ml, Female: 15 – 150 ng/ml.

H. pylori diagnosed by the same technology Fast Test Kit (Immunofluorescence Assay) is intended for in vitro quantitative detection of *H. pylori* specific antigen in human stool specimen. It is a useful aid in the diagnosis of a number of gastrointestinal disorders. Normal Rang IgM: ≤ 30 U/mL (negative), 30.01-39.99U/mL (equivocal), ≥ 40 U/mL (positive) IgG: < 0.75 (negative), 0.75-0.99 (equivocal), *geq1* (positive) [15,16].

4 Result and discussion

The results of the study conducted on 100 patients suffering from symptoms of *H. pylori* infection showed that 81of patients were confirmed to be infected with *H. pylori* 54.32% male and 45.67% female (Figure 1).

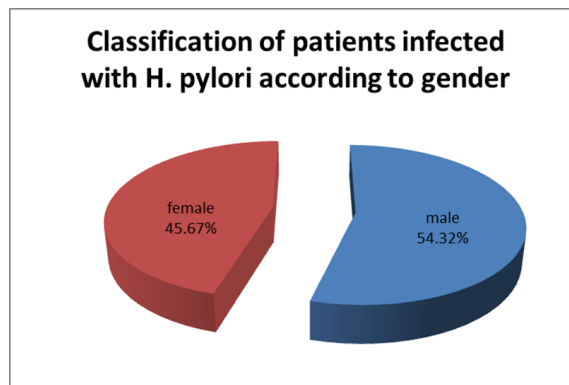


Figure 1: Classification of patients infected with *Helicobacter pylori* according to gender.

The other 19 patients had no bacterial infection identified in their blood serum so we can consider them control (Figure 2), their levels of S. Ferritin was between 30.63 – 310.25 ng/ml for male and 15.01 – 124.14 ng/ml for female therefore, this levels of S. ferritin can be within the normal rang, the reason for this may be due to several external factors, including the nature of the patients' diet [15].

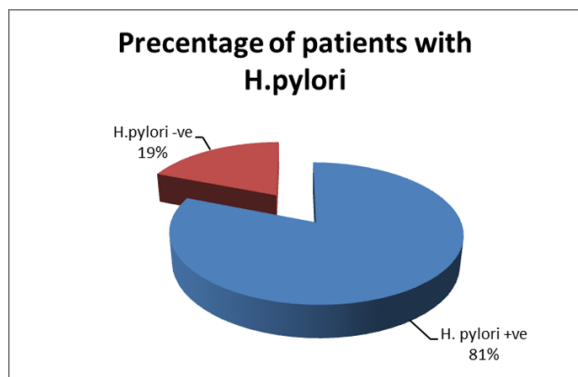


Figure 2: Percentage of patients infected with *H. pylori*.

The findings of this study suggest that 74.07% of the patients with *H. pylori* infection suffered from a ferritin deficiency anemia (FDA), the levels of S. ferritin was between 2.77 - 18.85 ng/ml for male and 0.5 - 12.79 ng/ml for female, and 25.92% of patients they have *H. pylori* infection but with normal levels of S. ferritin 34.11 - 218.73 ng/ml for male and 22.61 - 81.57 ng/ml for female (Figure 3).

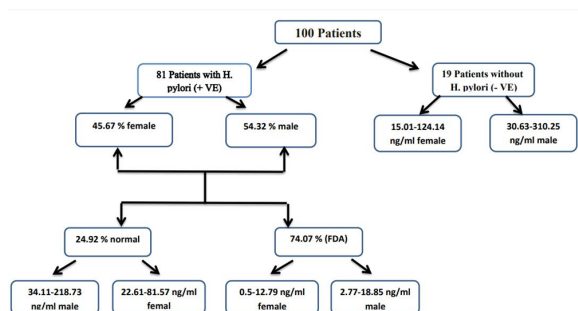


Figure 3: A chart showing the data found for all cases in this study.

This decrease in S. ferritin levels is due Upper Gastrointestinal Bleeding (UGIB) which is due to necrosis and ulceration of the wall lining the upper part of the digestive system by *H.pylori* [17, 18].

So we can conclude that patients infected with *H. pylori* are more likely to suffer from (FDA).

Compare the results with other research papers, Eman Elsaadany also demonstrated that her results also showed that children patients whose sample results were positive for *H. pylori* bacteria, had low levels of S. ferritin clearly [19], And also the researcher Adeel Rahat note that S. ferritin levels were decreased in 37.5% of cases 112 patients with H. Pylori infection [20]. I also call for more studies on this interesting topic, especially in young age groups under 15 years, so that we can better understand the relationship between infection with *H. pylori* bacteria and low levels of S. ferritin, this can be performed using techniques other than the techniques used in this study, which

are technical of (Immunofluorescence assay) in order to Diagnose Such As Enzyme Linked Immuno-Sorbent Assay (ELISA) or diagnosing bacteria using a Urea Breath Test.

5 Conclusions

Conclude from the study, that patients infected with *H. pylori* are more likely to suffer from (FDA). Whereas 74.07% of patients suffering from *H. pylori* have a deficiency in the level of S. ferritin. As for gender, males are more susceptible to infection with *Helicobacter pylori*.

Conflict of Interest: No conflicts of interest exist between the authors and the publication of this work.

Ethical consideration: The ethical committee approved the study at Al-Muthanna University, Al-Muthanna, Iraq.

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