

The effect serum iron, vitamin B12 and ferritin levels in adult patients infected with *Helicobacter pylori*

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DOI: 10.47750/pnr.2022.13.S06.432

Abstract

Objective : This study aimed to investigate the relationship between hematological parameters, serum iron, and vitamin B12 levels in adult hospitalized Palestinian patients infected with *Helicobacter pylori*.

Methods : The collected the data, prospectively, all *H.Pylori* cases admitted in lab private during the study period between April 2022 and August 2022. During the five months , (30) cases with *H.pylori* and (30) control . patients had *H.pylori* positive. laboratory analysis of inflammatory indices and organ function was accomplished for the sum total of cases and controls

RESULT : The results in this research showed that there is a highly significant between stomach germs(*H. pylori*), iron, ferritin and vitamin B12, and there is non-significant with vitamin D.

INTRODUCTION

H. pylori is a gram-negative bacteria that colonizes the human stomach mucosa. *H. pylori* infection has been linked to chronic gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue lymphoma, and other diseases. Gastric cancer is a kind of cancer that affects the stomach and digestive system (1,2).

It is the most common illness in humans since it affects almost 80% of the world's population. The prevalence rate is greater in underdeveloped nations, with an estimate of 80% (3). *Helicobacter pylori* (*H. pylori*) requires iron to live and may be linked to unexplained anemia (IDA).

H. pylori infection is more common in refractory IDA patients than in healthy persons, and a link has been shown between low serum ferritin and a high frequency of *H. pylori*-specific IgG. Even without oral iron therapy, several instances of *H. pylori*-associated refractory IDA have been cured by eradication of *H. pylori* (4). Anemia is a prevalent condition that affects a quarter of the world's population, with a greater frequency among preschool-age children and women who are menstruation (5). Because hemoglobin (Hb) is the most abundant iron-containing protein in humans and anemia is a defining feature of iron deficiency, iron deficiency anemia (IDA) is the most frequent nutritional deficit and the leading cause of anemia worldwide(6).

Vitamin D, a fat-soluble vitamin, has few dietary sources, and thereby, the primary route of obtaining this vitamin is through dermal synthesis after ultraviolet-B (UVB) radiation [7]. The two primary forms of vitamin D are vitamin D2 and vitamin D3, formed from ergosterol and 7-dehydrocholesterol by UVB radiation, respectively [8]. Vitamins D2 and D3 are prohormones and biologically inactive .

Vitamin D was found to suppress the *H. pylori*-induced production of proinflammatory cytokines including IL-1, IL-2, IL-6, IL-8, and TNF- α . A recent study demonstrated that vitamin D supplementation leads to downregulation of IL-8 in *H. pylori*-infected mice, in both wild type and VDR knockdown (9)

Vitamin B is composed of eight separate water-soluble important elements including B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B6 (pyridoxine), B7 (biotin), B9 (folate), and B12 (cobalamin). Except for vitamin B3, that can be made of tryptophan, none of the B vitamins is produced by the human body and must be acquired from the diet or microbial sources such as gut microbiota [10]. However, the main sources for vitamin B12 are animal foods such as meat, fish, eggs, or dairy products [12].

Material and method

the collected the data, prospectively, all H.Pylori cases admitted in lab private during the study period between April 2022 and August 2022. During the five months, (30) cases with H.pylori and (30) control. patients had H.pylori positive. laboratory analysis of inflammatory indices and organ function was accomplished for the sum total of cases and controls.

Study population: the study participants incorporates an admitted patients in the medical ward From a private lab in Baghdad city, the diagnosis relied on any attainable investigations in the case documents of patients, entire number of the patients comprised in the analysis was (60) cases, with (30) cases proved to be H.pylori and (30) controls Sampling size: was suitable, confined by accessibility of patients and time extents of the analysis, but sampling job for control, systematic random sampling technique was achieved to assemble the control. Ethical issue: an ethical agreement was attained from a private lab in Baghdad directorate. A knowledgeable permissions was gained from all candidates. All candidates undergone laboratory assessment laboratory indices of inflammatory markers were performed in form of ferritin, iron B12, vitamin D3.

RESULT

The results Serum vitamin B1, ferritin and iron levels were significantly lower in cases compared to controls VITAMIN D non significantly and was restored to close to normal levels after medical treatment.

Table 1- Correlation of H.pylori with all of the studied parameters in control Group and patients group

Variable		H.pylori	IRON	Ferritin	vitamin B12	vitamin D
H.pylori	Pearson Correlation		.484**	.787**	.812**	.252
	Sig. (2-tailed)		.000	.000	.000	.084
IRON	Pearson Correlation	.484**		.697**	.452**	.159
	Sig. (2-tailed)	.000		.000	.001	.280
Ferritin	Pearson Correlation	.787**	.697**		.647**	.384**
	Sig. (2-tailed)	.000	.000		.000	.007
vitamin B12	Pearson Correlation	.812**	.452**	.647**		.207
	Sig. (2-tailed)	.000	.001	.000		.159
vitamin D	Pearson Correlation	.252	.159	.384**	.207	
	Sig. (2-tailed)	.084	.280	.007	.159	

Discussion

The goal of the current investigation was to determine the prevalence of anemia and its relationship to H. The frequency of anemia generally among adult patients with dyspepsia in this investigation indicated a moderate public health issue.

This could be as a result of anemia-causing factors such as blood loss from chronic erosive gastritis, poor iron absorption from hypochlorhydria and chronic gastritis, and an increase in hepcidin levels following H. pylori infection. (12)

The association between anemia and H. pylori infection among adult dyspeptic patients has been explored by the number of previous studies this agreement study (13, 14)

Adult dyspeptic individuals may have gastrointestinal blood loss due to H. pylori-induced gastrointestinal lesions, (15) iron consumption by the organism itself, or both as a possible explanation for the link between anemia and H. pylori infection. [16], also gastritis Since H. pylori contains a lactoferrin-binding protein receptor and elevated quantities of neutrophil-derived lactoferrin, the infection may cause increased iron losses due to bacterial turnover. Due to the high turnover rate of these bacteria, a significant amount of iron may be lost in feces as dead bacteria [17] Additionally, chronic H. pylori gastritis can alter the physiology of the stomach by reducing gastric acid secretion, which prevents the absorption of dietary iron because acidic intragastric PH is necessary for iron absorption. (18).

Although the exact mechanisms are yet unknown, H. pylori is a contributing factor to IDA, and it may also be to blame for gastritis-related vitamin B12 malabsorption and hypochlorhydria. (19) Therefore, in the majority of individuals with atrophic gastritis, the absence of an intrinsic component may contribute to vitamin B12 malabsorption. H. pylori colonization in the stomach mucosa may impair certain of the mucosa's activities, decreasing iron absorption and increasing iron loss, according to earlier studies (20).

As a result of the relationship between H. pylori and B12 insufficiency, the vitamin B12 level was significantly lower in cases compared to controls. Healthy people have a 4.2-times lower risk of having low levels of vitamin B12 than H. pylori-positive people do. The prevalence of vitamin B12 deficiency was 28% in the H. pylori-positive group and 11% in the H. pylori-negative group, respectively, in earlier studies that demonstrated a statistically significant link between H. pylori infection and serum vitamin B12 levels.(21) There are several potential explanations for how H. pylori infection results in vitamin B12 malabsorption.

- Diminished acid secretion in H. pylori-induced gastritis may lead to a failure of critical splitting of vitamin B12 from food binders and its subsequent transfer to R binder in the stomach;
- A secretory dysfunction of the intrinsic factor and
- Decreased secretion of ascorbic acid from the gastric mucosa and increased gastric pH. The occurrence of chronic H. pylori infection in the gastric mucosa may impair the absorption of vitamin B12.(22)

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