Occurrence of *Helicobacter pylori* Specific antibodies in patients with Iron-deficiency anemia [+]

التحري عن اضداد النوعية لبكتريا *Helicobacter pylori* عند مرضى فقر الدم نوع نقص الحديد

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Abstract:

This study evaluates the prevalence and significance of *Helicobacter pylori* (*H. pylori)* infection in patients with iron- deficiency anemia. Analysis serum samples for the presence of *H. pylori* antibodies by ELISA was performed in 123 iron deficiency anemia sample and 100 sample for blood doners as control. Highly percentage of *H. pylori* antibodies positive was found in gastric patients with iron- deficiency and it was higher in females (66%) than males (55%) respectively. Majority of cases (more than 79%) from rural area. Percentages of patients with history of anemia and positive *H. pylori* is (55.2%), while (84%) for history of gastritis and positive *H. pylori* in blood doners (P < 0.001). From this study concluded that the sero-prevalence of *H. pylori* in patients and doners are (59%), (22%) respectively.

Keywords. H. pylori, Iron-deficiency, Anemia.

المستخلص:

قيمت الدراسة مدى شيوع واهمية الأصابة بالـ *H. pylori* لدى مرضى فقر الدم نوع نقص الحديد. حيث حددت الأجسام المناعية المضادة للبكتريا بواسطة اختبار مقاييسة الروز المناعي المرتبط بالأنظيم. شملت الدراسة لدى ١٢٣ عينة لمرضى نقص الحديد و 100 عينة اخرى لمتبرعي الدم كسيطرة. وجد ان اعلى نسبة اصابة بالـ *H. pylori* عند المرضى المصابين بالتهاب المعدة مع وجود فقر دم نوع نقص الحديد. ان نسبة الاصابة عند الأناث اعلى من الذكور 66%، 55% على التوالي. كما عرف ان غالبية الحالات (اكثر من 79%) من المناطق الحضرية.

نسبة الأصابة بالـ *H. pylori* لدى مرضى لهم تاريخ سابق بفقر الدم كانت ٥٥,٢% بينما ٨٤% لمتبرعي الدم ولهم تاريخ بالتهاب المعدة، وكانت هذه النتائج ذات تأثير معنوي مهم (P <= 0.001).

نستنتج من هذه الدراسة ان نسبة شيوع *H. pylori* عند مرضى نقص الحديد اعلى من متبرعي الدم وبنسبة تتراوح ٥٩%، ٢٢% على التوالي.

Introduction:

Helicobacter pylori is responsible for one of the most frequently encountered infectious diseases world wide [1]. Infection due to H. pylori can lead to the development of gastritis and peptic ulcer disease. The presence of H. pylori in the human stomach also represents an increased risk for gastric cancer and gastric lymphoma. [1]

The implication of Helicobacter pylori in the onset of anemia due to iron deficiency, other than the occult bleeding that this germ can provoke, mediated by a peptic ulcer, lymphoma or gastric adenocarcinoma, is still controversial. [2]

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The purpose of this study is to determine *Helicobacter pylori* specific antibodies in serum and its relation to iron-deficiency anemia in Iraqi humans.

Materials and methods:

A case series study was conducted in the gastroenterology and hepatology teaching hospital, primary health center services in bab-almudhum and National center of blood transfusion in Baghdad from October 2005 to may 2007.

A special questionnaire was designed by investigative to include information concerning demographic character such as age, gender, residence and previous history of gastritis and \ or anemia.

Two hundred seventy five blood samples studies. (175) patients with anemia (all types anemia), 123/175 iron deficiency anemia (patients group) and (100) blood doners (control group). Patients group were retrospective analysis with gastritis, gastric ulcer, duodenal ulcer, pregnant women's and kidney disease (included kidney failure and nephritis).

- All samples study investigation to determine anemia (n = 275) By: A complete blood count (CBC) test / Biokit (spain).
- To determine Iron-deficiency anemia in patients with anemia (n = 175) used serum ferritin levels by comerically avaibles enzyme – linked immunosorbent assay kits (ELISA)/ lab. system (finland).
- Investigation to determine *H. pylori* infection used serum IgG antibodies against *H. pylori* infection by ELISA test / lab. System (finland). Including all patients with iron-deficiency anemia and blood doners (n = 223).

The Chi-square test was used to test for association between variables with the result being considered as statistically significant when P value was < 0.05. [3]

Results and Discussion:

A total of 175 anemia samples, 123 (70.2%) were positive for iron-deficiency anemia, 73/123 (59%) were positive for *H. pylori* in iron-deficiency group and 22/100 (22%) were positive for *H. pylori* among a symptomatic attendants in national center of blood transfusion in Baghdad during the period of the study.

The prevalence of *H. pylori* in gastritis, gastric ulcer, duodenal ulcer, pregnant women's and kidney disease was 86%, 48.3%, 50%, 56.5% and 0% respectively. *H. pylori* was significantly linked to gastritis, pregnant women's in iron-deficiency anemia (Table 1). These results were similar to that found by Kato *et al*, in Japan [4] which was 98.5% in gastritis. Recent finding support the hypothesis that in subject with *H. pylori*- positive gastritis, concomitant changes in intragestic pH and ascorbic acid are present that might play a role in impairing alimentary iron absorption with consequent sideropenic anemia. [5]

Aguayo *et al*, in Mali [6] which was estimated 73% of pregnant women are anemic due to iron-deficiency and *H. pylori* positive. Because the growing fetus draws up on the mothers iron for the development of red blood cells and other tissues. [7]

Tables (1): Distribution of H. pylori antibodies according to the types of infection for patients group**.**

Types of infection	No. of patient with IDA	H. pylori	
		+	%
Gastritis	43	37	86
Gastric ulcer	31	15	48.3
Duodenal ulcer	16	8	50
Pregnant women	23	13	56.5
Kidney disease	10	0	0
Total	**123**	**73**	**59**

- IDA : Iron-deficiency anemia.
- H. pylori : Helicobacter Pylori.

The highest percentages of *H. pylori* was found in age group (46-55) years 86% and 90%, these result were similar to Edwards *et al*, in Barbadian [8] which was seroprevalence increased with age, to a peak of more than 90% in blood doners aged (50-59) years and in patients aged over 60 years, but differ from Pelser *et al*, in Bloemfontein, south Africa area [9] who found the prevalence of *H. pylori* 84.2% in patients and 67.3% in doners at age group (10-15) years. (Table 2)

Tables (2): Percentage of H. pylori according to the age group.

Age group	No. of patients	H. pylori		No. of doners (healthy control)	H. pylori	
		+	%		+	%
16 – 25	23	8	35	27	0	0
26 – 35	47	22	49	41	4	9.7
36 – 45	31	24	77	22	7	31.8
46 – 55	22	19	86	10	9	90
Total	**123**	**73**	**59**	**100**	**22**	**22**

The distribution of cases according to the gender was show in table (3), more cases positive with H. pylori in females patients and doners about 66% and 42.8% respectively, compare to cases positive in males.

This result were similar to Hamide and Sethuraman in India [10] in which the prevalence of H. pylori infection in the study population was found to be higher in females than males, 69.3%, 64.5% respectively, because women loss of blood during the menstrual period and from repeated pregnancies [11]. Differs from other published study Bohmer et al, in Nether land [12] in which the presence of H. pylori was significantly associated with male gender.

Tables (3): Distribution of cases according to the gender.

Gender	No. of patients	H. pylori		No. of doners	H. pylori	
		+	%		+	%
Male	76	42	55	86	16	18.6
Female	47	31	66	14	6	42.8
Total	**123**	**73**	**59**	**100**	**22**	**22**

Majority of cases more than 79% from rural area, compared to 20.5% from urban area in patient group. And 81% in rural area, compared to those urban area in doners (Table 4). This results is similar to other published studies [13,14] and differs from others . [15]

Tables (4): Distribution of cases according to the residence.

Residence	No. of patients	%	No. of doners	%
Rural	58	79.5	18	81.8
Urban	15	20.5	4	18.2
Total	**73**	**100**	**22**	**100**

Patient group (29 cases) with a history of previous anemia. 16 (55.2%) were positive to *H. pylori*, and 13(44.8%) were Negative to *H. pylori* infection, thus results were statistically significant $P < 0.001$ (Table 5). Because previous infection of *H. pylori* may cause iron-deficiency by acquiring iron as an essential nutrient for all bacteria including *H. pylori* which has a system of iron repressible outer membrane proteins that may be involved in iron uptake as well as a system of intracellular storage of ferritin like molecules. [10]

Tables (5): Distribution of cases according to the history of anemia in patients group.

H. Pylori	History anemia	%
+	16	55.2
-	13	44.8
Total	**29**	**100**

$P < 0.001$

Majority of cases more than 80% from *H. pylori* infected with history of previous gastritis, compared to 16% from Negative *H. pylori* infection with history of gastritis, the association was found to be statistically significant $X2 = 10.6$, $df = 1$, $P < 0.001$ (Table 6). This result is similar to other published study [2, 4, 5, 16]. Because *Helicobacter pylori* infection plays a pathological role in many gastrointestinal diseases through excessive mucosal-reactive oxygen species, production, pronounced membrane damage and the depletion of gastric anti-oxidants [17].

Table (6): Distribution of causes according to the history of gastritis in blood doners.

H. Pylori	History gastritis	%
+	21	84
-	4	16
Total	**25**	**100**

Conclusion:

In the present paper, we highlight the data association between *H. pylori* and iron-deficiency anemia, and we concluded that the sero-prevalence of *H. pylori* in patient and doners are 59%, 22% respectively, especially *H. pylori* infection appears to be risk factor in gastritis. And chronic infection with *H. pylori* is associated with anemia.

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