THE POSSIBLE RELATION BETWEEN *HELICOBACTER PYLORI* INFECTION WITH BLOOD GROUPS, ANEMIA AND PERIPHERAL LYMPHOCYTE ELEVATION

Zena W. Atwan
Department of Biology, College of Science, University of Basrah, Basrah, Iraq

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ABSTRACT

Biopsy were taken from 50 patients in order to cultivate *Helicobacter pylori* and blood samples to detect anemia, differential white blood cell count and blood groups.

The results showed that anemia was found in 48% of the patients while lymphocyte elevated in 44% of them, blood group O had the higher percentage (42%) in those patients among the other blood group types.

INTRODUCTION

*Helicobacter pylori* is a gram-negative microorganism that secretes many substances including ammonia, mucolytic enzymes (adhesins, catalase and urease), and acid secreting inhibitory proteins. In addition to that it secretes toxin like vacuolating cytotoxin A (VacA). The organism is able to adhere, catalase might protect the organism from the immune system, urease increase the secretion of gastrin which stimulate the intestinal tissues to grow faster, and so could result in increased cancer risk. Urease is responsible for hydrolyzing urea to NH$_3$ and CO$_2$, and acts as also protective by forming an alkaline environment around the organism. The combination of NH$_3$ and CO$_2$ and inhibitory proteins allows the bacteria to setup localized pockets where it can neutralize the acidity of blood type O stomachs.

The genetics of the secretor and non-secretor system interact to alter an individual's risk of ulcer. In several studies, non-secretors of ABO substances have been found to have significantly higher rate of duodenal and gastric ulcer.

*H. pylori* infection increases the percentage of peripheral lymphocytes above the upper limit of referential values.

Recent evidence suggests that *H. pylori* infection could cause iron deficiency anemia (IDA). Adolescents' female athletes may have development of *H. pylori* infection (4). *H. pylori* may have a role in causing IDA in school-age children (3).

MATERIAL AND METHODS

1-Biopsy samples:

Biopsy samples were taken from 50 patients underlined at endoscopy, samples then taken to the laboratory in order to cultivate them, samples transported in nutrient broth in a cold container, then grown on campylobacter selective agar consisting of 3% (v/v) sterile sheep blood in blood agar base No. 2 (oxoid) and supplemented (6 mg/ml Vancomycin, 2 mg/ml Nalidixic acid and 70 mg/ml after 2-3 days of incubation under microaerophilic conditions).

2-Blood samples:

Blood samples collected from patients underlined endoscopy in order to detect the anemia by sahl method, differential white blood cells count and blood groups.
Results

Diagnosis:
Diagnosis and culture results as described by the clinician were as follows:

![Bar graph showing distribution of disorders in 50 patients](image)

**Fig. 1:** Distribution of disorders in 50 patients

The figure explains that (G) represented the higher disorder, then gastritis and duodenal ulcer (G&D.U) and normal cases (N=10 patients have no disorders) followed by duodenal ulcer (D.U), gastritis and duodenitis (G&D), gastric ulcer and duodenal ulcer (GU&DU) and duodenitis (D) respectively.

In general, the infection with *H. pylori* reached to 70%

Blood groups test:

![Bar graph showing number of positive cases in culture](image)

**Fig. 2:** Number of positive cases in culture
It's obvious that gastritis had the higher percentage in positive cases in culture followed by G&D, U, D, U and normal cases, G&D, GU, DU and D respectively.

Blood group test:-

The following table shows the relation between the infection with *H. pylori* and blood groups:-

![Graph showing blood group distribution](image1)

**Fig. 3:** Distribution of blood group in 50 patients

![Graph showing culture results](image2)

**Fig. 4:** Distribution of positive cases in culture for each blood group

It's obvious that blood group O represented the higher percentage between the other blood groups and gave the higher percentage in culture results.
Differential Count:

This test showed that 44% of the patients had a high number of lymphocytes in the peripheral blood.

Anemia:

Anemia was found in 48% of the patients.

DISCUSSION

As it mentioned in the results, blood group O had the highest percentage in the infection and related diseases, this might explain the association of ulcer disease with group O (non-secretors).

Secretors secrete blood group substances into saliva and other bodily secretions recognized as immune substances (4). Researchers suggested that secretor status might influence H. pylori to attach to gastroduodenal cells.

Because non-secretors are limited in their ability to secrete blood group antigens into the mucus secretion of their digestive tract, it has been proposed that they might be at a competitive disadvantage to prevent H. pylori attachment. In other words, non-secretors lack of antigens in mucosal fluids might indirectly contribute to colonization by H. pylori, that’s mean when specific antigens are free floating in the mucus, it probably acts to bind up some of H. pylori before it can contact and attach to the tissues. This might indicate that non-secretor’s were unable to mount an aggressive immune response against this organism in comparison with their secretor individuals, evidence suggest that both bacterial colonization and the resultant ensuing inflammatory response are influenced, at least in part, by the ability to secrete blood group antigens. This relationship is strongest among blood type O non-secretor (8).

In Differential count of WBC it was obvious that lymphocyte number elevated in compared with the other cells types, this elevation was in 44% of the patients, this result agreed with (10).

The elevation in lymphocyte population in the course of H. pylori infection indicated that this infection lead to gastric and duodenal mucosa inflammation (10), this mean there is lymphocyte infiltration and increase in the peripheral blood lymphocytes (13).

From the results obtained, 48% of the patients were suffering from anemia, this is not surprising because there is association between a type of anemia (Iron Deficiency anemia and H. pylori) infection (2,5,6,9,1) the acquisition of iron is a necessity for bacterial growth in H. pylori, as it is for other organisms, in addition to that iron is a critical factor for this organism. Therefore H. pylori isolates have the potent to express at least three major iron acquisition mechanisms.

This association of H. pylori infection with host iron – scavenging systems play an important role (11).

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REFERENCES


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