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Evaluation of Some Extrinsic Factors Predisposing to Helicobacter Pylori-Associated Iron Deficiency Anemia

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ABSTRACT

In the article, iron deficiency associated with Helicobacter pylori is associated with a number of external factors and bad habits in the development of anemia. Helicobacter pylori should be tested in all patients with chronic iron deficiency anemia and gastrointestinal complaints. In patients diagnosed with Helicobacter pylori-associated iron-deficiency anemia, it has been shown to have a highly reliable effect of first carrying out antibacterial eradication therapy and then prescribing an iron supplement according to the severity of the disease.

KEYWORDS: Helicobacter pylori, bad habits, iron deficiency anemia.

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INTRODUCTION

Helicobacter pylori is one of the most common infections in the world, found in 50% of developed countries and 90% of developing countries [25, 13]. According to scientific observations, this Gram-negative bacillus is most often detected among people living on the African continent. [24, 27, 14].

Among the population of Latin America, the prevalence of this bacterium is closer to that of African countries [19, 15, 11].

In Western European countries and Australia, the infection is relatively rare, occurring in 30-40% of the population [2].

In the population of the Russian Federation, infection is detected in 50-80% of the population, and its indicators differ somewhat in different regions of the country. In Novosibirsk and St. Petersburg, these numbers are 80-95% [21, 26, 8]. 88% in Moscow [12], 78-88% in Yakutia [7], 80% in the Yamal-Nenets Autonomous District [7], 86.5% of the immigrant population of Khakassia, and 85.4% of the local population [9].

Helicobacter pylori is widespread in Uzbekistan, and 80% of patients with gastrointestinal diseases have Cag positive strains. In terms of regions, the highest number was found in Khorezm region (79%) and the lowest in Tashkent city (60%) [4].

Some authors believe that the difference in the population of gastroduodenal diseases with *H. pylori* among people living in different regions is related to the different distribution of its highly pathogenic strains [22,23].

A positive strain of *H. pylori* CagA is common among the population in all regions of Uzbekistan. More VacA s1m1 was detected in Khorezm region and Karakalpakstan, while VacA s1m2 was detected in Tashkent and Namangan. In gastritis, Cag + VacA s1 and Ice A1 strains, in ulcer disease Cag A + VacA s1, vacA m2, Ice A 1,2 strains are more common [24, 3].

The stomach plays a leading role in the absorption of iron into the body. It is known that under the influence of hydrochloric acid, the trivalent iron ion in the stomach changes to its bivalent form [5, 6]. Therefore, the cause of the formation of iron deficiency anemia can be atrophic gastritis. There are two types of atrophic gastritis that develop under the influence of autoimmune processes and as a result of long-term persistence of Helicobacter pylori [10].

C. Hershko and A. Ronson identified autoimmune gastritis in 20-27% of patients with unknown etiology of anemia and proved the presence of Helicobacter pylori in 50% of them [16,17,18].

The proliferation of Helicobacter pylori colonies in the stomach causes chronic inflammatory processes in the mucosa. As a result of this, Helicobacter pylori infiltration is observed in its plasma cells, inflammatory cytokines are produced and specific antibodies against it appear. Then the antigenic mimicry of Helicobacter pylori antibodies acts against the parietal cells of the stomach, and as a result, atrophy occurs in its antral part [18]. Japanese scientists observed 118 patients with atrophic gastritis associated with Helicobacter pylori for a long period of 8 years and 6 months, and it was shown that successful eradication of the bacterium significantly reduced atrophic processes in the stomach, including its antral part [20].

Although there is a large population infected with *H.pylori* and suffering from anemia in Uzbekistan, there are no observations on the level of dependence between them and the similar approach to treatment. With this in mind, we set the following goal.

THE AIM OF THE STUDY: Evaluation of some extrinsic factors predisposing to Helicobacter pylori-associated iron deficiency anemia.

RESEARCH MATERIAL AND METHODS: Based on the goal set before us, 90 patients diagnosed with iron deficiency anemia and complaints in the gastrointestinal system were taken and they were divided into three subgroups based on the severity of anemia. The first subgroup was composed of 30 (average age 45.35±2.7, 14 women and 6 men) with mild (Hgb >90 g/l), the second subgroup consisted of 30 (average age 44.65 ± 2.42, 17 women and 3 men) with medium-severe (Hgb 70-90 g/l), the third subgroup consisted of 30 (average age 46.35 ± 2.472, 18 women and 2 men) patients diagnosed with severe (Hgb <70 g/l) iron deficiency anemia.

A careful anamnesis was collected in order to determine the relationship between some external factors (smoking-cigarettes, nos, alcohol, diet, centralized water supply and sewage) and H.pylori. In this place, special attention was paid to the nose blowing of patients. Unfortunately, this harmful habit is widespread among the local population living in Central Asia, including Uzbekistan. The nasal composition consists of tobacco leaves, lime ($CaCO_3$), ash, vegetable oil and various spices, prepared in unsanitary conditions and taken under the tongue in small doses. According to the tests of some scientists, it has been proven that substances such as chromium, nickel, cadmium, lead and magnesium are more than the norm [1]. This composition creates alternative conditions for the growth of Helicobacter pylori in stomach.

The following indicators were found in the blood of patients under observation:

Determination of indicators of Helicobacter pylori: The VESTER-BEST immunoenzyme analysis kit containing 96 tests was used for its detection in blood serum. This kit is based on determining the quantitative index of Helicobacter pylori in blood serum using immunoenzymatic analysis. The test range is 0-20Ed/ml.

MS Excel (2013) package computer program was used for statistical processing of the data obtained in the study. Arithmetic mean and standard deviation (M±m) of indicators presented in all tables were calculated. The reliability of differences between groups was determined using Student's criterion for odd and even differences.

ANALYSIS OF RESEARCH RESULTS. Based on the goal set before us, we studied the level of H. pylori in patients under our observation depending on some external factors (smoking, cigarettes and nose, alcohol, availability of centralized water supply and sewerage, diet).

20% of patients with mild iron deficiency anemia smoked cigarettes or nos. The remaining 80% of these harmful habits were not detected. In them, respectively, *H.pylori* antibodies in blood serum were on average 26.9±1.2 Ed/ml and 22.6±1.3 Ed/ml, and it was noted that the difference between them was reliable ($r<0.05$).

57% of the patients did not follow the daily diet and the remaining 43% followed it. When the indicators of *H.pylori* antibodies determined by the IFA method were determined in their blood serum, its amount was 26.2±1.2 Ed/ml in patients who did not follow the rules, and 21.9±1.3 Ed/ml in those who did, and the difference between them was reliable ($r<0.05$).

These indicators were studied in comparison with the presence of centralized water supply and sewerage in patient residences in our observation. The following indicators were determined in it. The number of patients without centralized water supply and sewage was 70% and 76.7%, respectively. In these groups, *H.pylori* antibodies in blood serum were equal to 27.2±1.2 Ed/ml and 27.6±1.2 Ed/ml, respectively. In contrast, centralized water supply and sewerage were identified in 30% and 23.3% of patients, respectively. In the last group of patients, *H.pylori* indicators were 22.4±1.3 Ed/ml and 22.7±1.3 Ed/ml, respectively. The difference between groups of patients with and without centralized water supply and sewage was reliable ($r<0.01$ and $r<0.01$). These relationships are presented in Figure 1.

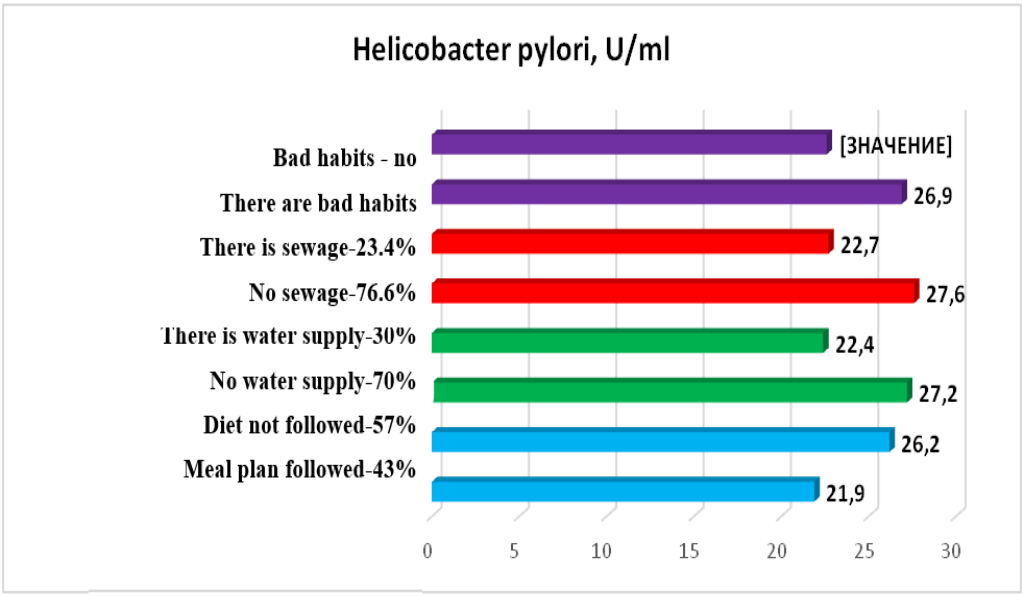

Figure 1. Indicators of detection of Helicobacter pylori antibodies in blood in relation to external factors in patients with a mild degree of iron deficiency anemia.

27% of patients with moderate iron deficiency anemia smoked cigarettes or tobacco. The remaining 73% of these harmful habits were not detected. In them, respectively, the indicators of H. pylori antibodies in the blood serum were on average 28.1±0.4 Ed/ml and 25.6±1.1 Ed/ml, and it was noted that the difference between them was reliable ($r<0.05$).

73.3% of the patients did not follow the daily diet and the remaining 26.7% did. When the indicators of *H.pylori* antibodies were determined in their blood serum, its amount was 27.6±0.4 Ed/ml in patients who did not follow the rules, and 25.3±1.1 Ed/ml in those who did, and the difference between them was reliable ($r<0.05$).

These indicators were studied in comparison with the presence of centralized water supply and sewerage in patient residences in our observation. The following indicators were determined in it. The number of patients without centralized water supply and sewage was 70% and 76.7%, respectively. In these groups, *H.pylori* antibodies in blood serum were equal to 29.2±0.4 Ed/ml and 30.4±0.4 Ed/ml, respectively. In contrast, centralized water supply and sewerage were identified in 30% and 23.3% of patients, respectively. In the last group of patients, the indicators of *H.pylori* were 26.2±1.1 Ed/ml and 26.7±1.3 Ed/ml, respectively. The difference between groups of patients with and without centralized water supply and sewage was reliable ($r<0.01$ and $r<0.001$). These relationships are presented in Figure 2.

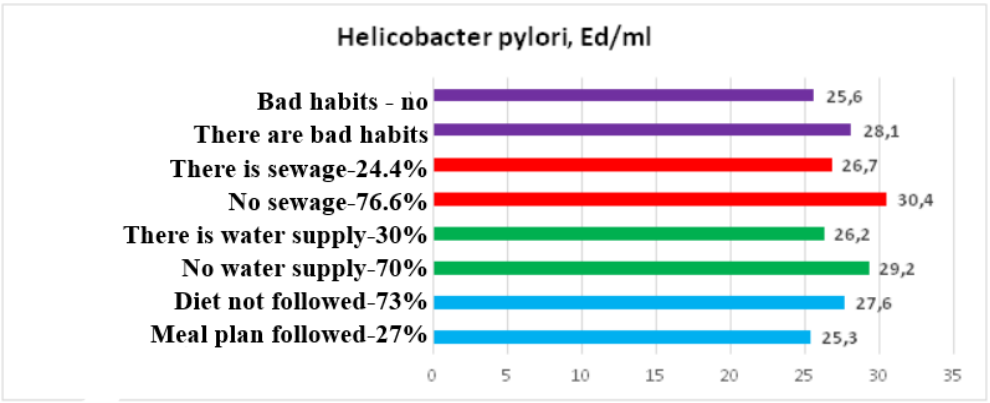

Figure 2. Indicators of detection of Helicobacter pylori antibodies in blood in relation to external factors in patients with moderate iron deficiency anemia.

10% of patients with severe iron deficiency anemia smoked cigarettes or tobacco. In the remaining 90%, these harmful habits were not detected. It was noted that *H. pylori* antibodies in their blood serum were on average 52.2±3.4 Ed/ml and 42.4±3.2 Ed/ml, and the difference between them was reliable ($r<0.05$).

86.6% of patients did not follow the daily diet and the remaining 13.4% followed it. When H.pylori antibodies were detected in their blood serum, its amount was 54.6±3.4

Ed/ml in patients who did not follow the rules, and 44.3±3.2 Ed/ml in those who did, and the difference between them was reliable (r<0.05).

These indicators were studied in comparison with the presence of centralized water supply and sewerage in patient residences in our observation. The following indicators were determined in it. Patients without centralized water supply and sewerage accounted for 76.6% and 83.3%, respectively. In these groups, *H.pylori* antibodies in blood serum were equal to 54.9±3.4 Ed/ml and 55.3±3.4 Ed/ml, respectively. In contrast, centralized water supply and sewerage were found in 23.4% and 16.7% of patients, respectively. In the last group of patients, the indicators of H.pylori were 43.2±3.2 Ed/ml and 44.1±3.2 Ed/ml, respectively. The difference between groups of patients with and without centralized water supply and sewage was reliable (r<0.05 and r<0.05). Figure 3 below shows these relationships.

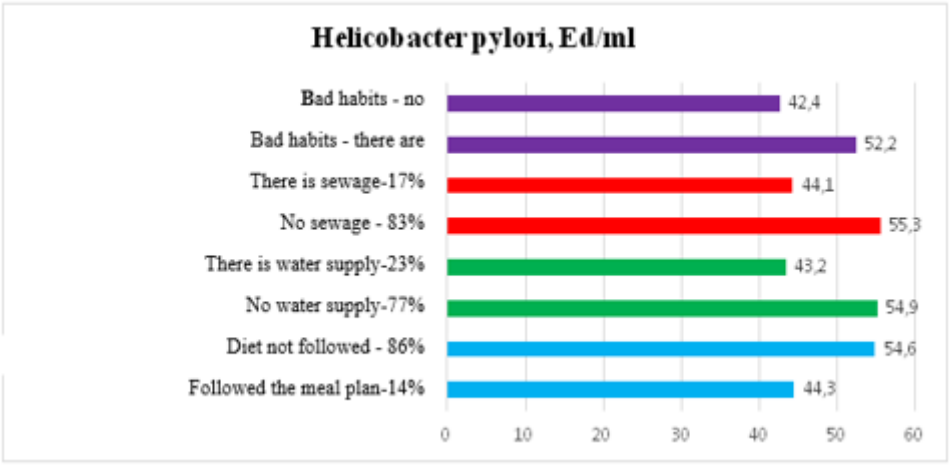

Figure 3. Indicators of detection of Helicobacter pylori antibodies in blood in relation to external factors in patients with severe iron deficiency anemia.

The following conclusions can be drawn based on our observations:

1. Among external factors such as *H. pylori*, iron deficiency anemia is associated with severity;
2. *An increase in H. pylori* antibodies activates the production of cytokines. This process, in turn, blocks iron absorption, causing anemia;
3. *Helicobacter pylori* should be detected in all patients with chronic iron deficiency anemia and gastrointestinal complaints.;
4. In patients diagnosed with *Helicobacter pylori*-associated iron deficiency anemia, early anti-bacterial therapy and then prescribing iron preparations according to the severity of the disease are highly effective..

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