



MORPHOLOGICAL CHANGES OF THE GASTRIC MUCOSA IN HELICOBACTER ASSOCIATED GASTRODUODENITIS

Saatov Ziyovuddin Ziyadullaevich¹

¹Candidate of medical sciences, independent applicant, State institution Republican specialized scientific and practical medical center therapies and medical rehabilitation, Uzbekistan.

Karimov Mirvasit Mirvasikovich²

²MD, professor, State institution Republican specialized scientific and practical medical center therapies and medical rehabilitation, Uzbekistan.

ABSTRACT

Using histological and histobacterioscopic methods, 178 biopsy samples of the mucous membrane of the antrum and fundus of the stomach were obtained from 100 patients with chronic gastroduodenitis associated with pyloric helicobacter. It was established that different life forms of pyloric helicobacter cause one type of chronic helicobacter gastritis, but different activity of the pathological process. A histobacterioscopic study of CO biopsy samples from different parts of the stomach in patients with chronic gastritis revealed a predominance of HP contamination in the form of associations of 3 forms of HP (convoluted, rod-shaped, coccoid) in 45.5% of cases. The degree of severity of chronic antral gastritis B and chronic fundal gastritis B was maximum with triple contamination of the stomach HP and minimal with its seeding by individual life forms of HP, mainly cocciform.

KEY WORDS: *H. pylori, diagnostics, morphology, prevalence, gastric mucosa.*

INTRODUCTION

Helicobacter pylori (H. pylori) is a microaerophilic spiral gram-negative bacterium that colonizes the mucous membrane of the human stomach. Due to its structure and the production of certain enzymes, the bacterium is able to overcome the host's protective barriers, survive in an acidic environment and colonize the gastric mucosa [1].

Infection occurs mainly through the oral fecal route, in particular through contaminated water and food. Oral transmission is also possible, as evidenced by the release of bacteria from saliva and plaque [2]. According to modern concepts, H. pylori causes chronic active gastritis in all infected individuals. This can lead to peptic ulcer, atrophic gastritis, gastric adenocarcinoma, or MALT lymphoma of the stomach [4,5]. Elimination of H. pylori leads to the cure of gastritis, which is the basis for the prevention of long-term complications or relapses of the disease. For these reasons, H. pylori-associated diseases are considered infectious, regardless of symptoms and stage [3,6].

The prevalence of infection varies by geographic area, age, ethnicity and socioeconomic status. A meta-analysis published in 2017 suggests that

H. pylori prevalence remains high in most developing countries (70–90%), as well as in individual indigenous populations of developed countries, and is usually associated with socio-economic status and hygiene. Moreover, there is a decrease in the prevalence of H. pylori in developed countries (25%–50%), which is explained by an increase in living standards and improved hygiene [7, 8, 9].

A significant decrease in the incidence of gastric cancer and peptic ulcer in Western Europe, the USA, and Japan is associated with a decrease in the prevalence of H. pylori [10, 11].

Methods for detecting bacteria include direct histological imaging, detection of bacteria by urease activity, metabolic products of urea degradation, detection of antigens, polymerase chain reaction (PCR) and antibodies as a result of a systemic immune response [12, 14].

Currently, there are both invasive and non-invasive methods for diagnosing H. pylori infection. Invasive methods, such as histology, an urease rapid test, microbiological cultivation and polymerase chain reaction, require esophagogastroduodenoscopy (EGD) and the study of biopsy specimens [13].



The histological method was the first method that was used to detect *H. pylori* in biopsy specimens of the gastric mucosa (coolant). The histological method allows you to directly visualize *H. pylori* and can be recommended for initial diagnosis in patients who are shown endoscopy [15, 16]. A histological examination allows not only to identify *H. pylori*, but also to quantify the degree of bacterial contamination, to assess the nature and activity of inflammation of the gastric mucosa, to identify the presence of other pathological processes (the severity of atrophy, intestinal metaplasia or precancerous changes) [17].

The purpose of this study is to study on the material of gastrobiopsates the morphological changes in the gastric mucosa of the antrum and fundus of the stomach during its contamination with different life forms of HP.

MATERIALS AND METHODS

By histological and histobacterioscopic methods, 178 biopsy samples of the antrum and fundus of the stomach were studied from 100 patients (men - 52 and women - 48) aged 20 to 45 years with chronic gastroduodenitis. Gastrobiopsates were taken during esophagogastroduodenoscopy (endoscopy) with the informed consent of the patient. Verification of the diagnosis of HP infection in addition to clinical data was carried out by histological, histobacterioscopic and urease express methods (Helik-test and Help-test)

Evaluation of histological preparations was carried out by a semi-quantitative method on the visual-analogue scale Dickson M.F. et al. [9] after preliminary staining of gastrobiopsates with Alcian blue, Mayer hematoxylin and eosin.

For histobacterioscopy, biopsy samples from different sections of the gastric mucosa were pre-stained with a 0.1% aqueous solution of acridine orange in our modification (rationalization proposal No. 214-493 of 08/13/90), alcohol solution of thionine according to Nicolas, as well as methylene blue according to Lefleur and azure II-eosin according to Giemsa without subsequent differentiation.

Contamination of gastric hypertrophy of the stomach was verified by a semi-quantitative method in three degrees: I degree (+) - 10-20, II degree (++) - 21-50 and III degree (+++) - more than 50 microbial bodies HP in the field of view with an increase of x600 [2] with the determination of the percentage of different forms of HP in the gastrobiopathy. The histological type of gastritis and the degree of activity of the pathological process (severe, moderate, minimal) were evaluated according to the Sydney classification.

RESULTS AND ITS DISCUSSION

When studying 178 gastrobiopsy samples of mucosa from different parts of the stomach from 100

patients, different life forms of HP were revealed - convoluted, rod-shaped and coccoid.

Of the 5 biopsy samples of mucosa of the fundus of the stomach contaminated with predominantly convoluted forms of HP, where chronic fundal gastritis B was histologically revealed, in 3 out of 5 patients minimal inflammatory activity was diagnosed, and only 2 patients had chronic fundal gastritis B characterized by moderate pathological activity process. The result obtained is most likely associated with histobacterioscopic features of the sample of biopsy material, as well as the small size of the gastrobiopsy specimens, the mucosa of which does not always fully reflect the true histological picture of its lesion by the mentioned forms of helicobacter.

In 10 biopsy samples of mucosa of the fundus of the stomach contaminated mainly by rod-shaped forms of HP in 1 patient, chronic fundal gastritis B with marked pathological process activity was verified, in 4 cases chronic fundal gastritis B with moderate inflammatory process activity and in 5 cases chronic fundal gastritis B with minimal inflammatory activity.

In 6 biopsy samples of mucosa of the fundus of the stomach, which was mainly contaminated with cocciform forms of HP, histologically also found chronic fundal gastritis B - in 1 patient with moderate activity of the pathological process, and in 5 cases with minimal activity.

In the study of 13 gastrobiopsy samples of mucosa of the fundamental part of the stomach, in which mucosa was simultaneously contaminated with different life forms of HP (crimped, rod-shaped and cocciform), chronic fundal gastritis B was revealed histologically in 6 patients with moderate activity of the pathological process, while with minimal activity of the inflammatory process in 7 cases.

It is known according to the literature [4] that with HP infection, the most frequently involved in the inflammatory process is the mucosa of the antrum, which is confirmed by more pronounced histological changes in this section of the stomach. So, with a histological analysis of 20 biopsy samples of the mucosa of the antrum and its contamination with predominantly convoluted forms of HP, chronic antral gastritis B was detected with moderate activity of the pathological process.

In the study of 32 biopsy specimens in which the antrum of the stomach was contaminated mainly by rod-shaped forms of HP, chronic antral gastritis B was revealed histologically in it. In 9.4% of cases, it had a pronounced pathological process activity, in 75% - moderate, while in 15, 6% - its minimum activity.

Analysis of 15 biopsy specimens of the antrum of the stomach, which was mainly contaminated with coccid forms of HP, histologically diagnosed chronic antral gastritis B, which in 26.6% (4) cases was with pronounced inflammatory activity, in 60.0% (9) with its



moderate and in 13.3% (2) - the minimum activity of the pathological process.

In 77 gastrobiopsy specimens of the antrum of the stomach, three life forms of HP (convoluted, rod-shaped, coccoid) were simultaneously detected. A histological examination diagnosed chronic antral gastritis B, which was pronounced in 42.9% (33) cases, moderate in 51.9% (39), and minimal pathological process activity in 5.2% (5) cases.

A critical analysis of the literature on helicobacteriosis showed that in chronic gastritis, the GM of the stomach is contaminated with different life forms in 65–85% of cases. Studying gastrobiopsates with different histobacterioscopic methods, we found that all the studied gastrobiopsates are contaminated with HP in 85.5% in the form of different forms and associations (convoluted, rod-shaped, coccoid), affecting not only the surface epithelium, but also the epithelium of the gastric dimples, causing the development of inflammatory process. We can agree with V.A. Isakov et al. [4] that the transition of convoluted forms of HP into coccoid forms occurs through rod-shaped and is a manifestation of phase processes of transformation of HP. At the same time, the contamination of HP gastrobiopsates in the triple association was found in 45.5%, while in the form of monoforms it varied from 3.6% (convoluted forms) to 22% (cocciform forms), and the severity of the inflammatory process in the antrum and fundus during *Helicobacter pylori* infection was maximal with their triple contamination and minimal with the dissemination of mucosa of different parts of the stomach by their monoforms.

Considering the obtained data, we consider it appropriate to conduct therapeutic measures taking into account the contaminating life form of HP and the severity of the pathological process in the gastric mucosa.

CONCLUSIONS

1. The study of gastrobiopsy specimens of the mucous membrane of the antrum and fundus of the stomach using histological, histobacterioscopic, and urease express methods in 100 of the observed patients revealed 100% of cases of chronic fundal gastritis B and chronic antrum gastritis B in these departments. 5%.
2. A histobacterioscopic study of CO biopsy samples from different parts of the stomach in patients with chronic gastritis revealed a predominance of HP contamination in the form of associations of 3 forms of HP (convoluted, rod-shaped, coccoid) in 45.5% of cases. The percentage of detection of monoform in biopsy specimens varied:

convoluted forms were detected in 3.6%, rod-shaped forms in 12.0%, coccoid forms in 22% of cases.

3. The degree of severity of chronic antral gastritis B and chronic fundal gastritis B was maximum with triple contamination of the stomach stomach HP and minimal with its seeding by individual life forms of HP, mainly cocciform.

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