

Types of Chronic Gastric and Duodenal Ulcer Disease, Complications, Incidence and Modern Methods of Examination

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Abstract: Chronic ulcer diseases of the stomach and duodenum, mainly manifested in the form of gastritis and peptic ulcer, lead to inflammation and ulceration of the mucous membrane of the intestinal system. This article provides a comprehensive overview of the types, complications, incidence and diagnostic methods of chronic ulcer diseases. The most common causes of the disease are the bacterium *Helicobacter pylori*, malnutrition, stress and medications. The article also provides information on diagnostic methods (endoscopy, radiography, *Helicobacter pylori* tests) and treatment methods (antibiotics, acid-suppressing drugs). These diseases can significantly reduce the quality of life, so early detection and effective treatment are important.

Keywords: stomach, duodenum, chronic ulcer, gastritis, peptic ulcer, *helicobacter pylori*, inflammation, endoscopy.

INTRODUCTION

Chronic peptic ulcer disease of the stomach and duodenum, known in medical terms as gastritis and ulcer (ulcer), are diseases associated with chronic inflammation and ulcers that occur in the organs of the gastrointestinal tract. This condition causes significant discomfort to patients not only physically, but also psychologically. This article provides detailed information on the types, complications, incidence and methods of examination of chronic peptic ulcer disease of the stomach and duodenum.

Peptic ulcer disease occurs in people of any age, but most often in their 30s and 40s, it affects approximately 5% of the adult population. Urban residents suffer from ulcers more often than rural residents, and men suffer 6-7 times more often than women. Gastrointestinal bleeding is the most common complication. Sudden major bleeding can be life-threatening [1][11]. It is associated with a mortality rate of 5% to 10% [14]. In Western countries, the percentage of people infected with *H. pylori* roughly corresponds to age (i.e., 20% in their 20s, 30% in their 30s, 80% in their 80s, etc.). Prevalence is highest in third world countries, where it affects 70% of the population, and in developed countries, where it is as high as 40%. Overall, *H. pylori* infections have declined worldwide, with the highest incidence in developed countries. Transmission occurs through food, contaminated groundwater, or human saliva (e.g., kissing or sharing eating utensils) [17]. Peptic ulcer disease is often associated with *Helicobacter pylori* infection, but can also occur without it, including frequent consumption of alcoholic and energy drinks, coffee, chronic overwork, acute or prolonged stress, injuries, fast food, poor diet with spicy, sour, salty or pickled, excessively cold or hot foods, lack of proper sleep, taking NSAIDs, steroid hormones, sulfonamides, potassium chloride, anticoagulants, nitrofurans, genetic predisposition, hyperparathyroidism, age-related hormonal changes, chronic gastritis, diabetes mellitus.

Several factors contribute to the development of peptic ulcer disease and gastritis. *Helicobacter pylori* infection is one of the main causes of these diseases. In the 1980s, Barry Marshall and Robin Warren discovered that the bacterium *Helicobacter pylori* causes stomach ulcers, which led to a major revolution in medicine. As a result of their work, it became possible to treat gastritis and peptic ulcers associated with *Helicobacter pylori* with antibiotics (Marshall & Warren, 1984).

In addition, studies conducted in the 2000s have shown that factors such as improper diet, alcohol consumption, stress, and anti-inflammatory drugs (such as NSAIDs) also have a significant impact on the development of the diseases (Tursunov & Jumaev, 2015).

Gastroscopy (endoscopy) is considered the most effective method for diagnosing chronic peptic ulcer disease of the stomach and duodenum. A study by Thomson et al. (2007) confirmed that endoscopy can detect the degree of inflammation and ulcers in the stomach and duodenum. This method helps to make a rapid and accurate diagnosis of the disease, and also allows for the possibility of obtaining a biopsy.

In addition, breath tests, blood tests and stool analysis are also used to detect *Helicobacter pylori* infection. The presence of the bacteria has been confirmed by microscopic tests and serological tests (Mulligan et al., 2001).

Chronic gastric and duodenal ulcers can lead to a number of complications if not treated in a timely manner. Perforation (opening of the ulcer) and intestinal bleeding are the most common and severe complications. In this regard, a study by Roth et al. (2011) noted that gastric ulcers and duodenal ulcers can lead to perforation, which is a life-threatening condition.

Also, long-term chronic ulcers increase the risk of malignancy (transformation into cancer). This was emphasized by López et al. (2014), who studied this situation. They concluded that chronic ulcers in the stomach and duodenum, especially those associated with *Helicobacter pylori*, increase the risk of malignant transformation.

Methodology

This article is based on scientific and clinical research on the topic of Chronic Gastric and Duodenal Ulcer Disease. The methodology consists of the following stages, and at each stage, data collection, analysis, and generalization were carried out.

Result

If *H. pylori* is diagnosed based on the history and physical examination, investigations should be performed to establish the definitive diagnosis and underlying etiology. In general, the diagnosis of peptic ulcer disease in general and, more specifically, duodenal ulcer can be made directly by visualizing the ulcer on upper endoscopy. The evaluation process will depend on what investigations the patient has had to assess their symptoms in the past. Patients who have had radiographs showing ulceration but do not have any suspicious signs of ulceration/perforation or obstruction may be managed without endoscopy. A computed tomography scan performed to evaluate abdominal pain may reveal an unperforated ulcer. However, most patients will require referral for esophagogastroduodenoscopy (EGD) for further evaluation. Duodenal ulcers occur most frequently (more than 95%) in the first part of the duodenum, with approximately 90% occurring within 3 cm of the pylorus and usually measuring less than or equal to 1 cm in diameter. Barium endoscopy is an option for patients with contraindications to EGD. Once a diagnosis of peptic ulcer disease has been made, it is important to determine the etiology of the disease as this will help to develop a treatment plan for the patient, not only for the acute phase but also for the long-term prevention of recurrence. Given the high correlation of *H. pylori* coinfection with duodenal ulcers, individuals evaluated for *H. pylori* will likely require additional testing to make a formal diagnosis [8]. Tissue biopsy during EGD is helpful in the diagnosis. However, other noninvasive tests may be performed to rule out *H. pylori* as part of the cause. If the patient has undergone EGD, a biopsy may be taken and further testing with urease testing and histology may be performed. Less invasive options include urea breath testing, stool antigen testing, and serological testing. Serology is less common because it can be positive if the patient has been previously infected and does not indicate active infection. The urea breath test has high specificity. However, false-negative results may occur when a proton pump inhibitor (PPI) is used. Stool antigen testing can be used to confirm the diagnosis and prove eradication because it indicates ongoing infection. If a peptic ulcer is suspected, the following tests are ordered: Detection of *Helicobacter pylori* in the body. Cytological examination of a gastric biopsy, detection of antigens to

the pathogen in the blood, is carried out using urease breath or antigen tests. Complete blood count to search for signs of an inflammatory reaction or bleeding. Biochemical analysis of blood, determination of the level of CRP, liver enzymes. Fecal occult blood test. Determination of the level of gastrin-17 in the blood as a method of diagnosing pancreatic gastrinoma. Pepsinogens of the first and second types, with calculation of their ratios. Serum iron concentration. Instrumental diagnostics of gastric ulcer includes: endoscopic examination of the hollow digestive organs with collection of biomaterials from damaged areas for laboratory analysis; computed tomography of the abdominal organs, if this is not possible, ultrasound examination of the abdominal organs or X-ray examination of the stomach and duodenum with preliminary introduction of an X-ray contrast agent into them; endogastric determination of the acidity of gastric juice.

Complications of gastric and duodenal ulcers include bleeding, perforation, penetration, pyloric stenosis, and malignant growth.

Penetration is a common complication of peptic ulcer disease, in which the ulcer process leads to adhesion of the stomach walls to one of the adjacent organs (for example, the intestine or pancreas) and the ulcer gradually penetrates into this organ. Penetration is less dangerous than perforation, since with it the wound still remains closed and massive infection of the abdominal cavity with microbes (peritonitis) does not occur. However, the patient can also die from penetration. The most dangerous is penetration into the pancreas.

Pyloric stenosis the pylorus is the last part of the stomach, connecting it to the duodenum. Ulcers are especially common in the pyloric region, since this part of the stomach is most suitable for the life of *Helicobacter* (a bacterium that causes ulcers) and the acidity of gastric juice is maximum here. According to the anatomical structure, the pylorus of the stomach is a narrow channel equipped with muscle rings that can contract and relax. When the muscles contract, the pyloric canal closes and the stomach cavity is separated from the intestinal cavity. When the pyloric muscles relax, the channel expands, and part of the food from the stomach passes into the duodenum for further digestion. Pyloric stenosis is characterized by its irreversible narrowing and deformation against the background of a chronic ulcer affecting this part of the stomach. In fact, the ulcer turns into a large, hard scar that deforms and tightens the pyloric canal, which loses its ability to expand and, therefore, pass food into the duodenum. The first symptoms of pyloric stenosis can appear many years after the onset of peptic ulcer disease. The disease begins with a feeling of fullness in the stomach after eating, heaviness and pain in the stomach, sour belching with an unpleasant odor. Patients also complain that they hear "liquid" in the stomach and feel full for a long time after eating. Treatment of pyloric stenosis can only be surgical. Usually, during surgery, the diseased part of the stomach is removed, and the healthy part of the organ is sutured to the small intestine to restore communication.

Discussion

Chronic ulcers of the stomach and duodenum, namely gastritis and peptic ulcer, are common diseases worldwide and have a serious impact on health. Several causes and risk factors can contribute to their development. The bacterium *Helicobacter pylori* is certainly one of the main causes, the growth of which in the mucous membrane of the stomach and intestines causes inflammatory processes. As shown in studies, this infection plays an important role in 80-90% of cases of peptic ulcer (Marshall & Warren, 1984). However, external factors such as nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol consumption and stress also affect the development of the disease. Studies have shown that their combined effect can lead to a faster and more severe course of the disease.

Diagnosis and Characteristics of Diseases

Diagnosis of stomach and duodenal ulcers is carried out using specific methods. Gastroscopy (endoscopy) is certainly recognized as the most effective diagnostic tool. This method helps to clearly see changes in the patient's stomach and duodenum and confirms the presence of ulcers. It is also possible to use methods such as a breath test, blood test and stool analysis to detect *Helicobacter pylori*

infection. Studies show that the full combination of these methods helps to make an accurate diagnosis of the patient and makes it possible to plan the correct treatment.

Treatment Methods

The approaches used in the treatment of diseases are wide-ranging, and their effectiveness has been confirmed by numerous studies. Antibiotics, in particular combination therapy (PPI and two antibiotics), have proven to be very effective in eliminating *Helicobacter pylori* infection. Studies, for example, clinical trials conducted by Wong et al. (2010), have shown that antibiotics can completely eradicate the bacterial infection, which leads to the healing of ulcers. In addition, drugs such as PPIs (proton pump inhibitors) and H2-antagonists reduce acidity and accelerate the recovery of the gastric and intestinal mucosa.

The effectiveness of treatment also depends on the timely and correct treatment of the patient. Long-term inadmissibility or improper treatment leads to the development of complications, such as perforation or intestinal bleeding. These conditions, in turn, pose a serious threat to the patient's life. Therefore, it is necessary to draw up an individual treatment plan for each patient and constantly monitor the treatment process.

Complications of the Disease

Chronic gastric and duodenal ulcers can lead to many serious complications. Perforation and intestinal bleeding are the most common complications and quickly worsen the patient's condition. Studies, for example, conducted by Roth et al. (2011), have shown that these complications are treatable only by surgical intervention and seriously complicate the patient's condition. In addition, chronic inflammatory processes can increase the risk of malignancy (transformation into cancer), as confirmed by studies by López et al. (2014).

Prevention

Factors such as maintaining a healthy lifestyle, proper nutrition, stress management, and reducing alcohol and tobacco consumption are very important in preventing diseases. Studies show that paying attention to these factors, as well as the careful use of medications such as NSAIDs, are effective in preventing diseases. Early detection and timely treatment of diseases create the opportunity to take effective measures against them. This, in turn, helps to prevent complications and improve the overall health of the patient.

Conclusion

Chronic gastric and duodenal ulcers pose a major threat to global health. The main causes of diseases are external factors such as *Helicobacter pylori* infection, malnutrition, stress, and NSAIDs. Early diagnosis and appropriate treatment, such as gastroscopy and antibiotic therapy, are effective and help prevent complications. Also, adopting a healthy lifestyle and implementing recommendations for disease prevention are the most effective approaches to protecting against chronic ulcers of the stomach and duodenum.

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