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MODERN STRATEGIES FOR THE TREATMENT OF GASTRIC AND DUODENAL PEPTIC ULCER DISEASE

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Abstract: Peptic ulcer disease of the stomach and duodenum remains a significant gastrointestinal disorder associated with mucosal damage, recurrent disease, and potentially serious complications. The development of modern diagnostic and therapeutic approaches has improved treatment effectiveness and reduced the risk of disease recurrence. This article examines contemporary strategies for the management of gastric and duodenal peptic ulcer disease, focusing on etiological factors, diagnostic methods, pharmacological treatment, and prevention of complications. Particular attention is given to Helicobacter pylori infection, nonsteroidal anti-inflammatory drug-associated ulcers, eradication therapy, and acid-suppressive medications. The role of proton pump inhibitors, potassium-competitive acid blockers, endoscopic procedures, and individualized therapeutic approaches is also discussed. The analysis demonstrates that successful management requires accurate identification of the underlying cause, appropriate selection of treatment regimens, confirmation of bacterial eradication, and continuous assessment of potential complications.

Keywords: Peptic ulcer disease, gastric ulcer, duodenal ulcer, Helicobacter pylori, eradication therapy, proton pump inhibitors, acid suppression, endoscopic treatment, gastrointestinal bleeding, ulcer recurrence, personalized treatment.

Introduction

Peptic ulcer disease of the stomach and duodenum remains an important clinical problem in modern gastroenterology due to its multifactorial etiology, potential complications, and impact on patients' quality of life. Despite significant advances in diagnostic methods and pharmacological treatment, this condition continues to require careful clinical assessment and an individualized therapeutic approach. The development of effective treatment strategies has substantially improved healing rates and reduced the risk of recurrence; however, complications such as gastrointestinal bleeding, perforation, and gastric outlet obstruction remain clinically significant. The pathogenesis of peptic ulcer disease is primarily associated with an imbalance between aggressive factors and the protective mechanisms of the gastroduodenal mucosa. Among the most important etiological factors are Helicobacter pylori infection and the prolonged use of nonsteroidal anti-inflammatory drugs. Other contributing factors include smoking, excessive alcohol consumption, severe physiological stress, and certain concomitant diseases. Helicobacter pylori contributes to chronic inflammation of the gastric mucosa, disrupts normal mucosal defense mechanisms, and promotes ulcer formation. Nonsteroidal anti-inflammatory drugs, in turn, reduce prostaglandin synthesis, thereby weakening mucosal

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protection and increasing susceptibility to injury. Modern approaches to the treatment of peptic ulcer disease are based on identifying and eliminating the underlying cause, suppressing gastric acid secretion, and promoting mucosal healing. Eradication therapy against Helicobacter pylori plays a central role in the management of infected patients. The selection of an appropriate antibiotic regimen should consider local antimicrobial resistance patterns, previous treatment history, and the possibility of treatment failure. Current clinical recommendations increasingly emphasize the use of effective combination regimens, including bismuth-based quadruple therapy when antibiotic susceptibility is unknown.

Acid-suppressive medications, particularly proton pump inhibitors, remain essential components of treatment because they reduce gastric acid production and create favorable conditions for ulcer healing. Potassium-competitive acid blockers represent another important development in acid suppression and have demonstrated promising therapeutic potential. In patients with drug-induced ulcers, discontinuation or modification of the causative medication, when clinically possible, is an important part of management. Additional therapeutic measures may include mucosal protective agents and appropriate prevention strategies in patients at increased risk of recurrence or complications. The management of complicated peptic ulcer disease requires a multidisciplinary approach. Upper gastrointestinal bleeding may necessitate urgent endoscopic examination and hemostatic intervention, followed by intensive acid-suppressive treatment. Perforation and gastric outlet obstruction require prompt assessment and, in selected cases, surgical management. Advances in therapeutic endoscopy have expanded the possibilities of minimally invasive treatment and reduced the need for emergency surgery in certain clinical situations. Nevertheless, the choice of treatment depends on the patient's general condition, the severity of the complication, and the availability of appropriate medical facilities.

Relevance

Peptic ulcer disease of the stomach and duodenum remains a significant medical and social problem due to its widespread prevalence, recurrent course, and risk of serious complications. Although modern diagnostic and therapeutic methods have considerably improved the management of this disease, gastrointestinal bleeding, perforation, and ulcer recurrence continue to represent important challenges in clinical practice. The persistent prevalence of Helicobacter pylori infection, increasing use of nonsteroidal anti-inflammatory drugs, and growing concerns regarding antibiotic resistance further complicate treatment outcomes.

Aim

The aim of this study is to analyze modern therapeutic strategies for gastric and duodenal peptic ulcer disease, with particular emphasis on etiological treatment, Helicobacter pylori eradication, acid-suppressive therapy, prevention of complications, and individualized approaches to improving clinical outcomes.

Main part

Peptic ulcer disease is a chronic inflammatory and destructive condition characterized by the formation of defects in the mucous membrane of the stomach or duodenum. Its development is

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associated with an imbalance between aggressive factors and the protective mechanisms of the gastroduodenal mucosa. Among the principal etiological factors, Helicobacter pylori infection and the prolonged use of nonsteroidal anti-inflammatory drugs play a particularly important role. H. pylori colonizes the gastric mucosa and induces persistent inflammatory changes that interfere with normal mucosal defense. The bacterium produces several virulence factors, including cytotoxin-associated gene A and vacuolating cytotoxin A, which contribute to epithelial damage and inflammatory responses. In addition, bacterial colonization may alter gastric acid secretion and influence the development of both gastric and duodenal ulcers. Nonsteroidal anti-inflammatory drugs contribute to ulcer formation primarily through inhibition of cyclooxygenase enzymes and reduced prostaglandin synthesis. This process decreases mucus and bicarbonate production, impairs mucosal blood flow, and reduces the regenerative capacity of epithelial cells. Other contributing factors include smoking, excessive alcohol consumption, severe physiological stress, and certain chronic diseases. Genetic predisposition and individual differences in inflammatory responses may also influence susceptibility to ulcer formation. The interaction of these factors determines the severity, localization, and clinical course of the disease. Understanding the underlying mechanisms is essential for selecting appropriate treatment and preventing recurrence.

Accurate diagnosis of gastric and duodenal peptic ulcer disease is essential for determining the appropriate therapeutic strategy and preventing complications. The diagnostic process begins with a detailed assessment of clinical symptoms, medical history, medication use, and potential risk factors. Common manifestations include epigastric pain, nausea, vomiting, abdominal discomfort, early satiety, and, in complicated cases, signs of gastrointestinal bleeding. However, clinical symptoms alone are insufficient to establish a definitive diagnosis because some patients may have atypical or minimal manifestations. Upper gastrointestinal endoscopy remains the principal diagnostic method because it allows direct visualization of the gastric and duodenal mucosa, identification of ulcer location, assessment of lesion size, and detection of bleeding or other complications. Biopsy examination is particularly important in gastric ulcers to exclude malignant disease. Detection of Helicobacter pylori can be performed using invasive and non-invasive methods. Invasive diagnostic approaches include rapid urease testing, histological examination, and culture of gastric biopsy specimens. Non-invasive methods include the urea breath test, stool antigen testing, and selected serological investigations. The urea breath test and stool antigen test are particularly useful for confirming successful bacterial eradication. Laboratory investigations, including complete blood count and biochemical analysis, may help identify anemia, inflammation, and associated metabolic abnormalities. The integration of clinical, endoscopic, histological, and microbiological findings provides a reliable basis for individualized treatment planning.

Modern treatment of peptic ulcer disease is based on eliminating the underlying cause, suppressing gastric acid secretion, and supporting the restoration of mucosal integrity. Eradication of Helicobacter pylori is a fundamental component of treatment in infected patients because successful bacterial elimination significantly reduces the risk of ulcer recurrence. The choice of eradication regimen should take into account regional antibiotic resistance, previous antibiotic exposure, drug allergies, and treatment history. Bismuth-based quadruple therapy, which combines a proton pump inhibitor, bismuth, tetracycline, and metronidazole, is an important treatment option, particularly when susceptibility data are unavailable. Other regimens may be selected according to current clinical

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recommendations and local resistance patterns. Proton pump inhibitors remain among the most effective medications for reducing gastric acid secretion and promoting ulcer healing. These drugs inhibit the hydrogen-potassium adenosine triphosphatase enzyme in gastric parietal cells, resulting in sustained suppression of acid production. Potassium-competitive acid blockers provide an alternative approach to acid suppression and have become increasingly important in contemporary gastroenterological practice. In addition, mucosal protective agents, including bismuth compounds and sucralfate, may be used in selected clinical situations. For ulcers associated with nonsteroidal anti-inflammatory drugs, discontinuation or dose reduction of the causative medication should be considered whenever clinically possible. If continued use is necessary, appropriate gastroprotective therapy should be provided. Successful treatment also depends on patient adherence, adequate treatment duration, and confirmation of H. pylori eradication after therapy.

Prevention of complications is an essential component of the long-term management of gastric and duodenal peptic ulcer disease. The most serious complications include upper gastrointestinal bleeding, perforation, penetration into adjacent organs, and gastric outlet obstruction. Early recognition of warning symptoms and timely medical intervention are necessary to reduce morbidity and mortality. Patients presenting with hematemesis, melena, sudden severe abdominal pain, or signs of circulatory instability require urgent clinical assessment. Endoscopic hemostasis is an important treatment method for many cases of ulcer-related bleeding and may be combined with intensive acid-suppressive therapy. Surgical intervention is considered when perforation occurs or when complications cannot be adequately managed using conservative and endoscopic methods. Long-term prevention focuses on eliminating modifiable risk factors and reducing the probability of ulcer recurrence. Confirmation of H. pylori eradication is particularly important, as persistent infection may contribute to recurrent ulceration. Patients should be advised to avoid unnecessary use of nonsteroidal anti-inflammatory drugs, stop smoking, limit alcohol consumption, and follow an appropriate medication regimen. Individuals with previous ulcer complications or a continuing need for potentially ulcerogenic medications require careful monitoring and preventive gastroprotective treatment. Follow-up endoscopy may be indicated in selected patients, especially those with gastric ulcers, to assess healing and exclude underlying malignancy. An individualized approach should consider age, comorbidities, medication exposure, ulcer characteristics, and previous treatment response. The combination of effective etiological treatment, appropriate pharmacotherapy, endoscopic management, and preventive measures provides the foundation for improved long-term clinical outcomes.

Results and Discussion

The analysis of contemporary scientific literature demonstrates that the effective management of gastric and duodenal peptic ulcer disease requires a comprehensive approach based on the identification of etiological factors, accurate diagnosis, appropriate pharmacological treatment, and prevention of complications. The reviewed evidence indicates that Helicobacter pylori infection and the use of nonsteroidal anti-inflammatory drugs remain the major factors associated with ulcer development. Therefore, determining the underlying cause of ulceration is an essential step in selecting an effective treatment strategy. One of the most important findings of the literature analysis is the central role of Helicobacter pylori eradication in preventing ulcer recurrence. Successful elimination of the infection contributes to mucosal healing and reduces the likelihood of repeated ulcer

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formation. However, increasing antimicrobial resistance has complicated the selection of antibiotic regimens. This emphasizes the importance of considering regional resistance patterns, previous antibiotic exposure, and individual patient characteristics when choosing eradication therapy. Bismuth-based quadruple therapy represents an important treatment option, particularly in clinical settings where antibiotic susceptibility is unknown.

The analysis also confirms the importance of acid-suppressive therapy in the treatment of peptic ulcer disease. Proton pump inhibitors remain the principal pharmacological agents because of their ability to reduce gastric acid secretion and create favorable conditions for ulcer healing. Potassium-competitive acid blockers provide an additional therapeutic option and demonstrate the development of more effective approaches to controlling gastric acidity. The selection of medication should be based on disease severity, ulcer localization, concomitant conditions, and previous treatment response. Modern diagnostic methods have also contributed significantly to improving treatment outcomes. Upper gastrointestinal endoscopy remains essential for confirming the diagnosis, evaluating ulcer characteristics, and identifying complications. Histological examination is particularly important in patients with gastric ulcers because it helps exclude malignant processes. Non-invasive methods, including the urea breath test and stool antigen testing, are valuable for detecting H. pylori infection and confirming successful eradication. These diagnostic approaches allow clinicians to evaluate treatment effectiveness more accurately and reduce the risk of persistent infection.

Another important aspect identified in the reviewed literature is the management of ulcers associated with nonsteroidal anti-inflammatory drugs. In such cases, discontinuation or modification of the causative medication, when medically appropriate, is an important therapeutic measure. When continued administration is necessary, proton pump inhibitors and other gastroprotective strategies may help reduce the risk of mucosal injury. Particular attention should be given to elderly patients and individuals with previous gastrointestinal bleeding or multiple concomitant diseases. The prevention and management of complications remain important challenges in gastroenterological practice. Upper gastrointestinal bleeding requires timely endoscopic assessment and, when indicated, endoscopic hemostasis. Perforation represents a potentially life-threatening condition that requires urgent medical and often surgical intervention. Gastric outlet obstruction may also require endoscopic or surgical management depending on its severity and underlying cause. These findings demonstrate that successful treatment depends not only on pharmacological therapy but also on early recognition of complications and appropriate multidisciplinary care. The reviewed evidence further emphasizes the importance of individualized treatment and long-term follow-up. Patient adherence to prescribed medications, confirmation of H. pylori eradication, reduction of modifiable risk factors, and appropriate use of preventive medication are essential for maintaining therapeutic success. Smoking cessation, avoidance of unnecessary nonsteroidal anti-inflammatory drug use, and appropriate lifestyle modifications may contribute to reducing recurrence risk.

Conclusion

Modern approaches to the treatment of gastric and duodenal peptic ulcer disease are based on a comprehensive understanding of disease pathogenesis, accurate diagnosis, and individualized therapeutic management. The analysis demonstrates that Helicobacter pylori infection and the use of

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nonsteroidal anti-inflammatory drugs remain the major etiological factors contributing to ulcer development. Therefore, identification and elimination of the underlying cause represent essential components of successful treatment. Eradication of Helicobacter pylori, appropriate administration of acid-suppressive medications, and protection of the gastroduodenal mucosa are fundamental elements of modern pharmacological therapy. Proton pump inhibitors remain widely used because of their effectiveness in reducing gastric acid secretion and promoting ulcer healing. The selection of antibiotic combinations should consider antimicrobial resistance, previous treatment exposure, and individual patient characteristics. Upper gastrointestinal endoscopy plays a significant role in establishing the diagnosis, assessing ulcer healing, and identifying potentially dangerous complications. Timely recognition and management of gastrointestinal bleeding, perforation, and gastric outlet obstruction are essential for reducing disease-related morbidity and mortality. Endoscopic and surgical interventions should be selected according to the patient's clinical condition and the severity of complications.

References

1. Sugimoto M., Kamada T., Ito M., Iwamoto J., Okimoto T. Evidence-based clinical practice guidelines for peptic ulcer disease 2026 // Journal of Gastroenterology. – 2026. – Vol. 61, No. 10. – P. 1361–1381.
2. Chey W.D., Howden C.W., Moss S.F., Morgan D.R., Greer K.B., Grover S., Shah S.C. ACG Clinical Guideline: Treatment of Helicobacter pylori Infection // The American Journal of Gastroenterology. – 2024. – Vol. 119, No. 9. – P. 1730–1753.
3. Malfertheiner P., Megraud F., Rokkas T., Gisbert J.P., Liou J.M., Schulz C., Gasbarrini A., Hunt R.H., Leja M., O'Morain C., Rugge M., Suerbaum S., Tilg H., Sugano K., El-Omar E.M. Management of Helicobacter pylori infection: the Maastricht VI/Florence consensus report // Gut. – 2022. – Vol. 71, No. 9. – P. 1724–1762.
4. Kamada T., Satoh K., Itoh T., Ito M., Iwamoto J., Okimoto T., Kanno T., Sugimoto M., Chiba T., Nomura S., Mieda M., Hiraishi H., Yoshino J., Takagi A., Watanabe S., Koike K. Evidence-based clinical practice guidelines for peptic ulcer disease 2020 // Journal of Gastroenterology. – 2021. – Vol. 56, No. 4. – P. 303–322.
5. Laine L., Barkun A.N., Saltzman J.R., Martel M., Leontiadis G.I. ACG Clinical Guideline: Upper Gastrointestinal and Ulcer Bleeding // The American Journal of Gastroenterology. – 2021. – Vol. 116, No. 5. – P. 899–917.
6. Lanas A., Chan F.K.L. Peptic ulcer disease // The Lancet. – 2017. – Vol. 390, No. 10094. – P. 613–624.