STM JOURNALS

Research & Reviews: A Journal of
Life Sciences

https://journals.stmjournals.com/journal/rrjols/

ISSN: 2249–8656 (Online)
ISSN: 2348–9545 (Print)
Volume 16, Issue 1, 2026
January–April
DOI (Journal): 10.37591/RRJOLS

Research RRJOLS

A Systematic Review of Peptic Ulcer Disease and Its Management

Devendra Kumar[1,*], Nancy Thakur[2], Deepika Bajwan[3], Vinod Bhatt[4]

Abstract

Peptic ulcer disease (PUD), which affects 5–10% of people worldwide, is still a significant global health concern. Gastric acid and pepsin's corrosive effects cause mucosal injury in the stomach, duodenum, or lower oesophagus. Long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) and Helicobacter pylori infection are the primary reasons. This review's goal is to examine PUD's aetiology, risk factors, pathophysiology, clinical symptoms, diagnostic methods, and evidence-based treatment modalities. PubMed, Google Scholar, Clinical Key, and WHO resources were used in a methodical search from 2010 to 2024. Only peer-reviewed articles, reputable medical websites, and clinical guidelines were included. Findings indicate that H. pylori continue to be a significant causative factor, accounting for 70% stomach ulcers and 90% of duodenal ulcers. NSAID-induced ulcers constitute a significant proportion, particularly among older adults and chronic pain patients. Key pathophysiological mechanisms involve mucosal barrier disruption, increased gastric acid secretion, and impaired healing processes. Asymptomatic to serious problems such gastric hemorrhage, perforation, and occlusion of the stomach outlet are examples of clinical symptoms. The urea breath test, endoscopy, biopsy, stool antigen test, and radiological imaging are among the diagnostic techniques. Proton pump inhibitors (PPIs), H2 blockers, antacids, cytoprotective medicines, H. pylori eradication therapy, and lifestyle changes are all effective treatments. Overall, this research finds that prompt identification, precise diagnosis, and suitable therapy considerably lower morbidity and avoid complications. PUD management outcomes will be further enhanced by ongoing research on antibiotic resistance, novel therapy combinations, and patient-centered preventive techniques.

Keywords: Peptic ulcer, *Helicobacter pylori*, NSAIDs, proton pump inhibitors, gastrointestinal bleeding, gastric mucosa

INTRODUCTION

Peptic ulcer disease (PUD) refers to mucosal ulceration that penetrates the muscularis mucosa of the stomach, duodenum, or lower esophagus due to the damaging action of acid and pepsin [1]. The muscularis propria layer of the stomach epithelium is where it extends. Usually, the proximal duodenum and stomach are affected. It may impact the distal duodenum, jejunum, or lower esophagus. Patients with duodenal ulcers usually feel discomfort 2 to 3 hours after eating, while those with stomach ulcers usually have epigastric pain 15 to 30 minutes after eating [2]. Reducing symptoms, healing the ulcer, preventing recurrences, and avoiding complications are the objectives of treatment. For individuals with duodenal and stomach ulcers, the recommended course of treatment is either cimetidine or ranitidine for four or six weeks, respectively, out of the four medication treatments

***Author for Correspondence**
Devendra Kumar
E-mail: devendra.kumar@galgotiasuniversity.edu.in

[1]Assistant Professor, School of Nursing, Galgotias University, Greater Noida, Uttar Pradesh, India
[2]Associate Professor, School of Nursing, Galgotias University, Greater Noida, Uttar Pradesh, India
[3]Professor, School of Nursing, Galgotias University, Greater Noida, Uttar Pradesh, India
[4]Nursing Tutor, School of Nursing, Galgotias University, Greater Noida, Uttar Pradesh, India

Received Date: December 11, 2025
Accepted Date: March 01, 2026
Published Date: March 02, 2026

Citation: Devendra Kumar, Nancy Thakur, Deepika Bajwan, Vinod Bhatt. A Systematic Review of Peptic Ulcer Disease and Its Management. Research & Reviews: A Journal of Life Sciences. 2026; 16(1): 60–64p.

now available (cimetidine, ranitidine, antacids, and sucralfate). Pain should be treated with antacids as needed, and the patient should be evaluated again at the conclusion of this time [3]. It is one of the main reasons for hospitalizations across the globe. While it can affect people of any age, the condition primarily affects middle-aged males. Due to long-term issues like bleeding, perforation, and an elevated risk of stomach cancer, PUD presents a substantial burden.

DEFINITION

A peptic ulcer is defined as an open sore on the stomach or duodenal lining resulting from the breakdown of mucosal defenses against gastric acid [4].

Types of Peptic Ulcer

- *Gastric Ulcer:* Stomach ulcers can be a relatively prevalent diagnosis that usually necessitates treatment. If millions of dollars to repair. These are a hole in the lining of the stomach mucosa that breaks through the muscularis mucosa and is more than 5mm in diameter. It's critical to understand that this disease process has a cure and a preventative. A patient's treatment plan may differ depending on the reason for a patient's stomach ulcer. The stomach mucosa is safeguarded by the body's own natural barriers against the potentially damaging acidity of the stomach lumen and nearly 20% of peptic ulcers.
- *Duodenal Ulcer:* "Peptic ulcer disease" describes the disease state and symptom resulting from an abnormality of the mucosal layer in the stomach or duodenum, which is the first part of the small bowel. The pre-epithelial layer, epithelial layer, and subepithelial layers together form the anatomical protective covering for the stomach and duodenum. Injury to the mucosal surface beneath the superficial layer results in ulcers. Though dyspepsia is the commonality with duodenal ulcers, there exist other symptom manifestations. It may present with varying severity, such as bleeding in the gastrointestinal tract, obstruction of the stomach outlet, perforation, or fistula and nearly 80% of peptic ulcers, are associated with *Helicobacter pylori* infection or NSAIDs.
- *Esophageal Ulcer:* The oesophageal ulcer can be described as a discrete break in the oesophageal mucosal membrane. Gastro-oesophageal reflux disease or severe, sustained oesophagitis due to other causes is commonly the cause of such insult to the oesophageal mucosa. 2% to 7% of gastroesophageal reflux disease sufferers are expected to develop oesophageal ulcers [5].

EPIDEMIOLOGY

Approximately 5–10% of the global population is afflicted with PUD, with four million cases occurring each year, despite the fact that its complications have not changed. The incidence in western nations is between 0.1 and 0.3%. In affluent nations, the incidence of this illness has decreased with the introduction of new treatments. Dyspeptic people are significantly more common in Sub-Saharan Africa. (24.5%) compared to symptomatic patients (12–25%). Globally, the prevalence reached 8.09 million individuals in 2019, and there was a further trend toward growth. Studies comparing the prevalence of PUD across Africa have found that Northern Savana has a lower prevalence than Central and Western Africa. Research has revealed that, except for Central Sub-Saharan Africa, the death rate for men is higher than that of women in Sub-Saharan African nations. The frequency in females is between 54–57% in Ghana and Nigeria. 16% of the 264 children, ages 2 to 11, who received treatment at Cottage Hospital in Inyi, Nigeria, were diagnosed with PUD, with 8.3% of the cases occurring in females and 7.6% in males. A study carried out at a teaching hospital in the northern region of Nigeria (Kanu State) revealed that out of a sample size of 70 patients, 64.3% were men and 35.7% were women. The greatest number of cases occurred in patients aged 31 to 50 [4].

Risk Factors and Aetiology

Peptic ulcers are caused by the inner lining of the stomach or the small intestine being damaged through the juices of the digestive system, which are the bodies that the foods pass through. It can lead to a sore that bleeds through the juices.

Primary Causes

- *Helicobacter Pylori Infection:* The mucus layer that shields the stomach and small intestinal lining is home to these bacteria. In most cases, the bacteria called *H. pylori* will not present any problems.

But then the lining on the inside of the stomach can grow irritated, which is called inflammation. An ulcer can then develop [5].

- *Extended Use of Nonsteroidal Anti-Inflammatory Medicines (NSAIDs):* Long-term use of aspirin or NSAIDs can cause irritation or inflammation of the small intestine and stomach lining [6].
- *Smoking:* Peptic ulcers may be more likely to develop in those with an *H. pylori* infection.
- *Alcohol Consumption:* Alcohol can damage and aggravate the mucous lining of the stomach. It also increases the amount of stomach acid.
- Physiological Stress.
- Hypersecretory Conditions.

Risk Factors

- *Age:* >60 years, previous ulcer history, chronic illness, steroid use, and genetic predisposition.

PATHOPHYSIOLOGY

The gastrointestinal mucosa is protected by mucus-bicarbonate layer, epithelial integrity, and adequate blood flow. Disruption of these defenses combined with excess gastric acid results in ulcer formation [5].

H. pylori produce urease, cytotoxins, and proteases that damage mucosal tissue.

NSAIDs inhibit prostaglandins, reducing mucosal protection and increasing acid susceptibility [7].

Clinical Features

Common symptoms include:

- Epigastric burning pain.
- Bloating and belching.
- Nausea and vomiting.
- Early satiety.
- Indigestion (dyspepsia).

Complication symptoms include:

- Hematemesis, Melena.
- Sudden severe abdominal pain (perforation).
- Persistent vomiting (obstruction).

Diagnosis

- *Urea Breath Test:* Eat or drink anything that contains radioactive carbon. *H. pylori* breaks down the stuff in your stomach. You then blow into a bag that has been sealed. If you have *Helicobacter pylori*, your breath sample contains carbon dioxide, which is radioactive carbon [8].
- *Endoscopy with Biopsy (Gold Standard):* Your doctor will examine the upper portion of your digestive tract using an endoscope, a long, flexible tube with a tiny camera. An endoscope is sent down your throat and into your esophagus, stomach, and small intestine to look for ulcers.
- *Barium Swallow:* Is a sequence of upper digestive system X-rays that provide images of your stomach, small intestine, and esophagus. You ingest a white beverage containing barium while undergoing the sequence of X-rays.
- CT scan.
- Stool Antigen Test.

Treatment

- *H. pylori* is killed by *antibiotics.* Your doctor may recommend a combination of medications, like *H. pylori* triple therapy (clarithromycin + amoxicillin + PPI), if you have *H. pylori* in your digestive system [9].

- *Acid-Blocking Medicines:* Proton pump inhibitors, sometimes known as acid-blocking medications, lower stomach acid. Proton pump inhibitors include omeprazole and pantoprazole [10].
- *Drugs to Lower Stomach Acid:* Histamine (H-2) blockers, another name for acid blockers, aid in ulcer healing and pain relief. H2 blockers, Antacids that counteract the effects of stomach acid include famotidine.

They are capable of quickly relieving pain. They do not, however, cure ulcers.

- *Medications That Protect the Lining of the Stomach and Small Intestine:* These are known as cytoprotective substances like cytoprotective medications (misoprostol, sucralfate) [11, 12].

Surgical Treatment

- *Laparotomy:* The preferred treatment for tiny PPU is surgical repair, which can be done openly using a midline laparotomy incision or by laparoscopic techniques. Depending on the complexity of the perforation and the surgeon's preferences, there are several surgical treatment options [13].
- PPU has been treated using both conventional open methods and laparoscopic repair methods.
- *Vagotomy:* By stimulating the parietal cells through the cholinergic receptor pathway, the Vagus nerve influences the control of gastrin release and stomach acid output. Vagotomy involves transecting either the distal nerve fibers (very selective vagotomy) or the vagal trunks (truncal vagotomy) [14].

Lifestyle Modification

- Stopping intake of the products whose ingredients are known to trigger peptic ulcers, such as tobacco smoking, opioids, alcohol, caffeine drinks, and NSAID use, is important in dealing with the disease.
- Increasing routine physical activity, improving sleep quality, and employing stress reduction techniques are all helpful in aiding the healing process from various diseases, including peptic ulcer disease [15].
- Many natural products are known to have a safer healing effect compared to PPIS. These products contain fruits, vegetables, and plant-based foods that are rich in fiber and vitamin A such as carrots, mangos, sweet potatoes, and apricots.
- Increasing water intake can significantly aid in the healing of peptic ulcer disease. This is because water is a significant nutrient that balances all other nutrients through dissolution and transportation. Proper hydration is essential for maintaining acid-base homeostasis, as well as for digestion.
- Supplementary products, such as probiotics, vitamin C, zinc, and glutamine, are known to be effective for gastric ulcers [16].

CONCLUSION

A frequent gastrointestinal ailment that can be fatal is peptic ulcer disease. Early diagnosis through endoscopy and non-invasive testing significantly improves prognosis. *H. pylori* eradication and acid-suppressive therapy remain the cornerstone of management. Preventive strategies – such as rational NSAID use, lifestyle modification, and patient education – are essential in reducing recurrence. Continued research in therapy-resistant cases and rising antibiotic resistance is crucial to improving long-term outcomes.

REFERENCES

1. Sung JJ, Kuipers EJ, El-Serag HB. Systematic review of peptic ulcer disease. Lancet. 2009;374(9699):1449–61.
2. StatPearls. Peptic Ulcer Disease. Treasure Island (FL): StatPearls Publishing; 2023. Available from: https://www.ncbi.nlm.nih.gov/books/NBK534792/
3. Soll AH. Pathogenesis of peptic ulcer disease. N Engl J Med. 1983;308(3):157–62. Available from: https://pubmed.ncbi.nlm.nih.gov/2869852/
4. Anchang MM, Okoyeuzu FC, Okafor JN. The management of peptic ulcer disease using conventional methods, bioactive compounds and dietotherapy. Int J Med Health Res. 2024;4(5):1202–10.

5. Sujal, Chandel A, Bhandari N, Gautam A. A review article on peptic ulcer. J Pharm Res Int. 2024;9(6):995–1000.
6. Feldman M, Friedman LS, Brandt LJ. Sleisenger and Fordtran's Gastrointestinal and Liver Disease. 10th ed. Philadelphia: Elsevier; 2016.
7. Malfertheiner P, Megraud F, O'Morain CA, et al. Management of Helicobacter pylori infection. Gut. 2017;66(1):6–30.
8. Lanas A, Chan FKL. Peptic ulcer disease and NSAID-related ulcer complications. Gastroenterology. 2015;149(1):56–72.
9. Gisbert JP, Calvet X. Management of peptic ulcer complications. Dig Liver Dis. 2011;43(9):661–8.
10. Chey WD, Wong BC. American College of Gastroenterology guideline on the management of Helicobacter pylori infection. Am J Gastroenterol. 2007;102(8):1808–25.
11. Savarino V, Zentilin P, Dulbecco P. Proton pump inhibitors in peptic ulcer disease. World J Gastroenterol. 2018;24(16):1703–13.
12. Katz PO, Gerson LB, Vela MF. Guidelines for the diagnosis and management of GERD and peptic ulcer disease. Am J Gastroenterol. 2013;108(3):308–28.
13. Vakil N. Review article: The role of sucralfate in peptic ulcer disease. Aliment Pharmacol Ther. 2014;39(5):458–66.
14. World Health Organization. Peptic ulcer disease: Fact sheet. Geneva: WHO; 2023.
15. Stettler GR, Follette CJ, Avery MD. Surgical management of perforated peptic ulcers. World J Surg Surg Res. 2025;13:9.
16. Kagusu DM. Navigating peptic ulcer disease: The role of lifestyle and natural remedies. J Integr Gastroenterol. 2025 Oct 14.

