

A Review on Peptic Ulcer Disease: Symptoms, Causes, Diagnosis and Management approach

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ABSTRACT:

Peptic ulcer disease is a chronic disease that affects up to 10% of the world's population. Formation of gastric ulcer depends on the pH value of gastric juice and the reduction of mucosal defences. Nonsteroidal anti-inflammatory drugs (NSAIDs) and *Helicobacter pylori* (*H. pylori*) infection are two major factors that impair mucosal resistance to injury. Patients commonly suffer from indigestion or bleeding peptic ulcers. Acid suppression therapy, *H. pylori* eradication, and avoidance of nonsteroidal anti-inflammatory drugs are the cornerstones of peptic ulcer treatment. Bleeding from a stomach ulcer can be life-threatening. On the other hand, medicinal plants and these compounds help prevent and treat many diseases. Therefore, this overview introduces common medicinal plants that can be used to treat or prevent disease.

Keywords: peptic ulcer disease; *Helicobacter pylori* infection; herbal treatment.

I. INTRODUCTION :

Peptic ulcer is a chronic disease caused by an imbalance of endogenous protective factors. Gastric mucosa (mucus and bicarbonate secretion, adequate blood flow, prostaglandin E₂, nitric oxide, sulfhydryl compounds and antioxidants, enzymes, etc.) and aggressive factors (acids and pepsin secretions). Behavioural and environmental factors such as smoking, poor diet, alcohol use, and non-steroidal drugs. There was also the use of anti-inflammatory drugs and *Helicobacter pylori* infection. Participation in the causes of stomach ulcers. (1) Peptic ulcer disease (PUD) is defined as damage to the mucosa of the upper gastrointestinal tract. Acidic digestion causes inflammation in the intestines, causing ulcers to form. It spreads beyond the muscle layer and into the Submucosa. (2) PUD (incidence of 0.1-0.3% per year) affects about 5-10% of the worldwide population and varies according to age, sex, and

geographic location. (3) The term peptic comes from the hormone pepsin. It plays an important role in the occurrence of mucosal rupture. Bleeding from peptic ulcer (PU) may include: Most common causes of upper gastrointestinal bleeding in the Western world (4) and results in significant morbidity, mortality, and healthcare costs. (5) About 19 out of 20 people have stomach pain. The ulcers are duodenal. An estimated 15,000 deaths occur each year from peptic ulcer disease. Annual Estimated rates of bleeding and perforation of peptic ulcers are 19.4 to 57 and 3.8 to 14 per 100,000. Respective individuals. The mean 7-day re-bleeding rate was 13.9% and the mean long-term bleeding time was 13.9%. Recurrence of perforation over time is 12.2%. (6)

PATHOGENESIS OF PEPTIC ULCER :

Nearly half of the world's population is affected by *H. pylori*, which remains one of the most common causes of peptic ulcers. (7) The prevalence of *H. pylori* is higher in developing countries, especially in Africa, Central America, Central Asia, and Eastern Europe (8) Physical infections usually occur especially in childhood, in unsanitary conditions, and in overcrowded conditions. Countries with low socio-economic status. *H. pylori* causes epithelial cell degeneration and damage, usually resulting in severe symptoms in the pylorus due to an inflammatory response from neutrophils, lymphocytes, plasma cells, and macrophages. The mechanism is *H. pylori*. The ability of *H. pylori* to induce the development of various lesions in the gastroduodenal mucosa has not been studied. Fully explained. *Helicobacter pylori* infection can cause both hypochloric acidosis and hyperchloric acidosis, which determines the type of peptic ulcer. The main intermediary of *H. pylori* infection involves cytokines that inhibit parietal cell secretion, but *H. pylori* can also have a direct effect. The alpha subunit of H⁺/K⁺-ATPase activates somatostatin-related calcitonin gene-

related peptide (CGRP) sensory neurons. Inhibits gastrin production. (9) Although gastric ulcer formation is associated with: Reduced secretion, 10-15% of patients infected with *H. pylori* have increased gastric secretion due to: Increased blood gastrin and decreased pyloric somatostatin levels. (10) This leads to increased histamine secretion, which in turn leads to increased parietal and parietal lobe acid or pepsin secretion. Stomach cells Further more, eradication of *H. pylori* reduces or increases gastrin mRNA expression. Somatostatin mRNA expression. (11) NSAIDs and aspirin both inhibit the cyclooxygenase pathway. It suppresses the production of prostaglandin that causes this. Cell protection of the gastric mucosa by stimulating mucus and bicarbonate secretion Increased mucosal blood flow. (12)Risk of developing NSAID-induced disease PUD increases with certain risk factors, including age 65 years, heart disease, history of PUD and simultaneous of corticosteroids, antiplatelet drugs and anticoagulants.

(13)However, the different physicochemical properties of a NSAIDs cause differences in their toxicity. (14)

SYMPTOMS :

The most common symptom of stomach ulcers is burning stomach pain. Stomach acid makes the pain worse, and the emptying of the stomach lining makes the pain worse. Stomach. Pain is often relieved by eating certain foods that reduce stomach acid or by taking medications that reduce stomach acid. Possibly it will come back. The pain may be worse between meals or at night. Less often, ulcers may cause severe signs or symptoms such as:

- Vomiting or vomiting blood
- unexplained weight loss
- Dark blood in stool, or stools that, are black, tarry
- Nausea and vomiting
- Appetite changes
- Trouble breathing (15)



Fig-1 <https://images.app.goo.gl/AMeKDYDX7DYwsS478>. (16)

STAGES OF PEPTIC ULCER :

1. Acute stage:

The characteristic signs of acute peptic ulcer disease are symptoms that often appear suddenly, clearly manifest, and progress over a short period of time. At this stage, the disease can be completely cured with proper detection and treatment. However, most patients often ignore this. Subjectively there are symptoms that do not seek medical attention and complicate the disease. (17)

2. Chronic stage:

If left untreated, acute stomach ulcers can cause long-term inflammation and swelling that can change over time in chronic form. (18) In the chronic stage, the lesions spread, making treatment more difficult and potentially dangerous. Complications such as atrophic inflammation, intestinal metaplasia (19) pyloric stenosis, bleeding, perforation, and gastric cancer. (20)

DIAGNOSTIC TEST FOR PEPTIC ULCER :

1. Blood test :

Doctors may use blood tests to look for signs of *H. pylori* infection or complications from peptic ulcers. For an NIH blood test external link, a health care professional will take a sample of your blood and send it to a laboratory.

2. Urea breath test :

Your doctor may do a urea breath test to check for *H. pylori* infection. The test involves swallowing a capsule, liquid, or pudding

containing urea that has been “tagged” with a special carbon atom. When *H. pylori* is present, the bacteria convert urea to carbon dioxide. After a few minutes, breathe into the container and exhale the carbon dioxide. A medical professional will test your exhaled breath. If the test detects a marked carbon atom, the doctor confirms *Helicobacter pylori* infection in the gastrointestinal tract.

3. Upper gastrointestinal (GI) endoscopy and biopsy :

Your doctor may order an upper gastrointestinal endoscopy to confirm the diagnosis of stomach ulcers and find the cause. In an upper gastrointestinal endoscopy, your doctor uses an endoscope (a flexible tube with a camera) to view the lining of the upper gastrointestinal tract, such as the oesophagus, stomach, and duodenum. During an upper gastrointestinal endoscopy, your doctor uses instruments through an endoscope to perform a biopsy and remove small pieces of tissue from the lining of your stomach. A pathologist examines the tissue under a microscope.

4. Upper GI series :

In some cases, your doctor may order an upper gastrointestinal series to help diagnose peptic ulcers or ulcer complications. The upper gastrointestinal tract series examines your upper gastrointestinal tract using X-rays and a swallow of a chalk-like liquid called barium. (21)

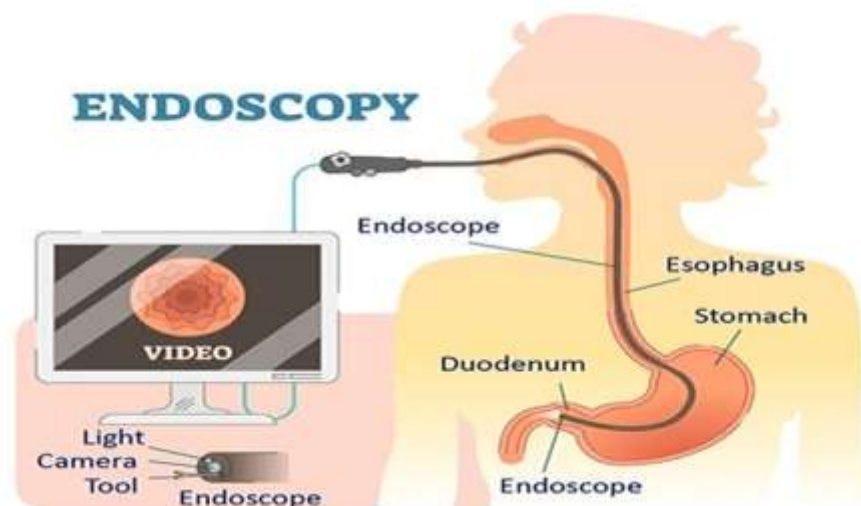


Fig -2 <https://images.app.goo.gl/RCVX7UrfKEmmcssEA> (22)

CASE STUDY :

A 23-year-old man presented to the clinic complaining of epigastric discomfort, heartburn, nausea, and occasional vomiting. He was in normal health when epigastric pain started 5 days ago. The pain was worse at night after eating a large meal. He likes fried and spicy foods. Stomach ulcers have run in his family. He denied smoking cigarettes.

Past medication history :

For the past two days, he has been using Synflux (naproxen) to relieve the pain, but without much benefit. Then he decided to see a doctor. Past Medical history: Medical history indicates that the patient did not have the disease.

Family history: Patient's father had a history of peptic ulcer disease.

General examination :

Weight: 58kg

Height: 5feet 8inches

BMI: 19.44kg/m²

Temperature: 98°F

BP: 120/70mmHg

Diagnosis of peptic ulcer:

According to the information provided, clinical tests were performed on the patient. There were no signs of bleeding such as HB levels Normal (13.5 g/dl), no bloody stools or vomiting. Helicobacter pylori positivity was confirmed by serology and urea breath test. Patient infection.

Medication therapy:

Pharmacist Interventions :

After reviewing the patient's medical history and the doctor's prescription, the pharmacist performed three different procedures. This includes drugs related interventions, dietary changes, and lifestyle changes (Table 1)

Drug related interventions :

- Take Omeprazole before meal.
 - There is no need of ranitidine (H₂ receptor antagonist) at this stage of patient. Triple drug therapy is followed in the patient.
- As, PPIs and Mucaine syrup is already added in medication to relieve burning sensation so, Glametis skipped from therapy.

Dietary modifications :

- a. Omega-3 polyunsaturated fatty acids should be added as they have an anti-inflammatory effect and protect stomach from ulcers.
- b. Avoid spicy food.
- c. Avoid late night meals.

d. Take healthy balanced diet having low cholesterol.

e. Take plenty of water and fresh juices.

Lifestyle modifications :

a. Avoid lying down in bed immediately after meal.

b. Elevate head of bed.

c. Avoid stress Outcomes Patient used the medicine regularly, routine tests and monitoring was done and patient was improved on follow-up. He was advised to visit in case of any complication.

Treatment:

The goals of gastric ulcer treatment are to reduce symptoms, heal the crater, prevent recurrence, and prevent complications. Pharmacotherapy includes pharmacotherapy and should be aimed at:

- 1) Reduce gastric acidity by mechanisms that inhibit or neutralize acid secretion,
 - 2) Coat ulcer craters to prevent acid and pepsin from penetrating to the ulcer base,
 - 3) provide a prostaglandin analog,
 - 4) Remove environmental factors such as NSAIDs and smoking, and
 - 5) reduce emotional stress (in a subset of patients).
- (23) (24)

ANTI-ULCER ACTIVITY OF SOME MEDICINAL PLANTS :**1) AZADIRACHTA INDICA:**

•Synonyms: margosa, neem, nimtree or Indian lilac

•Family: Meliaceae

•Chemical constituents: azadirachtin and the others are nimbolinin, nimbin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin, and quercetin.(25)

•Uses: The reported pharmacological activities on the leaves of Azadirachta indica are comprised of antiulcer, antifungal, anti-Inflammatory,

antibacterial, antiviral, antioxidant, antimutagenic, and antimalarial properties.(26)

2) ZINGIBER OFFICINALIS:



- Synonyms: canton ginger, stem ginger, adraka.
- Family: Zingiberaceae
- Chemical constituent: Chemical analysis of ginger shows that it contains over 400 different compounds. The major constituents in ginger rhizomes are carbohydrates (50–70%), lipids (3–8%), terpenes, and phenolic compounds (27)
- Uses: The antiulcer activity of ginger may also be due to the potent thromboxane synthetase inhibition. It has also had anti-bacterial, anti-inflammatory, antioxidant and anti-cancer activities.(28)

II. CONCLUSION:

Peptic ulcer illness is still a common clinical concern in our society, affecting people of all ages. Peptic Ulcer disease is predicted to continue to have a large global influence on health-care delivery, health Economics, and patient quality of life as the prevalence of the illness rises with age. Also, it would be beneficial to design studies to investigate and further elucidate the mechanisms of action of medicinal plants used for the treatment or prevention of peptic ulcer. Finally, herbal products used for medicinal purposes require licensing in order to ameliorate. Their safety and quality, and ensure that randomized controlled investigations validate demands of its possible efficacy. With increased reports of herb–drug interactions, there is still a problem of deficient research in this field, with no measures taken to address this problem. Hence, pharmacists and doctors should be aware especially of the risks associated with the usage of

herbal preparations, whether on their own or in combination with other herbal or standard conventional therapy.

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