International Journal of Pharmacy and Herbal Technology

e-ISSN: 2583-8962 Vol. 2, Issue 4 (October – December, 2024) pp: (2533-2548)

A Review of Herbal Remedies for Peptic Ulcer

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Received Date: November 27, 2024; Published Date: 17 December,2024

Abstract

Peptic ulcer is a common gastrointestinal disorder, is commonly caused by high gastric acid output, Helicobacter pylori or Helicobacter infection and usage of nonsteroidal anti-inflammatory drugs throughout Representative medicines (NSAIDs). Traditional therapies such as antibiotics and proton pump inhibitors (PPIs) may cause side effects and drug resistance. Often caused by an infection with H. pylori, long-term NSAID usage or excessive acid secretion, Peptic ulcers are a right gastrointestinal ailment defined to damage gastrointestinal / duodenal mucosa. Interest in alternative medicines has grown as a result of the potential side effects and complications associated with conventional treatments, notwithstanding their effectiveness. With a focus on their safety profiles, therapeutic efficacy and mechanisms of action, this review investigates the potential of herb treatments in the treatment of peptic ulcers.

Herbal remedies have been used traditionally in many medical systems and because of their many different mechanisms of action, which include antioxidant activity, anti-inflammatory effects, improved mucosal protection, decreased gastric acid secretion and antimicrobial properties, they offer promising alternatives to conventional therapies. This research investigates the effects of peptic ulcer treatment on medicinal plants such as Aloe vera (Aloe barbadensis miller), Neem (Azadirachta indica), liquorice (Glycyrrhiza glabra) , papaya (Papaya Carica) , Ginger, Garlic, Mango, Drum Stick Honey, Banana, custard Apple, Acacia arabica and Indian berry. Their capacity to shield the stomach lining, encourage ulcer healing and fight H. pylori is supported by preclinical investigations. Still, more thorough clinical trials are required to verify their safety and efficacy, despite the positive results. A potential option for the comprehensive care of PUD is the use of herbal remedies, which are more affordable and have a lesser chance of adverse effects.

Keywords - Ulcer, Elementary tract, H pylori, Herbal medicines, Natural compounds.

INTRODUCTION

A peptic ulcer is a lesion that grows on the lining of the stomach, small intestine, oesophagus. This starts the tissue is harmed by digestive acids due to a breach in the mucus layer. Prolonged us NSAIDS anti-inflammatory medicines (NSAIDs), smoking, heavy alcohol intake and Helicobacter pylori infection are common causes. Bloating, nausea, and scorching stomach pain are common symptoms. Antibiotics for infection, lifestyle modifications to encourage healing, and drugs to lower acid production are all possible forms of treatment [1]. This disease is characterized by a rupture on a lower oesophagus, a first segment of the small intestine, or the inner edge of the abdomen. A duodenal ulcer is found in the first part of the intestines, while a ‘stomach ulcer’ is known as a ‘gastric ulcer’. An ulcer in the stomach can hurt worse when you eat. A lot of folks

say that the pain is dull or burning. Additional symptoms include chewing, vomiting, weight loss, and decreased appetite.

The Duodenal ulcers in the stomach are both part of the most prevalent gastrointestinal issue, known as Peptic ulceration Disease (PUD), which calls for a carefully considered course of therapy. Ulcers most frequently occur in the intestines and the first a few meters of the duodenum. Urethral defects, which are common gastrointestinal conditions, are characterised as inflammation of the mucosal membrane and the GI tract. The oesophagus, small intestine and stomach are typically protected from pepsin and gastric juice by the mucous membrane, which is damaged and causes ulceration [2]. There are numerous varieties of ulcers, including vaginal, peptic, oesophageal, and oral ulcers. Peptic ulcers cause erosion of the duodenum or stomach lining [3]. The terms "gastric ulcer" and "duodenal ulcer," which denote the location of ulceration, are the most commonly used varieties. Pain is a characteristic of gastric ulcers, which are located inside the stomach. In older age groups, ulcers are common. Weight loss, vomiting, and nausea are possible symptoms Although ulcers continue to form in the total lack of acid; those who have stomach ulcers produce normal or decreased levels of acid [4]. Peptic ulcers can be treated with a wide variety of pharmaceuticals; however, clinical evaluations of these drugs indicate a significant risk of occurrence, adverse effects, and interactions between drugs. These difficulties encourage the creation of new antiulcer medications and the hunt for unique compounds in herbal remedies, or "nature's pharmacy. Plants are a useful source many novel substances in the search for innovative treatments for a variety of ailments.

Many plants with antiulcer qualities that are employed in traditional medicine may yield novel and improved antiulcer agents with a few potential chemical changes [5]. An imbalance in the stomach's naturally occurring protective and aggressive factors, growth factors, cytokines called cellular regeneration, flow of blood, mucus formation, mucosal barrier integrity, and acid-pepsin secretion—is the main cause of ulcers. Other risks associated with peptic ulcer disease include stress, alcoholism, the use of NSAIDs (like aspirin), the bacteria Helicobacter pylori infections, smoking, and a lower socioeconomic position. standing and ancestry Despite not being lethal, ulcers can have more serious side effects such bleeding into the digestive tract, perforations, ulcer penetration into adjacent organs to and obstruction of the stomach outlet [6].

Common sign and symptoms include

The age of the patient and the site of the illness may affect the peptic ulcer disease's signs and symptoms. Separating stomach and duodenal ulcers can be made easier by observing when symptoms first appear in response to meals. Pain at night is often associated with duodenal ulcers. Bloating or gas is a common complaint from obstruction to the stomach outflow [7].

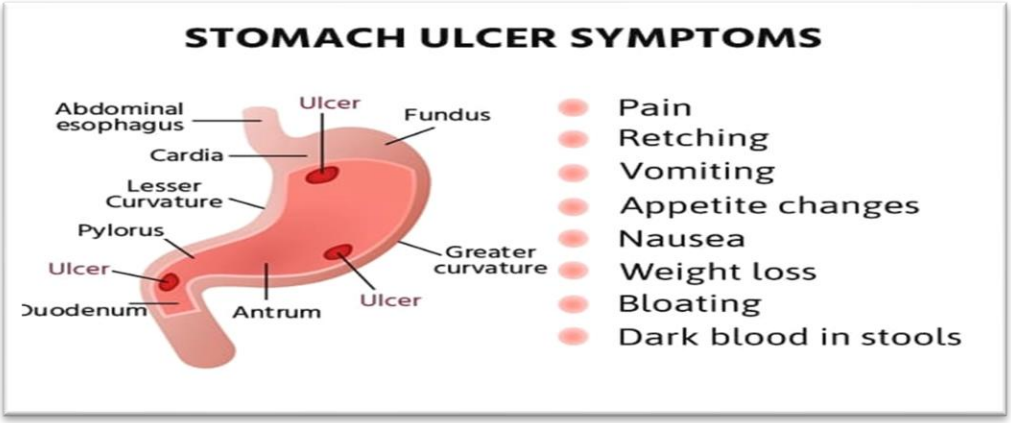

Figure 1: *Symptom of peptic ulcer*

Peptic Ulcer

Among the chronic gastrointestinal disorders that are most prevalent in the current era is peptic ulcer. Nowadays, a lot of individuals all over the world are affected by it as a widespread global health issue. Peptic ulcer disease patients may experience inflammation or erosion of the mucus and tissue lining their gastrointestinal tract. Peptic ulcers are caused by loss to the lining of the mouth that typically shields the oesophagus, duodenum, and GI tract from pepsin and stomach acid. Peptic ulcers may develop when energetic factors, such as 'acid and pepsin secretions', behavioural variables, environmental factors, like tobacco use, poor diet, alcohol consumption, use of not steroidal anti-inflammatory agents, intestinal Helicobacter pylori infections, are out of balance with the natural safety factors of the gastric mucosa, which include mucosa and bicarbonate production, sufficient blood flow, prostaglandin E2, nitric oxide, and anti-oxidant enzymes [8].

Peptic Ulcer Types

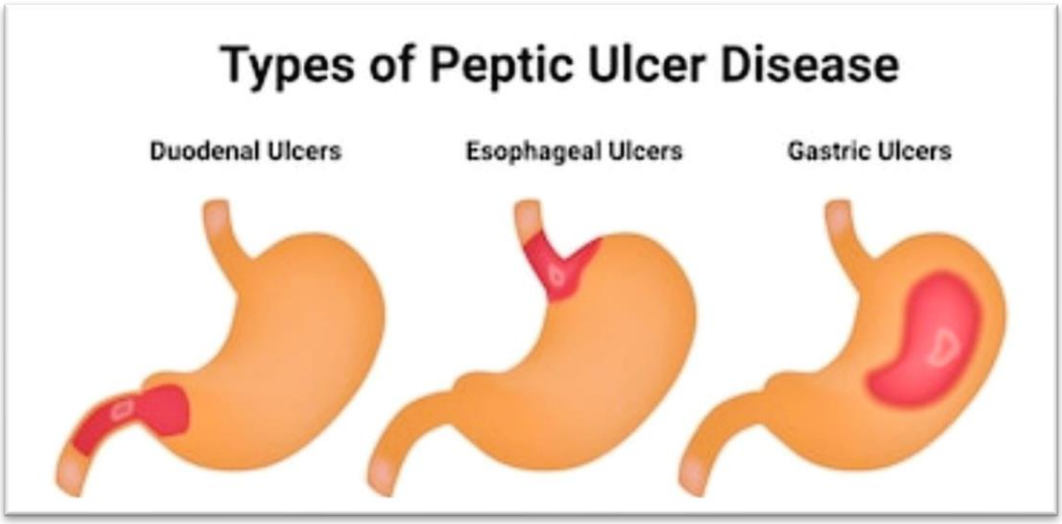

Figure 2*: *Peptic Ulcer Types

Gastric Ulcer

The stomach lining becomes infected with these kinds of ulcers.

Oesophageal Ulcer

Lesions in the oesophagus known as esophageal ulcers are most commonly formed at the end of the food pipe and cause pain directly below the breastbone, in the same region as heartburn symptoms. Prolonged NSAID use is linked to esophageal ulcers and acid reflux disease (GERD).

Duodenal Ulcer

Duodenal ulcers can occur when there is injury to the mucosa lining the duodenum. These ulcers are a part of a disorder called which affects that the stomach and the first part of the duodenum.

Cause of gastroduodenal ulcers

It (PUD) has multiple origins, but the two most common types are PUD linked to NSAIDs and Helicobacter pylori [9].

Helicobacter pylori

Living in the space between the gastric epithelium and the mucous layer, the Gram-negative bacterium Helicobacter pylori is able to withstand the harsh conditions found in the stomach. After starting out in the antrum, H. pylorus gradually spreads to the stomach's more proximal regions. The completed genome of H. pylori has 1500 protein codes [10]. The stomach epithelium contains Helicobacter pylorus, a gram-negative bacillus. This bacterium is the cause of between 70 and

90% of ulcers in the stomach and 90% of duodenal ulcers. Lower socioeconomic status is linked to a higher prevalence of Helicobacter pylori infection. and is usually picked up in early life. Bacteria have the ability to stick together to the gastrointestinal mucosa and produce inflammation due to a variety of virulence factors. This results in a deficiency of acidity or chlorine, which causes stomach ulcers [11].

PPI Use and NSAID-Associated Ulcer Disease

NSAID use comes in second, with H. pylori infections being the most a common cause of PUD. non-steroidal Gastroduodenal ulcers caused by anti- and aspirin and its aftermath can be avoided with a variety of therapy, Using COX-2 specific NSAIDs or combining them with a gastro protection. This (PPI) have been shown to be the most effective and widely used preventive medicine [12].

Alcohol Consumption

Nondistilled, fermented alcoholic beverages increase the levels of gastrin and acid secretion. Moreover, alcohol-containing foods that include maleic acid and succinic acids promote the release of stomach acid. Small doses of alcohol hasten stomach emptying while high doses impair intestinal motility [13].

Smoking & Tobacco

Research has been done on the connection between the patient's smoking behaviour and pepsin secretion. Smokers with peptic ulcers released considerably more pepsin after Penta gastrin or histamine than did those who don't with the same condition, with the amount released exceeding detectable amounts.

Medication

Studies have connected the mineral potassium chloride as a mixture of flu, bisphosphonates, corticosteroids, and NSAIDs to the aetiology of PUD. Though not a linear relationship, there seems to be a connection between smoking and duodenal ulcers. Alcohol could aggravate the stomach lining. Bisphosphonates, potassium chloride, fluorouracil, corticosteroids, and NSAIDs have all been connected to the genesis of PUD in Even if there isn't a direct correlation, drinking and duodenal ulcers appear to be related. Alcohol may aggravate the stomach lining [14].

Rare Cause

Malignancy
Stress
Viral Infection
Vascular Insufficiency
Use of radiation therapy

How to avoid a peptic ulcer

Avoid using tobacco products.
Neglect Smoking
NSAIDs and aspirin should be used with caution
Do not disregard your ulcer's symptom.
Wash your hand frequently and eat only fully cooked meal to preventing illness.

Epidemiology

Incidence was between 0.1% and 0.3%, while the lifetime prevalence was between 5 and 10%. Because more hospitals are being built and more innovative, efficient treatments are being introduced, the incidence of peptic ulcers has decreased over the past 20 to 30 years, particularly in high-income nations. [6 ulcer-3] The global incidence of Helicobacter pylori infection is

estimated to be between 10 and 20 percent, with significant differences observed among different racial and national groups.

Pathogenesis of peptic Ulcer

The most common cause of Peptic Ulcer is to be continuous H. pylori, which is carried by about 50% of people globally. It's unclear how exactly H. pylori causes the lining of the stomach to get ill with various ailments. The kind of peptic ulcer can be identified by identifying the hypoglycemia or hyperchlorhydria. In addition to directly affecting the H+/K+ ATPase α-subunit and activating sensory neurones associated to CGRP (somatostatin-related calcitonin gene-related peptide), H. pylori can also prevent gastrin formation or block parietal cell secretion, which is the primary H. pylori infection mediator. The development of gastric ulcers has linked for increased gastric secretion; however, in patients infected with the bacteria Helicobacter hypergastrinemia accounts for 10-15% of this enhanced secretion. enhanced secretions of pepsin and hepatocellular acid are the result of this enhanced histamine production. Moreover, the removal of H. pylori not only shows in a rise of somatostatin m RNA interpretation but also a fall in gastrin mRNA remarks [15].

The Development of Herbal Medicines to Treat Ulcers

From prehistoric times, people have utilised herbs for a wide range of medical needs. Since the starting point of recorded human history, phytotherapy has been used to treat a wide range of illnesses in the recent years the use of herbal products rise, especially these derived from some plants, in tandem with the growing interest in alternative medicine. Novel treatments with promising outcomes require the use in plant materials and their crude oil. Additionally helps heal gastric ulcers.

Herbal medicines contain active chemicals with antiulcer effects, such as flavonoids, tannins, and terpenes. It is believed that medicinal plants are the primary source of potential new medications. It is consequently necessary to further educate physicians and patients about herbal therapy and to enact legislation regulating the quality of herbal medicines, especially in light of the impending randomised studies to determine their efficacy [16].

Mechanism of Action

The protective benefits of herbal remedies against gastric ulcers are believed to stem from a number of mechanisms in both animal and human models, including their antioxidant properties, tissue development stimulation, reduced secretion and production of acid, enhanced secretion of mucus, and resistance to inflammation.

Antioxidant activity

Oxidative stress and peptic ulcers have been proven to be related by studies. Many herbal medicines are effective in treating stomach ulcers, probably because they are rich in antioxidants.

Stimulation of mucosal proliferation

Peptic ulcers and oxidative stress are known to be related. Due to their antioxidant properties, several herbal remedies are beneficial for treating stomach ulcers [17].

Several herbs that are used to treat stomach ulcers

Papaya:

Synonym: papaya Carica

Biological Source: A ripe fruit of Carica Papaya.

Family: caricaceae

Chemical Constituent:

Pectin, Carposide , Carpaine , Carotenoid

Figure 3*: *Papaya

Uses

Anti-cancer properties
Support gut health
Rich in vitamin C
Cure skin infection
Prevent wrinkles
The leaves are used to make medicine.
It applied to heels that are sore.
It facilitates the removal of killed skin cells [18].

Ginger

Synonym: Adrak, sonth, Zingiber
Biological Source: It involves in faded rhizome of Zingiber officinale.
Family: Zingiberacae
Chemical constituents:
Carbohydrate, Lipid

Figure 4*: *Ginger

Uses
To treat peptic ulcer
Support skin health
Settle upset stomach
Reduces joint pain
Reduces menstrual pain
Promote healthy heart
Anti-inflammatory
Anticancer agent
Ginger is used to soap and cosmetics.

Banana
Synonym: Musa Acuminata
Biological Source It's a matured fruit of Musa Paradisiaca
Family: Musaceae
Chemical Constituent:
Phenolics, Carotenoid, Phytosterols

Figure 5*: *Banana

Uses
Produce red blood cell.
Metabolise Carbohydrate and fat turning them into energy.
Metabolise amino acid.
Maintain a healthy nervous system.
Skin and hair care.
Used improve blood sugar level.

Garlic
Synonym: Allium, Lahsun
Biological Source: It is the bunch of Garlic sativum Linn.
Family: Liliaceae
Chemical constituents:
Vitamin C, Alline, Mucilage

Figure 6*: *Garlic

Uses:
Anti-inflammatory
Lower cholesterol
Antioxidant
Prevent heart disease
Regulate blood pressure and sugar
Anticancer
Improve bone health
Prevent and treat cold
Clears nasal congestion

Neem

Synonym: Margosa, Neem
Biological Source: Neem is gained from fully growned seed Azadirachta indica linn.
Family: Meliaceae
Chemical Constituent:
Nimbidin, Nimbin, Nimbinin, Nimbidol

Figure 7*: *Neem

Uses:
Boost immune system
Beneficial to treat acne
Give relief from bad breath
Help to protect against diabetes
Effective in treating maleria symptoms
Prevent development of blemishes and pimples
Lower risk of cancer and cardiovascular disease
Protect teeth and gum against oral periodontal
It can be applied topically to help with various skin conditions [19].

Indian berry

Synonym: Rasberry, pome

Biological Source: It's a dried matured fruit (berry) of berberis aristata

Family: Berberidaceae

Chemical constituent:
Flavanoid, physostigmine

Figure 8*: *Berry

Uses:
Promote anti-inflammatory properties that cool, tone and nourish tissue and organ.
Natural antioxidant
Related to eyes disorders
To treat diarrhoea

Aloe vera

Synonym: Aloe

Biological Source: Withered juice gained by incision, mainly from the leaves of various species of Aloe, Aloe barbadensis miller.

Family: Liliaceae

Chemical Constituent:
Anthraquinone, Phenylpropanoids, Coumarin, Aloe Emodin

Figure 9*: *Aloe vera

Uses:

Skin health and aging
Tooth and gum disease
Diabetes and high cholesterol
Acid Reflux and heartburn
To treat certain skin conditions
Improve hair growth and strengthen hair
Treat dry and flaky skin
Aloe Vera's hydrating, softening, and deep moisturizing characteristics nourish the skin wonderfully and act as a natural UV inhibitor, protecting it from the sun's rays[20].
Aloe vera has proteolytic enzymes that help the scalp's dead skin regenerate [21].
Improves insulin sensitivity and lowers blood sugar levels [22].

Mango

Synonym: Mangifera indica
Biological Source: It is the consumable fruit of Mangifera indica.
Family: Anacardiaceae
Chemical constituent:
Alkaloid, Tannin, Flavonoid

Figure 10*: *Mango

Uses:
May boost immunity
Support skin health and regeneration
Support healthy blood sugar levels
May help reduce kidney stone

Drum Stick
Synonym: Moringa oleifera
Biological Source: Vegetable of Moringa oleifera.
Family: Moringaceae
Chemical constituent:
Alkaloid, Flavonoid.

Figure 11*: *Drum Stick

Uses

The leaf use for treats Gastric Ulcers.
Reduce a effect of rheumatoid arthritis
Amazing for thyroid
It is help to reduce high blood pressure
Improve bone density
Improve immunity

Custard Apple
Synonym: surge apple, sitaphal
Biological source: It is a ripe fruit of Annona squamosa.
Family: Annonaceae
Chemical constituent:
Tannins, Alkaloid, Flavonoid

Figure 12*: *Custard Apple

Uses

Antioxidant

Anticancer

Prevent high blood pressure

Treat maleria

To treat rheumatoid arthritis

Great Source of vitamin A [23].

Honey

Synonym: Madhu , Mel

Biological Source: A sweet material called honey is secreted into honey comb by Bees of various species as well as Apis Millifera.

Family: Apidae

Chemical constituent

Maltose, Glucose, Fructose, Sucrose

Figure 13*: *Honey

Uses:
Anti-inflammatory
Antioxidant
Antibacterial agent
Burn, wound healing
Swelling and sore inside the mouth and cough

Acacia arabica

Synonym: GumAcacia, kher,

Biological source- Dried sticky substance extracted from Acacia arabica branches and stems.

Family: Leguminosae

Chemical Constituent

L- rhamnose, D-galactose, D-glucoronic acid

Figure 14*: *Acacia arabica

Uses
Help in cavity in the teeth.
Help in diabetes.
Wound healing.
Relieves pain and irritation.
Soothes cough and sore throat.
Reduce body fat.
Restricts blood loss.

Liquorice

Synonym: Glycyrrhiza, liquorice root.

Biological Source: Liquorice is the dried peeled or unpeeled, roots rhizomes or stolon of Glycyrrhiza.

Family: Leguminosae

Chemical Constituent:

Glycyrrhitic acid, Glycyrrhizin, Glucoronic acid, Resin, Volatile oil

Figure 15*: *Liquorice

Uses:

Anti-inflammatory
Anti-ulcer
To treat of Addison's disease
To prepare cough lozenges [24].

CONCLUSION

According to the research, reducing acid production was the sole productive treatment of ulcers and acid elimination was only factor that caused ulcers to develop. I.e. In modern times, reducing acid production and increasing immune system function are the main goals of ulcer therapy. Plant chemicals having therapeutic potential can be found with the help of Ayurveda, the oldest known medical system. Treatments for Peptic Ulcers may become more effective and have fewer side effects if conventional and modern techniques are used. Having been tested for anti-ulcer efficacy both in vivo and in vitro, these plants provide an alternate method of treating ulcers. These days, boosting immunity and lowering acid secretion are the main objectives of ulcer therapy. Strong antiulcer effects are exhibited by many medicinal plants and extracts of them (which contains active chemical components such as tannins and flavonoids). Herbal remedies are superior to allopathic ones. It is an effective, affordable, readily available product with no negative side effects.

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