



Herbal Potentials for Treatment of Peptic Ulcer: A Review

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ABSTRACT

The inflamed break in the skin or mucous membrane lining the elementary tract describes development of ulcer. About 10% of World's population suffering from peptic ulcer. It is a broad term that includes ulcers of digestive tract, in the stomach or the duodenum. The presence of acid and peptic activity in gastric juice with a breakdown in mucosal defences develops peptic ulcer. It may be occurring due to regular usage of drugs, irregular food habits, stress. The ideal aims of treatment of peptic ulcer disease are to relieve pain, heal the ulcers and delay ulcer recurrence. The availability of number of synthetic drugs such as proton pump inhibitors (PPIs) and histamine-2 (H2) receptor antagonists are conventionally used for treatments of peptic ulcers, associated with adverse effects, relapses, various drug interactions are observed and expensive when compared to herbal medicines. Herbal medicines demand has increased globally. Availability of gastro-protective remedies without side effects are excellent resources for cost-effective medicines. Natural compounds showed significant antiulcerogenic activity, compounds such as tannins, flavonoids, alkaloids, triterpenoids, steroids, saponins, and coumarins. The current review states some medicinal plants, being used in Ayurveda or modern science for the treatment or prevention of peptic ulcer and comparison with synthetic drugs.

Keywords: Ulcer, elementary tract, gastro-protective, synthetic drugs, herbal medicines, natural compounds.

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INTRODUCTION

Peptic ulcer also called pudor ulceration disease, an ulceration (defined as mucosal erosions equal to or bigger than 0.5 cm) of an area of the GI tract that's typically acidic and therefore very painful¹. Ulceration is common gastrointestinal disorder and can be inflamed lesions of the mucous membrane and tissue that defend the GI tract. Injury of mucus membrane, that commonly protects the oesophagus, stomach and small intestine from gastric acid and pepsin causes ulceration². There are many types of ulcers like mouth ulcer, oesophagus, peptic and genital ulceration. Erosion of lining of stomach or the duodenum occurs in peptic ulcer³. The most common types are referred as gastric ulcer and duodenal ulcer, indicating positioning of ulceration. Gastric ulcers are situated within the stomach, characterized by pain. Ulcers are common in old ages. Symptoms might include nausea, vomiting and weight loss. Ulcers could occur even in complete absence of acid though patients with gastric ulcers have normal or diminished acid production⁴. Duodenal ulcers are found at the start of intestine and are characterized by severe pain with burning sensation in upper abdomen that awakens patients from sleep. Generally, pain happens when the stomach is empty and

relieves once eating. A duodenal ulcer is very common in younger individual and preponderantly affects males, could see on both the anterior and posterior walls⁵. Medicines available in market are useful against the ulcers however they do not provide a permanent relief. Relapse of ulcers can be observed. Therefore, the herbal treatment is employed. Herbs give good protection from ulcers and has less side effects as compared to general medicines.

Causes of peptic ulcer

Helicobacter pylori: A major contributory factor for chronic inflammation is *Helicobacter pylori* that colonizes the antral membrane. The immune system is unable to clear the infection, despite the presence of antibodies. Gastrin secretion can either be reduced (most cases) resulting in hypo or achlorhydria or enhanced. Gastrin stimulates the production of gastric acid by parietal cells and *H. pylori* colonization increases gastrin, the rise in acid can contribute to the erosion of the mucous membrane and results in ulceration.

NSAIDs: The gastric mucous membrane protects itself from gastric acid with a layer of mucus, the secretion of mucus is aroused by certain prostaglandins. Use of NSAIDs block the function of cyclooxygenase (cox-1), that is essential for the production of those prostaglandins.

Factors responsible for increasing gastric acid secretion are;

Stress: In view of researchers, stress as a potential cause or a least complication, in the event of ulcers. Psychological stress will influence the event of biological



process ulcers. Burns and head trauma, however, can lead to physiological stress ulcers, that are reportable in several patients who are on mechanical ventilation. A study of peptic ulceration patients in a Thai hospital showed that chronic stress was strongly related to an enhanced risk of peptic ulceration, and a mixture of chronic stress and irregular mealtimes was a big risk issue.

Zollinger- ellison syndrome: it is a rare gastrin secreting tumors, also cause multiple and troublesome to heal ulcers.

Smoking: Studies show that cigarette smoking can increase a person’s probability of obtaining an ulceration. Smoking additionally slows the healing of existing ulcerations and contributes to ulcer return.

Caffeine: Beverages and foods that contain caffeine can stimulate acid secretion within the stomach. This worsen an ulceration; however, the stimulation of stomach acid cannot be attributed only to caffeine.







Alcohol: Ulcers are very common in people that have cirrhosis of the liver, an illness usually connected to serious alcohol consumption.

Genetic factor: Individuals with blood group O are more prone to develop peptic ulceration than those with different blood groups. Genetic influences seem to possess bigger role in duodenal ulcers as proof by their incidence in family’s monozygotic twins and association with HLB- B5antigen⁶.

Plant Used for Treating Peptic Ulcer

There are many herbs, nutrients and plant material that are found to play a role in protecting or serving to heal abdomen ulcers. Trials on human have shown sensible potential in animal or in vitro studies. Though variety of botanic product are reported as antiulcer product but the documented literature entirely focuses on pharmacologic action in experimental animals. The restricted clinical data support the employment of herbs as gastro-protective agents and thus, effectiveness and safety data are restricted. There are several botanic products with potential therapeutic applications and low toxicity. Finally, it is noted that chemical constituents like Flavonoids, aescin, succulent gel and lots of others, possess antiulcer activity are of specific therapeutic importance as most of the medicine medication used in trendy medication are ulcer genic⁶.

Table 1: Plants View

<i>Acacia Arabica</i>	<i>Adansonia digitata</i>	<i>Allium sativum</i>
		
<i>Aloe vera</i>	<i>Neem</i>	<i>Pineapple</i>
		
















<i>Bacopa monniera</i>	<i>Brassica oleraceae</i>	<i>Carica papaya</i>
		
<i>Cynodon dactylon</i>	<i>Commiphora molmol</i>	<i>Ficus religiosa</i>
		
<i>Glycyrrhiza glabra</i>	<i>Panax ginseng</i>	<i>Mangifera indica</i>
		
<i>Solanum nigrum</i>	<i>Terminalia chebula</i>	<i>Musa sapientum</i>
		
<i>Momordica Charantia</i>	<i>Ocimum sanctum</i>	<i>Bauhinia racemosa</i>
		

Table 2: Plants Profile

Sr. No	Biological Source	Family	Chemical constituents	Common name	Uses
1.	<u><i>Acacia Arabica</i></u> ^{7,8,9}	Mimosaceae	Synthetic resin compounds, tannins, and flavonoids, arabic acid	“Babul tree”	Antiulcer Activity stimulant and astringent
2.	<u><i>Adansonia digitata</i></u> ¹⁰	Malvaceae	- Root contains gum, glucose, phobaphenes, mucilage, salt and acetate of caustic potash, and different salts. - A leaf contains wax, glucose, salts, gum, and albuminoids. - Bark of tree contains wax, soluble and insoluble tannic acid, acid gum, albuminous carbonate and chloride of sodium and potassium, and a glucoside adansonin	“Boabab or baobab of Africa.”	Antiulcer Activity, indolent syphilitic ulceration, fomentations and poultices for irritable inflammatory ulcers
3.	<u><i>Allium sativum</i></u> ^{11,12}	Liliaceae	Volatile oil, alliin, and allicin are Present, acrid oil active principle, starch, mucilage, albumen, and sugar. Seeds yield aromatic oil. sulphur, iodine, and hydroxy acid necessary nutrient and vitamins .	“garlic” and regionally known as “lehsun.”	Antiulcer Activity, ulcers, ulcerous surfaces, and wounds, lotion for washing wounds and foul ulcers
4.	<u><i>Aloe vera</i></u> ^{13,14,15,16}	Liliaceae	Barbalin, isobarbolin, saponin saloin, and emodin, polysaccharides like mannose	“aloe gel.” & called “korphad”	gastroprotective properties and healing property
5.	<u><i>Azadirachta indica</i></u> ^{17,18,19,20,21,22}	Meliaceae	Chemical constituents reported in this plant are nimbidin, phenolic compounds, saponin, and flavonoids Stearic and palmitic acid Bitter alkaloid named Margosine mixture of stearic and oleic acids with a small amount of lauric acid	“Neem”	Antiulcer Activity, leaf extract protected against pylorus ligation and cold restraint stress induced peptic ulcer in rats anti-secretory and proton pump inhibitory activity stops oxidative damage of the gastric mucosa by blocking lipid peroxidation
6	<u><i>Ananas comosus</i></u> ^{23,24}	Bromeliaceae	Vianain, gastroprotective action is due to the sulfhydryl functional group	“Pineapple”	Antiulcer Activity wound healing property in a guinea pig ischemic ulceration model
7.	<u><i>Bacopa monniera</i></u> ^{25,26,27}	Scrophulariaceae	The main chemical constituent for treating the ulcer is bacoside A and bacoside B	“Brahmi”	Anti-ulcer and ulcer-healing activities Anti-H. pylori activity
8.	<u><i>Brassica oleraceae</i></u> ^{28,29}	Brassicaceae	Lysophosphatidic acid (LPA)	“cabbage”	antiulcerogenic activity
9.	<u><i>Carica papaya</i></u> ^{30,31,32,33,34,35}	Caricaceae	Papain, chymopapain, pectin, carposide, carpaine, carotenoids and xanthin	“papaya.” regionally known as “papae.”	Antiulcer Activity, salads, jellies, and stews, reduced the gastric juice volume and gastric acidity digestive disorders and disturbances of the gastrointestinal tract
10	<u><i>Commiphora molmo</i></u> ^{36,37}	Burseraceae	mucus production, increase in macromoleculu and non –protein sulfhydryl concentration	“Guggul”	Antiulcer activity anti- inflammatory drug and wound healing agent, free radical-scavenging properties

11	<i>Cynodon dactylon</i> ^{38,39,40}	Poaceae	The alcoholic extract showed the presence of flavanoids, that is meant to be accountable for antiulcer property	“Durva or Bermuda grass”	antiulcer activity in albino rats at a dose level of 200, 400 and 600 mg per kg. week grass herb contains flavonoids
12	<i>Ficus religiosa</i> ^{41,42}	Moraceae	phenols, tannins steroids, alkaloids and flavonoids, β -sitosterol-D-glucoside, vitamin K, n-octacosanol, methyl oleanolate, lanosterol, stigmasterol, lupen-3-one.	“Peepal tree”	Antiulcer activity, endogenous prostaglandins promotes mucus secretion, the plant also possesses anti-inflammatory and anti-oxidant properties
13	<i>Glycyrrhiza glabra</i> ^{43,44}	Leguminosae	Carbenoxolone a glycyrrhizate, glycyrrhizic acid, glycyrrhetic acid	“Liquorice”	It found effective on healing ethanol induced ulcers. It reduces gastric secretions and also produces thick protective liquid prostaglandins which covers the lining of stomach.
14	<i>Panax ginseng</i> (Korean red ginseng) ^{45,46}	Araliaceae	Ginseng species increases mucin secretion	“Ginseng”	Inhibited malondialdehyde (MDA) and H ⁺ / K ⁺ ATPase activity in the stomach. Korean red ginseng shows healing property on peptic ulcer
15	<i>Mangifera indica</i> ^{47,48}	Anacardiaceae	The plant contains alkaloids, sterols, saponins, tannins, and flavonoids	“mango tree”	Leaf extracts in rice bran oil given orally for ulcer. Plant is reported to have antiulcer activity. A mango has antioxidant property for inflamed lining stomach as an antiinflammatory agent .
16	<i>Musa sapientum</i> ^{49,50}	Musaceae family	Anti-ulcerogenic effect of banana	“Kela or banana”	Antiulcer, mucosal defensive factors in NIDDM rats
17	<i>Momordica charantia</i> ^{51,52}	Cucurbitaceous	Karela fruits extract contains momordicolide, monordico phenoide A	“Bitter melon and karel”	Antiulcer activity was supposed to be due to the increased secretion of mucus and anti-stress activity
18	<i>Ocimum santum</i> ^{53,55,56,57,58}	Lamiaceae	Fixed oil eugenol, alkaloids, tannins, saponins, flavonoids, and sterols	“holy basil, tulsi”	Commonly used for intestinal disorders. The fixed oil has antiulcer activity because of its lipoxigenase inhibitory activity, histamine antagonistic and anti-secretory effects
19	<i>Solanum nigrum</i> ^{59,60,61,62}	Solanaceae	Flavonoids, alkaloids, saponins phytosterols, tannic acid, gallic acid, chebulinic acid, lucilage and sorbitol	“Makoi, black nightshade berries”	Antiulcer activity was by blocking acid secretion through inhibition of H ⁺ K ⁺ ATPase and decreasing secretion of gastrin hormone
20	<i>Terminalia chebula</i> ⁶³	Combretaceae	Flavonoids, Triterpenes, Saponin, Phenolic compounds and Tannins	“Myrobalan, harada”	Antiulcer Activity, syphilitic ulcers
21	<i>Bauhinia racemosa</i> ⁶⁴	Caesalpiniaceae	The presence of flavonoids	“Bidi leaf tree”	Flavonoids may reduce the gastric secretion and peptic activity and prevent the formation of gastric ulcer.

Drawbacks of conventional treatment for peptic ulcer

1. **Proton Pump Inhibitors (PPIs)**- Constipation, Flatulence, Vitamin B12 deficiency, Osteoporosis⁶⁵
2. **H2 Receptor Blockers**- Anxiety, Depression, Dizziness, Cardiovascular events, Thrombocytopenia⁶⁶
3. **Antacids**- Hypophosphatemia, Chalky taste, Constipation, Abdominal cramping, Diarrhea, Electrolyte imbalance^{67,68}
4. **Potassium-Competitive Acid Blocker**- Nasopharyngitis, Upper respiratory tract inflammation Eczema, Back pain^{69, 70,71}
5. **Cytoprotective Agents**- Abdominal pain, Headache, Constipation^{72,73}

CONCLUSION

Various plant sources have been mentioned in Table no. 2 in this article on the basis of traditional knowledge and reports of various researchers. Research on natural products usually controlled by ethno medicinal data, and their contribution to drug innovation by providing novel chemical structures and mechanisms of action is substantial. In folk medicine number of herbal extracts are employed to treat various types of disorders. The synthetic medicines used to treat peptic ulcer are having side effects and it has been seen that some synthetic medicine has ulceration as their adverse effect. Aim of ulcer treatment mainly target in the potentiating the defensive system and lowers the acid secretion. The herbal natural remedy proved as an obvious alternative, that is safe and equally effective as the synthetic medicine. The presence of active chemical constituents such as tannins and flavonoids in medicinal plant and their extracts have significant antiulcer activity. Understanding the mechanism of ulcerogenesis targeted treatment can be design.

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