



## Review Article

## Herbal drugs: Boon for Peptic ulcer patients

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## ABSTRACT

Antibiotic, antiviral, antifungal and antiparasitic medicines are used to treat the diseases caused by pathogenic microorganisms. These microbes effects humans, animals and plants and produces diseases. As per the recent report of World Health Organization (WHO), the cases of Antimicrobial resistance (AMR) is continuously rising, which causes ineffective treatment and prevention of infections caused by bacteria, viruses, fungi and parasites. AMR occurs when these microbes gets resistance and the medications gets ineffective against these microbes, which makes treatment of common infections difficult and consequently increases the risk of severe illness, spread of disease and death. Because the medicines becomes purposeless, infections continue to exist in the body and increases the likeliness of spread to others. WHO recommends reduced use of synthetic antibiotics and raised use of herbal antimicrobial drugs. These are the ways by which the AMR can be controlled or abolished. Herbal drugs can be used for this purpose because these are considered to be effective with no or less side effects. In the present article we discussed about peptic ulcer, causative agent of peptic ulcer and the medicinal plants which can be used to treat this disease. Twenty medicinal plants were listed which contains both antibacterial and antiulcer activity. Due to these properties of these medicinal plants, these can be used for the treatment of peptic ulcer because of dual benefits firstly, antibacterial which kills or retards the growth of Helicobacter pylori and secondly, antiulcer which heals the ulcer.

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## 1. Introduction

Quadruple therapy is the method used to treat Peptic ulcers which comprises of four types of synthetic drugs in modern medicine i.e.

1. H2 antagonists to inhibit gastric acid secretion e.g. Cimetidine, Ranitidine, Famotidine etc.
2. Antacids to neutralize gastric acid e.g. Calcium carbonate, Magnesium hydroxide, Aluminum hydroxide and/or Sodium bicarbonate.
3. Proton pump inhibitors like Omeprazole, Pantoprazole and Lansoprazole as ulcer protective agents.
4. Antibacterial drugs like Amoxicillin, Clarithromycin, Metronidazole, Tinidazole, Tetracycline and Levofloxacin. These are chemically synthesized

drugs and the treatment continued for many days, hence they causes lot of side effects and also produces AMR. The use of herbal drugs to treat the disease can reduce AMR because they are effective and have very less or no side effects.<sup>1</sup>

## 2. Antimicrobial Resistance (AMR)

Disease producing microorganisms are called pathogenic microorganisms causes infection and responsible for producing many diseases in human, animals and plants. To treat those diseases by retarding the growth of microorganisms or destroying them, antimicrobial drugs are used like antibacterial, antifungal, antiviral and antiparasitic drugs. Over use (long term use and use of drug in wrong dose) of the antimicrobial drugs, results in developing resistance of microbes towards these

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drugs which makes medications ineffective. This is called antimicrobial resistance (AMR). WHO states that AMR is a global problem. To fight against AMR recommends to use the synthetic antimicrobial drugs whenever necessary in a right dose and if possible for a short period and secondly instead of synthetic antimicrobial drugs, herbal antimicrobial drugs should be used.<sup>2</sup> By following these two ways, AMR can be controlled or eliminated.

### 3. Peptic Ulcer Disease

Peptic ulcer disease is painful sores form in the lining of the stomach, duodenum (beginning of small intestine) or bowels. Ulcers can sometimes cause bleeding or a hole in the stomach or bowel. The common symptom is burning when the stomach is empty but it can happen any time and can lasts from few minutes to many hours. The other symptoms are stomach upset, blood in stool or vomit, loss of appetite or weight loss. The common causes of peptic ulcer is infection due to bacteria known as *Helicobacter pylori* (*H.pylori*) and Non-steroidal anti-inflammatory drugs (NSAID) use like Aspirin or Ibuprofen. Acid-pepsin secretions when exposed to the regions of the upper gastrointestinal tract (GIT) may leads to peptic ulcer.<sup>2</sup> It affects stomach or duodenum. The two most common types of peptic ulcer are Gastric ulcer (Ulcer of stomach) and duodenal ulcer (Ulcer of duodenum). Reports says that duodenal ulcer is 2-4 times more usual than gastric ulcer.<sup>3</sup> Ulcers of the stomach are common in persons of older age, which is characterized by stomach pain. Nausea, vomiting and weight loss are the other symptoms of gastric ulcer. It may occur in patients with normal or diminished acid production or even in absence of acid also.<sup>4</sup> The beginning of the small intestine is called duodenum where the duodenal ulcers are found which is characterized by burning sensation in upper abdomen with severe pain. Sometimes the severity of pain awakes patients from sleep. In empty stomach usually the pain occurs and after eating it stops. Males are mostly effected by duodenal ulcer and it is more common in younger individuals.<sup>5</sup>

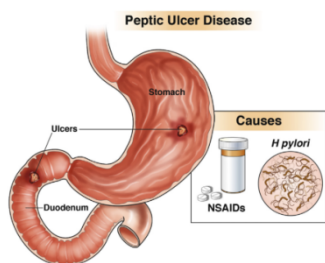


Fig. 1: Shows peptic ulcer & itscauses

### 4. Global and National Status of Peptic Ulcer

There are many GIT diseases but peptic ulcer is the major one in the world. About 10% of the total world population is effected by peptic ulcer disease.<sup>6</sup> In two types of peptic ulcer, duodenal ulcer is more common and in 20 peptic ulcer patients 19 are suffering from duodenal ulcer. As per estimation, annually 15000 deaths occurs due to peptic ulcer. A estimation also states that every year the incidence of peptic ulcer hemorrhage and peptic ulcer perforation was 19.4-57 per 100,000 individuals and 3.8-14 per 100,000 individuals respectively. On an average the rate at which peptic ulcer hemorrhage reoccurs in seven days and long term peptic ulcer perforation were 13.9% and 12.2% respectively.<sup>7</sup> WHO latest data published in 2017 says that 57,658 or 0.66% deaths was due to peptic ulcer disease of total deaths in India. Age adjusted death rate in India is 5.79 per 100,000 of population which keeps our country in 53 rank in the world<sup>8</sup> Antacids and antiulcer drugs shares 6.2 billion rupees or 4.3% of the total market share in Indian Pharmaceutical industry.<sup>9</sup>

The probable factors responsible for the occurrence of peptic ulcer are Aggressive and protective and due to the imbalance between these two factors in the stomach the disease occurs.<sup>10</sup> *Helicobacter pylori*, hydrochloric acid, pepsins, Non-steroidal anti-inflammatory drugs, bile acids, ischemia, hypoxia, smoking and alcohol comes under aggressive factors and bicarbonate, mucus layer, mucosal blood flows, prostaglandins and growth factors comes under protective factors.<sup>11</sup>

### 5. Helicobacter Pylori

*Helicobacter pylori* is a common human pathogenic bacteria which can transmit from one person to another person. It infects the upper GIT and causes gastroduodenal inflammation of progressive acute and chronic type. The other manifestations of *H.pylori* infection are Gastritis, gastric atrophy, duodenal ulcer disease, gastric ulcer disease, primary gastric B-cell lymphoma, gastric adenocarcinoma, iron deficiency anaemia, and vitamin B<sub>12</sub> deficiency. Risk factors which contributes to the infection are overall sanitary conditions and contact with infected humans. The mode of transmission is contaminated water in rural areas whereas in urban areas infection depends on the level of household hygiene.<sup>12</sup> *H. pylori* bacteria found in almost 50% of the population of the world. The relation between peptic ulcer disease and *H. pylori* infection was unknown earlier but has been found over the last few decades and scientific studies says that *H. pylori* infection is responsible for 90% of duodenal ulcers and up to 70% of gastric ulcers. If untreated or going for treatment late, it creates complications in about 20 to 25% of the patients.<sup>13</sup>

Natural products became the most attractive source of new drug because of easy availability, relatively less

**Table 1:** List of twenty medicinal plants having reported antibacterial and antiulcer activity

S.No.	Common name	Botanical name	Family	Plant part (Antibacterial)	Plant part (Antiulcer)	
1	Indian Gum Arabic tree, Babool	Acacia Arabica	Leguminosae	Bark	Seedless pods, gum	14,15
2	Bengal quince, golden apple, Japanese bitter orange, stone apple, wood apple, Bael, Belli	Aegle marmelos L.	Rutaceae	Leaves, bark & fruits	Leaves	16,17
3	Garlic, Lissan	Allium sativum	Amaryllidaceae	Bulbs	Bulbs	18-20
4	Aloe vera, Gwar Patha, Kuwar Patha	Aloe barbadensis M.	Asphodelaceae (Liliaceae)	Leaves	Leaves	21,22
5	Neem	Azadirachta indica	Meliaceae	Leaves	Leaves	23,24
6	Indian Barberry, Tree Turmeric, Chitra, Daruharidra	Berberis aristata	Berberidaceae	Stem	Roots & woods	25,26
7	Beet root	Beta vulgaris L.	Amaranthaceae	Pomace	Roots	27,28
8	Papaya, Papita, Melon tree	Carica papaya	Caricaceae	Leaves	Seeds	19,29
9	Peepal, Peepdi	Ficus religiosa	Moraceae	Latex	Leaves	30,31
10	Gurhal, China rose, Jasod	Hibiscus rosa sinensis	Malvaceae	Flowers	Leaves	32,33
11	Mango, Aam	Mangifera indica	Anacardiaceae	Stem bark	Leaves	34,35
12	Sensitive plant, touch me not, Lajjamdi	Mimosa pudica	Fabaceae	Whole plant	Leaves	36,37
13	Drumstick tree, Horseradish tree, Senjana, Seeng	Moringa oleifera	Moringaceae	Leaves, bark, seed and flesh	Leaves	38,39
14	Holi basil, Tulsi	Ocimum sanctum	Lamiaceae	Leaves	Leaves	21,40,41
15	Gale of the wind, Stone breaker, Seed under leaf, Bhuaamla	Phyllanthus niruri	Phyllanthaceae	Leaves	Leaves	42,43
16	Black nightshade, Moko	Solanum nigrum	Solanaceae	Whole plant	Leaves	44,45
17	Tamarind, Imli, Aml	Tamarindus indica	Caesalpinaceae	Stem, bark and leaves	Seeds	46,47
18	Myrobalan, Chebulic myrobalan, Harra, Harad, Harde	Terminalia chebula	Combretaceae	Leaves	Fruits	48,49
19	False daisy, trailing eclipta, Bhringraj, Kesharaj, Bhingdo	Eclipta alba	Asteraceae	Aerial parts	Whole plant	50,51
20	Field mint, Wild mint, Corn mint, Podina, Fudina	Mentha arvensis	Lamiaceae	Leaves	Whole plant	52,53

expensive, no or less side effects makes it safe to use even at higher doses for the treatment and prevention of many diseases. These are the broad reasons why herbal drugs are getting popularity over synthetic drugs and continuously expanding throughout the world.<sup>54</sup> According to WHO, for older diseases and for newer ones variety of drugs can be obtained from medicinal plants. It would be the best source. Therefore, these must be properly investigated to better understand their pharmacognostic properties, pharmacological properties, microbiological properties, safety and efficacy.<sup>55</sup>

In India, number of antibacterial drugs and antiulcer drugs are available and known for their properties individually. In this review article we tried to prepare a list of twenty medicinal plants which are potent antibacterial and antiulcer based on scientific studies.

## 6. Antibacterial activity of some Medicinal Plants

In present scenario, the incidence of antimicrobial resistance is on continuously rising threatening all to return to the pre-antibiotic era. There many bacterial infections now a days which are untreatable by the current available treatment methods.<sup>56</sup> Its time to think and act to solve this global

problem This review aims to focus on preparing a list of twenty medicinal plants used in traditional medicines having antibacterial activity.

## 7. Antiulcer activity of some Medicinal Plants

75–80% of the world total population uses herbal/traditional medicines especially in developing countries for their primary health care. The reasons behind this are better cultural acceptability of these drugs, easily available and lesser side effects.<sup>57</sup> Studies revealed that no any acute toxicity showed by these medicinal plants. Preliminary photochemical screening of these medicinal plants identified the presence of secondary metabolites like flavonoids and tannins which are responsible for the antiulcer activity.<sup>58</sup> Present study focused to prepare a list of medicinal plants which are considered as gastroprotective and healing agents on ulcers.

## 8. Conclusion

According to WHO, Antibiotic resistance is a global health problem and our country is also facing the same. Individuals of any age group can get effected by antibiotic resistance. Misuse of antibiotics is the reason behind raising cases of antibiotic resistance in humans and animals. Because of ineffectiveness of antibiotics, now a days its become very difficult to treat bacterial infections like pneumonia, tuberculosis, gonorrhoea and salmonellosis. Antibiotic resistance results in increase of hospital stay, medical expenses and death rate. To reduce AMR, treatment with herbal drugs is today's necessity and many medicinal plants are reported till date which possess both antibacterial and antiulcer activities and that were proved scientifically. The bacteria *H.pylori* is the causative agent of peptic ulcer disease. No or less literatures are available which shows effect of herbal drugs both on *Helicobacter pylori* and healing of ulcer, hence research is needed in this field to know the effect of these medicinal plants both on *H.pylori* & healing of ulcer i.e. antibacterial and antiulcer activity in single drug. If it shows positive effect then to reduce AMR these will be a nice herbal drug option to treat Peptic ulcer without any side effect.

## 9. Source of Funding

None.

## 10. Conflict of Interest

None.

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