A Review on some Indian Medicinal Plants for Antiulcer Activity

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ABSTRACT

Peptic ulcer is the most common gastrointestinal disorder. The knowledge of the pathophysiology of gastric ulcer disease remains incomplete. A number of drugs including proton pump inhibitors and H2 receptor antagonists are available for the treatment of peptic ulcer, but clinical evaluation of these drugs has shown many side effects, and drug interactions. Thus the development of new antiulcer drugs has been extended to herbal drugs that offer better protection. Medicinal plants provide an effective way in disease management. Many medicinal plants exhibit antiulcer activity and found useful in the treatment of peptic ulcer. In this review, there is some information about some plants which have been useful in peptic ulcer disease. Various plants like Abutilon indicum, Ageratum, Allophylus serratus, Aloe barbadensis, Aloe vera, Bachinia variegata, Basella rubra, Benincasa hispida, Capsicum, Carcuma longa, Desmodium gangeticum, Emblica officinalis, Felonica elephantum, Glycyrrhiza glabra proved useful in peptic ulcer disease.

Keywords: Medicinal plants, Peptic ulcer, Antiulcer activity, Gastrointestinal disorders.

INTRODUCTION

Peptic ulcer is the most prevalent gastrointestinal disorder. The pathophysiology of peptic ulcer disease involves an imbalance between offensive and defensive factors. Approximate 15,000 death occurs with peptic ulcer disease. In India, peptic ulcer is common. In the Indian Pharmaceutical industry, antacids and antiulcer drugs share 6.2 billion rupees and occupy 4.3% of the market share. Today, there are two main techniques for treating peptic ulcer. The first is reducing the production of gastric acid and the second is reinforcing gastric mucosal protection [1, 2]. Recently, there has been a rapid progress in the pathogenesis of peptic ulcer. Most of the studies focus on newer drug therapy. These have been made by the availability of the proton pump inhibitors, histamine receptor blockers, drugs affecting the mucosal barrier and prostaglandin analog [3]. However, the clinical evaluation of these drugs showed development of tolerance and side effects that make their efficacy arguable. This has been the rationale for the development of new anti ulcer drugs, which includes herbal drugs. Indian medicinal plants and their derivatives have been an important source of therapeutic agents to treat various diseases including peptic ulcer [4]. An indigenous drug possessing fewer side effects is the major thrust area of the present day research, aiming for a better and safer approach for the management of peptic ulcer. Several plants species like Allophylus serratus [5], Desmodium gangeticum [6], Ocimum sanctum [7], Hemidesmus indicus [8], Emblica officinalis [9], Commelina pluricaulis [10], Bidens pilosa [11], Asparagus racemosus [12], have shown encouraging findings.

METHODS AND MATERIALS

The potential medicinal plants used in ulcer:

In spite of being one of the well-known medicinal plants used in Indian traditional medicine to treat several minor illnesses, studies applicable to the pharmacological properties of some medicinal plants are very rare. We studied the antiulcer activity and acute toxicity of some medicinal plants. Our investigation showed that these medicinal plants could prevent ulcer in rats in a dose dependent manner. Histological studies showed that these medicinal plants did not show any acute toxicity. Phytochemical screening of these medicinal plants identified the presence of important secondary metabolites like flavonoids and tannins. A variety of botanical products have been possessed antiulcer activity. The documented literature has centered primarily on pharmacological action in experimental animals. Except for a few phytopharmaceutical products (i.e. aloe, liquorice and chilly), limited clinical data are available to support the use of herbal gastro-protective agents. Therefore, the data on efficacy and safety are limited. Despite this, there are several botanical products with potential therapeutic applications because of their high efficacy and low toxicity. Finally, it should be noted that substances such as flavonoids, aescin, aloe gel, and many others that possess antiulcer activity are of particular therapeutic importance as most of the anti-inflammatory drugs used in modern medicine are ulcerogenic [13, 14, 15].

Some Anti-Ulcer Plants:

**Amomum subulatum:**

Amomum subulatum Roxb. (Large cardamom) commonly used as a spice. Methanolic extract of fruits of large cardamom shows antiulcer activity [16].

**Scoparia dulcis:**

Freeze-dried aqueous extract of the aerial parts of Scoparia dulcis L. produced reduction gastric hypersecretion and ulcer in rodents [17].

**Jasminum grandiflorum:**

Jasminum grandiflorum L. is a folk medicine. Antiulcer activity of Jasminum grandiflorum L. was investigated using 70% ethanolic extract of leaves. It also produces in vitro antioxidant Activity [18].

**Davilla rugosa:**

Davilla rugosa Poiret is a commonly used Brazilian folk medicine. Antiulcer action of the fractions of the hydroalcoholic extract of D. rugosa stems was studied in rats [19].
Kielmeyera coriacea: Kielmeyera coriacea Mart. is a Brazilian cerrado plant belonging to family Guttiferae and is popularly known as “Pau Santo”. A. Juss. and a biphyl from Kielmeyera coriacea had shown antifungal activity against cladosporium cucumerinum and candida albicans [43].

Larrea divaricata: Anti-ulcerogenic effect of the methanolic extract of Larrea divaricata Cav. leaves was investigated against absolute ethanol and 0.6N HCl induced ulcer in rats [44].

Qualea grandiflora: Qualea grandiflora Mart (Vochysiaceae), popularly known as “Pau terra” is native to Brazilian cerrado. Antiulcer activity of hydromethanolic extract of bark of Qualea grandiflora (500 mg/kg) was evaluated [45].

Mammea Americana: Mammea americana L. (Guttiferae) is a tree native to the West Indies and Northern South America has been used for its several medicinal properties, such as antiulcer activity [66, 67].

Anacardium occidentale: Antiulcerogenic effect of a 70% ethanolic extract of cashew (Anacardium occidentale L.) leaves was investigated against HCl/ethanol induced ulcer and found that extract inhibit gastric lesions significantly in dose dependent manner [46].

Table 1: Some medicinal plants used in the treatment of ulcer

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical name</th>
<th>Family</th>
<th>Part used</th>
<th>Common name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abutilon indicum Linn</td>
<td>Malvaceae</td>
<td>Leaves</td>
<td>Indian mallow</td>
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<td>2</td>
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<td>Fabaceae</td>
<td>Bark &amp; leaves</td>
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<td>Rutaceae</td>
<td>Leaves</td>
<td>Bael</td>
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<td>4</td>
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<td>Anacardiaceae</td>
<td>Leaves</td>
<td>Biligolokul, Bilihills</td>
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<td>Allophylus serratus Kurz</td>
<td>Euphorbiaceae</td>
<td>Leaves</td>
<td>Elva</td>
</tr>
<tr>
<td>6</td>
<td>Aloe barbadensis Mill</td>
<td>Liliaceae</td>
<td>Leaves</td>
<td>Elva</td>
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<tr>
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<td>Aloe vera (L.)</td>
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<td>Khulanjan</td>
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<td>Neem</td>
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<td>Bidens pilosa</td>
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<tr>
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<td>Cinnamomum cassia Blume</td>
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<td>Dielleiaceae</td>
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<td>Bejikol, olorado</td>
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<td>Ginseng</td>
<td>Araliaceae</td>
<td>Roots &amp; stem bark</td>
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<tr>
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<td>Glycine yabura Linn</td>
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<td>Hemidesmus indicus</td>
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<td>Larrea divaricata</td>
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<td>Mammee americana</td>
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<td>Momordica charantia Linn</td>
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<tr>
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<td>Musa sapientum</td>
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<td>Leaves</td>
<td>Sweet banana</td>
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<tr>
<td>49</td>
<td>Myristica fragrans Houtt</td>
<td>Myristicaceae</td>
<td>Seeds</td>
<td>Jaggery</td>
</tr>
</tbody>
</table>

Ocimum sanctum: Ocimum sanctum, popularly known as Tulsi in Hindi, is a sacred plant that belongs to the family Labiatae. Ocimum sanctum contains a number of chemical constituents that interact in a complex way to elicit their pharmacodynamic responses. Ocimum sanctum is highly effective in a wide spectrum of diseases and reported to possess antiinflammatory, antiemetic, antispetic, antihemorrhagic, antiasthma, antibacterial and antifungal properties [48–53].

Azadirachta indica: Azadirachta indica A. Juss, commonly known as “Neem,” has been extensively used in India as an ayurvedic medicine for the treatment of various diseases, such as, leprosy, intestinal helminthisis, and respiratory disorders in children. Antiulcer and cytoprotective potential of Azadirachta indica (neem) stem bark extract was evaluated in albino rats [71, 72, 73, 74].

Allophylus serratus Kurz: Allophylus serratus Kurz (Synonym Allophylus cobbe Raeuschel; Allophylus edulis Radlk), is one of the largest genus of family Sapindaceae and carries a strong ethnopharmacological background. The plant is used in Ayurveda, to treat problems like inflammation, elephantiasis, edema, and fracture of bones. It is also used in several gastrointestinal disorders including dyspepsia, anorexia, and diarrhea [75].
CONCLUSION

From this study we can conclude that studies with plant sources can result in novel and effective treatment. Near about 5% of new chemical substances introduced during the past times are from natural products. Chemical substances derived from plants have been used to treat human diseases since the dawn of medicine. Many medicinal plants have shown significant anti-ulcer activity. Here we can use the combination of chemical substances and medicinal plants, the combination of traditional (medicinal plants) and modern knowledge (chemical substances) can produce better drugs for the treatment of peptic ulcer with fewer side effects. The combination of traditional and modern knowledge also produce side effects, therefore the traditional drugs may be used for the anti-ulcer activity. There are low chances of error on the therapeutic effects of traditional drugs. Hence it is suggested that the studies may be carried on these natural resources is for development of new anti-ulcer drugs in future.

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