NATURAL BIOACTIVES FOR THE POTENTIAL MANAGEMENT OF GASTRIC ULCERATION

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ABSTRACT

Many medications derived from herbs are used in the treatment of many human diseases. If you eat plants and herbs in their whole or natural form, you do not experience any adverse side effects. This demand has led to the increased use of medicinal herbs in the undeveloped and developed worlds. Duodenal ulcer disease is commonly seen in clinical practice, and NSAIDs are used to treat peptic ulcers. Besides, nonsteroidal peptic ulcers and gastric ulcers are well-known peptic ulcer complications. Gastric and/in the elderly population, there is a risk for peptic ulcers to occur. Many peptic ulcer medications are made artificially but have complex side effects. A racial, Ethno-tautological, or ethnohistory application of plants are remarkable. In this case, researchers attempted to identify the natural antiulcer drugs with their prescribed dosage, testing methods, the extraction process, and medical properties applied to examine and demonstrate their properties.

It is currently thought that isolated plant constituents can cure peptic ulcers, often caused by bacterial infection and strong acids. There is more and more demand for herbal products as an option due to the affordability in the current market. Alkaloids, flavonoids, and subphases In rural areas, different plants have been used for medicinal purposes, such as heartburn and stomach problems. This study's findings suggest that moreover research should be done to minimize antiulcer medication's side effects.

Keywords: Metabolites; herbals, gastro intestinal, Pharmacology, Ulceration

I. INTRODUCTION

An ulcer is simply an inflamed skin rupture of the mucosa covering the food tract. Ulceration takes place when the normal equilibrium is disrupted by either greater provocation or reduced mucosal resistance.¹ Of the 20 peptic ulcers, about 19 are duodenal. Gastric ulcers found on the stomach wall are less common. The gastric mucosa is continuously exposed to acid, pepsin, bile acids, food additives, Helicobacter pylori, and medicines as possibly harmful. These agents² pathogens included increased stomach acid and pepsin secretion, prostaglandin synthesis and cell proliferation formation, decreased stomach blood flows, and gastric motility³

1. Prescription treatment for peptic ulcer is either counteracting or stimulating mucosal protection;

2. The objective is to relieve pain, heal the ulcer and prevent the ulcer's recurrence. Several studies have measured the antiulcer effects of several spices and herbs to achieve a favorable result.⁴ Gastro-protectives are numerous medicinal plants and nutrients such as Aloe, Chebula, Zizinnoides Vetiveria, Ginseng, Capsicum, etc. While it is one of the common medicinal plants for treating several diseases in Indian traditional medicine, some plants' pharmacological properties are scarce. Certain medicinal plants have been tested for their antiulcer effectiveness and acute toxicity.⁵ Our research has shown that these plants in rats can prevent dose-dependent ulcers. Histological studies showed that the toxicity of these plants is not acute.⁶,⁷ Phytochemical preliminary screening of this medicinal plant has been achieved by the presence of important secondary metabolites, including flavonoids and tannins⁸,⁹.
There are suggestions that various botanical products have antiulcer effects, but the literature reported focuses mainly on laboratory animals' pharmacological actions. There is little clinical evidence available to encourage gastroprotective herbs except for several photogenic compounds (e.g., aloe, licorice, and chilly). However, numerous botanical products with potential therapeutic applications are available due to their high efficiency and low toxicity. Finally, it should note that Antiulcerants, such as flavonoids, resins, aloe gel, and many more, are very relevant since most anti-inflammatory medicinal products used in modern medicinal products are ulcerative.

CAUSES OF ULCER 22-24

Peptic ulcer (PUD) has many causes, but most etiological conditions are accounted for by PUD associated with Helicobacter pyloric and PUD associated with NSAID.
Symptoms 25-27
Large ulcers have some common symptoms, despite extreme bleeding (Figure. 3), while lower ulcers seldom cause symptoms, may not have them.

FIG 3: SYMPTOMS OF ULCER

Treatment 26-28
There have been two primary methods of treating peptic ulcers, prophylactic and therapeutic types, in the past. Prophylaxis mechanism (gastroprotective or cytoprotective) In addition to other gastrin-protective acts, protection factors are strengthened with enhanced prostaglandin synthesis and stimulated somatostatin synthesis. Moreover, several other gastro-protective effects that help treat peptic ulcers are the prevention of oxidative damage to gastric mucosa (by preventing lipid peroxidation and substantially reducing superoxide dismutase and increasing catalase activity) the possible NO-Synthase pathway.

Synthetic medication 29-30
They may also ruin the life of a human being, in addition to their novel cause, by generally damaging the quality of life and creating many other dangers. Synthetic drugs of different forms, introduced for treatment using their (MOA) and side effects of drug class, are in Table 1.

Table 1: GROUP OF DRUG CLASS AND THEIR MOA WITH SIDE EFFECTS RELATED TO ULCER

<table>
<thead>
<tr>
<th>GROUP OF DRUG CLASS</th>
<th>MOA of drug</th>
<th>LIST OF DRUG USED ON THIS</th>
<th>SIDE EFFECTS OF DRUG CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-Muscarinieagents</td>
<td>Inhibits gastric secretion action</td>
<td>Pirenzepine drug</td>
<td>Blurred Vision[24]</td>
</tr>
<tr>
<td>H2-receptor blockersagents</td>
<td>Inhibitor of H2 receptor (CYP450)action</td>
<td>Cimetidine drug</td>
<td>Headaches</td>
</tr>
<tr>
<td>Prostaglandins agents</td>
<td>Inhibits the acid secretion action</td>
<td>Misoprostol drug</td>
<td>Vomiting [29]</td>
</tr>
<tr>
<td>Antacids drug</td>
<td>Reduces pepsin formation action</td>
<td>Calcium bicarbonate drug</td>
<td>Hypokalemia[28]</td>
</tr>
<tr>
<td>Proton pump inhibitors drug</td>
<td>Inhibits H+/K+ ATPase in parietal collection</td>
<td>Inhibits H+/K+ ATPase in parietal cells reaction</td>
<td>Risk of Pneumonia</td>
</tr>
<tr>
<td>Mucosal protective agents</td>
<td>Stimulates angiogenesis for healing action</td>
<td>Bismuth Subsalicylate drugs</td>
<td>Darkening of stools[30]</td>
</tr>
</tbody>
</table>
Researchers were asked to analyze their chemical, toxicology, and pharmacology of flavonoids, terpenoids, and tannins. The room and value for motivating sources of potentially bioactive molecules in the pharmaceutical industry are recovered in natural products.

**ALKALOIDS**

For this study, 61 alkaloids were identified, studied in models evaluating antiulcer behavior, and distributed across 13 subtypes:
The narcotic analgesic morphine, antimicrobial berberine, and sympathomimetic ephedrine are among the numerous alkaloids with good pharmacology. The main sources of these alkaloids are Papaveraceae, Berberidaceae, and Ephedraceae. The antiulcer and gastric lesions triggering reserpine, aspirin, or indomethacin were also an inhibited compound of morphine and ephedrine. This activity was not shown in ethanol-induced ulcers by berberine. Rather, 7,8-dihydro-8-Hydroxypalmatine, a new type of Enantia Chlorantha alkaloid protuberant, improved ulcer healing and increased gastric mucous development following acetate acid, HCl/ethanol, or absolute ethanol lesions. Other Coptidis rhizomes, coptisine, and eight Oxocoptisin alkaloids showed similar defense of gastric mucosae, such as cimetidine and sucralfate, in gastroprotective medicines. Trojan alkaloids are dicyclic compounds composed of three carbon-derived acetate atoms condensed by an amino acid pyrrolidine precursor (ornithine). Some of these alkaloids, including atropine and scopolamine, are important classes of plant anticholinergic compounds that occur in many Atropa and Datura plants. They are clinically used to suppress the muscarinic activity of acetylcholine in spastic colitis, gastroenteritis, and peptic ulcers with antispasmodic and antisecretory impact. They are also valuable pharmacological tools to explore new active gastrointestinal action concepts. Anisodamine and job are atropine analogs and tested as protectors against damage caused by indomethacin, reserpine, agitation, pylorus, acetic acid, and absolute ethanol rats. These compounds prevented lesions caused by aggressive agents and altered their gastric acid secretion by increasing basal bicarbonate and PH in aluminum gastric development. Another well-known tropane alkaloid, cocaine, was used in rats against reserpine-induced oral ulcers to demonstrate antiulcer activity. This medicine has different central and peripheral nervous systems, originating from coca leaves of Erythroxylum. It is psychomotor with high abuse potential and can control or minimize activities such as eating and sleeping. Nicotine is a culture-known pyridine alkaloid, mainly present in the dried leaves of Nicotiana tobacco plant Linné. This medicine affects the autonomous ganglia, the surreal medulla, the neuromuscular junction, and the mammalian brain on nicotine acetylcholine receptors. Chronic use of nicotine can contribute to physical and psychological dependence. This alkaloid, however, protects the stomach against aspirin-induced damage by minimizing bleeding and increasing the pH gradient and gastric fluid volume. Sophora Flavescent (Fabaceae) were experimentally isolated and tested to inhibit gastric pyloric ligature ulcers, water immersion tension, and indomethacin, such as martin, 13 alpha Hydroxymatrine, and oxymatrine. Alkaloids reduced acid secretion and impaired gastric motility; Senecio Brasiliensis removed alkaloids such as pyrrolizidine, integerrimine, retrorsine, mentioning, usaramine and seneciphylline. Alkaloids have increased the stomach mucosa to free mucus and prostaglandin. Also, the exfoliation of superficial cells, bleeding, and blood cell infiltration has been reduced through increased gastrin secretion and mRNA epidermal expression.

**FLAVANOIDS**

The flavonoids are categories of low molecular weight and natural crops widely distributed in the vegetarian kingdom (2-Phenylchromone or 2-Phenylbenzopyrone). It is found in fruits, baits, nuts, plant leaves, flowers, and barks. The standard Western diet includes around 1 g of mixed flavonoids, which can be sufficient to reach significant pharmacological levels of tissues (1). In 1936, Szcnt Gyorgyi suggested first a biological function in humans and animals for these compounds, which indicated crude vitamin C preparations from natural resources were more effective in relieving capillary damage and prolonging the lives of scurvy animals than a pure vitamin. Lemon isolated and named citrin is the unknown substance that preserved the capillaries. It was later caused by many naturally occurring compounds and was later known as flavonoids. Eco related to the resistance to dietary diseases. This theory is based on the evidence of plant compounds absorbed in the body and is irreversibly linked to the blood cells, antiviral, antifungal, bacteriostatic, and immunostimulants. Some possible enzymes in the body that detoxify carcinogenic hydrocarbons have anti-inflammatory activity, the anti-adhesive effect on blood cells and anti-thrombogenic activity, and some action to control pathogens (1).
An update on the role of dietary components in cardiac disease prevention also highlights flavonoids' antioxidant properties. Most benign gastric ulcers are located in the stomach's lower curvature and are only far from the secretion's acidic mucosa. While stomach ulcer pathophysiology has not been fully understood, most studies show antral-pylorus-duodenal motility defects. Abnormal patterns of motility cause the duodenal material to reflux into the stomach with gastric mucosa disruption. Delays in gastric vacuuming can increase exposure to acid, pepsin, and duodenal refluxes gastric mucosa. Salt from the bile and pancreas seems to destroy the stomach mucosa, causing back-diffusion of hydrogen ions. It is expected to contribute to the production of ulcers. The gastric silver barrier can also be impaired by aspirin and NSAID, whose function is related to cyclo-oxygenase inhibition that causes cytoprotective prostaglandin synthesis. Therefore, the evidence confirms the importance of primary defects in gastric mucosal resistance as the main elements for gastric ulcers' pathogenesis as direct gastric mucosal wounds.42-43

TERPENES 44-46

The key components of essential oils are terpenes, the largest secondary plant metabolites[21]. These metabolites are biosynthesized by methylerythritol-phosphate (classic and alternate). Its basic structure contains isoprene units (C5H8) of pyrophosphate isopentenyl (IPP) (DMAPP). The classes of these components are defined in the isoprene unit classification in monoterpenes (C10), sesquiterpenes (C15), diterpenes (C20), triterpenes (C30), and tetraterpenes (C40). Several preclinical studies have shown that terpenes have a therapeutic activity such as anti-inflammatory antioxidants, antibacterial, gastroprotective and gastric cures.45 Recent studies have explored both the anti-inflammatory activity of terpenes and the intestinal anti-inflammatory activities of natural products.46 In recent years, this analysis is intended to compile studies to assess the anti-inflammatory role of terpenes in laboratory model IBD and action mechanisms.47,48

FIG 6: LIST OF SECONDARY METABOLITES FLAVANOIDS
II. CONCLUSION

In the ancient theory, the only cause of ulcer formation was acid secretion and the leading therapeutic approach to acid secretion. However, this definition has changed in light of recent evidence. Ulcer treatment today aims primarily to strengthen the protection mechanism and reduce acid secretion. This article explores the cause and application of herbal medicines for the treatment of peptic ulcers. Secondary metabolites of old traditional medicinal plants used in rural or remote areas to treat peptic ulcers are far from current. Subsequent metabolites, including alkaloids, flavonoids, and terpenoids from different plants, are used to demonstrate important consequences for the chemical structure, test models, and modes of action for peptic ulcers. The provided data may be useful to further research in the prevention and treatment of people with peptic ulcers.

REFERENCE


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