Formulation And Evaluation of Herbal Candy for The Treatment of Peptic Ulcer

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Abstract— **A chronic illness that affects about 10% of people worldwide is peptic ulcer disease. The pH of gastric juice and a decrease in mucosal defenses are necessary for the formation of peptic ulcers. PUD is a frequent disorder handled by general care physicians as well as gastroenterologists. Peptic ulcer illness can present with a variety of symptoms, such as bleeding, nausea, vomiting, weight loss, or perforation along with a complicated medical condition. The two primary variables that are affecting the mucosal resistance to damage are Helicobacter pylori (H. pylori) infection and non-steroidal anti-inflammatory medicines (NSAIDs). Proton pump inhibitors (PPIs) and histamine-2 (H2) receptor antagonists, two common therapies for peptic ulcers, have been linked to side effects, relapses, and a variety of pharmacological interactions. Conversely, medicinal plants and the chemicals they contain can be used to cure and prevent a wide range of illnesses. Therefore, common medicinal plants that can be utilized to cure or prevent peptic ulcers are presented in this review.**

***Index Terms*— Helicobacter pylori infection, herbal therapy, peptic ulcer illness.**

1. Introduction

A common gastrointestinal ailment that many people experience is ulcers. Essentially, it is an inflammatory rupture of the skin or mucous membrane lining the lower respiratory system.[1] It was once conventional wisdom that stress, through elevated gastric acid production, was the root cause of peptic ulcer disease. In the United States, antacids and anticholinergics were the primary treatments for peptic ulcers until the late 1970s. Surgery was often required to manage ulcer disease.[2] One prevalent digestive system condition is gastric ulcers. Western medicine is a major component of current treatment plans.[3] An increased risk of morbidity and mortality is linked to peptic ulcers, a common gastrointestinal condition.[4] Gastrin, histamine, and acetylcholine all act to control the release of hydrochloric acid from parietal cells.[5] Proton pump inhibitors, H2-receptor antagonists, antacids, and anticholinergics are the medications now utilized to treat stomach ulcers. [6,7]

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But most of these medications have side effects, including hematological abnormalities, gynecomastia, impotence, hypersensitivity, and arrhythmia.[8,9] While traditional chemistry and pharmacology have made strides in creating anti-ulcer medications, the kingdom of plants may still be a valuable source of novel molecules for pharmaceutical development or, on the other hand, as straightforward dietary supplements to current treatments. The first medication that effectively treats peptic ulcers was discovered thanks to early research on medicinal plants; carbenoxolone, derived from Glycyrrhiza glabra, was one such medicine. [10,11]

A few often-utilized herbs are as follows: Licorice (Glycyrrhiza glabra): Licorice root extract has been used for centuries to treat digestive problems and may have anti-inflammatory properties. Turmeric (Curcuma longa): Studies have looked into the anti-inflammatory and antioxidant properties of curcumin, the plant's key ingredient, which may help lessen ulcer symptoms and speed up recovery. Ginger (Zingiber officinale): Used for many years to soothe gastrointestinal pain, ginger may also aid to lower inflammation and shield the lining of the stomach. Herbs can help relieve symptoms and promote healing, but before using them, you should speak with a doctor. This is especially important if you have a medical condition already or are on other medications, as herbs can interfere with other medications. Although these herbs might help with symptoms and possibly speed up the healing process, you should always see a doctor before using them, particularly if you have a medical history or are on other medications. Herbs can interact with some medications and may not be right for everyone. Furthermore, while herbal remedies can be used as supplemental therapies under medical supervision, they shouldn't be utilized in place of standard medical treatment for peptic ulcers. There have been reports of the effectiveness of various plant resources, such as cabbage, in treating peptic ulcers. For decades, herbal treatments have been utilized to treat a wide range of illnesses, including peptic ulcers. Since several herbs have anti-inflammatory and antibacterial qualities, research has been done on their potential therapeutic benefits in treating peptic ulcers.

The bacterial theory was prematurely abandoned in the research on peptic ulcer disease (PUD), but it later made a reappearance and was found to be the primary cause of the disease: Helicobactor pylori.[12] In the late 20th century, Barry Marshall and Robin Warren discovered that H. pylori was the

primary cause of peptic ulcers, but the first documented case of a perforated peptic ulcer dates back to 1670. For their discovery in 2005, they were awarded the Novel Prize.

The etiology was found that the ulcer perforation incidence has decreased in the previous few decades among young men and women, but has increased among the elderly and females after rising sharply at the start of the 20th century.[13]

2. Rationale Objectives and Plan of Work

A. *Rationale*

There is various rationale to support the use of herbs in the treatment of peptic ulcer disease. A lot of herbs include anti-inflammatory qualities that can aid in lowering stomach lining irritation, which is frequently linked to peptic ulcers. Helicobacter pylori, or H. pylori, is a common cause of peptic ulcers. Certain herbs have antibacterial qualities that can aid in the removal of this bacteria. Some herbs have the ability to fortify the mucosal lining of the intestines and stomach, shielding it from additional harm caused by stomach acid. The analgesic qualities of numerous herbs can aid in reducing the discomfort brought on by gastric ulcers. Antioxidant-rich herbs can assist in scavenging free radicals, which may be responsible for stomach lining irritation and tissue damage.

B. *Objective*

The objective of this study is to evaluate the antiulcerogenic or gastro-protective properties of some of the herbal remedies currently utilized in traditional medicine to treat various gastrointestinal tract problems.

- *Formulation* - A. Conduct a literature paper or review to understand the existing formulation and dosage form of crude drugs. B. Selection of crude drugs as per there activities and efficacy. C. determine the accurate dosage strength. C. Develop a primary formulation by selecting appropriate excipients, binders, sweetning agents, preservatives.
- *Pre formulation Studies* - A. Characterization of various activities of the crude drugs including there amount B. Evaluate the drug substance's stability under various environmental condition (e.g. Temperature, humidity) to establish appropriate storage conditions.
- *Evaluation parameters* – Performed various evaluation test – 1. For Alkaloids- Dragendraff's test, Hager's test, Wagner's test. 2. For Steroids- Libermann-Burchard test. 3. For Carbohydrates- Molisg's test, Fehling's test.

C. *Role Of Drugs Selected for Herbal Candies*

- *Menthol*: It belongs to Lamiaceae family. Menthol demonstrated its antioxidant action by raising the activities of the GSH antioxidant as well as the enzymes GSH-Px and GR in the group treated with menthol as opposed to the group treated with vehicle. Menthol exhibited immunomodulatory properties; it raised levels of the anti-inflammatory cytokine IL-1 and lowered pro-inflammatory cytokines TNF- and IL-6 in stomach tissue.[14]
- *Ginger*: It belongs to Zingberaceae family. Numerous studies have shown ginger's antibacterial, antioxidant, and anti-inflammatory qualities as well as those of its active ingredients. HepG2 cell lines exposed to mycotoxin demonstrated the protective benefits of ginger extract through decreased lipid peroxidation and increased antioxidant enzyme activity. Patients with type 2 diabetes who took supplements containing ginger powder for ten weeks demonstrated a decrease in nuclear factor kappa light chain enhancer of activated B cells (NF-B) expression in their peripheral blood mononuclear cells. Acute or chronic illnesses are prevalent in numerous animals.[15]
- *Fenugreek*: It belongs to Febaceae family. The gel portion of fenugreek may offer protection against stomach sores. The reason fenugreek is beneficial for stomach protection could be due to the flavonoid and polysaccharide content of its gel. The anti-secretory characteristics of fenugreek might possibly act as a barrier against ulcers.
- *Fennal*: It belongs to Umbellifers family. The unique essential oil of fennel gives the plants a variety of therapeutic benefits. Like other organic chemicals, essential oils are composed of hydrocarbon molecules, which are further categorized into several classes according to structural variations, such as oxygenated molecules called terpene hydrocarbons, aldehydes, ketones, and other compounds.[16]
- *Cinnamon*: It belongs to Luarels family. The antispasmodic, sedative, hypothermic, choleretic, antibacterial, antifungal, antipyretic, antiviral, antiplatelet, antiseptic, lipolytic, anesthetic, cytotoxic, anodyne, and immune system stimulation properties of cinnamon may be useful adjuncts in reducing the risk of cardiovascular disease.[17]
- *Tulsi*: It belongs to Lamiacea family. Strong antioxidant tulsi works to shield the body from damage caused by free radicals. Numerous health benefits include treating respiratory conditions, reducing blood pressure, controlling hyperglycemia, and improving heart and cholesterol health. A mixture of tulsi leaves, honey, and ginger can be used as a decoction to treat colds, coughing, influenza, and pneumonia. Tulsi leaves can help you naturally combat ulcers as well.
- *Liquorice*: It belongs to Leguminaceae family. Apart from flavonoids, licorice also contains steroids like glycyrrhizinic acid, which has antiulcer properties for the stomach, and beta-sitosterol, which is thought to reduce the incidence of gastric ulcers.

Fig.1. Pippermint Zingiber officinate Trigonella foenum-graecum Foeniculum vulgare

Fig.2. Cinnamomum verum Ocimum Sanctum Glycyrrhiza glabra

3. Material And Methods

A. Ingredient, material and methods for the preparation of Herbal Candy

Table No1
Formulation Table for Making Candies

S.NO.	INGREDIENTS	QUANTITY (F1) (Suger candy)	QUANTITY (F2) (Suger free candy)
1.	Menthol	6 gm	7 gm
2.	Ginger	9 gm	8.5 gm
3.	Fenugreek	6 gm	6 gm
4.	Fennal	4 gm	5 gm
5.	Cinnamon	4 gm	3 gm
6.	Tulsi	5 gm	2 gm
7.	Liquorice	4 gm	6 gm

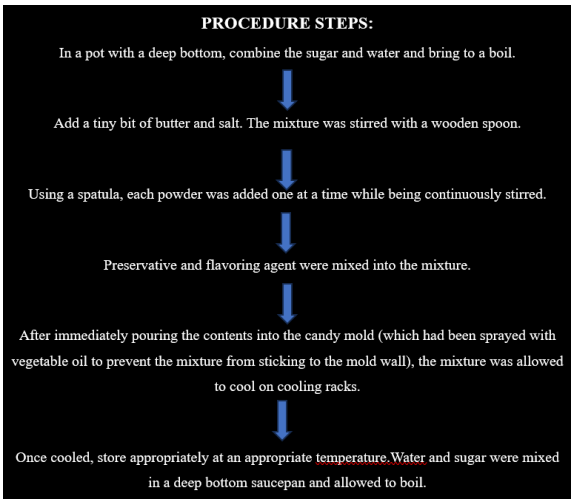

Fig.3. (Suger candies)

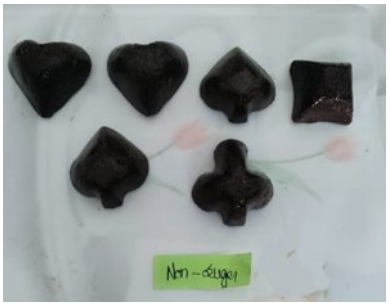

Fig.4. (Suger free candies)

B. *Evaluation Test for Herbal Candy*

Table No 2
Characterization of Herbal Candy

Parameter	Result
Colour	Brown
Test	Sweet and Slightly Bitter
Flavour	Pleasant
Consistency	Solid

Table No.3
Phytochemical test

Compound	Result
Alkaloids	Present
Steroids	Present
Carbohydrates	Present
Flavonoids	Present

C. *Evaluation Parameters for Herbal Candy*

1) Tests for Alkaloids

- Dragendroff's test: Firstly, crushed the candy and then treat with small amount of Dragendroff's reagent

Orange brown precipitate are obtain.

- Hager's test: The finely divided candy was treated with Hager's reagent; yellow precipitate is obtained.
- Wagner's test: Take a small amount of crushed candy and treat with few drops of Wagner's reagent, Reddish brown Precipitate obtained.

2) *Tests for Steroids*

- Libermann-Burchard test: Take 1 gm of finely divided candy and add 1-2 ml acetic anhydride and 2 drops of concentrated H2SO4 from the side of the test tube, fistly red colour obtained then blue and finally green colour.

3) *Test for Carbohydrates*

- Molish's test: Take a small amount of crushed candy then add alcoholic alfa-naphthol solution, shake well and add conc. H2SO4. violet ring at the junction of liquids is obtained.
- Fehling,s test: Take finely crushed candy and then treated with 1 ml Fehling's A and 1 ml of Fehling B solution are mixed and boiled for 1 min. with the help of water bath heat the mixture for 5-10 min. firstly yellow then Brick red colour precipitate are obtained.

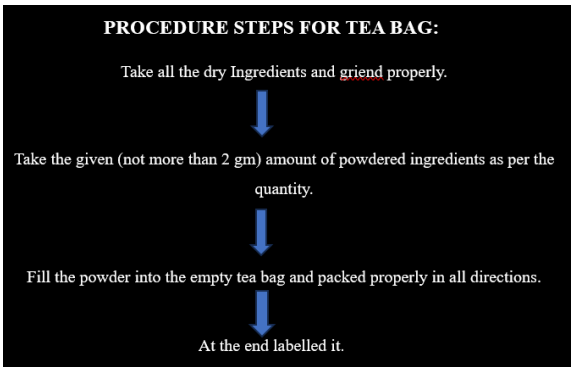

Fig.5. Herbal Tea Bags Permeability test of tea bag

D. Evaluation Parameters for Herbal Tea Bag:

Permeability study - Concentrated tea brew from tea infusion was used to measure the permeance of tea solutes through different tea bag materials. In a jar or beaker, 2 g of tea were infused in 30 ml of water at 60 °C for 15 minutes to create concentrated tea brew. The experiment was terminated after 15 minutes, and the brew was promptly filtered. It was determined how much the acquired filtrate's total volume was. Of this, 20 ml of concentrated brew were utilized as the permeability experiment's feed phase.

4. Result And Discussion

A common gastrointestinal ailment that many people experience is ulcers. Essentially, it is an inflammatory rupture of the skin or mucous membrane lining the lower respiratory system. Surgery was often required to manage ulcer disease. Various plant resources, including cabbage, have been reported to be useful in treating peptic ulcers. Herbal remedies have been used for decades to treat a variety of ailments, including peptic ulcers. Studies have been conducted on the possible therapeutic effects of various herbs in the treatment of peptic ulcers due to their antibacterial and anti-inflammatory properties. According to a sensory assessment, the polyherbal candies had a firm consistency, a brown color, a sweet flavor, and a pleasant aroma. Carbohydrates, alkaloids, flavonoids, terpenoids, and polyphenols were found in polyherbal candy obtained through phytochemical analysis. To document Indian medicinal herbs' capacity to reduce inflammation, a study was carried out. Results from this study shows that the polyherbal candy contain potential compounds that can reduce the production of acid in the stomach or can produce the anti-inflammatory effect which is caused by Helicobactor pylori. Candy is a fastest and highly effective delivery system for medications. The best consistency, moldability, thread-forming ability, brittleness, and desired flavor and color were obtained at a temperature of 145 °C.

5. Conclusion

Higher protection against various illnesses, such as the formation of more H. pylori bacteria and the generation of acid, may be obtained by using different plant-specific doses during the prescribed regimen. As a result, using herbal formulations may be advised for their beneficial anti-inflammatory effects. Numerous phytochemicals, including lactones, alkaloids, flavonoids, terpenoids, polysaccharides, and glycoside derivatives, have been found in the literature to be the cause of changes in anti-inflammatory effects. Numerous botanical compounds have the potential for therapeutic usage due to their great efficacy, affordability, and minimal toxicity. This could aid in the creation of new drugs and discoveries.

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