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Natural remedies: For gastroesophageal reflux disease

Kashish Bhardwaj and Ladli Kishore

Abstract
The present study is aimed at review on to find out natural remedies from medicinal plants which offer many potential efficacy to treat reflux disease (GERD), transient lower esophageal sphincter relaxations (TLESR) and reducing inflammation. *Fumaria officinalis* (Fumitory-of-the-wall) and *Chelidonium majus* (Celandine) are potent cholagogues that empirically seem to be helpful. *Artemisia asiatica* (Asian worm wood) has been shown to reduce GERD related symptoms. *Atropa belladonna* (belladonna, deadly nightshade) and other anticholinergics are also shown efficacy to treat TLESR. Demulcents, such as *Ulmus rubra* (Slippery Elm), Alginic acid, *Ceratonia siliqua* (Carob), *Althaea officinalis* (Marshmallow), and *Aloe vera* (Aloe) leaf gel showed to reduce acute symptoms and heal acid-damaged tissues. Inflammation herbal modulators, such as *Zingiber officinale* (Ginger), Deglycyrrhizinated liquorice, *Calendula officinalis* (Calendula), *Curcuma longa* (Turmeric), *Rosmarinus officinalis* (Rosemary) and *Symphytum officinale* (Comfrey) showed in tissue repair and symptom control. The present study indicated that these medicinal plants be a very useful to treat naturally the GERD with better efficacy.

Keywords: natural remedies, gastroesophageal reflux, *Chelidonium majus*

Introduction
Gastroesophageal reflux disease (GERD) involves common cases such as non erosive reflux and erosive esophagitis. From scientifically literature review, erosive esophagitis has been considered an unavoidable consequence of nonerosive reflux, by substantial evidence; these two are different conditions and progression from nonerosive reflux to erosive reflux to Barrett's esophagus, which is an uncommon even without treatment [1]. It has been seen that Barrett's esophagus (or metaplastic transformation of the esophageal lining into a type more similar to gastric epithelium) can posses into esophageal cancer. This study on GERD is quite rare and shows a completely different disease that may occur simultaneously with GERD [2].
This is the conventional treatment for GERD. Researcher identified that proton-pump inhibitors are the third most prescribed drugs in the United States. U.S generates more than $13 billion in sales each year [3]. During the treatment of GERD, long term acid suppression may cause various adverse effects like micronutrient malabsorption, increased risk of pneumonia, osteoporotic bone fracture, esophageal candidiasis, gastric and small-intestinal bacterial overgrowth and food allergy [4, 7]. This effect suggested that acid-suppressing drugs do not fix the underlying problems in GERD. When these drugs are withdrawn, symptoms almost always reverse [8]. Natural approaches can produce better results because it focuses on causes of GERD and managing the symptoms with more benign botanical constituents. This article reviews on better treatment and management of GERD by the use of presently identified botanicals.

Cholagogues
Transient lower esophageal sphincter relaxation (TLESR) is the major pathological and physiologic defect underlying GERD [9]. Normally the lower esophageal sphincter (LES) relaxes only during swallowing but in GERD the LES relaxes at other times of the day and night. Many factors such as: overeating, obesity, hiatal hernia, lying down after eating, wearing tight clothing around the mid section and smoking are believed to contribute to TLESR [10]. The medications that relax or otherwise affect the LES i.e. calcium-channel blockers, antihistamines, narcotic analgesics and bronchodilators also plays an important role [9, 10]. Often, patients who make dietary and lifestyle changes can eliminate GERD symptoms. However, from a literature review many patients will not be able to make or sustain those

changes and then continue to experience symptoms. So herbal medicine remedies should then be added to help correct TLESR.

While treating two patients for gallbladder symptoms, one of the authors Yarnell were observed that cholagogue botanicals also reduced the patient's symptoms of GERD. Cholagogues are the best herbs traditionally used to regulate gall bladder tone and activity some herbs are: *Fumaria officinalis* (fumitory-of-the-wall, fumitory) her band *Chelidonium majus* (celandine) herb. For GERD, no clinical research have been published on the use of these herbs but, as these herbs relax smooth muscle in the gallbladder, they might well have a similar effect on smooth muscle in the LES [11]. The study has shown that the cholagogue herb *Artemisia asiatica* (Asian wormwood) when combined with the antacid drug omeprazole it decrease the symptoms of reflux esophagitis and prevent its occurrence in rats.

Celandine is a potent plant that should only be used under the care of a practitioner skilled in its use. It has been seen that hepatotoxicity associated with celandine use, but this problem has not yet definitively proven that it is because of the herb [12, 13]. It has been reported that the reported reactions were idiosyncratic (meaning that this effect only occurs in a small percent of the population who may be susceptible and that there is no inherent propensity of the herb to damage the liver). From preclinical study suggests that celandine are hepatoprotective [14, 15].

Artemisia asiatica *Fumaria officinalis* *Celandine*

Fig 1

Anticholinergic Herbs

Atropa belladonna (belladonna, deadly nightshade) leaf and root contain alkaloid that acts as muscarinic receptor antagonists Figure 2. This anticholinergic herb has been shown to decrease TLESR and also cause reduction in reflux episodes in human trials [16, 17]. The action of atropine is apparently in the brain stem as opposed to a local action in the LES [18]. Purified atropine cause more adverse effects and as a result therefore, only whole-plant extracts are recommended for people with GERD. A typical dose of a 1:5 tincture of belladonna leaf is 8-10 drops with each meal is used. Mild dry mouth may occur but is not a reason to modify dosing. In contrast, blurred vision or confusion that develops after taking the herb can be signs of overdose. If these symptoms occur the herb should be withdrawn until the symptoms resolve. It can then be re-administered at half the prior dose.

Atropa belladonna *Ulmus rubra* bark

Fig 2

Demulcents

Demulcent herbs and constituents are used to offset symptoms in patients with reflux. These remedies are effective due to their extremely low toxicity. These studies are safe, even in infants with reflux. Demulcents low inflammation and show a temporary protective barrier against inflammation. The combination of algal polysaccharide known as alginic acid with antacid has been showed to relieve reflux symptoms and esophagitis in infants and children. The dose prefers 1–2 mL/kg per day [19]. *Ceratoniasiliqua* (carob) pod powder is a chocolate flavourful demulcent. Its pods grow on a plant in the Fabaceae family. Carob is administered mixed with apple sauce. The researcher found that combination of carob, alginic acid, and antacids is potent and safely for relieving GERD symptoms in adults [20]. Carob (350 mg) has mixed with cow's milk and showed reduce reflux in infants [21, 22]. However, from literature review, cow's milk is not optimal for most infants so in place of milk, apple sauce, breast milk or rice

gruel as a base would be advised. Other demulcents can be used to treat GERD are *Ulmus rubra* (slippery elm) bark, *Althaea officinalis* (marshmallow) leaf and root, and *Aloe vera* (aloe) leaf gel. Slippery elmand marshmallows are made into cold infusions, or powder is added to water to make gruel. The adult dose is 5–10 g in every meal. The progressive destruction of slippery elm by Dutch elm disease, marshmallow or aloe gel may be used from an ecologic perspective. The dose of aloe gel is referring 1–3 oz with each meal.

Inflammation Modulators

Inflammatory modulators reduce inflammation and promote healing effect so it is useful in patients with erosive esophagitis. From the above study demulcents fit this bill, as do a host of other herbs. There is some research on these herbs, despite the fact that they are such obvious choices. *Glycyrrhizin glabra* (liquorice) root has been helpful in its de-glycyrrhizinated form [23]. However, *Curcuma longa* (turmeric) rhizome, *Calendula officinalis* (calendula) flower, *Zingiber officinale* (ginger) rhizome, *Rosmarinus officinalis* (rosemary) leaf, *Symphytum officinale* (comfrey) leaf prove to be equally efficacious.

Pre-treatment with extract of *Artemisia asiatica* (DA-9601) were showed a decreased the thickness of the esophageal wall and extent of ulceration. This decrease in inflammatory factors, including NF-kB and COX-2, as well as a decrease in iNOS expression [24].

Carob powder *Morus Alba* leaf

Fig 3

Curcumin is an isolated constituent from the rhizome of *Curcuma longa* and showed a preventive role in the formation of acute acid RE. The combination with dimethyl sulfoxide as an antioxidant agent reduced the mortality rate and severity of the esophagitis ulcer index [25]. Curcumin have both antioxidant and anti-inflammatory activity which showed a crucial role in its beneficial effects on GERD [26].

Leaf extract of *Morus alba* can increased the gastric wall mucus. The level of plasma histamine and H+-K+-ATPase decreased significantly. *Morus alba* extract have antioxidant activity by inhibition of lipid peroxidation and an increase in the level of antioxidant enzymes [27].

Salvia miltiorrhiza causes tonic contractions of lower esophageal sphincter (LES), hence is beneficial for the management of GERD. The effect on extracellular C $^{(2+)}$ influx pathway was revealed to be an underlying mechanism of this contractile effect [28].

STW-5 (Iberogast) is a herbal medicine which showed the hydroethanolic extracts of nine herbs and may be used for functional gastrointestinal disorders, including GERD and irritable bowel syndrome [29, 30]. STW-5 have no effect on esophageal pH, but dose dependently reduced the severity of esophageal lesions and normalized the deranged level of pro-inflammatory cytokines, including tumor necrosis factor alpha (TNF-a) and interleukin-1 beta (IL-1b) [31].

Table 1: Efficacy of medicinal plants on treatment of GERD and its symptoms

S. no.	Drug Name	Effect of drugs on GIT diseases	Reviewed Year
1.	*Fumaria officinalis*	Relax smooth muscles in the lower esophageal sphincter	2005
2.	*Artimisia asiatica*	Decrease thickness of esophageal wall and extent of ulceration	2005, 2001
3.	*Atropa belladonna*	Decrease TLESR and cause reduction in reflux episodes	1995,1999 and 2000
4.	*Ceratonia siliqua*	Reduce reflux episodes, decrease inflammation, make temporary protective barrier against inflammation	1992, 2004 and 2007
5.	*Ulmusrubra bark*	Decrease inflammation	1992
6.	*Althaea officinalis* leaf and root	Decrease inflammation	1992
7.	*Aloe vera* leaf gel	Decrease inflammation	A study in 2012 showed that faringrel, an antacid supplement containing *aloe vera* gel reduce heartburn in patients with erosive and non-erosive esophagitis
8.	*Curcuma longa*	Reduce severity of ulcer index, anti-inflammatory, antioxidant	2006 and a separate study in 2011 showed that the anti-inflammatory effects of curcumin prevented esophageal inflammation
9.	*Morus alba* leaf extract	Reduce inflammation, increase gastric wall mucus	2014
10.	*Salvia miltiorrhiza*	Contraction of lower esophageal sphincter	2015
11.	*Iberogast*	Reduce severity of esophageal lesions	2010, 2012 and 2007

Conclusion

A multifaceted herbal medicine is potent to treat underlying causes of GERD and its managing symptoms. The present review can help many patients to reduce or avoid long-term use of antacid drugs. The combination of cholagogues and Anticholinergic potently decrease or eliminate TLESR with lifestyle changes. Demulcents and inflammation-modulators can relieve acute symptoms and heal damaged tissues. These review need to be studied further to determine accurate doses and herbs and to clarify when and if antacid drugs are needed in conjunction with herbs. The studies significantly improve the status of patients with GERD through the use of botanical medicines.

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