

PATOL Leaves and Peptic Ulcers: Therapeutic Benefits and Uses

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Abstract: Ulcer is tissue erosion, either on skin or inside the body, for e.g. lining of gastrointestinal tract. The diverse causes for ulcer development range from, Genetic factors to Physiological/ Environmental factors. Gastric ulcer disease is extremely common in developing and developed countries. Due to side effects from conventional drug therapy and non-specificity of therapeutic choices, there is inclination towards traditional medicines with low cost and low adverse effect incidences. The leaves of *Trichosanthes dioica* Roxb i.e. Patol selected for present work is purely herbal in origin, easily available and economic which offers added advantage for present study. Pathogenesis of Peptic ulcer involves three important factors Agnimandya, Ama, and annavahasrotodusti along with vitiation of Pitta and Kapha leading to qualitative and quantitative changes in pachaka pitta. Increase in ama and drava guna of pachaka pitta gives rise to Amlapitta and it leads to ulceration. Patol mainly possesses tikta in rasa, ruksha and laghu in guna. It helps in pacifying pitta dosha which is main pathological reason for ulcer formation. Patol reduces gastric secretion may be attributed to its anti-secretory property. The phytochemical tests of the *Trichosanthes dioica* extract showed the presence of tannins, saponins, flavonoids, triterpenoids vitamin A and vitamin C. Many research work proved the anti ulcer activity of saponin and tannin. Thus it can be suggested that presence of saponins and flavonoids may be responsible for *patol's* antiulcer activity. Thus the present study confirms the use of *Trichosanthes dioica* Roxb leaves in the traditional management of peptic ulcer disease.

Keywords: *Trichosanthes dioica*, Gastric Ulcer Diseases.

INTRODUCTION

A peptic ulcer, which can occur in the stomach, duodenum, or esophagus, is characterized by a break in the inner lining of these organs. When it occurs in the stomach, it's known as a gastric ulcer; in the duodenum, it's referred to as a duodenal ulcer; and in the esophagus, it's called an esophageal ulcer. These ulcers are caused by the erosion of the lining due to acidic digestive juices. A peptic ulcer differs from erosion because it extends deeper into the lining and

incites more of an inflammatory reaction from the tissues that are involved, occasionally with scarring. Peptic ulcer, commonly known as peptic ulcer disease (PUD), is a widespread condition globally. According to epidemiological data, the annual incidence of physician-diagnosed PUD ranges between 0.10% and 0.19%, while the incidence for PUD diagnosed during hospitalization is between 0.03% and 0.17%. In the United States, approximately four million individuals are currently affected by active peptic ulcers, with around 350,000 new cases diagnosed each year. Four times as many duodenal ulcers as gastric ulcers are diagnosed. Approximately 3000 deaths per year in the United States are due to duodenal ulcer and 3000 to gastric ulcer [1]. Peptic ulcers often recur, even after they have healed, unless specific treatments are applied to prevent their return. The annual medical expenses for managing peptic ulcers and their complications amount to billions of dollars. The antiulcer drugs used in the treatment of gastric ulcers like H₂-receptor antagonist, proton pump inhibitors reported for various side effects like, nausea, constipation, abdominal pain and diarrhea [2,3]. The disease has been also reported for high chances of recurrence and mortality. Therefore, there is a necessity for more effective and safe antiulcer medications designed to alleviate pain, promote ulcer healing, and prevent recurrence.

OBJECTIVES

- To study leaves of *Trichosanthes dioica* Roxb for their Anti-ulcer potential as per Ayurvedic perspective.
- To study the Rasa, guna, virya, vipaka of *Trichosanthes dioica* Roxb .
- To study the Etio-pathological factors of this disease.
- To present and discuss the state of the art of current research conducted on the *Trichosanthes dioica* Roxb with anti-ulcer activity, and its possible mechanisms of action described in literature.

METHODOLOGY

Trichosanthes dioica Roxb. is one of the most consumed species of *Trichosanthes* genus in the Asian tropical countries particularly in Bangladesh and India as a vegetable from February to September [4]. *Trichosanthes dioica* is thought to be originated in the Indian subcontinent or Indo-Malayan region [5-6]. It is a very nutritious vegetable which also has potential for industrial use in making different types of jam, jelly, and pickles [7]. There is an increasing demand of this vegetable in the ethnic grocery stores of the different parts of the world [8]. Different parts of this species are been used by the folk practitioners and in a number of Ayurvedic preparations. Due to its heavy consumption as vegetable and its different folkloric uses, the present review aims to present the dietary uses of leaves of *Trichosanthes dioica* Roxb in peptic ulcer.

Etiology-Pathology of peptic ulcer according to Ayurveda:

Modern era's changing lifestyle along with changing food culture and also depending upon one's body constitution ulcer due to amlapitta is one of the most common symptom (disease) seen in the society. Following are the etiological factors:

- Stressful daily routine.
- Insufficient sleep at night.
- Irregular meal times or skipping meals.
- Eating too late at night.
- Spicy food habits like pizza, burger, chinese food.
- Oily foods, pickles.
- Salty and sour foods like chips .
- Over eating of stale, fermented foods(bakery foods, idli, dosa, etc).
- Sleeping immediately after meals.

Cigarette smoking also is an important cause of ulcers as well as failure of ulcer healing. All these above factors result in excessive increase of 'Pitta dosha' which leads to agnimandya (Weakening of digestive fire) [9]

Pathology according to Ayurveda:

According to the factor Agni carries great importance. Mandagni is the main root cause of all diseases.[10] Mandagni leads to Ajeerna. Ajeerna if neglected gives rise to viscous cycle called as

amlapitta. Amlapitta vyadhi is a very common problem in socioeconomically developed as well as undeveloped countries When the Amla and Drava gun of Pitta dosha becomes exaggerated there is a sour blenching and this condition is regarded to be pathological condition termed as amlapitta. According to modern medicine these condition is called as hyperacidity. This Hyperacidity leads to Gastric as well as Duodenal ulcers. Amlapitta is one of the common reason for ulceration. Peptic ulcer is problem of Annavaha srotas caused due to Mandagni and vitiation of Pachaka pitta. Pathogenesis of ulcer involves three important factor (i.e.) Agnimandya, Ama, and annavahasrotodusti along with vitiation of pitta and kapha leading to qualitative and quantitative changes in pachaka pitta. Increase in ama and drava guna of pachaka pitta gives rise to Amlapitta and it leads to ulceration.

DISCUSSION

Role of *trichosanthes dioica* Roxb in management of ulcer:

Ayurved has provided a simple and cost-effective treatment for prevention of ulcer formation.. Main line of treatment is to correct ama formation & Agnimandya. The main objectives in treatment are Nidan parivarjan, Aampachan. Patol mainly possesses *Tikta* in rasa, It helps in pacifying *Kapha* and *pitta* dosha which is main pathological reason for ulcer formation. The *tikta* rasa possesses *aakash* and *vaayu* in their panchabautik constitution. *Chala* guna is one of the important nature of vata dosha. Dr. Dhananjay Kulkarni described the importance of *chal* guna. He said that *calatva* and *calakatva* is important nature of *vata* dosha, not a single entity ,other than vata dosha in the body ,has capacity of motion. according to hemadri "*Prerane cala*". There is no difference between *sara* guna and *cala* guna ,only the names are dissimilar but the functions of both are same. Bhavprakash has also described *sara* guna as promoter.Susruta has described *sara* guna as "anulomaka".Dalhan says "*anulomano vatapravartanah*"[10].so due to presence of *cala* guna of vata dosha it is responsible for anulomanan of vidhagdh pitta and break down the pathology of peptic ulcer.

According to acharaya Charaka "Samirano agni" is one of the important function of Vata dosha .It means vata dosha is also responcible for agnisandipan. Hence it stop the formation of aam and treats

agnimandya which is main line of treatment for ulcer formation.

Mode of action according to Ayurveda:

Role of Leaves of Patol according to modern:

The phytochemical tests of the *T. dioica* extract showed the presence of various phytoconstituents like tannins, saponins, flavonoids and triterpenoids^[11]. Wagner vilegas et al conducted chromatography and high-performance liquid chromatography fractionation of the aqueous infusion from *Maytenus aquifolium* Martius leaves afforded two flavonoid tetrasaccharides, then flavonoid tetrasaccharides structures were elucidated by spectroscopic methods. Pharmacological essays of the infusion showed antiulcer activity in rats¹², Eardem yesilada et al also isolated oleanene-type saponin from the flowers of *Spartium junceum*. with potent anti-ulcerogenic activity named as spartitrioside¹³. Thus it can be suggested that presence of saponins and flavonoids may be responsible for *T. dioica* antiulcer activity. N.Hamdulay et al conducted study over Ethanol/HCl-induced ulcer in wistar rats. Ranitidine (100 mg/kg) was used as the standard drug. Different groups of rats (n=6 in each group) were given two doses (250 and 500 mg/kg) of *T.dioica* extract. Phytochemical analysis of the extract was also done. Thus only *T.dioica* extract (500 mg/kg) significantly (p<0.001) reduced the ulcer index in all the models used. The extract also significantly (p<0.001) increased the pH of gastric acid while at the same time reduced the volume of gastric juice, free and total acidities. Also it showed significant (p<0.05) reduction in pepsin activity. In conclusion, study provides preliminary data on antiulcer potential of *Trichosanthes dioica* leaves and supports the traditional use of the plant for the treatment of gastric ulcer.¹⁴ Devansh Mehta et al conducted in-vivo study, Histopathology of Rats stomach clearly shows the effects of doses of Methanolic extract of *Trichosanthes dioica* in prevention of ulcer Rats stomach clearly shows the effects of doses of Methanolic extract of *Trichosanthes dioica* in prevention of ulcer. Pandya et al., 2011 studied antiulcer potential of *Oxystelma esculentum* against aspirin and ethanol induced ulcer models. It found compound classes like cardenolides, flavonoids, phenolics, sterols and triterpenoids depicting antiulcer activities in the rats induced ulcer models¹⁵

As we saw earlier Ulcers form when digestive juices damage the walls of the stomach or small intestine. If

the mucus layer gets too thin or stomach makes too much acid, it can raise the amount of acid, break down the protective mucus layer, and irritate the digestive tract. There are several types of medicines used to treat a peptic ulcer in modern. They are H₂ receptor blockers, proton pump inhibitor that block the action of histamine at the histamine H₂ receptors of the parietal cells in the stomach. They decrease the production of stomach acid. According to modern line of treatment anti-ulcer drugs reduce volume of gastric acid, increase the pH of gastric acid and protect the lining of stomach and duodenum. According to previous research *Trichosanthes dioica* increased the pH of gastric acid means it became more alkaline while at the same time reduced the volume of gastric juice, free and total acidities, Also it showed significant reduction in pepsin activity.

CONCLUSION

Peptic Ulcer is a serious gastro-intestinal disorder that requires a well targeted therapeutic strategy as many factors have been associated with the etiology of this disease. Main pathology for ulcer formation is excess production of gastric acid and it leads to break down the protective mucus layer. Leaves of *Trichosanthes dioica* Roxb increased the pH of gastric acid means it became more alkaline while at the same time reduces the volume of gastric juice. It Mainly having Tikta rasa which is responsible for Pacifying Kaph-Pitta dosha. Also chala guna responsible for removal of vidhagdha pitta which is main pathological factor for ulcer formation. Hence patol showed boost to the path of selecting traditional route for better cure. The tests and parameters to check effective gastro protective effect had been found significant and effective results. Thus highly recommend the plant, to carry out research for developing commercially available targeted medicinal leads for better prospect in Ulcer treatment.

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