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Research article

Evaluation of Antiulcer Activity of Maankombu Parpam (*Sirungi Bhasma)*

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Abstract

Gunmam (Ulcer) is one of the major diseases found in all the socio economic class and perhaps one of the most distressing diseases. The cause of ulceration in patient is mainly due to hyper secretion of Hcl, pepsin, infection of H. Pylori and also caused by stress and anxiety. In Siddha system of medicine, a number of preparations have been used for the treatment of *Gunmam*. The *Maankombu parpam (Sirungi Bhasma*-(SB)) has been used for the treatment of gastrointestinal disorders. In view of this, in present study we have to evaluate the anti-ulcer activity of SB. Study was carried out, by using pyloric ligation method in Wister albino rats . SB has significantly decreased free-acidity, total-acidity, ulcer index and gastric volume and significantly increased the pH in pylorus ligated model. Cyto-protective action may be the major mechanism responsible for the present study which cause the generation of prostaglandins promoting inhibition of ulcer. This study shows that SB has the potential to be used as an anti-ulcer drug.

Keywords: Ulcer, *Sirungi Bhasma*, Siddha medicine, pyloric ligation

Introduction:

Ulcers *(Gunmam)* are chronic most often solitary, lesions that occur in any portion of gastrointestinal tract exposed to the aggressive action of acid-peptic juices. It is the most predominant of the gastrointestinal diseases (1).The etiology of gastro duodenal ulcers is influenced by various aggressive and defensive factors such as acid-pepsin secretion, parietal cell, mucosal barrier, mucus secretion, blood flow, cellular regeneration and endogenous protective agents such as prostaglandins and epidemic growth factors (2). Some other factors such as inadequate dietary habits, excessive ingestion of non-steroidal anti - inflammatory agents, stress, hereditary predisposition and infection by Helicobacter pylori, may be responsible for the development of peptic ulcer.

Zootherapy, the use of animals and products derived from them in healing has been practiced by most ancient cultures throughout the world, and it continues to be prevalent within many contemporary societies(3,4).Since ancient time animals, their parts and their products have constituted part of the inventory of medicinal substances used in various cultures(5). Animal-based remedies are important therapeutic resources within many cultures and in some instances, the medicinal use of animal species has led to

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the development of pharmaceuticals for global markets (6).

Medicines from animal origin are generally used in Siddha medicine. The SB *(Sirungi Bhasma)* is used for treatment of general debility, cardiac diseases, cough, asthma and rheumatism (7). The aim of present study was to evaluate the anti ulcer property of SB.

Materials and Methods

The raw drug *Maankombu (Sirungi)* was purchased from the Vandalur zoological park, Chennai. Then, it was authenticated by Dr.C. Arulvasu, Lecturer, Department of Zoology, Madras University, Chennai. The drug was prepared as per the literature Yakobu Vaithiya Chinthamani 700 (8).

Preparation of the Drug

Step 1 (Purification)

The *Maankombu (sirungi)* was cut into medium size pieces and it was kept in a mud pot. The juice of *Sesbania grandiflora* was added in to the pot, till the pieces were dipped in the juice. Then it was allowed to dry in the sunlight from morning to evening. Likewise the same process was repeated for 7 days. By each time fresh juice was added. Then it was washed with water and dried.

Step 2 (Preparation of the *Parpam (Bhasma)*)

The leaves of *Alternanthera sessilis (Linn.) R. Br* were grinded in to fine paste. The pieces were covered (*kavasitthal*) by the paste and dried in sunlight. The dried pieces were burnt with 100 cow dunk cake. (*ganapudam)* (traditional method of calcination).The calcinated pieces were collected carefully then they were powdered uniformly. The drug was subjected to *'parpa sothanai'(Bhasma pariksha)* by putting a pinch of *Sirungi Bhasma* in a cup of water. It floated in the water. It was stored in an airtight container.

Animal Study

Pyloric ligation model:

18 Wister albino rats of either sex weighing about 100-130 g were taken for the study. Pregnancy was excluded. The animals were divided into three groups *(n* = 6). The animals were deprived of food for 24 hours before the commencement of the experiment, but water was allowed adlibitum. The vehicle, SB and Ranitidine were given orally 2 hours prior to pylorus ligation to respective group.

Drugs Administered

Group 1: Vehicle 5ml/kg (5%w/v Acacia)
Group 2: Ranitidine 20mg/kg
Group 3: *Sirungi bhasma* 40mg/kg

5% w/v acacia mucilage was used as a vehicle at a dose of 5ml/kg. The solvent control received equal volume of acacia mucilage. The standard group received Ranitidine 20mg/kg and the test drug group received 40mg/kg of SB.

The study was carried out according to the technique Shay et al (9). The animals were anesthetized with thiopental sodium (10 mg/kg, i.p.), the abdomen was incised and the pylorus was ligated. (1985).The animals were sacrificed 6 hours after pylorus ligation for observation of gastric lesion as described by Gupta et.el(1985).

The gastric juice was collected, centrifuged and its pH and volume were measured. Free and total acidity were estimated titrimetrically with 0.01 N NaoH using methyl orange and phenolphthalein as indicators.

1 ml of filtered gastric content was taken in a small beaker and 2-3 drops of methyl orange added to titrate with 0.01 NaoH, until all the trace of the red colour disappears and the colour becomes yellowish orange. The added alkali volume is noted. Then 2-3 drops of Phenolphthalein was added and titration is continued until a definite red tinge reappears. Again read the burette and so obtain the total volume of alkali added. If a yellow colour is obtained on adding

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methyl orange no free acid is present. Add the phenolphthalein and titrate the combined acid. This then equals the total acid. The data concerning the pH, volume, acid secretion of gastric juice and ulcer index were analyzed by student 't' test.

Total Acidity:

A volume of 2 ml diluted gastric juice was titrated with 0.01N sodium hydroxide run from a micro burette using phenolphthalein as indicator and the acidity was expressed as mg.Hcl/100g body weight of rat.

Free Acidity:

It is determined in similar manner using topfer's reagent as indicator and sodium hydroxide was run until canary yellow colour was observed.

Ulcer Index:

The method of Anderson and Soman (1965) was used for scoring the ulcer index.

Result:

Pyloric ligation:

The rat pretreated with SB (40mg/kg) produced significant (P<0.01) decrease in ulcer index, gastric volume. As well as SB also significantly (P<0.01) reduces free acidity, total acidity. Where as, pH was significantly (P<0.01) increased when compared with control group. Ranitidine also show similar effects but was more effective compared with SB.

Anti ulcer activity of Maankombu parpam (Sirungi Bhasma)(SB)
Pyloric ligation method in rats

S.No	Groups	Volume of gastric juice	pH	Total acidity	Free acidity	Ulcer Index
1.	Control	1.6±0.08	1.2±0.04	93.0±5.8	73.0±4.0	35.4±3.2
2.	Drug (SB) 40mg/kg	0.55±0.02*	4.4±0.10*	30.0 ±2.7*	19.0±1.3*	10.4±3.2*
3.	Raitidine 20mg/kg	0.5±0.03*	4.2±0.07*	26.0±1.6*	18.0±1.3*	10.2±1.3*

Data are expressed as mean ± S.E.., n=6; *p<0.01VsControl

Discussion and conclusion:

There are several factors that may induce ulcer in human being such as stress, chronic use of anti inflammatory drugs and continuous alcohol ingestion, among others (10). Although in most cases the etiology of ulcer is unknown, it is generally accepted that it is the result of an imbalance between aggressive factors and maintenance of the mucosal integrity through the endogenous defense mechanism (11, 12). An effective drug against ulcer should basically act either by reducing the aggressive factors on gastro duodenal mucosa or by increasing mucosal resistance against them. It has become imperative to scrutinize the animal products which are used in traditional medicine for evaluating their efficacy. Keeping this view, an attempt had made to study the SB for its anti ulcer activity by using pyloric ligation method in experimental models of gastric ulcer.

The mechanism of action responsible for anti ulcer activity of SB may be cyto-protective action or antioxidant property of SB. The cyto-protective action which promotes the generation of prostaglandin and causes decreases in secretion of gastric acid, significantly reduced the gastric ulceration in pyloric ligated rats without affecting the gastric secretion or pepsin. Further study required for finding out its exact mechanism of action which is underway.

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