



## Research Article

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### EVALUATION OF ANTIULCER ACTIVITY OF LAGHU SUTASHEKHARA RASA IN ALBINO RATS BY PYLORIC LIGATION MODULE

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#### ABSTRACT

Peptic ulcer has been recognized as the most important problem in developing countries & incidence of ulcer is significantly increasing in the past decade. According to the recent survey peptic ulcer disease remains a common condition worldwide, with annual incidence ranging from 0.10% to 0.19% diagnosed by physician and 0.03-0.17% diagnosed during hospitalization. Treatment options available are mucoprotectives, antacids, alginates, motility stimulants, acid suppressants and anti-reflux surgery is done in severe cases. It has become a matter of grave concern and hence the world shifts towards the safe and efficacious herbal drugs. The present investigation was performed in pylorus ligation-induced ulcer modules in albino rats, in which efficacy of laghusutashekhara rasa was studied at 4.5 mg and 9 mg doses level with standard drug omeprazole (0.36mg). Gastric protection was evaluated by measuring the ulcer index. The results were demonstrated with ulcer index. The ulcer index in group I fed with omeprazole is 0.5 and in group II is 2.33 which is nearly high than I group. In III group ulcer index is 2.0 which is less than group I and II. That shows the highly significant result of laghusutashekhara rasa (high dose) than omeprazole (standard) and laghusutashekhara rasa (low dose). Laghusutashekhara rasa the high & low dose have shown highly significant antiulcer activity than control drug. The result indicates that laghusutashekhara rasa has a protective action against gastric ulcers induced by pylorus ligation in albino rats.

**Keywords:** Peptic ulcer, Laghusutashekhara, Omeprazole, Pyloric Ligation

#### INTRODUCTION

Nowadays in developing countries peptic ulcer are very common among population. Even though the etiology of ulcers is still debated, it is accepted that ulcers are caused due to imbalances between the mucosal defensive and aggressive factors<sup>1</sup>. The recent survey shows that peptic ulcer disease remains a relatively common condition worldwide and also the incidence of ulcer has shown a significant increase in the past decade.<sup>2</sup> The choice of treatment options available are mucoprotectives, antacids, alginates, motility stimulants, acid suppressants and anti-reflux surgery is done in severe cases<sup>3</sup>. In spite of this, the rational therapy of ulcers is elusive and research advances in search for more potent drugs. Since ulcer is a disease that widely affects the population daily and if not treated can be fatal<sup>4</sup> studying it and finding a solution for the same is the need of the hour. It has become a matter of grave concern and hence the world shifts towards the safe and efficacious herbal drugs.

Pylorus ligation significantly increased gastric acid concentration. Ligating the stomach on the antrum did not change the gastric secretory pattern from that obtained by pylorus ligation<sup>5</sup>. Pylorus ligation in rats with vagally denervated gastric pouches did not stimulate pouch secretion, also suggesting a non hormonal mechanism<sup>6</sup>. The hyper secretion was postulated to be due to stimulation of pressure

receptors in the antral mucosa which initiated a vagovagal reflex. Pylorus ligation stimulated the acid output in vagally intact rats<sup>7</sup>.

#### MATERIALS AND METHODS

##### Materials

1. **Pharmaceutical study:** Shudha Gairika, Shunthi churna, Nagavalli patra swarasa etc.
2. **Experimental study:** Laghu sutashekhara rasa, Omeprazole, propylene glycol, albino-rats

##### Methods

1. **Pharmaceutical study:** Rasa Tantra Sara evam Sidha Prayoga Sangrah
2. **Experimental study:** Pyloric ligation induced ulcer module<sup>8-9</sup>

Albino rats were caged properly in separate cages at controlled room temp and relative humidity (24±2°C, 60-70%) in a 12 hours day night cycle. They were fed with diet and water. Antiulcer activity was carried out according to pyloric ligation induced ulcer module and it was conducted at BLDEA's AVS Ayurveda

MahavidyalayaVijayapur with Institutional Ethical committee (IAEC) certificate no AVS/PGCRC/IAEC/33/2010.

**Inclusive criteria**

- Adult healthy male albino rats
- Male albino rats weighing 150-200 gm

**Exclusive criteria**

- Unhealthy male albino rats
- Weighing range below 150 grams and above 200 gm
- Female albino rats

**Method of Pyloric ligation antiulcer activity**

Each rat of Group I administered 0.36 mg of omeprazole with 1 ml propylene glycol (suspension) once in 18 hrs. Each rat of Group II administered with 4.5 mg of laghusutsshekhara rasa with 1 ml of propylene glycol (suspension) once in 18 hrs. Each rat of Group III administered 9 mg of laghusutashekhara rasa with 1 ml of propylene glycol (suspension) once in 18 hours. Each rat of Group IV administered 1 ml of propylene glycol suspension once in 18 hrs. After 18 hrs of fasting ulcer induction was undertaken according to shay et al<sup>11</sup>. The rats were quickly and mildly anaesthetized with chloroform and the abdomen was cut opened through a midline incision. The pylorus was secured and legated with silk sutures, after which the abdomen was closed and the animals were allowed to recover from anesthesia. After ligation of the pylorus, drinking water was withheld and the gastric

examinations were undertaken 19 hrs after pylorus ligation. The animals were sacrificed with an overdose of chloroform and the abdomen was opened the external surface was studied for hemorrhage, congestion and perforation. The stomach was opened along the greater curvature, rinsed with saline to remove gastric content and blood clots and examined by magnified lenses (X5) to assess the formation of ulcer.

**Ulcer indexing**

Ulcer indexing was done according to the Ganguli & Bhatnagar<sup>10</sup> method as follows:

- 0 = Normal colored stomach,
- 0.5 = Red coloration,
- 1 = Spot ulcer,
- 1.5 = Hemorrhagic streak,
- 2 = Ulcer, 3 = Perforation

**OBSERVATION AND RESULTS**

The observation and results were demonstrated with ulcer index. The ulcer index in group I fed with omeprazole is 0.5 and in group II it is 2.33 which is nearly high than I group. In III group ulcer index is 2.0 which is less than group I and II. That shows the highly significant result of laghusutashekhara rasa (high dose) than omeprazole (standard) and laghusutashekhara rasa (low dose).

**Table 1: The calculated ulcer index in Group I-IV**

No of Rats	Groups			
	Test drug		Standard drug	Control drug
	high dose	low dose		
1	2	3.5	1	4
2	2	1.5	0	3
3	2	2.5	1	3
4	2	2.5	1	3.5
5	2	1.5	0	4.5
6	2	2.5	0	3
Average	2	2.33	0.5	3.5

**Table 2: Ulcer index in pyloric ligation induced Gastric ulcer in different groups:**

Sl. No	Groups	Ulcers index mean± S.E.M.
1.	Standard drug omeprazole	0.5±0.223
2.	Laghusutashekhara rasa (low dose)	2.33±0.307
3.	Laghusutashekhara rasa (high dose)	2±0
4.	Control(propylene glycol)	3.5±.258

**DISCUSSION**

Laghu sutashekhara rasa was prepared according to Rasa tantra Sara evam sidha prayoga sangrah kharaliya rasayan part-1 page no 330. Shodhitagairika&shunthi were used in definite proportionate as per reference in khalwayantra (mortar & pestel). To this mixture bhavana was given by nagavaliswarasa till mixture attains sticky pill mass and later on dried well. This powder was used for the experimental study

This module was studied in four groups, 6 rats in each group were taken for the study. The animals of Group I were received 0.36 mg of standard drug Omeprazole suspension once a day. The animals of Group II were received 4.5 mg (low dose) of laghusutashekhara rasa once a day. The animals of Group III received 9 mg (high dose) of laghusutashekhara rasa once a day. The animals of Group IV were received 1 ml of propylene glycol as control once a day for 6 days. Ulcer indexing was done

according to the modified scoring system of Ganguli & Bhatnagar as follows: 0= normal colored stomach, 0.5=red colouration, 1=spot ulcer, 1.5= hemorrhagic streak, 2= ulcer, 3= Perforation .Then mean score for each group were calculated and the result were analyzed.

The dosage was fixed by calculating human dose x 0.018 (Paget and Burnes table). Mean body weight after 6 days shown no significant variation. It may be due to feeding balanced diet and controlled environment maintained in animal house during experimental period.

In this module it was noted that the pyloric ligation in rats induced severe gastric mucosal damage in rats of control group. On gross examination, serosal surface presented with marked indurations and dilated blood vessels. Mucosal surface showed features of ulceration, bright red and oedematous. Ulcers of different size were noted.

The test drug samples (laghusutashekhara rasa low dose), (laghusutashekhara rasa high dose) and Standard drug protected animals from ulcerogenic effect of indomethacin. On gross examination the Group I (Standard) has shown gastritis with oedematous whereas occasional ulcers of < 1 mm size are noted in group II and group III.

It was revealed through analytical studies that the phytochemical constituents like alkaloids, carbohydrate, triterpenoids & saponin were noted in test drug. Elements like Fe, Si, Ni, Ca, P, Co, V & Al were found when subjected to elemental analysis and it was noted that test drug is having alkaline nature. Hence presence of Fe, Si, Ni, Co, Mn, V, Al, Zn, Ca, essential oils and phytochemical alkaloid, carbohydrate, triterpenoids and saponin might have contributed in neutralizing the gastric acid and reducing the size of the ulcerative lesions and expected to improve regeneration process.

The laghusutashekhara rasa i.e., 4.5 mg and 9 mg in group II & group III exhibited mean ulcer index of  $1 \pm 0.36$  &  $0.5 \pm 0.22$  which is significantly high than that of omeprazole ( $3 \pm 1.43$ ) and control 3.5258 which proved its highly significant antiulcer activity than standard and control drug.

## CONCLUSION

In the present study of laghusutashekhara rasa the high dose i.e. 9 mg & low dose i.e. 4.5 mg shown highly significant antiulcer activity than standard and control. This experimental study has provided scientific evidence base for the reference claimed in the classics on antiulcer property of laghu sutashekhara rasa.

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