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Pharmacological validation of *Kantha chendooram* for antiulcer activity in modified pylorus ligated (shay) rat model

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Abstract

The use of metals and minerals is predominant in siddha system of medicine. As per siddha concept, peptic ulcer is known as Valigunmam, the basic abnormality appears to be the derangement of metabolism in the stomach and duodenum resulting in malfunctioning of the secretory process of gastric mucosa. Chendooram is a group of siddha drugs which is used for anemia, obesity, rheumatic diseases; abdominal tumours etc.During the present study standardized Kantha chendooram was selected and evaluated for its anti-ulcer activity, which could not be attempted by researchers earlier.

Keywords: *Siddha drug Kantha Chendooram Anti-ulcer activity*

Introduction

Metals, minerals, gems and jewels are in the medicine since Vedic period. But they were used extensively during the post buddhist era. Several buddhist saints carried out research and composed works on metallic medicines. Some of these metals like mercury, lead and arsenic are known to be poisonous to the body and some of them do not get absorbed in to the blood from the intestines. Therefore all metals, minerals, gems and jewels are processed with the following aims in view:

- To make them absolutely nontoxic,
- To make them easily absorbable through the intestinal mucosa and to make them assimilable through the walls of the cells,

- To enhance their therapeutic efficiency so that these could be administered in very small dose,
- To make this therapeutic effects broad based and To make them delicious.

For the above-mentioned purposes these metals etc. are made to undergo process of shodhana (Purification) following marana (Calcinations).

It is keeping these above-mentioned facts in view, that the system of treatment with recipes containing metals etc., is called Daivi Chikitsa (heavenly treatment).

There has been a worldwide interest in scientifically validating the therapeutic efficacy of old traditional medicines. There are inherent problems in the scientific validation of clinically acclaimed effectiveness of plant products which are further attenuated by the lack of availability of suitable experimental and clinical models. However that should not deter the development and quest for researching new drugs from these alternative systems of medicine. **(1)**

Kantha Chendooram is a popular siddha preparation of eight ingredients indicated for microcytic anemia, anemia, chlorosis, obesity, edema, scrotal swellings, and rheumatic diseases, enlargement of liver and spleen and abdominal tumors. It consists of Purified Lode Stone (suththi seitha kantham), Purified Sulphur (Suththi seitha kanthakam), Lead

Wort root powder (Koduveliver podi), Eclipta juice (Karisalaisaru), Lime juice (Elumicham pazha saru), Milk (Paal), Egg albumin (Muttaiyin venkaru), Mudar Latex (Erukkan paal). **(2)** In the present study an attempt has been made to validate the antiulcer activity of standardized Kantha Chendooram.

Materials and Methods

Kantha Chendooram was procured from Indian Medical Practitioners Cooperative Pharmacy and Stores Ltd., Tirunelveli (IMCOPS).

Healthy adult albino rats of Wistar strain weighing 180-250g were obtained from J.S.S. College of Pharmacy, Animal House, and Ooty, India. The animal house was well ventilated and animals had 12±1 hour day and night schedule with temperature between 11-20±2^{o}C. The animals were housed in large spacious hygienic cages during the course of the experimental period. The animals were fed with rat pellet feed supplied by M/s. Hindustan Lever Ltd., Bangalore, India and water *ad libitum.* Six animals ere used in each group.

The protocol was approved by Institutional Animal Ethics Committee constituted for the purpose.

We have converted the human dose of siddha drug in to animal dose as per the standard surface ratio method. **(3)**

Anti-ulcer Screening model

The anti-ulcer screening of Kantha chendooram was carried out in albino rats using modified pylorus ligated (Shay) rat model. **(4)**

Adult Wistar albino rats of either sex weighing 180-250 g were divided into four groups of six animals each and placed in cages with grating floor to avoid coprophagy and fasted for 48 hours allowing free access of water.

Group 1	Served as solvent control (0.3% Carboxy Methyl Cellulose Sodium)
Group 2	Received Ranitidine (27 mg/kg)
Group 3	Received Kantha Chendooram (20 mg/kg)
Group 4	Received Kantha Chendooram (40 mg/kg)

The animal was anaesthetized by using combination of Ketamine (100 mg/kg) and Xylazine (10 mg/kg) in sterile water for injection in the ratio 2:1:1 at a dose rate of 0.2 ml/100 gm body weight intraperitoneally. **(5)** The abdomen was opened by a small midline incision below the xiphoid process. Pyloric portion of the stomach was slightly lifted out and ligated avoiding traction to the pylorus or damage to its blood supply. The stomach was replaced carefully and the abdominal wall closed by uninterrupted sutures. The test drugs were administered twice daily for 2 days and standard drugs were administered once daily orally for 2 days prior to and one hour before to pyloric ligation. The animals were deprived of both food and water during the post-operative period. The animals were sacrificed after four hours, the stomachs were taken out and they were opened along the greater curvature. The Ulcer index was calculated and the lesions were counted with the aid of hand lens (10X) and each given a severity rating as follows, **(6)**

The Ulcer index was calculated and the lesions were counted with the aid of hand lens (10X) and each given a severity rating as follows, **(6)**

Ulcer Score	Descriptive Observation
0	Normal
1	Less than 1mm (Pin point)
2	1-2 mm
3	Greater than 2 mm and above

The ulcer score was divided by a factor of 10 to get the ulcer index. % Ulcer protection was calculated according to the standard formula. **(7) Ulcer Index in Control – Ulcer index in Test ————————————————————————— X 100 Ulcer Index in Control**

Statistical Analysis

Results were expressed as mean ± SEM. Statistical significance were determined by one way analysis of variance (one way ANOVA) followed by Dunnett's 't' test .

Results And Discussions

The results of the experiment are given in the table1.It indicates that the siddha drug Kantha Chendooram at both the dose levels have anti-ulcer activity. The anti-ulcer activity of Kantha Chendooram at both the dose levels of 20 mg/kg and 40 mg/kg produced a significant decrease in the ulcer index ($p<0.01$), which is also evidenced by significant increase in percentage protection from ulcers at both the dose levels (75.56 & 79.47) respectively. The activity was comparable and equipotent with that of standard drug Ranitidine (27 mg/kg). The anti-ulcer activity of the siddha drug may be due to presence of metals (zinc, lead and mercury) and alkaloid present in it. **(8)**

Conclusion

In future, this work can be extended further for antisecretory, cytoprotective and antioxidant studies in different ulcer models and safety profile of the drug, so far not attempted.

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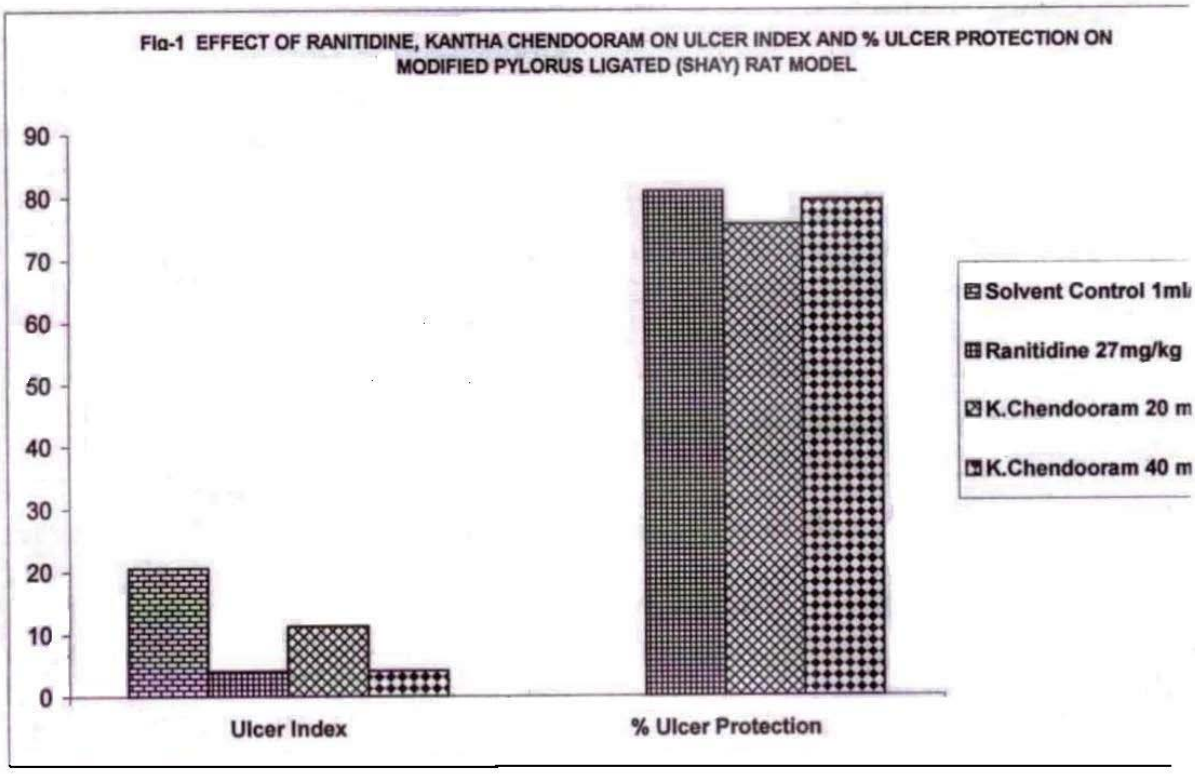
Table 1

Effect of Ranitidine, *Kantha Chendooram on* Modified Pylorus Ligated (Shay) Rat Model

Effect of Ranitidine, Kantha Chendooram on Modified Pylorus Ligated (Shay) Rat Model

Group	Average Body Weight (g)	Treatment	Dose	Ulcer Positive Animals/ Total Animals	Gastric Erosion Ulcer Score*				Ulcer Index	% Ulcer Protection
					0	1	2	3		
I	195.85	Solvent Control (0.3% CMC)	1ml/kg	6/6	0	6	3	6	20.5 ±0.224	-
II	214.24	Ranitidine	27mg/kg	4/6	0	3	2	0	4.03**± 0.13	80.83
III	192.54	Kantha Chendooram	20mg/kg	5/6	0	3	2	1	11.3**±0.11	75.56
IV	220.67	Kantha Chendooram	40mg/kg	4/6	0	3	2	0	401**±0.16	79.47
One- way ANOVA		F df P							95.06 3,20 <0.0001	

Ulcer Scoring is as follows: 0= normal; 1=1mm; 2=2mm; 3=3mm and above•
Values are mean ± SEM; No. of animals in each group = 6**$P<0.01$



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