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ANTI-ULCERATIVE EFFICACY OF METHANOLIC ROOT EXTRACT OF ASPARAGUS RACEMOSUS (MEAR) ON GASTRIC ULCER HAS SIMILAR EFFECT IN ALBINO RATS WHEN COMPARED WITH RANITIDINE HYDROCHLORIDE, A H_2-RECEPTOR ANTAGONIST

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ABSTRACT

Objective: To investigate the anti-ulcer activity of Methanolic extract of Asparagus Racemosus in animal models Materials and Methods: Healthy albino rats (n=30) of either sex weighing between 180-260 grams were selected for the experiments. Saline (control), ranitidine and MEAR were given. Effects were assessed by volume of gastric juice and ulcer index. Results: Mean values of gastric volume were 1.6ml with ranitidine and 1.7ml with MEAR. Ulcer index was 3.5 and 5.2, with ranitidine and MEAR respectively. Conclusion: MEAR anti-Ulcerative effect has similar comparable effect to standard drug like ranitidine hydrochloride

KEY WORDS

albino rats, ranitidine, MEAR, Asparagus Racemosus, Ulcer index

INTRODUCTION

The time trends in the epidemiology of Gastric ulcer disease reflect complex, multi-factorial etiologies. Gastric ulcers were rare before the 1800s. The pathology of gastric ulcers (GUs) was first described in 1835 [1]; during the late 1800s the prominent form was GUs in young women. It is generally recognized that gastric ulcer is caused by a lack of equilibrium between the gastric aggressive factors and the mucosal defensive factors [1].Gastric ulcer is among the most serious diseases in the world. Currently many drugs are being used for anti ulcer therapy such as H_2 receptor antagonists (cimetidine) [2], Proton pump inhibitors (omeprazole) [3], Anti helicobacter pylori drugs (amoxicillin). These drugs may cause side effects like endocrinal effects, increase the risk of gastric neoplasia, and increase the risk of chronic inflammation of gastric body which may culminate into atrophic gastritis and intestinal metaplasia on long term use [4, 5]. Naturally occurring agents cause less adverse effects. Hence this study pertains to investigate the anti - ulcer activity of Methanolic extract of *Asparagus Racemosus* in animal models.

MATERIAL AND METHODS

The study was carried out in the experimental laboratory of the Department of Pharmacology S.V.S Medical College Mahabubnagar (A.P.), permission and approval for animal studies

were obtained from the Institutional animal ethical committee.

Animals: Healthy albino rats (*n=30*, six in each group, Groups I-V) of either sex weighing between 180-260 grams were selected for the experiments. *Categorization*: Group I (normal saline), Group II (ranitidine 30mg/kgBW), Group III (MEAR 100mg/kgBW), Group IV (MEAR 200mg/kgBW) and Group V (MEAR 400mg/kgBW).

Drugs, chemicals and reagents used:

- Ranitidine hydrochloride[7]: It was used as a standard drug and was given in the dose of 30mg/kgBW
- NaOH: It was prepared fresh by diluting 1N NaOH at the time of estimation.
- Topfer's Reagent
- Phenolphthalein indicator
- Methanolic extract of *Asparagus Racemosus*
- Ether: It was used to induce mild anesthesia in rats.
- Formalin (10%): It was used to preserve stomach for histopathological studies.

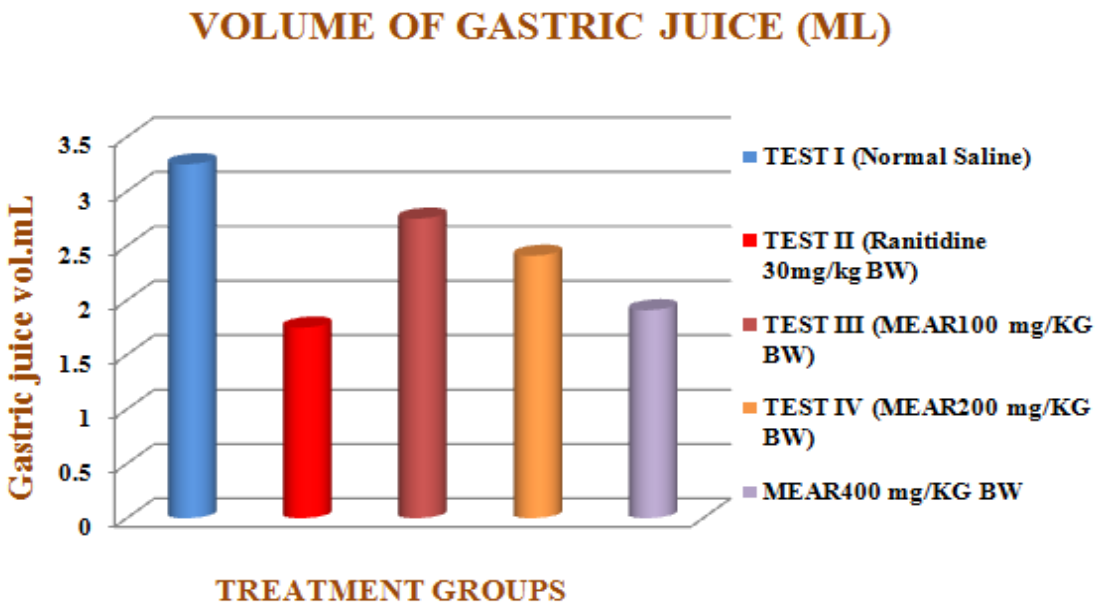
Pyloric Ligation Induced Ulcer Model: The animals were fasted for 24hours before the experiment but were allowed water and ad libitum during that period. On the day of experiment the dose of the test drug was given 2 hours prior to pyloric ligation, which was done under ether anesthesia. The anesthetized rats were subjected to pyloric ligation taking care that no blood vessels were occluded. The gastric juice was collected 4hours after sacrificing the animals with anesthetic ether, as described earlier by Sanyal et al(1971)[8].The gastric contents were evacuated in a graduated tube by cutting along the greater curvature of the stomach. The stomach was then fully opened, washed gently under running tap water and examined for presence of hemorrhage erosions, desquamation of epithelium, sub mucosal hematomas and ulcers. The stomachs were then fixed in 10% neutral formalin for 10minutes and sections were taken for histological study. The gastric content was centrifuged and volume was noted which has been expressed as ml/100grams body weight. The ph of the gastric juice was determined with the help of ph meter (Elico) using drop electrodes.

Ulcer index: The ulcer index was calculated following the method described by Robert et al (1968) [9].Every stomach prior to fixing in formalin was examined with the help of magnifying glass and ulcer index was scored for the group as the sum of the following:

a) Percentage incidence (divided by number of animals) of animals with ulcers.
b) Average severity per group scored in pluses (from a scale of 0 to 4+) and
c) Average number of ulcers per stomach.

RESULTS

Volume of gastric juice decreased with increase in dose of *Methanolic root extract of A.racemosus* (MEAR). The volume showed consistently low when compared with ranitidine group. Dose of 400mg/kg BW had equivalent affect compare to ranitidine group (Figure-1).



Ulcer index: The number of ulcers was counted by using the magnifying glass. Severity scores: normal coloration as 0, red coloration 0.5, spot ulcer 1.0, hemorrhagic stress 1.5, deep ulcer 2.0 and perforations as 3.0.

Ulcer index = (UN + US+ UP) x 10^{-1}

UN = Average of number of ulcer per animal

US = Average of severity score

UP = Percentage of animal with ulcer.

Adverse effects of the drugs were calculated based on ulcer index. Ulcer index was 5.2, 8.9 and 10.9 in 400mg/kg BW, 200 mg/kg BW and 100 mg/kg BW, respectively (Table-1). Control group was 11.09. Ranitidine had similar effect compared to MEAR 400mg/kg BW.

Groups	Treatment	Dose (mg/kg) BW	Ulcer index
I	Normal Saline	1ml/animal	11.09 ± 0.18
II	Ranitidine	30	3.54 ± 0.08***
III	MEAR	100	10.8±0.19*
IV	MEAR	200	8.9±0.18*
V	MEAR	400	5.24±0.13***

Table 1: Effect of Methanolic root extract of A.racemosus on ulcer index

All values represent mean±SD, n= 6 in each group

*: P<0.05, ** P<0.01 & P<0.001 as compared to control group.

MEAR:- Methanolic Extract of *Asparagus racemosus*

DISCUSSION

The Methanolic extract of Asparagus racemosus (MEAR) with doses 200mg/kg and 400mg/kg orally to rats significantly inhibited the formation of ulcers in the stomach and also decreased both the acid concentration, gastric volume, ulcer index and increased the pH values. These results were found to be

statistically significant. Earlier studies by, Bhatnagar Met et al demonstrated that the Asparagus racemosus was found to be an effective anti-ulcerogenic agent, whose activity can well be compared with that of ranitidine hydrochloride [10]. The results of their study suggested that Asparagus racemosus causes an inhibitory effect on release of gastric hydrochloric acid and protects gastric mucosal damage. In our present study the Methanolic extract of *Asparagus racemosus* possess a significant antiulcer effect in pyloric ligation induced ulcer in rats. Its effect is comparable to that of standard drug rantidine (30mg/kg/day orally). Suggesting anti histaminic action could be a possible mechanism of anti-ulcer action as that of rantidine. The phytochemical studies have demonstrated that flavanoids, saponins, polyphenols, tannins etc., are the active principles in *AR* extracts. From earlier studies it has been reported that the presence of flavonoids facilitates the increase in the mucosal prostaglandin levels and inhibition of histamine release thus exhibiting a protective effect of the extracts [4,5].

CONCLUSION

Methanolic extract of *Asparagus Racemosus* has a similar antiulcer property like ranitidine. The underlying mechanisms may be due to blockade of H2 receptors. The active constituents such as flavonoids, saponins and tannins of MEAR may be responsible for its anti ulcer action.

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