



EVALUATION OF ANTI ULCER ACTIVITY BY POLY HERBAL FORMULATION ON INDOMETHACIN INDUCED GASTRIC ULCERS

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ABSTRACT

A peptic ulcer is an area of the gastrointestinal tract that is usually acidity and thus, extremely painful. For this propose, the healing effect of poly herbal formulation containing the combination of four plants viz. *Piper betel*, *Emblica officinalis*, *Ocimum sanctum* and *Azadiracta indica* were evaluated on indomethacin induced gastric ulceration in rats. 40 Rats were divided into 8 groups; 5 animals in each groups. Groups I rats serving as the ulcerated control received only indomethacin and were sacrificed four hours after indomethacin administration. Ulceration in the groups II-VIII rats was induced with indomethacin dissolved in distilled water. Group II received only the vehicle oral dose of gum acacia in distilled water (1 mL per rat). Group III-VII rats received the only the poly herbal formulation. Group VIII rats received misoprostal (1.43 µg body weight) once daily by oral intubation starting from four hours after the indomethacin administration. After seven days, the rats of groups II to VIII were sacrificed by cervical dislocation followed by cutting of abdominal aortic artery. The ulcer activity of poly herbal formulation was evaluated by total acidity and free acidity.

Key words: *Piper betel*, *Emblica officinalis*, *Ocimum sanctum*, *Azadiracta indica*, Indomethacin, Misoprostal.

INTRODUCTION

A peptic ulcer is an area of the gastrointestinal tract that is usually acidity and thus, extremely painful. Peptic ulcers usually occurs in the part of gastrointestinal, which is

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exposed to gastric acid and pepsin. Gastrointestinal toxicity is associated with non-steroidal antiinflammatory drugs, may be high as 4-8 % per year, despite the recent pharmaceuticals advances. For elderly NSAIDs ulcers, fatal complications are close to 1 to 1000 person-years of NSAIDs use and higher for those with additional risk factors, such as prior history of ulcer diseases. For this the healing effect of poly herbal formulation containing the combination of four plants viz. *Piper betel*, *emblica officinalis*, *ocimum sanctum* and *azadiracta indica* were evaluated on indomethacin induced acute experimental gastric ulceration in rats and the activity was compared with that of the synthetic anti ulcer drug, misoprostal.



Fig. 1: *Piper betel* plant



Fig. 2: *Emblica officinalis* tree



Fig. 3: *Azadirachta Indica* tree



Fig. 4: *Ocimum Sanctum* plant

EXPERIMENTAL

Materials and method

The plant parts viz. *Piper betel* (leaves), *Emblica officinal* (fruits), and *ocimum sanctum* (leaves) and *Azadiracta indica* (leaves) were collected from different parts of Nellore district and authenticated by Dr. C. Venkatramaiah, Reader in Botany, V. R. College, Nellore district, Andra Pradesh.

Animals

Adult male albino Wistar rats weighing about 150-175 g were used for pharmacological and toxicological studies.

Preparation of the plant extract

The plant parts viz. *Piper betel* (leaves), *Emblica officinal* (fruits), and *ocimum sanctum* (leaves) and *Azadiracta indica* (leaves) were dried and powdered to get a coarse powder about 250 g and was extracted with ethanol by continuous hot percolation using Soxhlet apparatus.

Preparation of herbal formulation

All the extracts were macerated with a mortar and pestle in double distilled water containing gum acacia (2% w/w) to provide the drug.

Animal study

Material and drugs

Male albino Wistar rats, misoprostal, indomethacin, and poly herbal formulation.

Selection, grouping and acclimatization of animals

Adult male albino Wistar rats weighing about 150–175 g were kept at room temperature and a total of 40 rats were divided into 8 groups (5 animals in each groups). Groups I rats serving as as the ulcerated control received only indomethacin and were sacrificed four hours after indomethacin administration. Ulceration in the groups II-VIII rats was induced with indomethacin (30 mg/kg body weight, oral intubation) dissolved in distilled water. Group II received only the vehicle oral dose of gum acacia in distilled water (1 mL per rat). Group III-VII rats received the only the poly herbal formulation with the

dose of 50 mg, 100 mg, 150 mg, 200 mg, respectively. Group VIII rats received misoprostal (1.43 µg body weight) once daily by oral intubation starting from four hours after the indomethacin administration. After seven days, the rats of groups II to VIII were sacrificed by cervical dislocation followed by cutting of abdominal aortic artery.

Evaluation of ulcer activity

The ulcer activity of poly herbal formulation was evaluated by the following tests

Total acidity

A volume of 2 mL of diluted gastric juice was titrated with 0.1N sodium hydroxide run from a micro burette by using phenolphthalein as indicator and the acidity was expressed as mg.HCL/100 g body weights of rat.

Free acidity

It is determined in similar manner by using TOFER'S reagent as indicator and sodium hydroxide was run until yellow colour was observed.

Determination of ulcer index

Ulcer index was calculated by using the formula

$$\text{Ulcer index} = X/10 \quad \dots(1)$$

Where X = Number of ulcers + severity of ulcer

Severity of ulcer was calculated by using the following scale:

0 = Normal grey coloured stomach

0.5 = Pink to red coloured stomach

1 = Stop ulcer

1.5 = Hemorrhagic streak

2 = Number of ulcers < 5

3 = Number of ulcers > 5

4 = Ulcer with bleeding

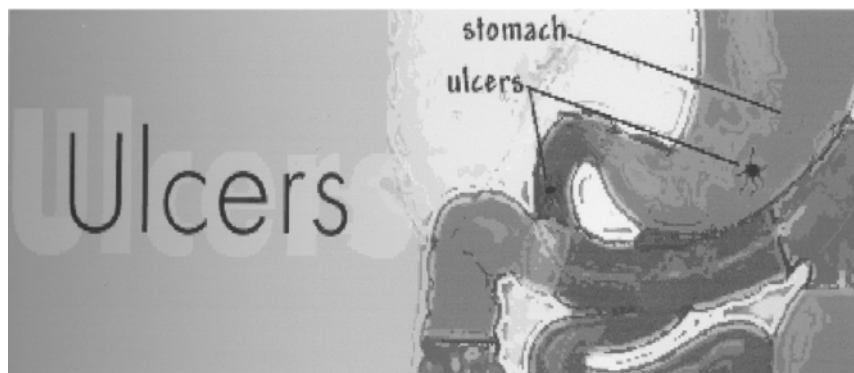


Fig. 5

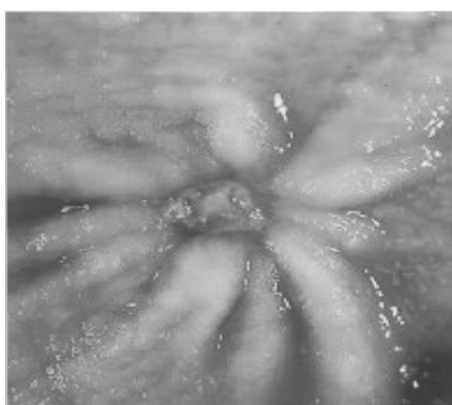


Fig. 6

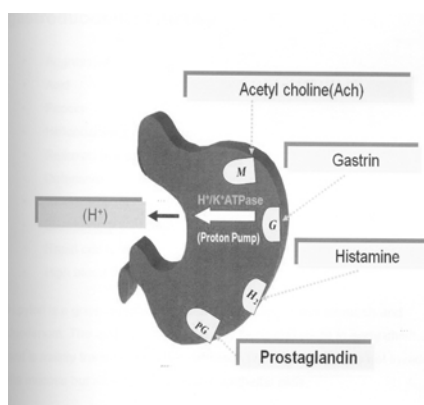


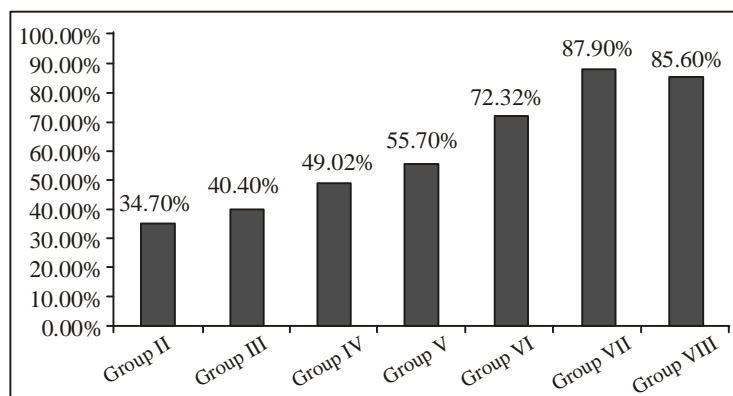
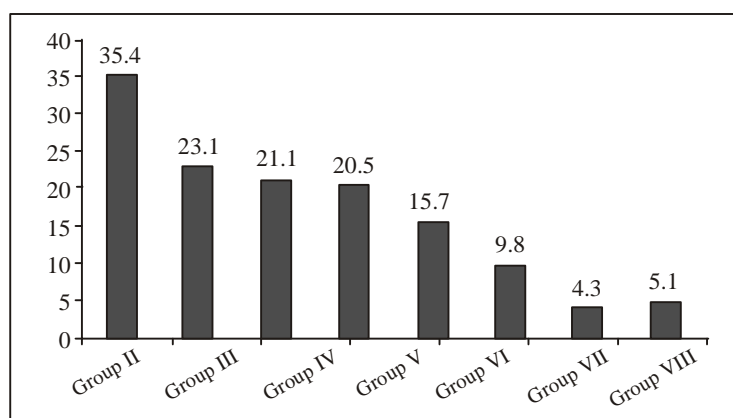
Fig. 7

RESULTS AND DISSCUTION

Oral administration of poly herbal formulation at different doses of 50-250 mg/kg body weight for seven days accelerated the rate of healing of gastric lesion induced by indomethacin. It was found that a seven day post ulcerative treatment with the poly herbal formulation at the designated doses was optimal for effective ulcer healing. Hence, all the subsequent experiments were carried out with the same protocol. The dose of the positive control, misoprostal 1.43 $\mu\text{g}/\text{kg}$ body weight is based on its recommended dose for humans. Treatment of rats with indomethacin produced typical acute lesions in the gastric mucosa resulting in substantial ulcer index. This was reduced by 34.7 % for the group II rats due to auto healing compared to the zero day ulcered group II (group I) treatment with poly herbal formulation reduced the ulcer index by 87.9 % in comparison with misoprostal, which gave 85.6 % reduction in ulcer index.

Table 1: Results

Group	Total acidity	Free acidity	Ulcer index	% Protection
Group I	98 ± 7.3	77 ± 6.3	35.4 ± 3.2	-----
Group II	59 ± 2.7	47 ± 1.9	23.1 ± 2.2	34.7%
Group III	4.5 ± 2.8	33 ± 1.8	21.1 ± 2.2	40.4%
Group IV	4.1 ± 2.9	32 ± 2.1	20.5 ± 1.2	49.02%
Group V	30 ± 2.4	22 ± 0.8	15.7 ± 0.8	55.07%
Group VI	28 ± 1.9	19 ± 0.9	9.8 ± 2.8	73.32%
Group VII	25 ± 1.6	17 ± 0.8	4.3 ± 3.1	87.97%
Group VIII	28 ± 1.0	16 ± 0.9	5.1 ± 0.8	85.69%

**Fig. 8: % Protection****Fig. 9: Ulcer index**

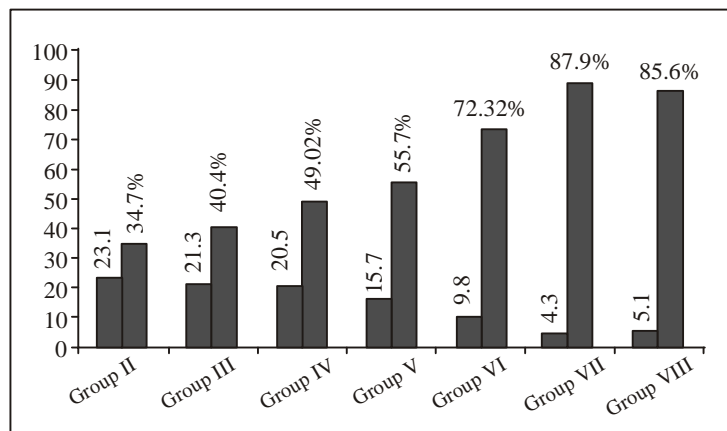


Fig. 10: Ulcer index and % protection

Currently, the NSAIDs are preferred for various diseases, however, these are known to generate oxygen free radicals, which play a role in the pathogenesis of mucosal injury. The measurement of ulcer indices of the rats demonstrated that the treatment with the poly herbal formulation combination leads to faster ulcer healing effect as compared to the misoprostol.

CONCLUSION

The experimental results and biochemical parameters findings obtained in present work with the tested formulation enable us to conclude that the poly herbal formulation has the ability to heal indomethacin induced stomach ulceration in the rats. There is a scope to identify and isolate a marked anti ulcer activity principle from the extract of the poly herbal formulation.

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