PAPER

Anti-Peptic Ulcer activity of Myin-khwa in rats

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INTRODUCTION

Ulceration of the gastric mucosa, in the form of peptic ulcer may be caused by many factors including drugs which cause gastric irritation. Of these, aspirin which is known to cause gastric irritation at any dose is one example. Apart from direct irritation, being an acid, aspirin also inhibits the protective prostaglandins, as do many NSAIDs. While aspirin is seldom employed as an analgesic nowadays it is still prescribed for other purposes including prevention of coronary thrombosis. Therefore, many strategies have been employed to mitigate gastric irritation of aspirin such as taking the drug concurrently with H2 blockers or with light refreshments.

Many herbs, nutrients and plant products have been found to play a role in protection or helping to heal peptic ulcer Supercript· Myin khwa gyi (*Centella asiatica* Linn) has been widely used for its alleged ability to heal wounds, improve mental clarity, improve hypertension and skin disorders, among others. It is also shown to be curative in gastric and duodenal ulcers. And significantly inhibited gastric lesions by 58 to 82%. It is widely distributed in Myanmar and easily available throughout the country the whole year round even becoming a weed in tropical and subtropical regions.

The present study was conducted to find out the anti-ulcerogenic effect of Myin khwa in albino rats.

AIM AND OBJECTIVES

To study the anti-gastric ulcer effect of Myin khwa (*Centella asiatica* Linn) by determining

(a) The protective effect on aspirin-induced gastric ulcer in rats
(b) The healing effect on aspirin-induced gastric ulcers in rats

MATERIALS AND METHODS

Study design

Controlled parallel experimental study.

Subjects

Wistar albino rats, 160-180 g of both sexes; in groups of 8 rats each.

Place of study

- Pharmacology Research Division, Department of Medical Research (Lower Myanmar)
- Department of Botany, University of Yangon
- Myanmar Science and Technology Research Department, Yangon

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Preparation of test substance

Whole plants of *Centella asiatica* (Myin khwa) were washed thoroughly with water and air dried at room temperature for 3 weeks. They were then crudely powdered by grinding machine. The powder was then percolated with 95% ethanol (BDH Laboratory) for 1 month Supercript. It was then filtered through Whatman filter paper No 2 and the filtrate concentrated under reduced pressure using rotary evaporator. For comparison Cimetidine, a known anti-ulcer drug was used; and distilled water was used as blank control.

Procedure

1. Protective action

Each group of test animals (Wistar albino rats) was orally administered respectively, once a day for 4 days:

(a) 1.5 g/Kg, 3 g/Kg, and 6 g/Kg body weight, of test substance (prepared extract)
(b) Cimetidine 200 mg/Kg
(c) Distilled water

Drinking water was allowed *ad lib* throughout. From the second day food was withdrawn while continuing with administration of test substance and cimetidine. After 48 hours of fasting aspirin 600 mg/Kg in suspension form was administered to each rat. Four hours after aspirin the animals were sacrificed under anaesthesia (chloroform). With each rat the abdomen was opened, the stomach was removed and opened along the greater curvature. Gastric mucosa was examined for haemorrhages (number) and presence of lesions, noting the number of ulcers and total length of ulcers by using a magnifying lens of 2.5 magnification.

Median Effective Dose ED_{50} of the extract for protective action was calculated by the method of Litchfield & Wilcoxan.

2. Healing action

Three groups of rats, 8 in each group were fasted for 48 hours but water was allowed *ad lib*. After fasting, each rat was given 600 mg/Kg body weight of aspirin. Four hours after aspirin each group of mice were given by the oral route, respectively:

(a) 6 g/Kg of the extract of Myin khwa which was the most effective dose observed in the above experiment (Protective action)
(b) 200 mg/Kg of cimetidine
(c) Distilled water in the same volume as test substance

Thereafter, food was allowed normally. Twenty four hours later a second dose of (a), (b) and (c) were given. Four hours after the second dose the rats were sacrificed under anaesthesia. Examination of the gastric mucosa was done as in the previous experiment.

Data analysis of the observed findings was done by ANOVA test for calculation of the mean, Standard Deviation and Standard Error.

RESULTS

1. Protective action

Compared to blank control (water), protective effect in aspirin-induced gastric ulceration and haemorrhages was observed to be statistically significant with cimetidine and all doses of Myin khwa extract tested ($p<0.05$). While the effect of 1.5 mg/Kg dose of the extract was significantly different from that of cimetidine ($p=0.038$), the effects of 3 g/Kg and 6 g/Kg doses were not ($p=1.00$). Even so, the effect of 1.5 mg/Kg of the extract was not significantly different from those of 3 mg/Kg and 6 mg/Kg doses. The same was observed between the effects produced by 3 mg/Kg and 6 mg/Kg. Nevertheless, the protective effect

on aspirin induced gastric ulcer was observed to be dose-related, best seen with 6 mg/Kg dose, being comparable with that of cimetidine (Diagrams 1, 2, 3).

2. Healing action

Compared to blank control (water) both cimetidine and 6 mg/Kg of Myin khwa extract were found to produce healing of aspirin-induced gastric ulceration in rats, which was statistically significant ($p<0.05$). Between the two, the effects were not significantly different statistically ($p=1.0$).

3. Median Effective Dose (ED_{50})

Calculated according to the method of Litchfield & Wilcoxan (1949) ED_{50} of Myin khwa extract for anti-peptic ulcer action was found to be 5.025 g/Kg, with 95% confidence interval of 3.87 – 6.53 mg/Kg.

DISCUSSION

Of the many methods of inducing gastric ulceration in rats, induction by oral aspirin (Shay et al, 1976) is the most convenient. Administered on empty stomach, aspirin causes gastric haemorrhage and ulceration within 4 hours in rats (Lui and James, 2005). The present study was done on this basis.

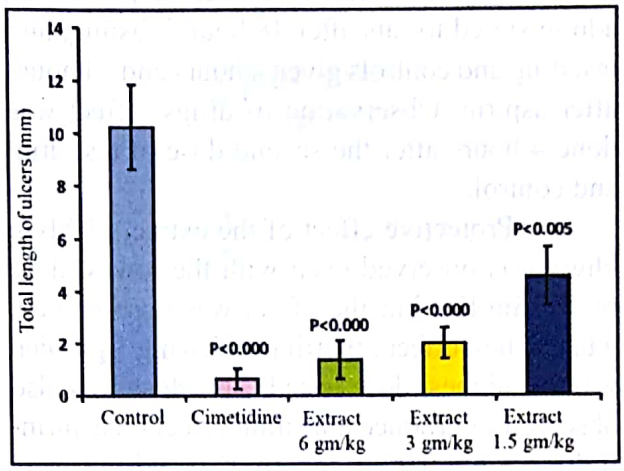

Diagram 1. Mean ± S.E of total length of ulcers obtained with protective effect of water (control), cimetidine (200 mg/kg) and 3 different doses of extract (1.5 gm/kg, 3 gm/kg and 6 gm/kg) on aspirin-induced gastric ulcerations in rats. ANOVA test was used for comparison. n = 8 in each.

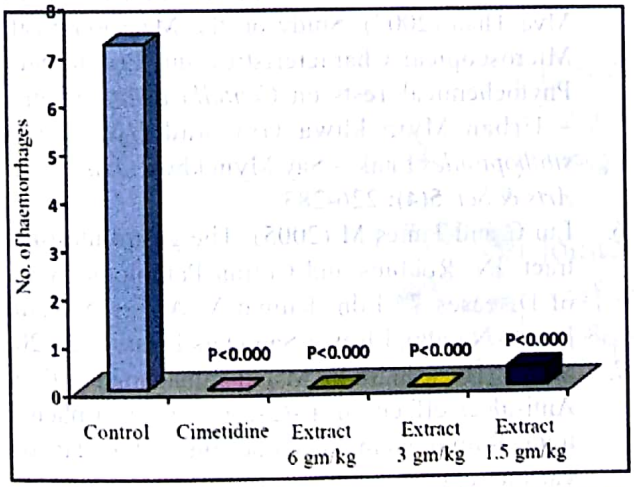

Diagram 3. Mean ± S.E of numbers of haemorrhages of ulcers obtained with protective effect of water (control), cimetidine (200 mg/kg) and 3 different doses of extract (1.5 gm/kg, 3 gm/kg and 6 gm/kg) on aspirin-induced gastric ulcerations in rats. ANOVA test was used for comparison. n=8 in each.

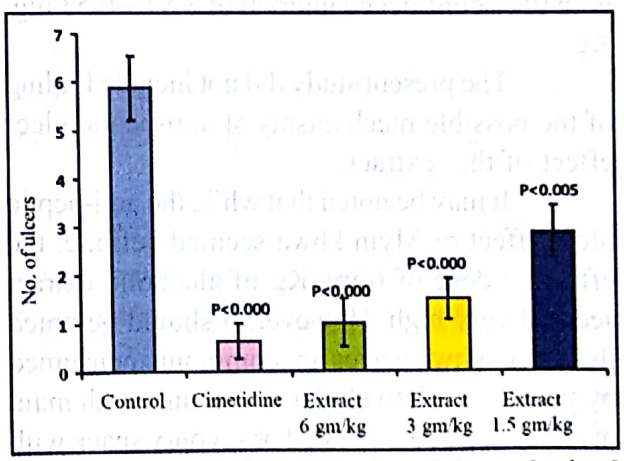

Diagram 2. Mean ± S.E of number of ulcers obtained with protective effect of water (control), cimetidine (200 mg/kg) and 3 different doses of extract (1.5 gm/kg, 3 gm/kg and 6 gm/kg) on aspirin- induced gastric ulcerations in rats. ANOVA test was used for comparison. n= 8 in each.

For testing the protective effect of drugs, test drug and control were given for 4 days prior to aspirin which was administered after 48 hours of fasting, and the effect of drugs observed 4 hours after aspirin administration. ED_{50} was calculated from the findings observed accordingly. For testing the healing effect, aspirin was administered to rats after 48 hours' fasting, and test drug and controls given 4 hours and 24 hours after aspirin. Observation of drugs' effect was done 4 hours after the second dose of test drug and control. .

Protective effect of the extract of Myin khwa was observed even with the lowest dose of 1.5 mg/Kg, but the effect was dose-related, with the best effect occurring with 6 mg/Kg which was the highest dose tested. This dose was also observed to produce a healing effect on aspirin-induced gastric ulcer in rats which was comparable to that of cimetidine, a well recognized anti-peptic ulcer drug. The wound healing effect of *Centella asiatica* was also shown by Cheng et al, (2004)

ED_{50} of anti-peptic ulcer effect of Myin khwa extract was calculated to be 5.025 mg/Kg with 95% confidence interval of 3.87 – 6.53 mg/Kg.

The present study did not include finding of the possible mechanisms of anti-peptic ulcer effect of the extract.

It may be noted that while the anti-peptic ulcer effect of Myin khwa seemed definite, the effective dose of 6 mg/Kg of alcoholic extract seemed very high. However, it should be noted that Myin khwa leaves are commonly consumed by people in relatively large amounts with main meals as vegetable in salad or savoury snack with ngapi, or its juice as a beverage. Thus, a dose equivalent to 6 mg/Kg of the extract does not seem unrealistic in practice.

CONCLUSION

The present study has demonstrated the anti-peptic ulcer effect of Myin khwa leaves extract. Myin khwa is readily available all over Myanmar throughout the year. It may be suggested that consumed in sufficient quantities Myin khwa leaves may also serve as an alternative medicine, an indigenous drug, or even an adjunct to classical drug therapy to prevent or even cure peptic ulcer.

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