



Short Communication

Anti-ulcer activity of Lucer against experimentally induced gastric ulcers in rats

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Abstract

The present study is designed to explore the mechanism of action of herbal formulation Lucer against experimentally induced gastric ulcers. The aqueous extract (120 and 180 mg/kg) of Lucer was tested against aspirin and ethanol-induced gastric ulcer model in rats. The drug has been found to be very effective in inhibiting gastric ulceration. This is evident from reduction in ulcer index parameters. Besides, significant reduction in acid secretory parameters such as total acidity, total acid output and volume of gastric secretion were also observed. It is concluded from this study that the drug possesses anti-ulcer activity in both the models. The anti-ulcer activity of the drug can be attributed to inhibition of acid secretory parameters and strengthening of gastric mucosal barrier.

Key words: Anti-ulcer, aspirin-induced ulcers, cyto-protection, gastric ulcers, herbal drugs

Introduction

Peptic ulceration is one of the common disease affecting millions of people. It is now considered to be one of the modern age epidemics affecting nearly 10% of world population.^[1] Research advances during last decade have offered new insights in the therapy and prevention of peptic ulceration. Although drug treatment for peptic ulceration has improved in the recent past, the need for better therapy is still prevailing. Drugs are found by screening compounds against an animal model of human disease. Plants provide an alternative strategy in search for new drugs. There is a rich abundance of plants reputed in traditional medicine to possess anti-ulcer properties.^[2] It is likely that plants will continue to be a valuable source of new molecules which may, after possible chemical manipulation, provide new and improved anti-ulcer drugs.

Researchers^[3] has reported anti-ulcer activity of a number of herbal extracts such as triterpenoid glycyrrhizin acid from *Glycyrrhiza glabra*, a diterpenoid nimbodin from *Neem*, tannins from *Cinnamomum cassia* and *Emblca officinalis*, etc. The oxygen-derived free radicals are directly implicated in ulcerogenesis and use of antioxidants may lead to gastro protective effects.^[4]

In the light of various reports of herbal drugs and preliminary findings of our study, it was considered worthwhile to evaluate

the effects of the lucer against experimentally induced gastric ulcers and elucidate its possible mechanism of action.

Materials and Methods

Marketed herbal formulation named Lucer (Tonix Health Care Pvt. Ltd., Batch No. 40901, Date of Mfg.: Sept 2004) contains *Pravala Pishti* (60 mg), *Kamadudha Rasa* (50 mg), *Sutashekhara Rasa* (40 mg), *Amalaki ext.* (40 mg), *Godanti Bhasma* (30 mg), *Jatamansi* (30 mg), *Muktashukti Pishti* (30 mg), *Svarnamakshika Bhasma* (30 mg), *Shankha Bhasma* (30 mg), *Guduchi Satva* (20 mg), *Kiratatikta ext.* (20 mg), *Jyotishmati Beeja* (20 mg), *Parsika Yavani* (10 mg), *Vacha* (10 mg). Albino rats of either sex weighing between 200 and 300 g were used. Aspirin was given in a dose of 500 mg/kg, once a day orally. From the results of preliminary studies, the drug Lucer was administered at a single dose of 180 mg/kg for 6 days orally, and 120 mg/kg for 3 days twice a day orally to study the anti-ulcer effects.^[5] A single dose of Cimetidine (50 mg/kg) has been administered as a standard control. Animals were fed with standard chow diet and were divided into groups of six each. Fasted animals were used as

Table 1: Effect of lucer against aspirin-induced gastric ulcers

Treatment	Dose, p.o. (mg/kg)	Ulcer index
Aspirin (control)	500 Single dose	3.2±0.0003
Cimetidine	50 Single dose	0.24±0.0300 *
Lucer	120 b.i.d	0.0055±0.0017 *
Lucer	180 Single dose	0.04992±0.0409 *

n= 6 in each group, * P<0.05 compared with control group, All values represented mean±SEM

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Table 2: Effect of lucer on acid secretory parameters

Treatment	Dose, p.o. (mg/kg)	Volume of gastric juice (ml/100 g.b.w.)	Acid output (mEq/l)	Total acidity (μ Eq/100 g.b.w.)
Aspirin (control)	500 single dose	2.42 \pm 0.16	11.03 \pm 0.49	4.56 \pm 0.12
Lucer	120 b.i.d	1.8 \pm 0.47	5.58 \pm 1.45*	3.04 \pm 0.12
Lucer	180 single dose	1.05 \pm 0.05*	3.54 \pm 0.59*	3.49 \pm 0.56

All values represent mean \pm SEM, n=6 in each group, *P<0.05 compared with control group

Table 3: Effect of lucer against ethanol-induced gastric ulcers

Treatment	Dose, p.o. (mg/kg)	Ulcer index
Ethanol (control)	1 ml, single dose	4.557 \pm 0.1519
Lucer	120, b.i.d	0.1058 \pm 0.0266*

All values represent mean \pm SEM, n=6 in each group, *P<0.005 compared with control group

described in each of the experiment. Coprophagy was prevented by fasting the animals in metabolic cages. Throughout the experiment, the animal house was maintained in the same identical conditions according to the norms and standards of CPCSEA. The protocol was approved by Institutional Animal Ethics Committee (IAEC) vide protocol no. 3/05 dated 26/07/05. Anti-ulcer activity of the drug was evaluated against aspirin and ethanol-induced gastric ulcers in rats. The observations are reported as mean \pm SEM. The statistical analysis was carried out using two-tailed Student's paired t-test. P values < 0.05 were considered as significant.

Aspirin-induced gastric ulcers in rats

Aspirin was suspended in 1% carboxy methyl cellulose in water and administered orally in the dose of 500 mg/kg in 36 h fasted rats.^[6] Six hours later, the animals were sacrificed, stomachs were removed and opened along greater curvature for determination of ulcer index (U.I.). Ulcer index was measured.^[5] The acid secretory parameters like total acidity, total acid output and volume of gastric secretion were also measured.

Ethanol-induced gastric ulcers in rats

In this model, animals were fasted for 36 h before the experiment. 1 ml of 80% ethanol was administered p.o. in those animals.^[7] In treated group, drug was administered p.o. in the dose of 120 mg/kg, twice a day, 1 h before the administration of ethanol. After 2 h of ethanol administration, animals were sacrificed and stomach was removed, and opened along the greater curvature and subjected to measurement of ulcer index.

Results and Discussion

The gastro protective effects of Lucer were investigated against aspirin- and ethanol-induced gastric ulcer model in rats. It has shown significant gastro protective effects against these

models. The aqueous extract of Lucer has shown significant reduction in the ulcer index as compared to control group in aspirin-induced gastric ulcer model in both the doses. 120 mg/kg of the drug has also significantly decreased ulcer index as compared to control group in ethanol-induced gastric ulcer model. Further the acid secretory parameters like total acidity, volume of gastric acid secretion and total acid output were also studied in aspirin-induced gastric ulcer model. Significant reduction was observed in total acid output and volume of gastric acid secretion although total acidity was observed to be reduced insignificantly against aspirin-induced gastric ulcer model as compared to control group [Table 1-3].

Conclusion

It is suggested that anti-ulcer activity of Lucer in aspirin-induced gastric ulcer model is likely to be associated with both inhibition of acid secretory parameters and strengthening of gastric mucosal barrier. This is under investigation for its alteration of mucosal resistance.

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हिन्दी सारांश

प्रायोगिक आमाशय व्रण में औषध योग Lucer की व्रणप्रतिरोधी कार्मुकता का अध्ययन

जिज्ञा एस्. शाह, जेतुन आर. पटेल

प्रस्तुत शोधकार्य प्रायोगिक रूप से प्रेरित आमाशय व्रण में आयुर्वेदिक औषध योग लुसर के प्रभाव की कार्मुकता का अध्ययन करने हेतु किया गया। लुसर का जलीय सार चूहों में एस्पिरिन और एथेनॉल प्रेरित गेस्ट्रिक अल्सर द्वारा परखा गया। औषध का जलीय सार (१२० और १८० मि.ग्रा./कि.ग्रा.) चूहों को मुख मार्ग से उपरोक्त मॉडल्स में दिया गया। औषध योग, एस्पिरिन और एथेनॉल प्रेरित gastric ulceration रोकने में काफी प्रभावी है, अल्सर इंडेक्स के मापदंडों में कमी से यह स्पष्ट होता है। इसके अलावा ऐसिड सिक्रिटरी मापदंड जैसे कि टोटल एसिडिटी, टोटल एसिड आउटपुट और वोल्यूम ऑफ गेस्ट्रिक सिक्रिशन में भी कमी देखी गयी। इस अध्ययन से यह निष्कर्ष निकलता है कि यह औषध योग दोनों मॉडल्स में एंटीअल्सर एक्टिविटी दिखाता है। औषध योग की एन्टीअल्सर एक्टिविटी हेतु एसिड सिक्रिटरी मापदंड और गेस्ट्रिक म्युकोसल बैरियर की दृढ़ता को उत्तरदायी माना जाता है।