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Evaluation of Gastric Anti – Ulcer Activity of Hydroalcoholic Extract of *Solanum nigrum*: An Animal Study.

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ABSTRACT

In stomach mucus and bicarbonate stimulated by the local generation of prostaglandin which protect the gastric mucosa. A localised loss of gastric mucosa as well as duodenal mucosa leads to formation of peptic ulcer. *Solanum nigrum* linn also known as sunberry or wonder berry(Makoy) belongs to the family Solanaceae, distributed as weed through dry place of India. The whole plant is used for medicinal purposes It has been claimed to have antiulcer and anti-inflammatory activity and useful for treatment of ulcer, flatulence and Hepatomegaly. *Solanum nigrum* linn has been documented and screened for antiulcer activity. To evaluate the gastric anti-ulcer activity of hydro alcoholic extract of leaf of *Solanum nigrum* in albino rates. Antiulcer activity of *Solanum nigrum* was studied in ethanol induced gastric ulcers in albino rates. *Solanum nigrum* was administered in the dose of 50,100 and 200mg/kg orally 30 min. prior to ulcer induction. The antiulcer activity was assessed by determining and comparing the ulcer index in test drug group with that of the vehicle control group. Ranitidine was used as a reference drug. The ulcer index in the *Solanum nigrum* treated animals was found to be significant less when compared to the vehicle control animals. Ranitidine produced a significant gastric ulcer protection. The antiulcer activity of *Solanum nigrum* was less than that of Ranitidine. It can be concluded that *Solanum nigrum* possesses significant antiulcer property which could be either due to cytoprotection action or by strengthening of gastric mucosa and thus enhancing mucosal defence.

Keywords: Cytoprotection, gastric ulcer, mucosal defence, ulcer protection .

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INTRODUCTION

In stomach mucus and bicarbonate stimulated by the local generation of prostaglandin which protect the gastric mucosa. A localised loss of gastric mucosa as well as duodenal mucosa leads to formation of peptic ulcer [1,,2,]

Solanum nigrum Linn also known as sunberry or wonder berry (Makoy) belongs to the family Solanaceae, distributed as weed through dry place of India. The whole plant is used for medicinal purposes It has been claimed to have antiulcer and anti-inflammatory activity and useful for treatment of ulcer, flatulence and Hepatomegaly [3,4,5.] *Solanum nigrum* Linn. has been documented and screened for antiulcer activity [6,7,8] *Solanum Nigrum* also mentioned in ayurveda that it is useful in gastric ulcer. Since peptic ulcers one of the most common disease resulting in substantial human suffering and high cost therapy so we have studied the antiulcer potential of *Solanum nigrum* in rates.

Objective: To evaluate the gastric anti-ulcer activity of hydro alcoholic extract of leaf of *Solanum nigrum* in albino rates.

MATERIALS AND METHODS:

Experimental animals-The study was conducted on albino rats of 150-200g and maintained under standard conditions. Rates of either sex were allocated to groups of six animals each. The animal experiment were approved by institutional animal ethical committee.

Chemicals and drugs-Ethanol, Ranitidin, hydroalcoholic extract of *Solanum nigrum* leaves. Preparation of hydroalcoholic extract of *Solanum nigrum*. Leaf of plant was dried under shade in a room. After 10 days drying the leafs were powdered by grinding, than powder was macerated with distilled water for 24 hrs later the extract was filtered and dried at 45°C. Ethanol induced gastric ulcer.

Before induction of ulcer, rats were fasted 24 hrs, they were deprived of food but free allow of water was allowed.. The rates were caged in wire meshed cages having a plate at its base to avoid corpophagy.

The animals were divided into six groups.

- One group received distilled water, served as control group .
- 4 groups were administered orally 50,100 and 200mg/kg and 400mg/kg of the test drug
- Ranitidine (10 mg /kg administered as standard drug for comparison.

Gastric ulcer in albino rats were induce by oral administration of single dose 1ml 96% ethanol orally after 45 minutes of ranitidine and *Solanum nigrum* treatment. The animals were anaesthetized 1 hr later and stomach was incised along with greater curvature to measure the ulcer index

Scoring of ulcer [9]

0= Normal Coloured Stomach
0.5=Red colouration
1=Spot ulcer
1.5=Haemorrhagic streaks
2=Ulcer>3 but< 5
3=>5

Calculation of ulcer index[10]

$U1 = UN + US + UP \times 10^{-1}$
U1=Ulcer Index
UN = Average of number of ulcer per animal
US= Average of severity score
UP=Percentage of animal with ulcer

Determination of Percentage protection= (Control mean ulcer index –Test mean ulcer index/Control mean ulcer index X 100

RESULT

Solanum nigrum in graded doses of 50,100,200,400mg/kg orally showed protection against ethanol induced lesion in rat stomach which was statistically significant. Maximum protection was seen with 200mg/kg oral dose.

Standard Drug – Ranitidine 10mg/kg orally produced significant (0.01) protective activity against ethanol induced gastric lesion.

Effect of solanum nigrum leaf extract on Ethanol Induced Gastric ulcer: Table 1.

DISCUSSION

In the ethanol treated rats significant hemorrhagic lesion was noted as compared with control .in controlled group showed normal tissue. In ranitidine treated group there was a reduction in the haemorrhagic lesion indicative of antiulcer activity. The antiulcer activity of ranitidine in ethanol induced haemorrhagic lesion may be due to inhibition of first pass gastric metabolism of ethanol.(KATZUNG) and by inhibiting gastric acid secretion. In solanum nigrum and ranitidine treated groups almost the same features were seen, that is the tissue show ulcer reduction.

CONCLUSION

Table 1.

Groups	Drugs	Dose/PO	Ulcer index	Ulcer protection%
I	Control	10ml/kg	14.50 ± 1.20	
II	Ranitidine	10mg/kg**	2.10 ± 0.10	82
III	Solanum nigrum	50mg/kg	4.10 ± 1.40	56
IV	Solanum nigrum	100mg/kg	3.90 ± 0.50	62
V	Solanum nigrum	200mg/kg*	2.84± 1.20	74
VI	Solanum nigrum	400mg/kg	2.84 ± 1.06	74

Value are mean±SEM Significant as control
P value - *<0.05 ** < 0.001

Our result suggested that solanum nigrum possesses significant antiulcer property which could be either due to cyto protective action or by strengthening of gastric mucosa and thus enhancing gastric mucosal defence.

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