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Study of antigastric and anti ulcer activity of *Abutilon indicum* plant extract in shay rats

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Abstract
Different extracts of Abutilon indicum plant were tested for its antigastric ulcer activity in shay rat model, out of which Ethanolic extract 800mg/kg afforded complete inhibition of ulceration in shay rat which is equal to the antiulcer activity shown by 2mg/kg of Rabeprazole in shay rat.
Key words: *Antigastricantiulcer , Abutilonindicumplant, shay.*

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I. Introduction

Cimitidine, Rantidine,Famotidine,Omeprazole,Rabeprazole,Pantoprazole,lansoprazole,etc allopathic drugs are known for their antiulcer activity.It is know that there is no definite curative therapy in allopathic system. This therapy only causes systematic relief. The most Allopathic drugs after long use precipitate their own toxic activities.indigation, stress and heredity are some of the reason which may cause peptic ulcer. It is found that some tribal of south Orissa are using Abutilon indicum plant extract for treatment of peptic ulcer and hyper acidity. In such traditional use, the toxic manifestation are not found . But there is no scientific proof so far established in support of such utility in literature. Hence the said plant is selected to test its extract in experimentally induced peptic ulcer. In animal model pylorus ligation method as followed by Shay rat 1945 is followed for inducing ulceration in rats. The direct parameter of ulcerations like Total Acidity ,Free Acidity, Peptic Activity, Ulcer Index are determined to establish the antiulcer activity in terms of their proportionate inhabitation of these parameters.

Materials

Solvents like Methanol, pet ether A.indicum, Rabeprazole, Toffer's reagent, 0.01N Sodium Hydroxide,Tyrosine, Folins Phenol reagent etc.

Animals

Adult wistar Albino rats (150-170gm) were used for this experiment obtained from M/S Chakravorty Enterprises, Kolkata were housed in standard polypropylene cage at room temperature of 27-30ºC and 60-65 relative humidity and had free access to food and water adlibilum. The rats were used for the experiment after an acclimization period of one week. All procedures described were approved by the Animal ethical committee of UDPS registration no (990/C/06/CPCSEA).

Preparation of Extract

The aerial parts of A.indicum were collected in winter and are shaded dried.About 1kg of dried plant was extracted with methanol in soxhelt apparatus. The extraction procedure was carried out untilthe solvent system becomes clear. The extract was collected and concentrated by evaporating the solvent completely. This extract was dried and stored in refrigerator for our pharmalogical evaluations.

Studies in Shay Rat

Albino rats of both sex male and female were purchased from M/S ChakravortyEnterprises, Kolkata and housed for four days to bring stability. Rats weighing 150-170 gms were fasted for 24hr and care was taken to avoid corophagy.Rats were divided into five groups each group consists of six rats.One group is kept as control and operated for pylorus ligation which was made under the ether anaesthesia. The control pylorus ligated rats were administrated with 0.5 ml of 1% Carboxymethylecellolose suspension soon after recovery from ether anaesthesia .Similarly 2nd groups are operated and administrated 2mg/kg of Rabeprazole suspended in 1%

carboxymethyle cellulose soon after recovery from ether anesthesia .Similarly 3rd,4th ,5th groups were administrated with Ethanolic extract of Abutilon indicum plants at dose of 200,400 and 800 mg per kg body weight separately to each groups of shay rat orally.All the groups were kept separately and after operation all the shay rats were deprived of supplying drinking water. The animals were maintained without food and water for 24 hrs after pylorus ligation and were killed by spinal traction.The abdomen was opened the oesophagus end of stomach was isolated with its contents intact. The greater curvature of the stomach was cut longitudinally and the gastric juice was collected into a beaker and washing were collected into a breaker. Distilled water 9ml was added and centrifuged. The volume of the supernant liquid was measured and aliquots were taken to determine the total acidity, free scidity, peptic activity of gastric juice. The stomach mucosa was observed under magnifying lenses for ulcer after washing with stream of tap water.In preliminary study of pet ether extract, chloroform extract and aqueous extract did not protect the mucosa and acidity was not reduced .so these were not tried in further number of rats.

Total Acidity

A volume of 5ml diluted gastric juice was titrated with 0.01N sodium hydroxide run from a micro burette using phenolphthalein as an indicator and the acidity was expressed as mg.HCL/00gm body weight of rat.

Free acidity

It is determined by using Toffer's reagent as an indicator and titrating with sodium hydroxide which was run until canary yellow colour was observed.

Peptic Activity

The method as followed by the lowereyetal 1951 was followed to estimate peptic activity and was expressed as µ mol Tyrosine/100gm body weight.

Ulcer Index

The method of Anderson and Soman (1965) was followed for scoring the ulcer index.

Effect of ethanol extract of Abutilon indicum on Volume of Gastric Juice, Free acidity,Total acidity,Peptic activity,Ulcer index and % reduction in shay rats and its comparison with Rabeprazole.

Table-1: Effect of various extracts of Abutilon indicum on Gastric Juice, Free Acidity, Total Acidity, Peptic Activity, Ulcer Index in shay rats and its comparison with Rabeprazole.

Group	Dose	VGJ ml/100gm	FA mg/100gm	TA mg/100gm	PA mole Tyrosine/100gm	Ulcer index (UI)+
I	Vehicle Vontrol (1% CMC)	4.93±0.08 (0)	2.68±0.049 (0)	12.48±0.072 (0)	2214.75±19.81 (0)	5+ (0)
II	PEAI 800gm/kg	3.76±0.045 (23.73)	1.45±0.048 (45.89)	3.06±0.065 (75.48)	1568.8±1.006 (31.40)	3+ (40)
III	CEAI 800mg/kg	4.43±0.05 (10.14)	1.43±0.038 (46.64)	2.93±0.045 (76.52)	1576.4±0.854 (28.82)	3+ (40)
IV	AEAI 800mg/kg	3.95±0.056 19.87	1.78±0.102 33.58	2.71±0.043 78.28	1561.5±0.491 29.5	2+ (60)
V	EEAI 200mg/kg	3.9±0.077 (20.89)	1.28±0.054 (52.23)	1.71±0.054 (86.24)	1493.4±0.978 (32.57)	2+ (60)
VI	EEAI 400mg/kg	4.16±0.056 (15.61)	0.96±0.004 (64.17)	1.78±0.036 (85.73)	1409.4±1.277 (36.36)	1+ (80)
VII	EEAI 800mg/kg	3.31±0.109 32.86	1.01±0,054 62.31	1.48±0.043 88.14	1338.83±0.760 39.54	0 (100)
VIII	Rabeprazole 2mg/kg	1.65±0.038 66.53	1.05±0.329 60.82	1.7±0,006 86.37	1331.73±17.122 39.89	0 (100)

Results are expressed means +-SEM of six readings; Significance evaluated by one-way analysis of variances (ANOVA) followed by Document's test various control group.

$^{a}p<0.001$,$^{b}P<0.005$,(n=6),$^{c}P<0.05$,(n=6)

PEAI- Petroleum ether extract of Abutilon indicum, EEAI- Ethanol extract of Abutilon indicum.

CEAI- Chloroform extract of Abutilon indicum, AEAI- Aqueous extract of Abutilon indicum

VGJ-Volume of Gastric Juice, FA-Free Acidity, TA-Total Acidity, PA-Peptic Activity, UI-Ulcer Index

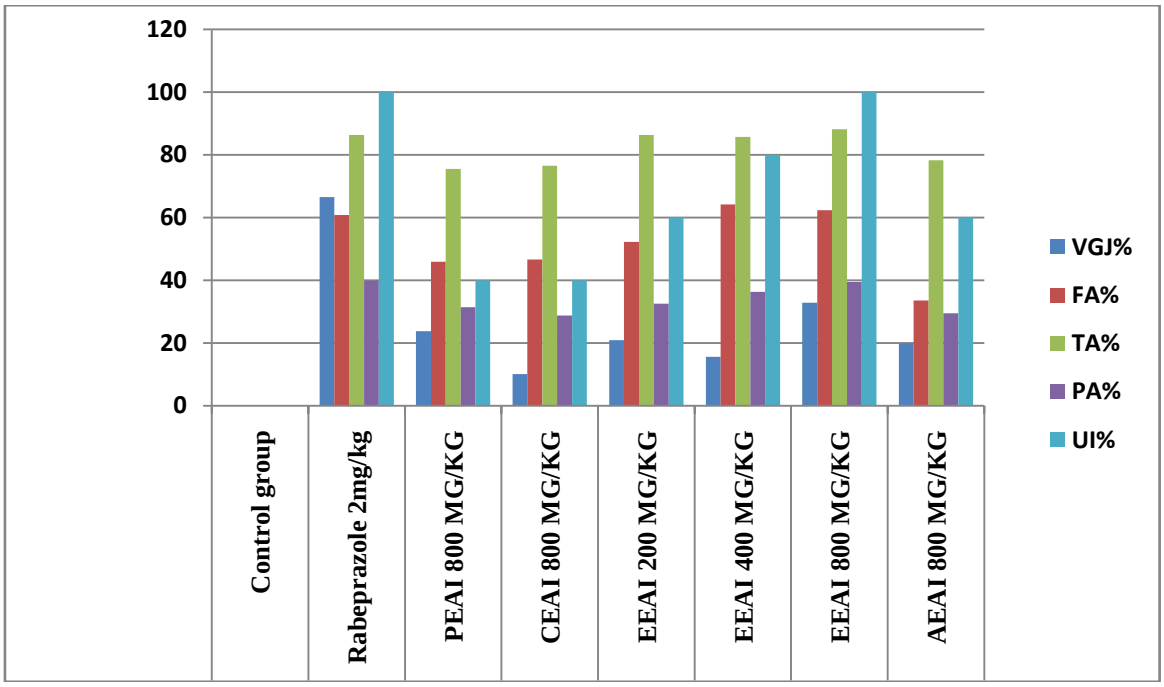

Fig-1: Bar chart of comparison of % reduction of observed activities of different extract with Rabeprazole

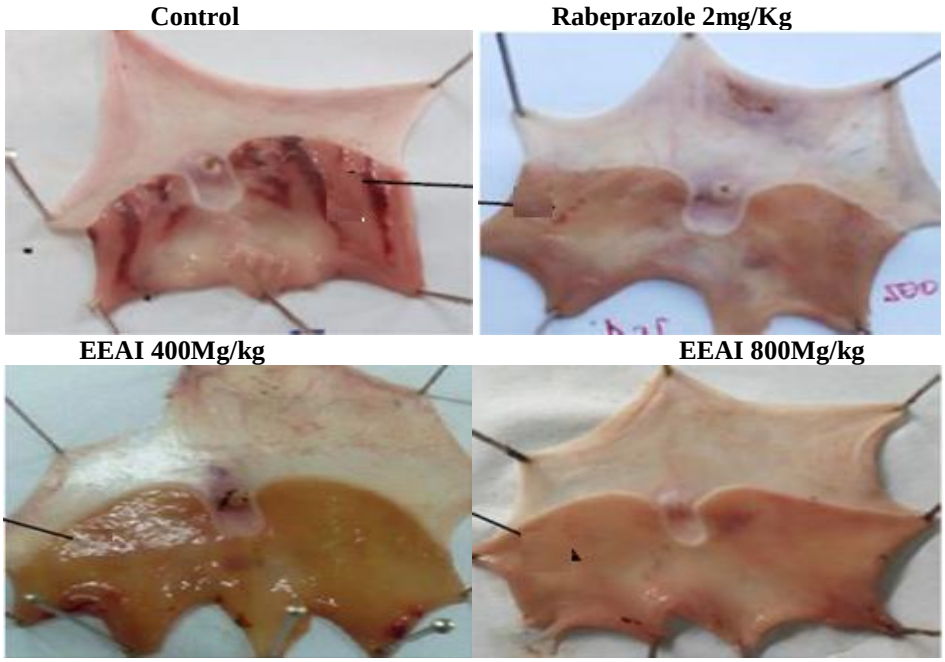

Fig-2: Antiulcer activity of Ethanolic extract of Abutilon indicum and its comparision with control and Rabeprazole

II. Results and Discussion

From the preliminary study it is that the petroleum ether, chloroform& aqueous extracts of A.indicum did not protect the gastric mucosa even in high dose. But the ethanolic extract showed gastric protection as well as inhibition of activity peptic activity gastric juice with 200mg/kg A.indicum ethanolic extract reduction the VGJ 20.87%, FA 52.23%, TA 86.24%, PA 32.57% and UI 60%. With 400mg/kg A.indicum ethanolic extract reduction the VGJ 15.61%, FA 62.31%, TA 85.73%, PA 36.36% and UI 80%. With 800mg/kg A.indicum ethanolic extract showed the reduction of the VGJ 32.86%, FA 64.17%, TA 88.14%, PA 39.54% and UI 100 %. which are comparable with effect of 2mg/kg of Rabeprazole that resulted the reduction of theVGJ,FA,TA,PA,& UI by 66.53%, 60.82%, 86.37%, 39.89% & 100% respectively in comparison with control. The ethanolic extract 800mg/kg protected the gastric mucosa 100% and reduced VGJ,TA,FA,PA,UI significantly. The results are interpreted graphically in figure.The active constituents present in the ethanolic extract probably blocked acidity

and protected the mucosa completely in this experimental Shay rat model and hence proved its anti ulcer activity.

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