Mintage Journal of Pharmaceutical & Medical Sciences

Vol7, Issue 2, 2018 ISSN: 2320-3315

Research Article

HERBAL CHURNA PREPARATION OF AEGLE MARMELOS & *ELEPHANTOPUS SCABER* FOR ANTI-ULCER STUDY

NADUGOPALBHUYAN[1]*, J K KHUNTIA[1], DEEPAK KUMAR[2], C P MEHER[3]

[1]Gayatri Institute of Science and Technology, Gunupur, Rayagada,765022, Odisha, [2]Al-Ameen College of pharmacy, Bangalore, [3]The Pharmaceutical College, Tingipali, Barapali, Dist-Bargarh, Odisha. Email: nadugopal.1997@gmail.com

Received - 31.01.2018; Reviewed and accepted - 06.03.2018

ABSTRACT

Objective: Now in the development of human civilization the ulceration is becoming a life threaten disease due to imbalance between acid pepsin secretion and mucosal defense factors by stress, strain in day to day life style modification. To full fill the great demand of medicine, the modern approach of science makes the modernization of therapy by means of allopathic system of medicine, in which most drugs having more side effects. At the same time, synthetic drugs are very costlier which is not afforded by the people of below the poverty. So, in this context our main objective is to detect anti-ulcer study by using herbal formulations. **Materials and methods:** we used two herbs i.e *Aegle marmelos* & *Elephantopus scaber* for CHURNA preparation.Here swis albino rats are used for detect the anti-ulcer study. 24 swis albino rats were divided into 4 groups and each group containing 6 rats.The anti-ulcer activity demonstrated by using two methods i.eAcid determination method & Ulcer index method. **Results:** In acid determination method, the group-I which contain formulated Churna, having an average range of 5.3 which is nearly comparable with the group-II,that contain highly significant Ranitidine.In ulcer index study, here also a good result of group-I having 2.58 score whereas group-II having a score of 1.6. **Conclusion:** From the results, it is apparent that our CHURNA preparation induced group having high protectivity as compared to our standard drug. So, CHURNA preparation for anti-ulcer study has therapeutic effect as much the synthetic drug and having negligible side effect.

KEY WORDS: Ulceration, CHURNA, Anti-ulcer activity, Pylorus Ligation

INTRODUCTION

Peptic Ulcer is characterized by the presence of Ulcer in any portion of gastrointestinal tract exposed to gastric acid and pepsin. An Ulcer is defined as a breach in the continuity of the epithelial lining of more than 5mm in diameter, with associated inflammation. Peptic ulcers developed when the balanced between defensive factors and aggressive factors is disruptured. The treatment of peptic ulcer depends upon reduction of the aggressive factors or enhancement of defensive mechanism. The main purpose in peptic ulcer treatment us to relief pain, heal the ulcer and delay ulcer recurrence. Many substances like alcohol, hydrochloric acid, caffeine, sodium chloride and non-steroidal anti-inflammatory drugs i.e. NSAID'S caused stimulation of gastric secretory cells which cause excess acid secretion. Many drugs like PPI and H_2 receptor antagonist and anti-adrenaline are used against the treatment of peptic ulcer, but they have several side effects. To minimize these side effects, in the present study an attempt was made to prepare a herbal CHURNA preparation of the plants using their parts like fruits and roots respectively to prove a better antiulcer activity.

MATERIALS AND METHODS

PLANT MATERIALS

For better anti-ulcer study, two plant products has choosen i.e. Aeglemarmelos (Dried fruit pulp), belongs to family Rutaceae & Elephantopusscaber (Dried root bark), belongs to family Asteraceae.

Fig. 1: *Elephantopus scaber* & Aeglemarmel

PREPARATION OF CHURNA

CHURNAs are the powder preparation of drugs used for oral administration.

The ripe fruits of Aeglemarmalos were collected, and the pulps of fruit were dried under sun.

The roots of *Elephantopus scaber* were collected, washed properly and dried under sun.

After complete drying they are allowed to size reduction process up to fine particles to the help of grinder separately.

The powders are allowed to sieve with sieve no 80, was weighted accurately.

After preparation of the two types of powdered drug they are mixed in the 1:1 proportion.

ANIMAL AND ULCER STUDY

- The anti-ulcer activity of the CHURNA was investigated with NSAID induced ulcerative model.
- 24 Swiss albino rats with weight 190 to 200 gm were used for the experiment.

Animal specification

Animal type - Swiss albino rats
Animal purchasing – OUAT, Govt. Odisha
Animal feeding – Standard laboratory animal food and water
Temperature – $25^{o} \pm 1^{o}$c
Lightening – 4hrs light / 4hrs dark

DOSE OF DRUG ADMINISTERED

Dose for CHURNA Preparations

For 60kg person, the dose of drug = 10g
For 1kg person, the dose of drug = 10/60kg
For 200g Swiss albino rat, the dose of drug I= 10/60,000×200g
= 0.03g

As CHURNA contains dried powder of *Aeglemarmelos* and *Elephantopus scaber*, the dose of drug is in the 1:1 proportion. Therefore the dose of CHURNA is 0.03g+0.03g.

Dose of drug for NSAID

For 60kg person, dose = 500mg = 0.5g
For 1kg person, dose = 0.5g/60kg =0.5/60,000g
For 200gm Swiss albino rat, dose = 0.5/60,000 × 200gm = 1.6mg
The animals are divided in to 4 groups

Group- I

The Group-I animals were feeded with formulated CHURNA for 7 days and NSAID administered before 72 hrs. of experiment.

Group-II

The Group-II animals were feeded with Ranitidine for 7 days and NSAID has administered before 72 hrs. of experiment.

Group-III

The Group-III animals were feeded with normal died for 7 days, and NSAID has administered before 72 hrs. of the experiment.

Group-IV

The Group-IV animals are the normal rats with normal feeding behavior.

PROCEDURE

Ulcer index method (scoring method)

Anaesthetize the overnight fasted rate with anesthetic ether.

The rat was secured on the operating table. Then an incision of 1cm long was given in the abdomen and stomach was exposed.

A thread was passed around the pyloric sphincter, and a tight knot was applied. While putting the knot, care should be taken so there no blood vessel is tied along the knot.

The abdomen wall was closed by putting the sutures. The skin was cleaned from any blood spots and bleeding.

Collodion was applied over the wound. The rat was kept in a separate cage and was allowed it to recover.

To another group of rat, ranitidine (10mg/kg, IP) was injected. After 15min perform pyloric ligation was done.

After 4hrs of pyloric ligation, both the animals were sacrificed by decapitation. Open the abdomen and tie the esophageal end (Cardiac end) of the stomach. Cut and remove the entire stomach from the body of the rat.

Give a small cut to the pyloric region just above the knot and collect the contents of the stomach in a graduated centrifuge tube.

Open the stomach along the greater curvature and wash it slowly under the running tap water. Put it on the slide glass and observe under 10 x magnification for ulcers.

The ulcer is scored as below.
0= Normal colored stomach.
0.5= Red coloration.
1= Spot ulcers.
1.5= Haemorrhagic streaks.
2= Ulcers ≥ 3 but ≤ 5
3= Ulcers > 5

RESULTS

Mean ulcer score for each animal is expressed as ulcer index.
Ulcer index = 10/X
Where X = $\frac{\text{Total area of stomach mucosa}}{\text{Total ulcerated area}}$

ACIDITY DETERMINATION PROCESS

The gastric content is centrifuged at 1000rpm for 10mins, the volume is noted. 1ml of supernatant liquid is pipetted out and was diluted up to 10ml with distilled water. The pH of the solution with the help of pH meter is estimated. The solution is titrated against 0.01N sodium hydroxide using Topher's reagent as an indicator (It is dimethyl-amino-azo-benzene with phenolphthalein and used for detection and estimation of hydrochloric acid and total acidity in gastric fluid). The solution is titrated to the end point when the solution turns to orange colour. The volume of the NaOH is noted to the free acidity. The solution was further titrated up to pink colour. The total volume of NaOH corresponding to the total acidity was noted.

Acidity can be calculated using the following formula.

$$\text{Acidity} = \frac{\text{Vol. of NaOH} \times \text{Normality} \times 100\text{meq / lit./ 100gm}}{0.1}$$

Compare the gastric volume, acidity and ulcer index of control animal and the animal treated with Ranitidine.

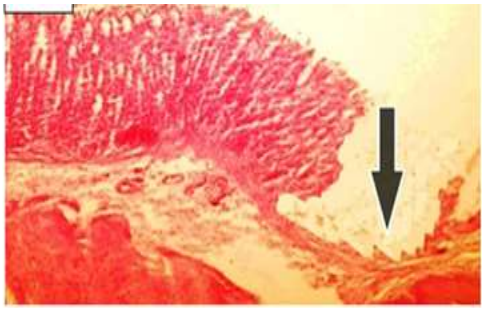

Fig.1 Deep induced ulceration in Rat stomach

Fig. 2: Gross picture of normal rat stomach. Normal gastric mucosal surface with no hyperemia, no dot hemorrhages or ulcers.

Table 1: Acid Determination Method (Titration Method)

Sl. No.	Group I (in percentage)	Average	Group II (in percentage)	Average	Group III (in percentage)	Average	Group IV (in percentage)	Average
1	5	5.3	3	3.16	28	29.5	1.5	1.33
2	5.5		3.5		30		1	
3	5		3.5		32		1	
4	6		3		27		2	
5	5		3		29		1.5	
6	5.5		3		31		1	

Table 2: Ulcer Index Method (Scoring Method)

Sl. No	Group I (in percentage)	Average	Group II (in percentage)	Average	Group III (in percentage)	Average	Group IV (in percentage)	Average
1	2.5	2.58	2	1.6	5	5.5	1	0.58
2	2		1.5		5		0.5	
3	3		1.5		5.5		0.5	
4	3		2		5		0.5	
5	2.5		1		7		0.5	
6	2.5		2		5.5		0.5	

DISCUSSION

In acid determination method the value are reported by simple alkali metric titration method, the four groups have shown various percentages as shown below.

The Group-1 have 5.3%
The Group-2 have 3.16%
The Group-3 have 29.5%
The Group-4 have 1.33%

It is clear cut under stable that the NSAID causes high percentage of ulceration. Whereas the protective effect of ranitidine is highly significant. Whereas our drug (CHURNA) have also same level significance of standard drug.

The ulcer index study the value are reported by observing with the help of magnifying glass. By simple observation method the following result has come out.

The group-1 rate have 2.58 score
The group-2 rate have 1.6 score
The group-3 rate have 5.5 score
The group-4 rate have 0.58 score

It signifies that the NSAID induced group having highly ulcer index. The Ranitidine induced group signifies its high protective property as Ranitidine.

So it signifies that our CHURNA preparation induced group having high protective as compared to our standard drug.

CONCLUSION

Here our CHURNA preparation for anti-ulcer study has therapeutic effect as much the synthetic drug and having negligible side effect

REFERENCES

1. INDIAN HERBAL PHARMACOPOEIA REVISED NEW EDITION, Volume-I, Indian Drug manufacturer's Association and Regional Research Laboratory, 2002.
2. M.P. SINGH AND HIMADRI PANDA, Medicinal Herbs With Their Formulation
3. Vinay Kumar, Kotran, Robbins, Robbins Basic Pathology, 7th Edition, Elsevier Health Sciences.
4. K.D. TRIPATHI, Essential medical pharmacology, 7th Edition.
5. PULAK MUKHARJI, Quality control of herbal drug.
6. C.K Kokate, A.P. Purohit, S.B. Gokhale, Text Book of Pharmacognosy.
7. Dndia, Kulkarni, Hand book of experimental pharmacology.
8. Book of Indian plants and Drug.