

An Ayurvedic Tonic Formulation and Investigations for its Antiulcer Activity

Ravichandran S^{*1}, Bhavani J², Satheesh Kumar D³, Chandrasekaran A R⁴, Saraladevi V⁵, Irfana Asma S⁶

¹Department of Pharmacognosy, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

²Department of Pharmaceutics, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

³Department of Pharmaceutical Analysis, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

⁴Department of Pharmaceutical Chemistry, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

⁵Department of Pharmacognosy, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

⁶Department of Pharmacology, PSV College of Pharmaceutical Science & Research, Orappam, Krishnagiri-635108, Tamilnadu, India

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ABSTRACT

The ulcers are complications, and as a disease, it is called PUD (Peptic Ulcer Disease). In the current scenario, a large population around the world are suffering from the ulcers, which are ranging from 25-55 years the age. This is not so dangerous as such but can become most dreadful when untreated or unattended. PUD can become the causes for other diseases like malnutrition, stomach pain etc. there are a lot of factors that are responsible for causing an ulcer. Few of them are the prolonged use of pain medications, malnutrition, stress and free radicals. There are also medicinal plants that are used to treat ulcers and effectively cure them without causing significant side effects. Various research publications prove the antiulcer property of the herbs and plants. The ayurvedic tonic formulation was prepared using the herbs and sugar base. The formulation was investigated for the antiulcer activity in the Ethanol-induced ulcers method. The antiulcer activity was investigated using two doses and compared to the ayurvedic standard marketed formulation and the standard drug omeprazole.



*Corresponding Author

Name: Ravichandran S
Phone: +91-9344712926
Email: rselvapharmacy@gmail.com

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INTRODUCTION

The ulcers are complications, and as a disease, it is called PUD (Peptic Ulcer Disease). In the current scenario, a large population around the world are suffering from the ulcers, which are ranging from 25-55 years the age [1]. This is not so dangerous as such but can become most dreadful when untreated or unattended. PUD can become the causes for other diseases like malnutrition, stomach pain etc. there are a lot of factors that are responsible for causing an ulcer. Few of them are the prolonged use of

pain medications, malnutrition, stress and free radicals [2].

There are many mechanisms by which the ulcers are formed, and they are 1: Gastric elevated secretion, 2. Increase in the PG synthesis and 3. Elevation in the H-pylori infection. The ulcers can grow more and cause the spread of the disease into other areas of the stomach. One of the above mechanisms would be the major mechanism that would be the drugs to act as antiulcer agents [3]. Many drugs are synthesized to treat ulcers. These are very effective in treating ulcers, and the side effects of those drugs are the major concerns to take a note of. These effects are the significant factors that are limiting the use of drugs rapidly [4]. There are herbal remedies that are known to human beings that are used to treat the diseases, and many investigations have been made to prove their activity against many diseases [5]. There are also medicinal plants that are used to treat ulcers and effectively cure them without causing significant side effects. Various research publications prove the antiulcer property of the herbs and plants [6-8].

Various formulations act against ulcers, but in this work, an ayurvedic tonic formulation was prepared using the herbal extracts, and the prepared formulation was compared for its antiulcer activity in Ethanol induced procedure of ulcer induction.

EXPERIMENTAL SECTION

Formulation

The plant parts were bought and collected from the local store, and the proper authenticity of the plants was established. The specimen of the herbarium was submitted in the laboratory. The plant parts were dried in a ventilated room where the elevation of the desk was maintained. Normal temperature and the humidity and conditions were maintained. The drying was continued for about four days, and the material was powdered using mortar [9]. The powder material was then used for the extraction of the chemical constituents. The powder was macerated with the water for about three days with shaking and stirring to ensure the proper mixing of the drug with solvent. The macerate was compressed and extruded out by filtering. The filtrate was then dried, and the thick paste was weighed and dissolved in distilled water to get a concentration of 500mg/ml. The sugar syrup was prepared using the simple sugar and distilled water at a concentration of 20% solution w/v, and this was mixed with extract in specific weights and volumes were the final volume of the tonic was 500ml, and the extract concentration in the tonic was 100mg/ml in

the tonic (Table 1).

Animals

The rats of the albino type and Wistar strain were selected for the study of the antiulcer property of the prepared tonic formulation. The animals were maintained in their cages by keeping the laboratory conditions controlled with air temperature and humidity. The animals were exposed to the dark and light cycles, which are 12 hrs. they were given food and water freely at the cages only and are treated with following the guidelines of the animal ethics committee.

Activity testing

The antiulcer activity of the prepared formulation was tested using the Ethanol-induced method [10]. The tonic formulation was prepared and tested at two doses of 2.5ml and 5ml, where it gives the final dose of 250mg and 500mg per kg weight of the rat.

Batch-1 group of animals were given normal saline solution at a dose of 1.5ml/kg of the rats, which was at the concentration of 0.9% with distilled water.

Batch-2 group animals received the normal saline only as above but with the induction of the ulcers using Ethanol.

Batch-3 group animals received the dose of marketed antiulcer tonic formulation as per the label claim and dosage of the formulation using an oral syringe.

Batch-4 animals were given the prepared formulations at a dose of 2.5ml to the animal's weight using an injector.

The batch-5 group were given the tonic formulation at a dose of 5ml to the animal weight using an injector via the oral route.

Batch-6 group animals were given the standard synthetic antiulcer drug, Omeprazole drug at a dose of 25mg/kg of the weight via the oral route.

All the batches except the first batch were given the Ethanol drug at a dose of 10ml/kg in the oral route [11]. The drug treatment was given for 2weeks period with the free access of pellet food and water. On the last day, the animals were sacrificed, and the stomachs were collected. The stomachs were opened along the big curvature, and the gastric contents were collected, and the pH was measured using digital pH meter.

The calculation of the ulcer index was according to the formula as below.

Ulcer index (UI)=(Ulcer-surface of the control group)-(ulcer surface area of the treated group)/(Ulcer surface of the control group) x 100

Table 1: Ayurvedic polyherbal tablet

Material	Quantity
1	Picorrhiza kurroa extract 500mg
2	Azadirachta indica extract 500mg
3	Sugar 10g
4	Starch 50mg
5	Distilled water qs

Table 2: Ulcerhealing property of the prepared ayurvedic tonic formulation

Batches	Treatment groups	Ulcer Index-UI	%inhibition of ulcers	Gastric Volume-ml/g	Gastric juice pH
1	Normal Saline control	-	-	0.97± 0.013	3.15 ± 0.09
2	Ethanol Induced batch	16.59± 7.41	-	7.63± 1.02	5.1± 0.84
3	Marketed formulation	11.32± 4.62	30.14	5.12± 0.93	6.27± 2.05
4	Tonic formulation 2.5ml	9.71 ± 5.43	48.71	4.23± 0.65	5.02± 0.96
5	Tonic formulation 5ml	7.13± 4.56	64.32	5.17± 0.80	6.09± 1.03
6	Omeprazole-25mg/kg	6.19±1.23	81.44	4.35±0.78	5.43±2.69

RESULT & DISCUSSION

The ulcers were induced effectively using the Ethanol in the rats, which was effectively noted from the ulcers score of the batch2 and then the elevation in the gastric volume and lowering the pH of the gastric contents towards the acidic side. The tonic formulation, which was prepared using the plant extracts, was tested for the antiulcer potency and compared to the standard ayurvedic formulation and the standard drug too. The tonic formulation that was tested at the higher dose at 500mg/kg has shown a higher ulcer activity. At this dose, the tonic showed higher activity compared to the lower dose of the tonic at 250mg/kg. This indicates that the extract was significant compared to the standard ayurvedic formulation and the standard drug too.

Ethanol-induced ulcers in the animals in a mechanism where it produces the free radicals. These generated free radicals will interfere in the cell membrane integrity and disrupt the cell membrane. This results in the breakdown of the gastric mucosal layer [11]. These free radicals are the major causes of the physiological disturbances in the human body. From this, it can be advocated that the prepared formulation exhibits the antiulcer mechanism due to

the antioxidant activity of the herbs (Table 2).

CONCLUSION

The ayurvedic tonic formulation was prepared using the herbs and sugar base. The formulation was investigated for the antiulcer activity in the Ethanol-induced ulcers method. The antiulcer activity was investigated using two doses and compared to the ayurvedic standard marketed formulation and the standard drug omeprazole.

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Conflict of Interest

Authors declared no conflict of interest.

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