

An ayurvedic tablet formulation for ulcer protection

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ABSTRACT

Gastric ulcers or the peptic ulcer is the primary disease that affects the gastrointestinal system. A large extent of the population in the world are suffering from the disease, and the age group of people those who suffer from ulcers are 20-55years. Herbs are known to the human beings that are useful in the treatment of diseases, and there are a lot of scientific investigations that prove the pharmacological activity of herbal drugs. Practitioners have been using the herbal material to treat the ulcers successfully, and the same had been reported scientifically. Numerous publications have been made that proves the antiulcer activity of the plants around the world. The tablets were investigated for the antiulcer activity in two doses 200 and 400mg/kg in albino Wistar rats in the artificial ulcer those are induced by the ethanol. The prepared tablets showed a better activity compared to the standard synthetic drug and the marketed ayurvedic formulation. The tablets showed a dose-dependent activity in ulcer prevention and treatment. Many synthetic drugs are available for the ulcer treatment, and the drugs pose the other problems in the body by showing the side effects and some other reactions. This limits the use of synthetic drugs to treat ulcers effectively. Herbs are known to the human beings that are useful in the treatment of diseases, and there are a lot of scientific investigations that prove the pharmacological activity of herbal drugs.



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INTRODUCTION

Gastric ulcers or the peptic ulcer is the primary disease that affects the gastrointestinal system. A large extent of the population in the world are suffering from the disease, and the age group of people those who suffer from ulcers are 20-55years [1]. Ulcers are usually caused by any intake of alcohol or drugs that cause prostaglandin inhibition. Other than this,

chronic habits of smoking and improper lifestyle habits cause ulcers in most cases [2]. The general other causes of ulcers are physiological stress in the body which generate free radicals.

Various mechanisms are involved in the ulcer formation are mostly related to the gastric acid secretion. The elevation in the gastric acid secretion, increase in the prostaglandin synthesis, and pyroli infection is the mechanism in the ulcer formation. One of the mechanisms from the above is the setbacks for the ulcer treating drugs [2]. Many synthetic drugs are available for the ulcer treatment, and the drugs pose the other problems in the body by showing the side effects and some other reactions. This limits the use of synthetic drugs to treat ulcers effectively [3].

Herbs are known to the human beings that are useful in the treatment of diseases, and there are a lot of scientific investigations that prove the pharmacological activity of herbal drugs [4]. Practitioners have been using the herbal material to treat the

ulcers successfully, and the same had been reported scientifically. Numerous publications have been made that proves the antiulcer activity of the plants around the world [5-7].

In the following work, the ayurvedic tablets were prepared using a herbal powder that has the antiulcer property. As per the ayurvedic profile of the herbs, the plants had been used to prepare the tablets, and the antiulcer activity was investigated.

Experimental section

Formulation of tablets

The plant that is used in the preparation of the tablets were collected from the local ayurvedic drug store, and the plant parts were dried for two days [8]. The dried parts were collected and then powdered using a mill and passed through the sieve to achieve a fine powder. Then the powders are weighed as per table and then mixed with the excipients and then compressed using a punching machine. The overall weight of the tablet was around 690-710mg. This tablet was powdered and used directly for the investigation of the activity.

Lab animals

The experiments were performed for the antiulcer activity on the albino Wistar laboratory rats. The animals were bought from a seller in the locality preordering them, making sure to get the animals which weighed about 130-150gm. They were kept healthy in the cages and maintained in an air controlled and humidity-controlled environment. The rats were acclimatized for dark and light cycles and are allowed to have water and free pellet diet food.

Investigations of the activity

The antiulcer screening was performed on the tablets on the rats in the ulceration that is induced by the Ethanol [9]. Ethanol was administered to the rats at a dose of 10ml/kg orally. The tablet formulation was tested in the two doses of 200mg/kg and 400mg/kg of the bodyweight of the rats.

Batch 1

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

Received the normal saline only as above but with the induction of the ulcers using ethanol.

Batch 3

Received the marketed tablet that is used for ulcers at a dose as per the label claim and dosage of the formulation using an oral syringe which is suspended in normal saline.

Batch 4

Given the prepared tablet at a dose of 200mg/kg to the animal's weight using an injector which is suspended in normal saline.

Batch 5

Given the prepared tablet at a dose of 200mg/kg to the animal's weight using an injector which is suspended in normal saline.

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.

Ethanol was induced ulcers in all the batches, but ethanol was not given to the batch 1 due to the standard control batch [10]. The treatment or the investigations were performed for 14 days, and the food and water were given as usual to the rats. On the 14th day, the animals were sacrificed, and then the stomachs were isolated. The stomachs were opened to collect the gastric contents by opening it through the more significant curve of the stomach. The pH of the gastric contents was measured using the digital pH meter.

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

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

RESULTS & DISCUSSION

The induction of ulcers was successful with the induction of the ethanol at a dose 10ml, and the ulcers were noted clearly in batch 2, and the gastric volume was elevated. The pH of the gastric fluid was also moved on to the acidic side of the pH scale. The prepared tablet formulation was investigated for the antiulcer activity in two doses of 200 and 400mg/kg. The prepared tablets were showed the antiulcer property by lowering the ulcer scale compared to the standard drug and marketed ayurvedic formulation. The gastric content volume is also lowered, confirming the herbs influenced the gastric acid secretion. The pH was also elevated towards the primary side, which suggests there is a significant activity by neutralizing the gastric acid. The herbal tablet showed a better activity at 400mg/kg, which is significant when compared to the marketed formulation and the standard synthetic drug too [Table 1].

The ulcer causative mechanism of ethanol is it produces the free radicals that cause the membrane

Table 1: Ayurvedic polyherbal tablet

Sl no.	Material	Quantity
1	Glycerrhiza glabra powder	100mg
2	Guava leaf powder	100mg
3	Ficus Microcarpa powder	100mg
4	Starch	50mg
5	Magnesium stearate	25mg
6	Talc	qs

Table 2: Effect of tablets on the gastric contents

Batches	Treatment groups	Ulcer Index-UI	%inhibition of ulcers	Gastric Volume-ml/g	Gastric juice pH
1	Saline 1.5ml	Not applicable	No ulcers	0.99± 0.015	4.16 ± 0.11
2	Ethanol 10ml	17.63± 8.52	No inhibition	8.74± 2.04	6.2± 0.93
3	Marketed ayurvedic for- mulation	12.45± 5.73	31.17	6.18± 0.96	7.34± 3.07
4	Tablet 200mg/kg	10.82 ± 6.64	49.83	5.35± 0.78	6.16± 0.98
5	Tablet 400mg/kg	8.16± 5.85	65.41	6.23± 1.02	7.42± 2.09
6	Omeprazole-20mg/kg	7.24±2.36	82.59	5.46±0.81	6.57±3.74

instability. The cell membrane of the gastric mucosa is disrupted, and the gastric mucosal ulcers are formed [10]. After formation, they are exposed to the gastric acid the ulcer formation was elevated [Table 2]. The herbal tablet that is prepared might have exhibited the antiulcer activity by acting against the free radicals, which was due to the antioxidant activity. There was an ulcer protection mechanism by preventing the direct contact of ulcer to the gastric acid. There was also some neutralization of the gastric acid that is seen due to the lowering of the pH.

CONCLUSION

An ayurvedic herbal tablet was prepared using the herbs and compressing into tablet form. The tablets were investigated for the antiulcer activity in two doses 200 and 400mg/kg in albino Wistar rats in the artificial ulcer those are induced by the ethanol. The prepared tablets showed a better activity compared to the standard synthetic drug and the marketed ayurvedic formulation. The tablets showed a dose-dependent activity in ulcer prevention and treatment.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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