

ANTI INFLAMMATORY ACTIVITY OF A NOVEL HERBAL COMBINATION

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ABSTRACT

A traditional herbal formulation containing *Colchicum luteum*, *Butea frondosa*, *Withania somnifera*, *Pyrethrum indicum*, *Myrtus caryophyllus*, *Zinziber officinalis* and *Allium cape* was evaluated for anti-inflammatory activity in Rat paw edema models in albino rats. The activity was compared with that of the control and Indomethacin (25mg/kg body weight). The results indicate that the formulation, given orally, in the dosage of 100 mg/kg body weight and 200mg/kg body weight possess potent anti-inflammatory activity ($P < 0.01$)

Keywords: Anti-inflammatory activity, Herbal formulation, Indomethacin, Carrageenan.

INTRODUCTION

Inflammation is a normal, protective response to tissue injury caused by physical trauma, noxious chemicals or microbiological agents. Inflammation is the body's effort to inactivate or destroy invading organisms, remove irritants and set the stage for tissue repair [1]. The cell damage associated with inflammation acts on cell membranes to cause leukocytes to release lysosomal enzymes; arachidonic acid is then liberated from precursor compounds and various eicosanoids are synthesized. The cyclo-oxygenase pathway of arachidonate metabolism produces prostaglandins, which produce a variety of effects on blood vessels, on nerve endings and on cells involved in inflammation [2]. Anti-inflammatory drugs have been evaluated by studying inflammatory responses produced in animals by injecting the foreign or noxious agents. The principle underlying the testing of anti-inflammatory activity is the reduction of the local oedema induced by injecting irritants, inflammatory substance.

The inflammatory process involves a series of events that can be elicited by numerous stimuli (e.g. infectious agents, ischemia, antigen-antibody interactions and thermal or other physical injury.) Each type of stimulus provokes a characteristic pattern of response that represents a relatively minor variation on a theme.

The complete process of inflammation contains of three phases,

- i) Dilatation and increased permeability of small blood vessels resulting in the formation oedema and swelling.
- ii) Emigration of leukocytes from venules and capillaries, cellular infiltration and a general mopping up reaction.
- iii) Proliferation of fibroblasts and synthesis of new connective tissue to repair the injury.

A number of mediators have been identified which initiate the early development (first phase) of certain experimentally induced inflammatory processes [3-6].

In the present study a traditional herbal formulation containing *Colchicum luteum*, *Butea frondosa*, *Withania somnifera*, *Pyrethrum indicum*, *Myrtus caryophyllus*, *Zinziber officinalis* and *Allium cape* was which is claimed to have the potential to treat wounds, burns, fistula, inflammation etc was selected for the evaluation of anti-inflammatory activity in carrageenan induced Rat paw Edema in Albino rats.

MATERIALS AND METHOD

The formulation was obtained as gift sample from a Ayurvedic Practitioner Dr. Syed Zahed, Dabeerpura, Hyderabad, Andhra Pradesh and used as such.

Materials

Albino rats of Wistar strain (180-200 g), Plethysmograph, Standard drug Indomethacin obtained as gift sample from KBN Chemicals and Pharmaceuticals, Gulbarga, Tween-80 solution (0.1%), Carrageenan (0.1%).

Method

Acute toxicity study

The animals were fasted overnight prior to the experimental procedure. The up and down or 'Staircase' method [6] was adopted and accordingly two doses of 100mg/Kg body weight and 200 mg/Kg body weight were selected for the assessment of Anti-inflammatory activity.

Rat paw edema method is based on plethysmograph measurement of carrageenan-induced acute rat paw edema produced by sub plantar injection of carrageenan in hind paw of the rat.

Evaluation of anti-inflammatory activity

Rat paw edema method

For this study, albino rats of either sex weighing between 180-200 g were used and divided into different groups of six animals each. The group I served as control and received Tween-80 (0.1 %, 1 ml) solution orally. The group II received indomethacin at a dose of 25 mg Kg⁻¹ body weight served as standard. Remaining groups received herbal formulation at 100 and 200 mg Kg⁻¹ body weight. [7,8]

Statistical analysis

The data is expressed as mean \pm S.E and subjected to students 't' test and the level of significance was set at $p < 0.01$.

RESULTS AND DISCUSSION

The results of anti-inflammatory activity of herbal formulation obtained by paw edema method are as shown in **Table-1**.

Table 1: Anti-inflammatory activity of herbal formulation on carrageenan induced rat hind paw edema.

Group	No. of Animals	Dose mg/kg	Paw edema percent protection (Hr.) \pm S.E.M			
			½ Hr	1 Hr	2 Hr	4 Hr
Control	06	1 ml(1% Tween 80)	0.182 \pm 0.14	0.283 \pm 0.03	0.388 \pm 0.16	0.48 \pm 0.04
Standard (Indomethacin)	06	25	36.12 \pm 0.02	50.05 \pm 0.01	72.31 \pm 0.01	55.49 \pm 0.03
Formulation	06	100	29.11 \pm 0.34	44.40 \pm 0.26	62.50 \pm 0.03	41.04 \pm 0.05
Formulation	06	200	38.32 \pm 0.01	55.96 \pm 0.07	76.21 \pm 0.03	58.12 \pm 0.50

Formulation at a dose of 200 mg/ kg body weight (76.21 %, at 2 hrs) exhibited promising anti-inflammatory effect at 2hr. Similarly formulation at a dose of 100 mg / kg body weight (62.50% at 2 hrs) exhibited moderate anti-inflammatory effect compared to standard indomethacin (72.31%).

The anti-inflammatory effect of formulation is due to inhibition of either vascular event or cellular events or due to both in experimental rats. The effect of this formulation may be due to inhibiting either of the any chemical mediators or due to any one of enzymes involved in the process of inflammation in the experimental rats. The moderate formulation may be due to the inhibition of any of chemical mediators involved in the process of inflammation.

CONCLUSION

In conclusion, simple and convenient methods of the formulation for anti-inflammatory were demonstrated. Formulation at a dose of 200 mg/kg body weight was found to be most potent anti-inflammatory formulation. The study suggests that the formulation under study has potential anti inflammatory effect and can be explored for further phytochemical studies.

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