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TOPICAL ANTI-INFLAMMATORY ACTIVITY OF PINDA THAILAM, A HERBAL GEL FORMULATION

K.Periyanayagam, T. Venkatarathnakumar, A. Nagaveni, V.G.Subitha, P.Sundari, M. Vaijorohini, V.Umamaheswari.
Department of Pharmacognosy, Madurai Medical College, Madurai

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ABSTRACT

The present study aims to evaluate the topical anti-inflammatory activity of "Pinda thailam", a herbal gel formulation containing aqueous extract of roots of Rubia cordifolia (Rubiaceae) and Hemidesmus indicus (Asclepiadaceae) which are known for their anti-inflammatory activity using the technique of carrageenin induced paw oedema in albino rats. The herbal gel formulation showed significant anti-inflammatory activity comparable to the reference standard Diclofenac sodium gel.

INTRODUCTION

Inflammatory diseases including different types of rheumatic problems are very common throughout the world. Several indigenous drugs have been described in Ayurveda for the management of inflammatory diseases [(1).] Combinations of pharmacological active principles in different plant families and species often exhibit remarkable potency and tolerance, particularly in the long term treatment of chronic disorders, like rheumatic diseases[(2).]

Pinda thailam is one of the ayurvedic formulations used as topical anti-inflammatory agent in humans [(3).] It contains aqueous extract of roots of *Hemidesmus indicus* [(4)] and *Rubia cordifolia* [(5) (6)] as important active constituents. These two plants are found to possess antinflammatory activity. Keeping this in view, we planned to bring it our as semisolid external preparation (Pinda thailam) and to screen its efficacy for topical anti – inflammatory activity.

Moreover literature survey revealed that there is no scientific validation for this activity. So, an attempt was made to screen the aqueous extract of the roots of *Hemidesmus indicus* and *Rubia cordifolia* for topical anti-inflammatory activity after incorporating them in a gel base.

KEY WORDS

Carrageenin, Pinda thailam, Herbal gel formulation, *Rubia cordifolia, Hemidesmus indicus.*

MATERIALS

(i) Plant Material

The plant *Hemidesmus indicus* was collected in and around Azhagar kovil, Madurai district, the plant *Rubia cordifolia* was collected in the place Oothu in Kodailkanal, Dindigul district and they were authenticated by Dr. D. Stephen, Department of Botany, American College, Madurai. The roots were thoroughly

washed, shadow dried and size reduced into coarse powder.

(ii) Drug

1. Diclofenac sodium gel. (1.16%)
2. Herbal gel formulation (Pinda thailam as per Ayurveda) containing roots of H. indicus and R. cordifolia at 2% and 4% concentration
3. Carrageenin (1% w/v)

(iii) Animals

Albino rats of either sex weighing between 120-150gm.

METHODS

Preparation of gel base

Carbomer 934[7] (5g) was mixed in 100ml of distilled water at room temperature. By constant stirring, acidic and colloidal solution of low viscosity was obtained. Then the solution was neutralized by adding 5% Sodium hydroxide solution with constant stirring in the PH between 5.5-6. A Viscous smooth gel base was obtained.

Preparation of herbal gel formulation (Pinda thailam)

The aqueous extract of equal parts of roots of *Hemidesmus indicus*, *Rubia cordifolia* were mixed and the combined extracts were mixed in carbomer gel base. They were prepared in two concentrations namely Pinda thailm 2% and 4% w/w.

TOPICAL ANTI-INFLAMMATORY ACTIVITY STUDIES

Albino rats weighing between 120 -150gm were selected for the present study. The anti- inflammatory activity was studied by carrageenin induced rat hind paw oedema method [8] [9].

The rats were divided into 4 groups, each consisting of 6 animals. First group served as control (received carbomer gel alone topically, the second group served as positive control (received Diclofenac sodium gel) while the other groups IIII & IV) received Pinda thailam in different doses of 2% and 4% topically.

The paw volume was measured at 0 hour and 3rd hour after the injection of carrageenin (0.1 ml in right hind paw) using Plethysmograph. The test drugs were applied topically 30 minutes after the carrageenin injection.

The percentage inhibition of oedema was calculated by using the formula,

Percentage inhibition of oedema = $(1-V_t/Vc)$ x100
Where,
V_t=Mean volume of paw oedema in drug treated group.
V_c = Mean volume of paw oedema in control group.

The result is shown in the Table 1 and Figure 1.

STATISTICAL ANALYSIS

All the data obtained were subjected to students t-test. The results obtained were statistically significant at $P<0.001$. Values obtained are expressed as Mean ± S.E.M.[10]

RESULTS & DISCUSSION

Oedema suppressant effect of Pinda thailam at 2% concentration showed equipotent percentage inhibition as that of Diclofenac sodium (76.08% and 76.1% respectively).

At 4% concentration, the percentage inhibition (82.15%) was found to be superior when compared with the reference standard Diclofenac sodium gel, Finally, at two different concentrations, the Pinda thailam gel showed significant anti-inflammatory activity.

Oedema induced by carrageenin is inhibited by majority of the established anti-inflammatory agents. Moreover, the lesions produced by carrageenin are said to resemble histologically, to those of rheumatoid arthritis in human to a certain extent. These observations have lent support to the use of carrageenin as the prime Oedemogen. Carrageenin induced paw oedema which was taken as a prototype of exudative phase of inflammation development of oedema has been described as biphasic. The initial phase in attributed to the release of histamine, serotonin and kinins in the first hour after injection of carrageenin is more pronounced. Second phase is related to the release of prostaglandin like substances in 2-3 hours (11, 12).

The results obtained indicates that Diclofenac sodium, the standard NSAID used in this study have exhibited significant anti-inflammatory activity. The herbal gel formulation "Pinda thailam" shown promising anti-inflammatory activity in comparison with Diclofenac sodium.

Further Dermatological study should be carried out in animal models, to prove a toxic free topical anti-inflammatory agent.

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Table 1. Topical anti-inflammatory activity of Pinda thailam on carrageenin induced paw oedema in albino rats.

Group No	Drugs	Mean paw Volume (Mean ± S.E.M)		Mean difference 3rd hour	Percentage of inhibition 3rd hour
		Initial	3rd hr		
I	Control (Carbomer -934 (5%)	0.012 ±0.0017	0.04±0.0026	0.0280±0.0030	-
II	Standard (Diclofenac sodium gel 1.26%)	0.013±0.0052	0.017±0.0021	0.0067±0.0021	76.1%*
II	Pinda thailam (2%)	0.015±0.0022	0.018±0.0031	0.0067±0.0033	76.08%*
IV	Pinda thailam (4%)	0.015±0.0022	0.02±0.0026	0.0050±0.0033	82.15%*

No.of rat=6 per group, tabular value represents Mean ± S.E.M.
*P<0.001 Comparison of I with III, IV)

Figure 1. Bar diagram showing topical anti-inflammatory activity of standard drug (Diclofenac sodium) and test compound (Pinda thailam 2% and 4%) in the carrageenin induced oedema in rats hind paw [Mercury Plethysmograph Method]