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Research article

Evaluation of Anti-Inflammatory & Analgesic Properties of Siddha Classical Medicine *Pavattai illai kudineer*

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ABSTRACT

The Siddha system is ancient medicine. It cures many acute and chronic disease. Most of the synthetic drugs used as analgesic and anti-inflammatory agents cause many side effects and toxic effects. The plant Paveta indica is reported to be used as a Anti inflammatory, Analgesic, Anti spasmodic &Astringent agent.

The aim of the present study was to evaluate the analgesic and anti-inflammatory activity of *Pavattai illai kudineer* (Paveta indica) in animal model. The analgesic and anti-inflammatory activities evaluation were done by Eddy's Hotplate method and by carrageenan induced acute hind paw oedema method on Wister albino rats, respectively.

Group III and IV received 200 mg/kg and 400 mg/kg of dose was selected to study both activities. Wister albino rats and albino mice are used for this study.. 0.1ml of 1.0% carrageenan in normal saline (0.9% w/v NaCl) was injected to the sub plantar region of right hind paw. The standard drug for Anti inflammatory and Analgesic activity are Indo methocin (10 mg/kg)& pentazocin (5 mg/kg) respectively. The ethanolic - extract of the plant significant. ($p < 0.01$) .Therefore, it can be inferred that the inhibitory drug 200 /kg was found to exhibit higher analgesic activity. Effect of the extract on the carrageenan induced inflammation could be due to the inhibition of enzyme cyclooxygenase leading to inhibition of prostaglandin synthesis.

Keywords:

Analgesic, Anti inflammatory, *Pavattai* ,Siddha drug .

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INTRODUCTION

In India treating specific ailments by the use of the different parts of many medicinal plants has been vague from ancient traditional system of medicine like siddha medicines. Inflammation is a local response of living mammalian tissues to injury. It is a body defense reaction in order to eliminate or limit the spread of injurious agent such as heat, chemicals and immunological reactions. There are various components of an inflammatory reaction that can contribute to the associated symptoms and tissue injury .Oedema formation, leukocyte infiltration and granuloma formation represent such components of inflammation. Many Non steroidal anti-inflammatory drugs (NSAIDS) are available in the market. These anti-inflammatory drugs are associated with some side effects when using it for a long time. Therefore, the development of potent herb based Anti-inflammatory &Analgesic, drugs are necessary.

Hence the present study was undertaken to evaluate the therapeutic efficacy of Paveta indica in the treatment of Lumbar Spondylosis.

MATERIALS AND METHODS

Plant collection & Authentication:

The Pavvatai was collected from in and around areas of Palayamkottai and tirunelveli, Tamilnadu. After collection the plant was identified and authenticated by the Medicinal botanist experts at Government Siddha Medical College and hospital, Palayamkottai.

Preparation

The trial drug was purified ,dried and grinded into fine powder. *Pavattai illai* was prepared by the method described in *Gunapadam muligaivaguppu (Murugesa Muthaliyar* 2008),Pg no 218,

Animals

Young mice of either sex aged 4-5 weeks, average weight 20-25 gm were used for the experiment. Albino mice (No.20) and Wister rats (No.24) either sex were obtained from the animal house of department of pharmacology, Kalasalingam University, Sivakasi. The mice were purchased from the animal nagerkovil. They were kept in standard environmental condition (at 24.0±0°C temperature & 55-65% relative humidity and 12 hour light/12 hour dark cycle) for one week for acclimation after their purchase and fed ICDDRB formulated rodent food and water ad libitum. The set of rules followed for animal experiment were approved by the institutional animal ethical committee (Zimmermann, 1983).

Evaluation of Anti- inflammatory activity by Carrageenan induced rat paw oedema method:

Anti-inflammatory activity of *Pavattai illai kudineer* was evaluated by Carrageenan induced rat paw oedema method.The rats were divided into four groups containing six rats in each group. 0.1ml of 1.0% carrageenan in normal saline (0.9% w/v NaCl) was injected to the sub plantar region of right hind paw. The trial drug PIK was administered to the rats 1 hr

before carrageenan injection. Different groups were treated as follows:

Group I: Carrageenan (0.1 ml of 1.0% carrageenan/rat to the sub plantar region).

Group II: Carrageenan + Indomethacin (10 mg/kg b. w., p. o.)

Group II and IV: Carrageenan + CKC (200 mg/kg and 400 mg/kg b. w., p. o.respectively). The paw volume was measured initially and at 1, 2, 3 and 4 hr after carrageenan injection, using Plethysmograph, inflammation was calculated for comparison .

Evaluation of Analgesic activity by Eddy's Hot plate method:

The hot-plate method was employed to assess the analgesic activity. Experimental animals of either sex were randomly selected and divided into four groups designated as group-I, group-II, group-III and group-IV consisting of five mice in each group for control, positive control and test sample group respectively. Each group received a particular treatment i.e. control (1% Tween-80 solution in water, 10ml/kg, p.o.), positive control (pentazocin 5 mg/kg, p.o.) and the test sample (drug of 200 mg/kg, p.o.& 400 mg/kg, p.o. respectively). The animals were positioned on Eddy's hot plate kept at a temperature of 55±0.5 0C. A cut off period of 15 s (Franzottiet al., 2000) was observed to avoid damage to the paw. Reaction time was recorded when animals licked their fore or hind paws, or jumped prior to and 0, 30, 60 and 90 min after oral administration of the samples (Eddy et al., 1953; Kulkarni,1999; Tomaet al., 2003).

Statistical analysis :

The results of statistical analysis for animal experiment were expressed as mean ± SEM and were evaluated by ANOVA followed by Dunnet's multiple comparisons.

RESULTS

Table :I Anti inflammatory activity of Test drug

Group	Treatment	1hr	2hr	3hr	4hr	Percentage of Inhibition
group 1	Carragenan (1% w/v)	0.72	1.36	1.70	1.62	-
group 2	carragenan(1% w/v)+ indomethacin(10mg/kg)	0.21	0.53	0.32	0.23***	85.80
group 3	carragenan(1% w/v)+low dose(200mg/kg)	0.31	0.51	0.46	0.34***	79.01

group 4	carrageen(1% w/v)+high dose(400mg/kg)	0.32	0.51	0.42	0.31***	80.86

*Values are mean ± SEM (n = 6) (Dunnett' test). *** p < 0.001 when comparedto c ontrol*

Figure 1. Percentage Inhibition of Anti-inflammatory activity of Test drug.

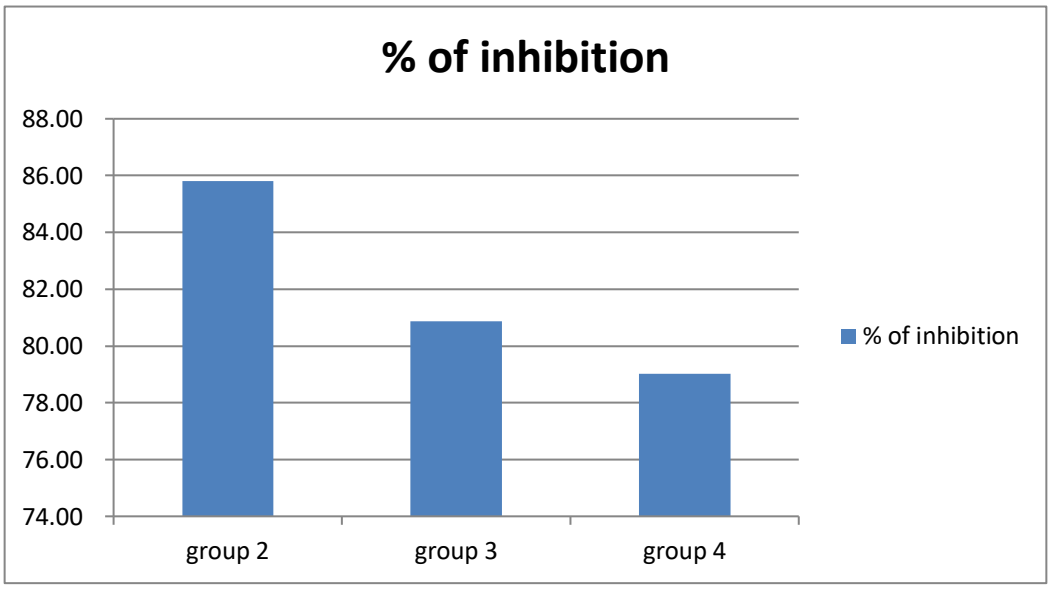

Figure no:2 Percentation inhibition of anti-inflammatory studies

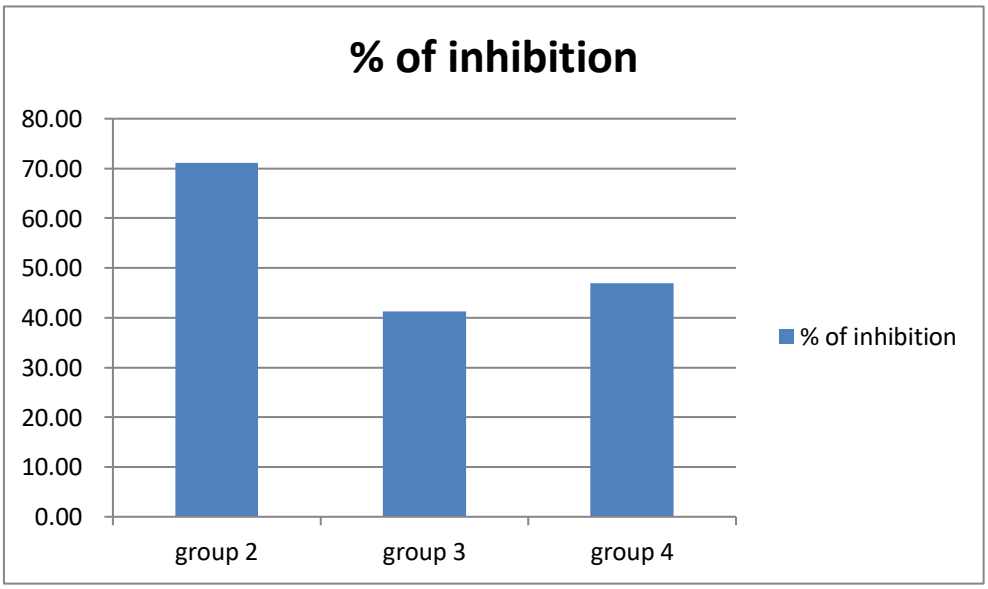

Table No.2 Analgesic activity of test drug.

Group	Dose	Mean latency before and after drug administration				% inhibition		
		0 min	30 min	60 min	90 min	30min	60min	90min
Group I	Vehicle	2.36 ±0.230	2.55±0.236	2.26±0.198	2.68±0.277	.	.	.
Group II	10	2.44±0.098	5.62±0.635	7.87±0.655	11.77±1.008	54.626	71.283	77.230
GROUP III	200	2.31±0.084	3.37±0.285	5.29±0.786	5.27±0.817	24.332	57.278	49.146
Group IV	400	2.27±0.018	3.67±0.872	6.44±0.524	5.93±0.475	56.998	61.889	54.806

Values expressed in mean ±SEM and units in seconds, Significant *p<0.05, **P<0.01 (n=6)

Results of hotplate test are presented in Table for drugs respectively. The drug were found to exhibit a dose dependent increase in latency time when compared with control. At 90 minutes, the percent inhibition of two different doses (100 and 200 mg/kg body weight) was 49.14% & 54.80% respectively.

The results of the effect of *PIK* on pain induced by hot plate method are given in Table 2. As pentazocine, *PIK* 200 and *PIK* 400 significantly increased percentage of reaction time with dose dependent response.

The hot plate test is commonly used to test central-mediated anti-nociceptive effects and analgesic effect. The cyclooxygenase pathway promotes inflammatory pain via conversion of AA to PGE2 by COX-2, an important inflammatory mediator . In this study, PIK at the dose of 2000 and 400 mg/kg significantly increased latency time (during about 60 min in hot plate test).

The drug of both the doses showed significant analgesic action compared to the reference drug Pentazocin but drug 400 /kg was found to exhibit higher analgesic activity. Results showed *PIK* has significant analgesic, properties. The PIK showed dose dependant analgesic activity and anti inflammatory actions. This study results confirmed the validity of traditional indications of *PIK* in pain conditions.

DISCUSSION

In the present investigation anti-inflammatory activity of ethanolic extracts *of Pavattai illai kudineer* was studied by using inhibition of carrageenan induced

inflammation.Oedema formation in rat paw is a biphasic response. The first phase is mediated through the release of histamine,serotonin, whereas the second phase is due to the release of prostaglandin and slow reacting substances. The ethanolic extract of *Pavattai illai kudinner* significantly reduced the paw oedema. In the experiment the suppression of inflammation may be due to PG and kinin synthesis or release inhibition and antihistamine activities. The hot plate test is commonly used to test central-mediated anti-nociceptive effects and analgesic effect. The cyclooxygenase pathway promotes inflammatory pain via conversion ofAA to PGE2 by COX-2, an important inflammatory mediator . In this study, CKC at the dose of 100 and 200 mg/kg significantly increased latency time (during about 60 min in hot plate test).The drug of both the plants doses showed significant analgesic action compared to the reference drug Pentazocin but drug 200 /kg was found to exhibit higher analgesic activity.

CONCLUSION

In conclusion, results showed the ethanolic extract of *Pavattai illai kudineer* has significant Analgesic& Anti-inflammatory Activities. The *PIK* showed dose dependant analgesic activity.The presence of Flavonoids, eugenol, alkaloids, tannin, phenolic compounds, glycoside in the ethonolic extract *Pavattai illai kudineer* under the study may be responsible these activities.This study results confirmed the validity of traditional indications of *Pavattai illai kudineer* in pain conditions.

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