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Research Article

ANTI-HISTAMINIC ACTIVITY OF *UTHAMANI CHOORANAM* (*PERGULARIA DAEMIA)* AGAINST HISTAMINE INDUCED PAW OEDEMA IN RATS

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ABSTRACT

Atopic dermatitis (AD) is a chronic relapsing, pruritic, inflammatory skin disease in children associated with personal or family history of other atopic disease like asthma, allergic rhinitis. Clinically characterized by itching, dryness, erythema, vesiculation, exudation and lichenification etc. The present treatment for AD in modern science is steroids or calcinueurin inhibitors. But repeated course of steroids can cause immuno suppression and growth retardation. The drugs in Siddha system of medicine is well known for their effectiveness and less toxicity. One such medicine is *Uthamani Chooranam* (UC) indicated for AD. The activity of UC was studied by using histamine induced paw oedema in rats by phenylbutazone. Exposure of rats hind paw to histamine resulted in marked increase of paw tissue weight and skin thickness. After oral administration of UC at various dose levels of 200mg/kg and 400mg/ kg reduce the paw volume when compared to control group. The present studies shown the Siddha drug UC is significantly reduce the paw oedema and this study supports the anti-histamine effect of UC.

KEYWORDS: Atopic dermatitis (AD), *Uthamani chooranam* (UC), Anti- Histaminic activity, Phenylbutazone.

INTRODUCTION

Atopic dermatitis (AD) often called eczema is a chronic, highly pruritic inflammatory skin disease, and is one of the most common skin disorder in children. Clinically characterized by dry, itchy, scaly skin, cracks, rashes on cheeks, arm, legs, weeping, crusting, and lichenification [1]. The prevalence of AD has increased over the past 30 years. It is currently estimated that 10-20% of children and 1-3% of adults in developed countries are affected by the disorder. AD often starts in early infancy approximately 45% of all cases begin within the first 6 months of life, 60% during the first year, and 85% before 5 years of age. Up to 70% of these children outgrow the disorder before adolescence. Children with AD are at high risk of developing asthma and allergic rhinitis. The pathogenesis of AD is multi factorial, the following factors like genetics, skin barrier dysfunction, impaired immune response, environment, are thought to play varying roles in AD [2].

The potential AD triggers are classified into three factors, they are associated with direct contact are toiletries containing alcohol, soaps, abrasive clothing. Associated with emotional stressors, infection, overheating/sweating, psychological stress. Associated with food are allergens found in cow's milk, eggs, peanuts, tree nuts, soy, wheat, fish [3].

The clinical features of AD correlates with the symptoms of *Balakarappan* described in the Siddha text *Balavagadam*. In Siddha literature *Bala karappan* is one of the eighteen types of *"Karappan noi"* that occurs in children. This skin disease was described by various Siddhars in detail about the general etiology, signs & symptoms and prognosis on the basis of three *Thosha* and *Envagai thervugal,* one of the causes of *Karappan* was consumption of non-vegetarian foods, intake of maize, pearl millet, foxtail millet, little millet and certain tuberous root [4].

AD can be usually controlled with corticosteroids, topical immuno modulators, moisturizers, topical calcineurin inhibitors, anti-histamines, and oral cyclosporines. It can produce adverse effects like skin thinning, possible hypothalamo pituitary-adrenal axis suppression, growth retardation in children and malignancies are caused due to prolonged use of immuno modulators [5]. Because of their side effects a newer effective drug with lesser side effects is necessary. In Siddha system of medicine many herbal drugs are non toxic, low cast, easily available, with their effectiveness in the treatment of AD mentioned in various Siddha literature. One of such medicine was *Uthamani chooranam* mentioned in the siddha text *Koshayi Anuboga Vaidhya Bremma Ragasiyam* [6].

The drug *Uthamani chooranam* is containing whole plant of *Pergularia daemia* which possesses alkaloids, glycosides, steroids, flavanoids, cardenolides, saponin, tannin, phenolic compounds, terpenoids [7]. Hence in the present study an effort has been made to evaluate the Anti histaminic activity of *Uthamani Chooranam* in Histamine induced Hind paw oedema in rats**.**

MATERIALS AND METHODS

The *Uthamani chooranam* contains the whole plant of *Pergularia daemia* is known as *"Veliparuthi"* belongs to the family Asclepediaceae. The plant material was collected from the fertile area of Arakkonam, Vellore district, Tamilnadu, India. The plant was identified and authenticated by the pharmacology experts of post graduate department of *Gunapadam*. Govt. Siddha Medical College, Arumbakkam, Chennai. Plants of *Pergularia daemia* were air dried under shade, powdered with a mechanical grinder, filtered in fine cloth then the fine powder made into *Chooranam*. This powder was sieved through a clean white cloth and further purified by *Pittaviyal method* (steam boiling with milk) based on Siddha classical literature[8].

The *Chooranam* was moistened with cow's milk and made into a solid form. Then it is kept in a clean cloth which is tied to the mouth of a mud vessel containing equal amount of cow's milk and water. Then it is finally covered over with a top vessel and their junction is covered with a cloth, so that vapor does not escape while boiling. After boiling and complete evaporation of liquid, the solid mixture is taken and dried in sunlight and grinded finally and stored in an air tight container kept at room temperature. This *Chooranam* was labeled as UC and used for the present study.

Figure 1: Whole plant of *Pergularia daemia*

Figure 2: Final drug -*Uthamani chooranam*

Preparation of stock solution

The suspension of Siddha drug UC in 2% (W/V) CMC (Chemistry manufacturing

control) was prepared for oral administration by gastric intubation in rats.

Animals

Swiss albino rats of female sex weighing about 230-250 gm were obtained from the animal house of King Institute of Preventive Medicine, Guindy, Chennai. The animals were acclimated to standard laboratory condition (temperature – 24 to 28°C and humidity 60- 70%) and maintained on 12 hr light/ dark cycle. The animals were housed in polypropylene cages at C.L. Baid Metha College of Pharmacology, Thoraipakkam, Chennai, and fed with standard rodent pellet obtained and water ad libitum. The present study was approved by the institutional animal ethical committee (IAEC) with the approval number: IAEC/XXXIX/12/CLBMCP/2013/ dated 29.6.2013.

Acute toxicity studies

The acute oral toxicity study was carried out as per OECD guidelines 423. One tenth of the median lethal dose was taken as an effective dose[9].

Evaluation of the Anti histaminic activity

Histamine induced paw oedema in rats

Exposure of rat's hind paw to histamine resulted in a marked increase of paw tissue weight and skin thickness. Single intra plantar injection of 0.1 ml of 1% of histamine will produce significant increase in paw volume. The change in hind paw volume was measured using plethysmometer and expressed as mean paw volume of left hind paw of the rats. After the induction of paw oedema, the increase in paw volume was calculated at a fixed interval of 0, 60, 120, 240 and 180 mints. The change in paw volume was measured as the difference between the final and initial paw volume. Standard Phenylbutazone (100 mg/kg) were used as standard drug and administered as CMC suspension by oral route.

Animal Grouping

Group I- Negative control - single intra plantar injection of 0.1 ml of 1 % of histamine.

Group II- Histamine+ Low dose of test drug (200 mg/kg) p.o.

Group III- Histamine+ High dose of test drug(400 mg/kg) p.o

Group IV- Histamine + Standard Phenylbutazone (100 mg/kg) p.o

Table1: Estimation of Paw volume at different time intervals

Paw volume at different time intervals (ml) (mean ±SEM)					
Groups and Drugs	**0 min**	**60 min**	**120 min**	**180 min**	**240 min**
Histamine	0.266± 0.05	0.761± 0.02	0.882± 0.01	0.954± 0.05	1.181±0.08
Histamine + Low dose of Test Drug	0.27± 0.01	0.561± 0.03	0.746± 0.08	0.891± 0.09	1.033± 0.02
Histamine + High dose of Test Drug	0.252± 0.04	0.488± 0.02	0.624± 0.01	0.786± 0.03	0.824± 0.04
Histamine + Phenylbutazone	0.251± 0.05	0.287± 0.06	0.348± 0.01	0.372± 0.01	0.41± 0.02

Mean changes in paw volume using mercury Plethysmometer in rats n=6, values are expressed as mean ± SEM.* $P < 0.05$, significantly different from negative control (histamine only).

STATISTICAL ANALYSIS

The statistical analysis was carried by one way ANOVA (GRAPH PAD PRISM 5 computer program). Results are expressed as mean ± SEM. A statistical comparison was carried out using the Dunnets 't' multiple comparison test for comparing control and treatment group.

RESULTS AND DISCUSSION

Observation of results predicts that histamine induced group shows increased displacement value ranges from 0.26 to 1.18. Treatment with test drug at the dose of 200

mg/kg shown displacement of value ranges from 0.27 to 1.03. Treatment with the dose of 400mg/kg shown displacement of value ranges from 0.25 to 0.82. Treatment with standard drug at the dose of 100mg/kg shown displacement of value ranges from 0.25 to 0.41. From the observation it was conclude that test drug at both the dose level significantly [p< 0.05] reduced the paw oedema induced by Histamine at plantar region.

Histamine is one of the inflammogens that contributes to acute inflammation and increase of vascular permeability. It is reported earlier that the drug phenylbutazone has the capacity to reduce the histamine concentration by decreasing the vascular permeability [10]. The present study document the ability of *Uthamani chooranam* (whole plant of *Pergularia daemia*) to suppress the histamine induced inflammation in rats compared with control group. The results show that *Uthamani chooranam* was able to suppress histamine induced paw oedema in rats.

CONCLUSION

The results of the present study demonstrate that the *Uthamani chooranam* has significant anti-histaminic activity by the suppression of increased vascular permeability, reflected in the decreased paw volume in rats. It has been concluded that the potent Anti-histaminic activity of *Uthamani chooranam* in rats and this results contribute towards the validation of the traditional use *Uthamani chooranam* in the treatment of Atopic Dermatitis.

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