International Journal of Reverse Pharmacology and Health Research (IJRPHR)

Research article

Evaluation of Anti-histaminic and anti-anaphylactic activity of ancient traditional Siddha drug *Palath Ennai*

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Abstract

Objectives

The objective of this study was to evaluate the invitro anti histaminic and anti anaphylactic potential of traditional drug- *Palath Ennai.*

Methodology

We studied scientifically Palath Ennai for its the active anaphylaxis and mast cell stabilization in rats, and histamine-induced bronchospasm in guinea pigs. Inbred Wistar rats (175–200 g) and guinea pigs (400–600g) of either sex housed in standard conditions (temperature22 ± 2° C, relative humidity 60 ± 5% and 12 h light/dark cycle) were used. They were fed with standard pellet diet andwater *ad libitum.* Bronchospasm was induced in guinea pigs by exposing them to 1% histamine aerosol under constant pressure (1 kg/cm2) in an aerosol chamber (24 × 14 × 24 cm) made of perplex Glass, of the three groups of six animals each.

Results

Mast cell stabilizing potential of PalathEnnai- Antigen challenge resulted in significant degranulation of the mesentric mast cells.Pre treatment of sensitized animals with PalathEnnaiat a dose of 15ml and 30ml/kg, p.o., for 2 weeks resulted in a significant reduction in the number of disrupted mast cells (P <0.001) when challenged with horse serum.

Conclusion

From the result of the present in-vitro study it was concluded that the test drug Palath Ennai possess considerable anti-histaminic and anti anaphylactic activity The study is the first step in the scientific validation of Palath Ennai for anti-histaminic and anti anaphylactic activity in use against allergic and asthmatic conditions.

Keywords

Siddha ,Anti allergic drug,Palath Ennai, Anti asthmatic drug.

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CODENJ : IJRPHR

To access this article online

Website : http://www.ijrphr.com/

DOI : 10.121/ijrphr/02.0203.339

Quick response code

How to cite this article:

Vaniswari DS, Arunachalam K, Evaluation of Anti-histaminic and anti-anaphylactic activity of ancient Traditional Siddha drug *Palath ennai*, International Journal of Reverse Pharmacology and Health Research, 2019, 2(2), 89.

Received: March, 2019.

Accepted: May, 2019.

INTRODUCTION

Allergy is one of the common diseases that affect mankind with diverse manifestations. The prevalence of allergic diseases has risen in the recent years despite an improvement in the general health of the population. Allergic diseases are responsible for significant morbidity and have severe economic impact. Various epidemiological studies have identified the causes for an increase in the prevalence of allergic diseases.

Some of the postulated reasons are increasing environmental pollution and increased predisposition of individuals producing excessive Ig E through a major change in the gene pool, changing lifestyles, and an increasing awareness of the disorders Intensive research during the last several decades has highlighted the role of lymphocytes, immunoglobulin's, mast cells, and various autacoids in the etiopathogenesis of allergic conditions. Inspite of the voluminous literature on the subject, the treatment of allergic diseases continues to be far from satisfactory.

The available treatment options for allergic diseases have major limitations owing to low efficacy, associated adverse events, and compliance issues. AYUSH, an Indian system of medicine, has described several drugs from indigenous plant sources for use in the treatment of allergic disorders. In the present study, the effect of siddha formulation *Palath Ennai* were studied on the active anaphylaxis and mast cell stabilization in rats, and histamine-induced bronchospasm in guinea pigs.

MATERIALS AND METHODS

Details regarding the sample

Palathu Ennai was mentioned in the traditional siddha text- *Agathiyar vaithiyarathina churukam*-360,1887 page no.42, poem 252,253. The ingredients of the sample drug include Citrus medica, Aloe vera, *Ricinus communis*-Castor oil, *Terminalia chebula* were purified and prepared as per siddha materia medical procedures.

Animals

Inbred Wistar rats (175–200 g) and guinea pigs (400–600g) of either sex housed in standard conditions (temperature22 ± 2° C, relative humidity 60 ± 5% and 12 h light/dark cycle) were used. They were fed with standard pellet diet and water ad libitum. The Institutional Animal Ethics Committee approved the experimental protocol. Histamine and horse serum were procured from Sigma Chemicals and toluidine blue from Loba-Chemie, Mumbai. Elisa kit for Ig E was supplied by Orion diagnostics, Espoc, Finland. All other chemicals and reagents were procured from Hi-Media Laboratories limited, Mumbai.

MAST CELL STABILIZING ACTIVITY.

Treatment protocol

Group I- Twenty-four rats were divided into Five groups of six animals in each group.

Group II- Served as control and received vehicle (water) (sensitized control group)

GroupIII- Served as the treatment control, which was treated with Palath-Ennai (medicated oil)at a dose of 15 ml/kg body weight, in oral route.

Group IV- Served as the treatment control, which was treated with-Palath Ennai at a dose of 30 ml/kg body weight, in oral route. In group11 to group 1V were sensitized by injecting 0.5 ml of horse serum subcutaneously along with 0.5 ml of triple antigen containing 20,000 million Bordetella pertussis organisms (Serum Institute of India Ltd., Pune), Once a day for 14 days.On day 14, the rats were sacrificed 2 h after the treatment and the intestinal mesentery was taken out for the study on mast cells. Mesenteries along with intestinal pieces were excised and kept in Ringer Locke solution (NaCl 154, KCl 5.6, CaCl2 2.2, NaHCO3 6.0, glucose 5.55 mM/L of distilled water) at 37oC. The mesenteric pieces were challenged with 5% horse serum for 10 min after which the mast cells were stained with 1.0% toluidine blue and examined microscopically for the number of intact and degranulated mast cells.

HISTAMINE –INDUCED BRONCHOSPASM INGUINEA PIGS

Bronchospasm was induced in guinea pigs by exposing them to 1% histamine aerosol under constant pressure (1 kg/cm2) in an aerosol chamber (24 × 14 × 24 cm) made of perplex Glass,of the three groups of six animals each. **Group I** served as control. **GroupII** served as the treatment control, which was treated with Palath Ennaiat a dose of 15 ml/kg body weight, in oral route.**Group III** served as the treatment control, which was treated with Palath Ennaiat a dose of 30 ml/kg body weight, in oral route.

The animals were exposed to 1% histamine aerosol under constant pressure (1 kg/cm2) in an aerosol chamber on day 0 without any treatment. The end point, pre-convulsive dyspnea (PCD) was determined from the time of aerosol exposure to the onset of dyspnea leading to the appearance of convulsions. As soon as PCD commenced, the animals were removed from the chamber and exposed to fresh air. This PCD was taken as day 0 value. On days 1 and 5,2 h after the administration of the drug, the time for the onset of PCD was recorded as on day 0.

STATISTICAL ANALYSIS

The results of various studies were expressed as mean ± SEM and analyzed statistically using one-way ANOVA, followed by Newmannkeul's multiple range tests. $P<0.05$ was considered statistically significant. The analysis was performed using Graphpad Prism software package (Version 4.0).

RESULTS

Mast cell stabilizing potential of Palath Ennai-Antigen challenge resulted in significant degranulation of the mesenteric mast cells. Pretreatment of sensitized animals with Palath Ennai at a dose of 15ml and 30ml/kg, p.o., for 2 weeks resulted in a significant reduction in the number of disrupted mast cells ($P <0.001$) when challenged with horse serum.

Effect on histamine-induced bronchospasm- Palath Ennai at a dose of 15ml and 30ml/kg p.o., significantly prolonged the latent period of PCD ($P <0.001$) as compared to control, following exposure to histamine aerosols on day 5 .

DISCUSSION

Experimental animal model of asthma is characterized by allergen induced immediate airway constriction and late airway reactivity to a pharmacological vasoconstrictor such as histamine and leukotrienes. Histamine is a central mediator in the pathogenesis of allergic and inflammatory disorders. In the present study, Palath Ennai prolonged the latent period of PCD in guinea pigs following histamine aerosol. This may be suggestive of an antihistaminic activity following treatment.

ISSN 2589 3343

Antigen challenge, in sensitized animals, results in the degranulation of mast cells, which is an important feature of anaphylaxis. In the present study, Palath Ennai showed marked protection against the mast cell degranulation following antigen challenge in sensitized animals. Mast cell stabilizing activity of Palath Ennai may be attributed to the presence of active constituents which are known for their mast cell stabilizing potential against antigen–antibody reaction and/or due to the suppression of Ig E antibody production, which is responsible for degranulation mast cells.

This anti-anaphylactic and antihistaminic effect may be caused by the stabilization of the mast cell membrane, suppression of IgE, and inhibition of pathological effects induced by the release of inflammatory mediators in Palath Ennai treated animals. All the above findings lend credence to the beneficial use of Palath Ennaiin the treatment of allergic conditions.

However, further studies with other experimental models, especially to explore the role of cytokines are warranted to substantiate the anti-asthmatic and anti-allergic activity of Palath Ennai

ACKNOWLEDGMENT

The authors are thankful to Sigma Chemicals and toluidine blue from Loba-Chemie, Mumbai. Orion diagnostics, Espoc, Finland and Hi-Media Laboratories limited, Mumbai for providing the facilities.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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