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Bronchodilator activity of Rajakesari Chooranam

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Abstract

Bronchial Asthma is the most common disabling syndrome. It is the most common allergic disease of human beings leading to more complication. Bronchial asthma is a chronic airway inflammatory disease is characterized by various airway obstruction. Airway inflammation and bronchial hyper responsiveness and is a global health problem that result from a complex interplay between genetic and environment factors. Nearly 7 – 10% (300 million) of the world.

population suffers from Bronchial Asthma. In siddha aspect there is a preparation called RAJAKESARI CHOORANAM which is especially indicated for Eraippu Noi (Bronchial Asthma) in Literature SARABENDRA VAITHIYA MURAIGAL for its easy availability of drugs which is exclusively indicated for Eraippu Noi (Bronchial Asthma) the ingredients of these formulation are easily available and affordable. The evidence in siddha literature strongly support its bronchodilator activity.

Keywords: Bronchial Asthma, RAJAKESARI CHOORANAM, bronchodilator activity.

Introduction

Siddha is a natural and holistic medical system that given important role of physical, mental, the cultural and the spiritual it has combined all these aspects and

diversitied in the form of aga marunthugal, pura marunthugal and natural remedy of yoga, pranayama, panchakarma, kalpa medicine, the humours, the 96 thathuvams and so on.

Materials and Methods

1. Athimathuram (<i>Glycyrriza glabra</i>)	-1/4palam [8.75gm]
2. Yelam (<i>Elletaria cardamomum</i>)	- 1/4palam [8.75gm]
3. Chukku (<i>Zingiber officinale</i>)	-1/4 palam [8.75gm]
4. Jaathikkai [<i>Myristica fragrans</i> , Houtt]	-3/4palam [26.25gm]
5. Lavangapattai (<i>Cinnamomum verum</i>)	-1/4palam [8.75gm]
6. Kirambu [<i>Syzygium aromaticum</i> , Linn]	-1/4palam [8.75gm]
7. Thippili (<i>Piper longum</i>)	-1/4palam [8.75gm]
8. Maasikkai (<i>Quercus infectoria</i>)	-1/4palam [8.75gm]
9. Perarathai (<i>Alpinia galanga</i>)	-1/4palam [8.75gm]
10. Vaalmilagu (<i>Piper cubeba</i>)	-1/4 palam[8.75gm]
11. Kasthuri (<i>Moschiferus musk</i>)	-1 varaagan [4.2gm]

INGREDIENTS OF RAJAKESARI CHOORANAM



Athimathuram



Kirambu



Saathikkai



Perarathai



Kasthuri



Lavangapattai

INGREDIENTS OF RAJAKESARI CHOORANAM



Thippli



Chukku



Maasikkai



Vaal milagu



Elam



Rajakesari Chooranam

1. Athimathuram:

Wash in pure water and remove the skin and cut into small pieces and dry it.

2. Lavangapattai:

Dry in the sunlight.

3. Vaalmilagu:

Remove the stalk then dry in the sunlight

4. Kasthuri:

Remove the hair particles

5. sukku:

Fry the dry ginger with limestone 1:2 ratio. After 9 hours wash it and dry then remove the external skin

6. Thippili:

Soak in 24 minutes in kodiveli leaf juice and dry in the sunlight.

7. Yelam:

Clean the dust and dry in the sunlight.

8. Maasikkai:

Fry in the cows ghee.

9. Jathikkai:

Remove the outer skin and it dried with sunlight.

10. Kirambu:

Remove the dust particles and dry in the sunlight.

11. Perarathai:

Remove the skin and dry in the sunlight.

Process of preparation

The purified drug has to be made into powder separately and mixed thoroughly and kept it in the air tight container.

Indication: kasam, swasam, kshayam (Respiratory disorders) .

Dosage : 1/2 Varagan(2.1gram)

Adjuvant : Honey, Piper Betle juice.

Pharmacological study

Effect of *Rajakesari chooranam* on bronchoalveolar Lavage in mice

Procedure

Albino mice of either sex were divided into six groups containing five animals each (n=5). All animals were sensitized by an intraperitoneal injection of 1ml alum precipitate antigen containing 20µg of ova albumin and 8mg of alum suspended in 0.9% of sodium chloride solution. A booster injection of this alum-albumin mixture was administered 7 days later. Non sensitized animal were injected with alum only (Group II). Seven days after (15 days) the second injection, animal was exposed to aerosolized oval albumin (1%) for 30 min. Animals belonging to groups I received orally on distilled water and Group IV, V, VI received orally on RC 0.226mg, 1.134mg and 56.7mg. Animals of group III, as positive control group received dexamethasone (0.27mg/kg p.o.) 5 hr before antigen challenge. The mice were sacrificed at the end of study (24hr after sensitization) and trachea catheter was inserted in trachea. Bronchoalveolar lavage fluid (BALF) was collected by lavaging the lung with two aliquots 5ml of 0.9% of sodium chloride solution. Total recovery volume per mice was approximately 5ml. Total leukocyte Eosinophils and Neutrophils were counted under microscope and histopathologic evaluation of lung tissue was carried out. [1]

1. Connett G. J., Warde C., Wooler E. And Lenney W. Arch Dis Childhood 1994; 70: 170- 173

Dosage Schedule:

The required dose for mice/rat will be calculated by using the standard dose calculation procedure from recommended clinical dose.

Conversion Formula:

Human dose is 2100mg, BD

Total clinical dose (a) x conversion factor

(b) 0.018 = (c) per 200 gm of rat

2100 mg x 2(a) x 0.018 (b) = 37.8

(c) /30gms of MICE

37.8/1000X30 = 1.134mg/kg

S.No	Groups	Dose /kg, weight	Dose /200 gms, weight	Volume of administration
1	Vehicle Control	-	-	0.5ml
2	Therapeutic Dose	1.134mg	0.026mg	0.5ml
3	Average Dose	5.67mg	1.13mg	0.5ml
4	High Dose	11.34mg	56.7mg	0.5ml

Experimental Doses Calculated as per the standard procedures

Experimental design

GROUP 1: CONTROL (Normal Saline)

GROUP 2: ONLY ALUM

GROUP 3: ONLY ALUM + Dexamethazone

GROUP 4: ONLY ALUM + R.C 0.226mg/kg

GROUP 5: ONLY ALUM + R.C 1.134 mg/kg

GROUP 6: ONLY ALUM + R.C 56.7 mg/kg

Results and Discussion

Pharmacological results

Bronchodilator result

Table Effect of Rajakesari Chooranam On Broncho-Alveolar Lavage In Mice

GPS	Eosinophils	Differential Leukocytes (x10 ⁶ /μl)	Differential Leukocytes (x10 ⁶ /μl)	Total Leukocytes (per cu.mm)
		Neutrophils	Monocytes	
(Normal) control	42.6667± 1.83787	3.93333± 0.276486	42± 1.46059	1138.67±1 3.2531
(allergic) only Alum	179.333± 5.67255***	15.4667± 0.256472***	61.3333± 2.56472***	1438.67± 17.7739***
Alum + dexamethazone	52.3333± 1.28236*	5.4± 0.0730297*	36.6667± 1.83787*	1024± 24.133**
Alum + R C.LOW DOSE	116.667± 1.83787***	7.66667± 0.787683***	49± 2.39444***	1087.33± 18.2623***
Alum + R C.MIDDLE DOSE	87.3333± 1.52023***	7.1± 0.0966092***	37± 1.09545***	903.333± 29.2878***
Alum + R C.HIGH DOSE	53.3333± 1.11555***	6.36667± 0.147573***	30.3333± 0.557773***	813.333± 30.4047***

Values are expressed as the mean ± S.D; Statistical significance (p) calculated by one way ANOVA followed by dunnett's ns- no significant *P < 0.001, **P < 0.01, ***P < 0.05 calculate by comparing treated group with CONTROL group.

Increased level of Leucocytes and eosinophils counts in our respiratory system play a vital role to induce bronchial hypersensitivity and produces airway inflammation in allergic and non-allergic asthma. The inflammatory reaction of bronchial walls in asthma is brought about increased level of bronchial eosinophils. It occupied in the later phase reaction of bronchial asthma. Subcutaneous administration of boiled and cooled milk into the Wister albino rats acts as antigen and produced allergic response in mice increase the total leucocyte and eosinophil count in 24

hour administration (Limbasiya KK. et al, 2012). During asthmatic inflammation leukocytes release the following inflammatory mediators are cytokines, histamine mainly and basic protein, which promote the endurance of inflammation [Brekman LI et al., 1969]. Eosinophils infiltrating the airway also have an effect on mucus secretion by epithelial goblet cells (Shimizu T et al., 2003). Eosinophils part in bronchial asthma was quite an active in the development of allergic airway inflammation (Elizabeth R. Walsh et al., 2010).

Eosinophil creates bronchoconstriction through the secretion of mediators such as eosinophil cationic protein, eosinophil-derived neurotoxin, and prostaglandin, which results in broncho constriction in respiratory tract (Limbasiya KK. et al, 2012).

In this study was observed that leukocytes count was decreased in rat treated with *RAJAKESARI CHOORANAM* at doses of 200mg/ kg significantly as compared to disease control group. Result suggests that *RAJAKESARI CHOORANAM* decreases milk induced leukocytes count in rat. And this study was observed that *RAJAKESARI CHOORANAM* at doses of 200mg/kg significantly decreased milk induced eosinophils count in rat. Eosinophils counts of disease control group was compared with *RAJAKESARI CHOORANAM* treated group results showed the drug reduces eosinophil counts in rat. Finally the test drug *RAJAKESARI CHOORANAM* treated group rat leucocytes and eosinophils count was considerably reduced. During bronchial asthma broncho construction is developed by inflammatory changes of the airways. If a drug reduces or prevents bronchial inflammation of airways bronchodilation happens. The effect of *RAJAKESARI CHOORANAM* on reducing bronchial inflammation through reducing the increased leucocytes and eosinophils counts in rat. Finally the *RAJAKESARI CHOORANAM* results represents reduce bronchial inflammation helps airways to dilate. *RAJAKESARI CHOORANAM* indirectly proves its broncho dilator activity in the management of asthma.

Interpretation

The test drug *RAJAKESARI CHOORANAM* has got significant Broncodilator Activity.

Conclusion


RAJAKESARI CHOORANAM was selected for the elaborate study of its efficacy on *Eraippu Noi* (Bronchial Asthma). Pharmacological analysis, It has been concluded that *RKC* has got a good Bronchodilator activity.

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