VOLUME 10 ISSUE 1 2019

*e ISSN 2350-0204*

# ijapc

*www.ijapc.com*

Greentree Group
Publishers

Int J Ayu Pharm Chem

RESEARCH ARTICLE

www.ijapc.com

e-ISSN 2350-0204

# Evaluation of *Shwasahara* Effect of *Karchura* (Curcuma *zedoaria* Rosc) with special reference to Bronchodilator Action

Vijay Kappathanwar[1], Roshi Mahajan[2*], Paramjeet Puri[3], Rekha Sharma[4] and Shipra Sharma[5]

[1]Dravya guna, Shri kalidas Ayurvedic Medical College, Karnataka, India

[2]Rog Nidaan, Govt. Ayurvedic Medical College, Jammu, J and k, India

[3]Dravyaguna, Govt. Ayurvedic Medical College, Jammu, J and k, India

[4]Samhita and Siddhanta, Govt . Ayurvedic Medical College, Jammu, J and K, India

[5]Prasooti and Stri Roga,Govt . Ayurvedic Medical College, Jammu, J and K, India.

## ABSTRACT

This ever vibrant science of life Ayurveda has bestowed us with innumerable number of herbs which have great potential in managing various types of ailments. The presently undertaken drug Karchura has been commonly used for the management of several diseases because of its significance for its various pharmacological activities. Ayurveda has given prime importance to *shwasa roga* as it exists both as an independent disease as well as symptom of other diseases. *Shwasa* may present as a troublesome disease which should be treated as early as possible. So in order to evaluate the effectiveness of Karchura in the management of shwasa an experimental study was planned. The experimental study was conducted on 24 guinea pigs which were divided into four groups. Standard histamine was used for bronchial constriction and standard antihistamine drug Chlorophenaramine was used to evaluate the Shwasahara (Bronchodilator) effect of Karchura. The efficacy of the drug was evaluated by the difference in change in pre-convulsion time before and after the drug administration. Upon comparing the results to standard antihistaminic drug, the test drug Karchura in its two different forms viz. Mula churna and Mula kashaya showed lesser percent of protection against histamine induced broncho constriction. Whereas on the other hand, Churna form of the test drug Karchura was more effective as compared to kashaya form.

## KEYWORDS

*Antihistaminic, Bronchial constriction, Pre-convulsion, Rasapanchaka, Shwasahara*

Greentree Group Publishers

Received 27/11/18 Accepted 27/12/18 Published 10/01/19

## INTRODUCTION

The utility of *Ayurvedic* science is to maintain the health of a healthy individual and to cure the diseases of the patients. There are many fatal diseases but they do not take away the life as quickly as *shwasa*. *Shwasa roga* is a disease of the *pranavaha srotas* caused due to predominant morbidity of *vata* and *kapha* afflicting the *rasa dhatu*[1]. The *Samhita* and *samgraha granthas* have given an elaborated description about the *nidana panchaka* of *shwasa roga*. The word *Shwasa* refers to the forceful respiration, producing audible sound, similar to the one produced during blowing of the air, with a blower by a blacksmith[2]. Of all the five types described by the *Acharyas*, *Tamaka shwasa* is said to be *yapyavyadhi*[3]. While describing the involvement of *doshas Acharyas* say that *Tamaka shwasa* has the predominance of *kapha dosha*[4,5]. *Pranavilomata* and *Sakapha Kasa* are the main features of the illness. In addition to this, running nose, sweating on the forehead, difficulty in breathing, comfort in sitting position than lying down, aggravation of the symptoms on exposure to factors that provoke *vata* and *kapha* [6] are the other features of the disease.

*Tamaka shwasa* described in *Ayurvedic texts* shows close resemblance to bronchial asthma on the basis of clinical manifestations. Bronchial Asthma is a reversible, chronic inflammatory disease of the airways characterized by recurrent episodes of wheezing, breathlessness, tightness of chest and cough particularly at night or early morning[7].

The word Asthma is derived from Greek word meaning 'breathless' or 'to breathe with open mouth[8]'. Bronchial asthma is a major chronic airway disorder; a serious health problem in developing as well as developed countries affecting about 10-12% of world population. In India prevalence of asthma has found to be around 6%[9]. Bronchodilators have been prescribed by medical practitioners to be part of management, but the use of these drugs may end up with many adverse reactions like- Nausea, vomiting, gastric irritation, metallic taste, destruction of gastric flora and anaphylactic reactions causing even death. It becomes our moral responsibility to seek out for an ideal remedy from the *Ayurvedic* literature of therapeutics. Our *acharyas* have listed many herbs which have *shwasahara* action. The *Shwasahara* drugs include respiratory tonics and naturally occurring bronchial dilators and immune modulators. Karchura (*Curcuma zedoaria. Rosc*) mentioned in *Ayurvedic* classics, is abundantly available and cost effective which may satisfy the need of present day situation by acting as

potent herbal bronchodilator. Karchura(*Curcuma zedoaria.Rosc*) is one such herbal drug, which acts as *shwasahara* as mentioned in classics[10]. With this perspective, the study is selected for the critical assessment of bronchodilator effect of Karchura (*Curcuma zedoaria. Rosc*) as an experimental study.

## OBJECTIVES

1. To evaluate the *shwasahara* effect of Karchura *mula churna* and Karchura *mula kashaya* in guinea pigs.
2. To compare *shwasahara* action (bronchodilation) of test drug (Karchura *mula churna* and Karchura *mula kashaya*) with negative control and standard treated groups.

## MATERIALS AND METHODS

a) **Preparation of the drug:** This chapter include identification, collection of raw drug, drying, powdering of Karchura.

b) **Experimental study:** This includes the comparative experimental study Karchura *mula kashaya* and Karchura *mula churna* on Guinea pigs w.s.r.to Bronchodilator action.

1. **Plan of the study:**

Four groups were formed as –

- Negative control group
- Standard drug group – CPM was administered as Standard drug.
- 2 Test groups –

a) Karchura *mula kashaya*

b) Karchura *mula churna*

2. **Experimental study**:

**I. Place of work**:

The study was conducted in Research center KLE's Pharmacy college, Gadag.

**II. Source of animals:**

The required number of healthy Guinea pigs of either sex were selected from Shri Venkateshwara enterprises, Bengaluru and maintained in the animal house in KLE's Pharmacy College, Gadag.

**III. Guinea pigs Maintenance:**

All the animals were maintained in the animal house in PG cum research center KLE's Pharmacy College, Gadag under identical conditions of place, light, temperature, food and other conditions.

**IV. Examination of the animals prior to the experiment:**

All the Guinea pigs were subjected to general check up for weight by using spring balance. The animals with abnormal behavior and ill health were excluded.

**V. Posology**

**Table 1** Predetermined filtered quantities of test drugs along with their forms and dose

| Drug | Form | Dose |
|---|---|---|
| Chlorophenaramine | Aqueous suspension | 2mg/kg orally. |
| Karchura *mula Kashaya* | Aqueous suspension | 4ml/kg orally. |
| Karchura *mula Churna* | Aqueous suspension | 450mg/kg orally. |

## I. Procedure:

Guinea pigs which develop typical asthma within 3 minutes of histamine exposure (i.e. pre convulsion time of less than 3 minutes) were selected 3 days prior to the day of experimental study. Thus 24 guinea pigs were selected and were placed in 4 groups. They were kept on fasting for 24 hours.

The guinea pigs were exposed to anatomized fine mist of 2% Histamine Dihydrochloride aerosol (dissolved in normal saline) using nebulizer at a pressure of 300 mm of Hg in the histamine chamber. Guinea pigs exposed to histamine aerosol showed progressive signs of difficulty in breathing leading to convulsions, asphyxia and death. The time until signs of convulsion appeared is called Pre Convulsion Time (PCT). As soon as PCT commences animals were removed from the histamine chamber and placed in fresh air to recover.

As per table 1 and 2 dose was given in the following groups as follows:

**Group 1**: 6 Guinea pigs were administered 5% gum acacia (equal volume as that of volume of administered drug in other groups) orally.

**Group 2**: 6 Guinea pigs were administered with CPM 2mg/kg orally.

**Group 3**: 6 Guinea pigs were administered trial drug (Karchura *mula kashaya*) 4ml/kg orally.

**Group 4**: 6 Guinea pigs were administered trial drug (Karchura *mula churna*) 450mg/kg orally.

**Table 2** Experimental protocol

| Groups | No. of Guinea pigs | Study | Duration |
|---|---|---|---|
| Control | 06 | Normal control | 04 days |
| Standard | 06 | Standard drug (CPM) | 04 days |
| Test 1 | 06 | Standard dose of Karchura *mula churna* | 04 days |
| Test 2 | 06 | Standard dose of Karchura *mula Kashaya* | 04 days |

## VI. Method of evaluation:

The pre-convulsion time before and after the drug administration was noted and the difference i.e. the rise in the pre convulsion time after administration of the drug indicates the efficacy of the drug.

In the present experiment the criterion used was time for onset of dyspnoea (PCT) and % protection was calculated for all group animals. Animals which did not develop typical asthma within 6 minutes were taken as protected.

# RESULTS

The results of the present study are based on the preconvulsive time i.e. the preconvulsive time (PCT) was determined from the time of exposure to onset of dyspnea leading to the appearance of preconvulsive dyspnea in a minute. The

percentage of protection offered by drugs in PCT was calculated for each dose and positive control. All values are expressed as Mean ± SEM of a sample size of no = 6 level of significances chosen was * P < 0.001. All treated groups were compared with control group.

**Table 3** Effect of the test drug on histamine induced Bronchoconstriction

| Group | Drug and Dose (P.O.) | Pre convulsive Time | | % of protection |
|---|---|---|---|---|
| | | PCT Before Treatment | PCT After Treatment | |
| 1. Control | 2% Acacia 1ml/kg | 2.200+/0.2769 | 2.467+/-0.2525 | |
| 2. Standard | CPM 2mg/kg | 2.833+/-0.3685 | 9.997+0.6696 | 75.32% |
| 3. Decoction | Karchura *mula Kashaya* 4ml/kg | 2.203+0.2812 | 5.410+0.7216 | 54.39% |
| 4. Powder | Karchura *mula Churna* 450mg/kg | 2.150+0.2078 | 6.022+0.4376 | 59.03% |

**Analysis of experimental result:**

After the treatment there was an improvement in the pre convulsion time of all the samples, the dose of the samples standard, Karchura *mula kashaya* and Karchura *mula churna* were 2 mg/kg, 4ml/kg and 450mg/kg respectively. The average pre convulsion time of standard group before treatment was 2.833±0.3685 and it increased to 9.997±0.6696 after treatment showing significant improvement and showed 75.32% of protection i.e. bronchodilatation. The average pre convulsion time of test drug Karchura *mula kashaya* before treatment was 2.203±0.2812 and it increased to 5.410±0.7216 after treatment showing significant improvement and showed 54.39% of protection i.e. bronchodilatation and the average pre convulsion time of Karchura *mula churna* before treatment was 2.150±0.2078 and it increased to 6.022±0.4376 after treatment showing significant improvement and showed 59.03% of protection i.e. bronchodilatation. A Comparison of p values in pre convulsion time between the same group has been shown in the table 4, 5, 6.

**Table 4** Group 02

| Standard group – CPM | No. Of animals | Mean | SEM | SD |
|---|---|---|---|---|
| Before treatment | 06 | 2.8367 | 0.3697 | 0.9056 |
| After treatment | 06 | 9.9967 | 0.6696 | 1.6402 |

**Table 05** Group 03

| Kashaya | No. Of animals | Mean | SEM | SD |
|---|---|---|---|---|
| Before treatment | 06 | 2.2033 | 0.2812 | 0.6888 |
| After treatment | 06 | 5.410 | 0.7216 | 1.7676 |

**Table 06** Group 04

| Churna | No. Of animals | Mean | SEM | SD |
|---|---|---|---|---|
| Before treatment | 06 | 2.150 | 0.2078 | 0.5089 |
| After treatment | 06 | 6.0217 | 0.4376 | 1.0720 |

The percentage of protection is more in churna as compared to that of *kashaya*, so *churna* is more significant statistically. Standard drug Karchura *mula churna* were extremely statistically significant whereas Karchura mula *kashaya* was statistically significant.

## DISCUSSION

This experimental study entitled "Evaluation of *Shwasahara* effect of Karchura (*Curcuma zedoaria Rosc*) with special reference to bronchodilator action" was aimed at an effective cure for bronchial asthma. Karchura was selected for this study based on references available in Charaka, Bhavaprakasha and Kaiyadeva *Nighantu*. Guinea pigs were considered to be suitable model for the present study as they have more susceptible respiratory system compared to other animals.

According to *Ayurvedic* literature, *Tamaka Shwasa* is caused by the imbalance of *Vata* and *Kapha* doshas. The vitiated doshas afflict *Rasa dhatu*, involving *Pranavaha srotas* and produces the illness. The vitiated *doshas*, stemming out from the *Pitta sthana*, while circulating in the head and chest region, affect the *Rasa dhatu* and then localize in the *Pranavaha srotas*, wherein, excessively secreted *Sleshma*, along with the defective *Pranavaha srotas* renders obstruction to the passage of *Prana Vayu*. The ultimate result is the reversal in the course of *Prana Vayu*, which is known as *vilomata* or labored breathing, the cardinal symptom of *Tamaka Shwasa*. The involvement of *Vata* and *Kapha* dosha that get vitiated independently, demand treatment. Whereas, in modern parlance, Undue hypersensitivity of the tracheobronchial tree to a number of allergens, is said to be the basic pathology of the illness. Asthma is a respiratory disease characterized by variable airway obstruction, airway inflammation and airway hyper-responsiveness. Characteristic features of the airway inflammation are an increased number of activated Eosinophils, mast cells and T lymphocytes in the airway mucosa and lumen, and an increased thickness of the reticular layer of the basement membrane (sub epithelial fibrosis). These changes maybe present even when asthma is asymptomatic. Personal or family history of respiratory or skin allergy, positive wheal and flare skin reaction test, increased level of the IgE immunoglobulins, all are suggestive of allergic Asthma. Yet, bronchial asthma is not a curable disease. But with proper self-management and medical treatment, most people with asthma can lead normal lives.

**Probable mode of action of drug:**

The drug Karchura has been referred to as *shwasahara* by *Charaka samhita*[10], *Bhavaprakash* and *kaiyadeva nighantu*[11]. Based on its *rasapanchaka* its action may be assessed. It has *katu, tikta rasa* which is *kaphahara* and removes the obstruction produced by *kapha*[12,13,14]. *Tikta rasa* also acts as *srotoshodhaka*, the *ushna veerya* acts as *kaphavatahara* i.e. it does *kapha chedana* and *vatanulomana*. The *katu vipaka* also has a *kaphahara* action along with its *laghu, tikshna* and *ruksha guna*[15].

## CONCLUSION

In this experimental study ,in vivo study was done by using a histamine chamber. The study was conducted with experimental protocol using histamine as broncho constrictor and Chlorophenaramine (CPM) as standard bronchodilator. Compared to standard antihistaminic drug Chlorophenaramine, the test drug Karchura in its two different forms viz. *Mula churna* and *Mula kashaya* showed lesser percent of protection against histamine induced bronchoconstriction. Whereas *Churna* form of the test drug Karchura yielded better results as compared to kashaya form. Hence it can be concluded Karchura cannot be as efficacious as the standard antihistaminic drug CPM but on the other hand *churna* form of the drug is better than its kashaya form. The study can also be conducted with other standard bronchodilators and also with other forms of test drug or with other experimental models. Analytical study can be carried out on Karchura. Higher phytochemical investigations are required for the confirmatory evaluation of responsible phytoconstituents contributing to anti histaminic action. Karchura can also be compared with other existing anti histaminic drugs.

## REFERENCES


1. Agnivesha, Charaka Samhita, Chikitsasthana, Chapter 17th, Yadavji Trikamji Acharya editor. reprint edition. Varanasi: Choukhambha prakashan; 2007. P. 533
2. Sushruta, Sushruta samhita, Uttaratantra, chapter 51st, Yadavaji Trikamji Acharya editor. reprint edition 2003. Varanasi: Choukhambha surbharti prakashan; 2003. P
3. Agnivesha, Charaka Samhita, Chikitsasthana, Chapter 17th, Yadavji Trikamji Acharya editor. reprint edition. Varanasi: Choukhambha prakashan; 2007. P. 533.
4. Agnivesha, Charaka Samhita, Chikitsasthana, Chapter 17th, Yadavji Trikamji Acharya editor. reprint edition. Varanasi: Choukhambha prakashan; 2007. P. 533.
5. Sushruta, Sushruta samhita, Uttaratantra, chapter 51st, Yadavaji Trikamji ,Acharya editor. reprint edition 2003. Varanasi: Choukhambha surbharti prakashan; 2003. P. 761.
6. Agnivesha, Charaka Samhita, Chikitsasthana, Chapter 17th, Shloka 55-62, Yadavji Trikamji Acharya editor, reprint edition. Varanasi: Choukhambha prakashan; 2007. P. 535.
7. API Text book of medicine, chapter 9th, topic no 5, Siddarth. N. Shah et al editor. 7th edition. Mumbai: The Association of Physicians of India; 2003. Pg no.292-294
8. Harrison's Principles of Internal Medicine, 2nd Volume, Chapter 248th, Braunwald et al editor. 17th edition. Boston: McGraw hill; P. 1596.
9. Davidson's Principles and Practice of Medicine, Nicholas A. Boon et al editor. 20th edition. Philadelphia, U.S.A: Churchil Livingstone Elsevier; 2006. P. 670
10. Agnivesha, Charaka Samhita, Sutrasthana, Chapter 27th, Shloka 155, Yadavji TrikamjiAcharya editor. reprint edition. Varanasi: Choukhambha prakashan; 2007. P. 161.
11. Kaiyadeva, Kaiyadeva nighantu, Oshadhi varga, shloka 1360, P.V.Sharma editor. 1st edition. Varanasi: chaukambha orientalia; 1986. P. 257.
12. Bhavamishra, Bhavaprakasha Nighantu, Karpuradi varga, Shloka 96. Dr.G.S.Pandey editor. 6th ed. Varanasi: Chaukhamba Bharati Academy; 2004. P. 245.
13. Madanapala, Madanapala Nighantu, Karpuradi varga, Shloka 55. Ramaprasada Patiyala editor. Bombay: Khemaraj Shrikrishnadasa prakashana; 1998. P. 87.
14. Kaiyadeva, Kaiyadeva nighantu, Oshadhi varga, shloka 1360, P.V.Sharma

editor. 1st edition. Varanasi: chaukambha orientalia; 1986. P. 257.

15. Bhavamishra, Bhavaprakasha Nighantu, Karpuradi varga, Shloka 96. Dr.G.S.Pandey editor. 6th ed. Varanasi: Chaukhamba Bharati Academy; 2004. P. 245.