



Researches on Nebulization in Ayurveda – A Systematic Review

Dr. Amrutha D. C.¹, Dr. Anand Katti²

¹PG Scholar, Government Ayurvedic Medical College, Dhanvantari Road, Bangalore - 560009

²Associate Professor, Government Ayurvedic Medical College, Dhanvantari Road, Bangalore - 560009

ABSTRACT: In the pyramid of research evidence, systematic reviews attain second place only after meta-analysis. Research itself is nascent in Ayurveda. Therefore, there is not much scope for systematic review and meta-analysis in Ayurveda. However, for the progress of Ayurveda systematic reviews on already conducted research is important. In this background present study was aimed at systematically reviewing and analyzing researches carried out in the field of Ayurveda where in nebulization is one of the interventions. Tamaka shwasa is one among major disease explained in Ayurveda is caused due to vitiation of kapha and vata. In classical context different treatment modalities has been explained. Among these, the administration of drug through nasal as Nasya and using the drug in the form of fumes as Dhumapana. Present day the management of same is done by Nebulization, so there is a need for the assessment of new drug molecule as a treatment. Various research databases were used to obtain the required literature. References and details regarding Nebulization in Ayurveda were collected from various published research papers and previous works done. After screening and diligently going through these databases, 10 research works are obtained. The present article discusses the utility and merit of these 10 researches.

KEY WORD: Tamaka shwasa, Nebulization, Arka, Bronchial asthma, A systematic review in Ayurveda

INTRODUCTION

Tamaka shwasa is one among major disease explained in Ayurveda is caused due to vitiation of kapha and vata. Based on signs and symptoms it nearly corresponds with Bronchial Asthma in conventional science. It is characterized by breathlessness, wheezing which vary in severity and from person to person, which frequently requires continuous medical care. Our Acharyas have explained different treatment modalities in the management of tamaka shwasa that consist of shodhana, shamana and tarpana. Among these, the administration of drug through nasal as Nasya and using the drug in the form of fumes as Dhumapana. Present day the management of same is done by Nebulization, which is a process that involves suspension of fine vaporized liquid droplets in air otherwise known as aerosol. But the drugs used in conventional medicine are anti-inflammatory, and long-acting bronchodilators etc. which results in side effects on prolong use, so there is a need for the assessment of new drug molecule as a treatment.

In Arka prakasha the author has explained intake of Arka and its benefits in tackling the signs and symptoms of Asthma. As these situations the inhalation routes developed so far is the better method to reduce the undesirable effects of systemic administration. Thus, keeping the importance of Nebulization in managing Tamakashwasa, the classic preparation was conceptualized with certain modifications. Nebulization has been very effective in controlling episodes of acute exacerbations.

Ayurveda also talks about Dhumapana where in patient is made to inhale medicated smoke emanating from some selected herbs.

Even though Nebulization is not mentioned as route of drug administration many Ayurveda researchers have employed ayurvedic formulations and conducted research. Therefore, a need was felt to analyse them and present. Hence this systematic review is carried out.

OBJECTIVE

To systematically review and analyze the researches carried out in the field of ayurveda where in Nebulization using ayurvedic formulation is an intervention

MATERIALS AND METHODS

Various research databases were used to obtain the required literature. References and details regarding Nebulization in Ayurveda were collected from various published research papers and previous works done. The search was carried out using Key words and Boolean search that involved terms like Nebulization, Arka, Ayurveda, Tamakashwasa, Bronchial asthma, Dhumapana. These key words were used with the purpose of identifying the Ayurveda researches where in Nebulization is one among intervention. This search was carried during 2nd week of December 2021 to 3rd week of December 2021.

RESULT

Search result for each keyword in the specific database obtained is mentioned in the table No 1.

After screening and diligently going through the content of these results, the research publication that had ayurvedic medicine being used in the form of nebulization the results obtained was 1 in PubMed, 4 in Ayush research portal, 5 in google scholar, none in Dhara and Rajiv Gandhi University of Health sciences Bangalore (RGUHS) dissertation repository.

(RGUHS repository was selected as we were aware of few researches conducted in this field)

List of research articles (RA) obtained after the screening and considered for analysis have been listed below.

RA 1: Clinical evaluation of role of herbal nebulizer in the management of bronchial asthma w.s.r to tamaka shwasa.¹

RA 2: Anti – asthmatic effect of shirishadi compound through nasal spray actuation.²

RA 3: Role of dhumapana (Nebulization) and pana with ardraka arka in the management of tamakashwasa.³

RA 4: Efficacy of bharangimoola arka nebulization in tamakashwasa (Acute exacerbation of bronchial asthma) - A case series study.⁴

RA 5: Tulsi arka nebulization- An instant management in vegavastha of tamakashwasa.⁵

RA 6: A clinical study to evaluate the combined efficacy of nebulization with bharangi arka and oral administration of ardraka, nagavalli, and vasa swarasa in the management of vegavastha tamaka shwasa vis-à-vis exacerbation of bronchial asthma.⁶

RA 7: Comparative clinical trial of bharangimoola arka and salbutamol nebulization in tamakashwasa (acute exacerbation of bronchial asthma) – A case series study.⁷

RA 8: Nebulization with haridra arka versus meter dose inhaler in acute exacerbation of bronchial asthma- An open label, non-inferiority trial.⁸

RA 9: A comparative clinical study on the efficacy of bharangimoola arka and tamboola patra arka for nebulization in the management of tamakashwasa in children.⁹

RA 10: A comparative pharmaceutico-pharmaco clinical study of formulation of tulsi pills, tulsi arka and tulsi aerosol on tamakashwasa.¹⁰

All the above research articles were carefully critically analysed for the age of patients included for the trial, number of groups, intervention, comparator drug, dose duration of the medication and results. Which is presented in the table no 2.

DISCUSSION

Tamaka shwasa is one among the major diseases explained in Ayurveda which is a disease of Pranavaha strotas caused due to vitiation of kapha and vata dosha with the lakshanas like peenasa, ghurghuraka shabda, teevravega shwasa and prana prapedaka kasa etc. on observing these breathing pattern, pathological changes and clinical features it can be correlated to Bronchial asthma in conventional science.

In all these research works assessment was done before and after treatment with the help of subjective and objective parameters

Subjective parameters - breathlessness, wheeze, cough, expectoration and chest tightness

Objective parameters – Peak expiratory flow rate, Spirometer, Respiratory rate.

RA 1: - In this research clinical study was planned in two parts. One is deals with the preparation and standardization of drug and another part deals with assessment of its efficacy in acute attack of Bronchial asthma.

Herbal nebulizer contains drugs which are divided into two groups. First group mainly having ant inflammatory and antihistaminic property (kapha shamaka) which are sati, bharangi, pushkaramoola. Second group drugs having bronchodilator effect (vata shamaka) which are dhatura, tea leaves, coffee seeds, vacha and apamarga. For standardization of drug thin layer chromatography (TLC) was carried out.

Total 20 patients were selected for the study. 10 were given Herbal Nebulizer and remaining 10 were divided into two subgroups of 5 patients each. One sub group was treated with asthalin and another with budecort. The bronchodilator and ant inflammatory effect of modern drug was compared with that of Ayurvedic medicine. Result was found very encouraging in terms of improvement in clinical features, and pulmonary functions without any apparent toxic side effects.

RA 2: - Clinical study was conducted to evaluate the efficacy of Shirishadi polyherbal compound which includes shirisha, nagaramotha and kanthakari. 60 subjects with mild to moderate asthma were divided into 3 subgroups of 20 each. First group administered with Shirishadi Nebulization, second group with Duoline and Budecort and third group administered with normal saline dosage of 2.5 ml in all groups. Study signifies that Shirishadi polyherbal drug may prove beneficial future alternative remedy for asthma, and its effect is similar to that of modern contemporary drug when given through Nasal route.

RA 3: - The study followed randomized open case study of 10 subjects divided into two groups with 5 in each. Group A treated with 5 ml of Ardraka Arka Nebulization and Group B was given one pala(48 ml) of Ardraka arka internally in single dose. Assessment was done after 20 minutes in Group A and 40 minutes in Group B. On concluding Group, A has shown considerable result in reducing the symptoms when compared to Group B.

RA 4: - Clinical study conducted in 30 patients of acute exacerbation of Bronchial asthma. Nebulization with 5ml of Bharangimoola arka was administered 8th hourly for 3 times. This study provides good evidence which shows the significant effect in reducing symptoms in acute exacerbation of Bronchial asthma.

RA 5: - The study is taken up to evaluate the efficacy of Tulsi arka in vega avastha of Tamakashwasa. Subjects fulfilling the diagnostic criteria are divided into two groups in which trial group given with 5ml of Tulsi arka and controlled group given with 5ml of normal saline. Signs and symptoms were analyzed after 10 minutes of Nebulization. Statistical analysis revealed that the treatment had significant effect on subjective and objective parameters in the trial group.

RA 6: - The study was selected to evaluate the combined efficacy of Nebulization with 5ml of Bharangimoola arka followed by 15 ml of oral administration of swarasa of Ardraka, Nagavalli and Vasa 5ml each with 5gm of Madhu as anupana, every 8th hourly for 3 consecutive days. It was a single group clinical study with pre and post-test design. Pre-test assessment of subjective parameters was done on 1st day before the 1st dose of intervention and the post-test assessment was done on 3rd day after 9th dose of intervention. The study has shown statistically highly significant reduction in the subjective parameters. Hence it was inferred that the intervention selected for the present study possess combined effect in the management of Tamakashwasa w.s.r to exacerbation of Bronchial asthma.

RA 7: - The main aim of the study was comparing the efficacy of Bharangimoola arka Nebulization with standard drug salbutamol in reducing the symptoms of vegavastha of Tamakashwasa. It was an open label, double arm clinical study conducted in 100 patients. The patients were hospitalized for 2 days, and Nebulization was done 8th hourly with affixed dose of 5ml of Bharangimoola arka and 2.5ml of salbutamol sulphate in two groups. Before and after each episode of Nebulization peak expiratory flow test was done. This study provides evidence for the significant effect of 5 ml Bharangimoola arka in reducing symptoms of asthma which is equally with the standard drug salbutamol sulphate 2.5ml when administered six doses 8th hourly without inducing tremors.

RA 8: - The objectives of this study is to find out the efficacy of Nebulization with Haridra arka and compare efficacy of Nebulization against Meter Dose Inhaler in acute exacerbation of Bronchial asthma. 30 patients equally divided into two groups. Group A was given Nebulization with Haridra arka 3-6ml for a period of 10 minutes and in Group B were advised to take 2-10 puffs of meter dose inhaler salbutamol. Statistical analysis states in Group A improvement were seen in intensity of wheeze, sputum production whereas in Group B better results obtained in parameters like cough, FVC, PEFR. Equal effectiveness seen on breathlessness, chest tightness. Haridra arka Nebulization can be safely and effectively administered in providing instantaneous relief in acute exacerbation of Bronchial asthma.

RA 9: - This is the thesis research work done on children below the age group of 10 years to compare the efficacy of Bharangimoola arka and Tamboola patra arka for Nebulization in the management of Tamakashwasa. It is an open labelled double arm clinical study of 30 subjects divided into two groups and given Nebulization for 2 days. Group A treated with 3ml of Tamboola patra arka and Group B treated with 3ml of Bharangimoola arka every 8th hourly. Statistically Tamboola patra arka showing marginal better results on symptoms than Bharangimoola arka.

RA 10: - This clinical attempt has been made to observe the effect of the drug Tulsi by different formulations namely vati, arka and aerosol. Randomly selected patients were divided in three groups. Group A treated with Tulsi inhalation with Nebulizer for 5 minutes per week. Group B treated with Tulsi tablet 1TDS and Group C treated with Tulsi arka 20ml BD for 28 days. The study has shown encouraging results in patients of shwasa by Tulsi aerosol followed by vati and arka.

In all these research works an attempt is made to manage the condition of Acute exacerbation of Bronchial asthma by giving Nebulization with Ayurvedic formulation Arka. The drugs which are used here are Ardraka, Bharangi, Tulsi, Tamboola, Haridra and Shirisha mainly acts on its vatakaphahara and ushna veerya properties helps in kapha bhedana and clearing margavarana of vata caused by kapha during episode by providing easy movement of vayu. Main aim of all works is to compare the efficacy of Arka Nebulization with the drug of conventional science. Results were found to be more effective or equal to that of compared drug. So Arka Nebulization can be safely and effectively administered in providing instantaneous relief in Acute exacerbation of Bronchial asthma.

It is the need of present era to expand the knowledge of Ayurveda with the help of contemporary technique and re-establish routes of herbal drug administration in acute condition also.

During the research, one case report has been observed with the title “Role of karpuradi arka as a new dosage for in the management of Tamakashwasa w.s.r to Bronchial asthma- A case study.”¹¹ In which 60 years female patient came in OPD with chief complaints of dyspnea at rest since morning, cough with expectoration and throat congestion for 7 days and mild chest pain during and after coughing.

Patient had given prop up position and immediately started Nebulization with karpuradi arka diluted in 10 parts of distilled water (1:10). Within 10 minutes of Nebulization patient got symptomatic relief. Patient was stable at that time.

CONCLUSION

Tamaka shwasa is a disease of Pranavaha strotas which can attain acute condition any time during the course of illness. As Acharya Charaka stated it as pranahara, if immediate measures are not instituted.¹² Inhalation mode of drug administration proves to be beneficial in establishing a new route of drug administration in Ayurveda. In all these research studies, Arka Nebulization was selected to administer which helps in delivering the active principles of the drug directly to target organ. Arkas were specifically selected because of their guna, karma, indication, phytochemical constituents and properties which are beneficial in subsiding vegavastha of Tamaka shwasa. So, these studies proved to be easy administration, cost effective and safe as they did not show any side effects.

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Table no 1: - Mentioning the search result for each keyword in the database.

Sources	PubMed	DHARA	Ayush research portal	RGUHS	Google Scholar
Nebulization	19687	0	4	0	50500
Arka	117	11	831	3	247000
Nebulization, Arka	0	0	1	0	195
Nebulization, Ayurveda	2	0	0	0	1790
Tamakashwasa	10	12	8	0	444
Tamakashwasa, Arka	0	0	0	0	4
Bronchial Asthma	203213	71	250	0	941000
Dhumapana	1	1	4	0	234

Table no 2: Showing analytical synopsis of various researches

R A	Age group (years)	group	Intervention		No. of subjects	Dosage and duration	Results
			Group 1	Group 2			
1	More than 16	2	Herbal nebulizer	Asthelin and budecort	10 each	2.5 ml Twice in a day for 15 days	Equal effect
2	More than18	2	Shirishadi	Normal saline	30 each	2.5ml	Equal effect
3	10-70	2	Ardraka arka nebulization	Ardraka arka pana	5 each	Group A-5ml Group B -40ml in a single dose	Group A > Group B
4	16-60	1	Bharangimoola arka		30	5ml – 8 th hourly 3 times	Significant effect
5	16-60	2	Tulsi arka	Normal saline	20 each	5ml- Single dose for 15 minutes	Group A > Group B
6	18-60	1	Bharangimoola arka with oral drugs		30	5ml- for 3 days	Significant effect
7	18-60	2	Bharangimoola arka	Salbutamol	50 each	5ml- 8 th hourly 3 times	Equal effect
8	20-60	2	Haridra arka	Salbutamol	15 each	3-6 ml for 10 minutes	Equal effect
9	More than 10	2	Bharangimoola arka	Tamboolapatra arka	15 each	3ml for 3 days	Tamboola patra arka > bharangi arka
10	Irrespective of age	3	Tulsi nebulization	Group 2 – tulsi vati Group 3 – tulsi arka	10 each	Group A- 5 minutes in a week Group B- 2TDS Group C- 20 ml BD	Aerosol>vati>ark a

Note - > denotes MORE SIGNIFICANT EFFECT