



Case Study

EVALUATING CLINICAL EFFICACY OF *KANTAKARI* AEROSOL IN THE MANAGEMENT OF BRONCHITIS: A CASE REPORT

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ABSTRACT

Bronchitis refers to the inflammation of the bronchi and bronchioles, which helps in the movement of the air through the lungs. Bronchitis can be of two types acute and chronic. Acute bronchitis is very common which mainly occurs due to respiratory infections like common cold and chronic bronchitis on the other hand occurs due to the constant irritation which leads to inflammation of the bronchi mainly due to smoking or environment dust and pollution. Major signs and symptoms are dyspnea, cough with sputum. Main risk factors involves smoking, environmental pollution, dust and recurrent lung infections. In Ayurveda it can be correlated with *Tamakashwasa* on the basis of similar manifestations. Drug delivery mode through nasal route is termed as inhalation therapy; it has various plus points as compare oral drug administration mode. There is an immediate effect, drug goes directly to the site of pathogenesis and quick absorption of the drug. *Rasayana* therapy is mainly refers to the attainment of the excellence of body fluids, this helps in the rejuvenation of the body and reduce the recurrence of the disease, it also helps in improving the strength and immunity of the body. A case study was done on bronchitis in the All India Institute of Ayurveda hospital. Inhalation therapy was given for 15 days followed by *Rasayana* therapy for one month. There was marked improvement in all the signs and symptoms of the disease along with increase in pulmonary function test, also there is no recurrence of the signs and symptoms of the disease after the whole course of treatment during follow up.

KEYWORDS: Bronchitis, Dyspnea, *Tamakshwasa*, Inhalation therapy, *Rasayana* therapy.

INTRODUCTION

Bronchitis refers to the inflammation of the bronchi and bronchioles, which helps in the movement of the air through the lungs. Chronic bronchitis mainly manifested by cough with mucus for more than 3 months for two consecutive years. Bronchitis can be of two types acute and chronic. Acute bronchitis is very common which mainly occurs due to respiratory infections like common cold and chronic bronchitis on the other hand occurs due to the constant irritation which leads to inflammation of the bronchi mainly due to smoking or environment dust and pollution.

Acute bronchitis is common term used for the inflammation of the bronchi of lung. The most common feature includes cough with sputum along with shortness of breath chest discomfort fever on and off.

The major cause of bronchitis is viral infection which is in more than 90% of cases. This viral infection spread through air or by direct contact. Main risk factors for bronchitis include smoking, exposure Risk factors include exposure to tobacco

smoke, dust, and other air pollution. A small number of cases are due to high levels of air pollution or bacteria.

Acute bronchitis is one of the most common diseases. About 5% of adults are affected and about 6% of children have at least one episode a year. It occurs more often in the winter.

Chronic bronchitis is defined as a productive cough that lasts for three months or more per year for at least two years. Most people with chronic bronchitis have chronic obstructive pulmonary disease (COPD). Protracted bacterial bronchitis is defined as a chronic productive cough with a positive bronchoalveolar lavage that resolves with antibiotics. Symptoms of chronic bronchitis may include wheezing and shortness of breath, especially upon exertion and low oxygen saturations. The cough is often worse soon after awakening and the sputum produced may have a yellow or green color and may be streaked with specks of blood.

Most cases of chronic bronchitis are caused by smoking cigarettes or other forms of tobacco.

Additionally, chronic inhalation of air pollution or irritating fumes or dust from hazardous exposures in occupations such as coal mining, grain handling, textile manufacturing, livestock farming and metal moulding may also be a risk factor for the development of chronic bronchitis. Protracted bacterial bronchitis is usually caused by *Streptococcus pneumoniae*, *Non-typable Haemophilus influenzae*, or *Moraxella catarrhalis*

Individuals with an obstructive pulmonary disorder such as bronchitis may present with a decreased FEV1 and FEV1/FVC ratio on pulmonary function tests. Unlike other common obstructive disorders such as asthma or emphysema, bronchitis rarely causes a high residual volume (the volume of air remaining in the lungs after a maximal exhalation effort).

Chronic bronchitis has a 3.4% to 22% prevalence rate among the general population. Individuals over the age of 45, smokers, those that live in areas with high air pollution and those have asthma have a higher risk of developing chronic bronchitis. This wide range is due to the different definitions of chronic bronchitis which can be defined based on signs and symptoms or the clinical diagnosis of the disorder. Chronic bronchitis tends to affect men more often than women. While the primary risk factor for chronic bronchitis is smoking, there is still a 4%-22% chance that people with chronic bronchitis were never smokers. This might suggest other risk factors such as the inhalation of

fuels, dusts, and fumes. Obesity has also been linked to an increased risk in the onset of chronic bronchitis. For either acute bronchitis or chronic bronchitis, signs and symptoms may include:

- Cough
- Production of mucus (sputum), which can be clear, white.
- Fatigue
- Shortness of breath
- Slight fever and chills
- Chest discomfort

Risk factors

Factors that increase risk of bronchitis include:

- Cigarette smoke. People who smoke or who live with a smoker are at higher risk of both acute bronchitis and chronic bronchitis.
- Low resistance. This may result from another acute illness, such as a cold, or from a chronic condition that compromises your immune system. Older adults, infants and young children have greater vulnerability to infection.
- Exposure to irritants on the job. Your risk of developing bronchitis is greater if you work around certain lung irritants, such as grains or textiles, or are exposed to chemical fumes.
- Gastric reflux. Repeated bouts of severe heartburn can irritate the throat and leads to bronchitis.

Table 1

	Causes	Risk factors	Symptoms
Acute	Inflammation due to a viral or bacterial infection	<ul style="list-style-type: none"> • Children under five years old • People with a weakened immune system 	<ul style="list-style-type: none"> • Cough lasting three weeks or less • Cold or flu symptoms • Sore throat • Headache • Nasal congestion • Fever
Chronic	Inflammation due to environmental contaminants such as chemicals or tobacco smoke	<ul style="list-style-type: none"> • Adults over 40 years old • People with an occupation exposing them to airborne contaminants • Smokers 	<ul style="list-style-type: none"> • Daily cough lasting three months of the year, two years in a row • Shortness of breath • Wheezing

Bronchitis can be correlated with *Tamakshwasa* in Ayurveda on the basis of clinical signs and symptoms. Due to various causative factors there is derangement in *Vatadosha* and *Kaphadosha* simultaneously, vitiated *Vatadosha* obstructed by vitiated *Kaphadosha* leads to the abnormal movement which results in various manifestation like dyspnea and cough and leads to development of

Tamakshwasa disease. Inhalation therapy is the use drug through nasal route to treat respiratory diseases and conditions. It is mainly helps in improving breathing and lung function in order to alleviate the symptoms of chronic respiratory issues, such as asthma, bronchitis, chronic obstructive pulmonary disease (COPD), and emphysema. This therapy may also be used to treat respiratory

complications that might result from heart attacks and stroke.

Most common types of inhalation therapy include oxygen therapy, mechanical ventilation, incentive spirometry, nebulization therapy, and continuous positive airway pressure (CPAP). Any drug administration done through nasal route come under the category of inhalation therapy. In Ayurveda this therapy is termed as *Nasya* therapy which is one of *Panchkarma* procedure mentioned in Ayurveda. *Acharyacharak* has described 5 types of *Nasya* therapy. Inhalation therapy can be correlated with *Dhumapana*. There are different diseases in which *Nasya* therapy is administered which are mentioned in Ayurvedic classics.

Administration of drug through nasal route is well described in Ayurvedic texts for the management of *Tamaka Shvasa*. Different form of drugs like *Kvatha* (decoction), *Svarasa* (juice), *Kalka* (paste), *Taila* (oil preparations), *Dhumapana* (smoking of herbs), etc. are instructed to be given through nasal route for the management of acute as well as chronic exacerbation of dyspnea. Drugs given through nasal route helps in relieving cough, easily expulsion of sputum and also helps in revitalizing the respiratory drive.

Rasayana therapy is Ayurveda devotes one whole branch for studying the methodology for prevention of aging, rejuvenation and achieving the bliss of ever youthfulness termed as "*Rasayana*". Regeneration is the process of regrow, restore and renewal. It literary means formation of any new thing whether a tissue, cell or a complete organ. At its most elementary level, regeneration is mediated by the molecular processes of gene regeneration. Regeneration is different from reproduction. The

Examination

Table 2:

General Physical examination	Dashvidhpariksha	Systemic examination
<ul style="list-style-type: none"> • Appetite: average • Bowel: irregular Bladder: normal Sleep: average • Blood pressure:130/70 mmHg Pulse:78/min, regular (<i>Vatapittaj</i>) • Respiratory rate:16/min • Temperature:normal Pallor:absent Icterus:absent Lymphadenopathy:none • Clubbing: absent • Pedal oedema: not present 	<ul style="list-style-type: none"> • <i>Prakriti- Vatapittaja</i> • <i>Vikriti-Vataja, Kaphaja</i> • <i>Sara - Madhyam</i> • <i>Samhana -Madhyam</i> • <i>Ahara Shakti - Madhyam</i> • <i>Abhyarana Shakti - Madhyam</i> • <i>Jarana Shakti - Madyam</i> • <i>Vyayam Shakti - Avara</i> • <i>Vaya - Vridha</i> • <i>Satva - Madhyam</i> • <i>Satmya - Madhyam</i> • <i>Bala - Avara</i> ❖ <i>Ashtavidhpariksha</i> 	<ul style="list-style-type: none"> • Cardio vascular System: S₁S₂normal, no added sounds. • Respiratory System: Expiratory rate= inspiratory rate. on auscultation wheezing sound present. • Gastrointestinal System: No abnormality detected. • Nervous System: Higher function-normal • Motor functions- normal

Rasayana term is formed by two words – *Rasa* and *Ayana*. It refers to the attainment of excellence of vital fluids of the body to achieve a state of positive health and disease free living. *Rasa* means the first nutritive *Dhatu*. In Ayurveda, *Dhatu* refers to constitutional unite of the body that support as well as nourish the body. On the basis of its morphology and physiology it can be correlated "Lymphoid plasma" which is believed to be the nutritious fluid part of the blood that has escaped from the blood-vessels, and which has irrigated the tissues and ministered to their nutrition. *Ayana* refers to acquire, in the present context it means the method or technique or pathways for acquiring best *Rasa dhatu*. Thus *Rasayana* refers to all the pathways or techniques by which vitality and body immunity can be enhanced for the promotion and maintenance healthy tissues, for the replenishment of daily wear and tear and for regeneration of tissues. Here is case of Bronchitis which is treated through the Ayurvedic inhalation therapy and *Rasayana* therapy.

Case Presentation

A 65 years old male patient (UHID no: 339776) visited *Kayachikitsa* OPD of AIIA hospital on 31 December 2018 with complaints of shortness of breath, cough with sputum since one year.

History of Present illness: According to the patient he was asymptomatic before 1 year then gradually he developed cough with sputum and breathlessness, weakness all over the body. He took allopathic treatment for this but could not got satisfactorily relief, so he came to All India Institute of Ayurveda (AIIA) for his further management.

History of past illness: no history of HTN/DM/Hypothyroidism/Tuberculosis.

	<ul style="list-style-type: none"> • Nadi- 78/min (Vatapittaj) • Jivha - Sama • Mala - Malabaddhata • Mutra - Samyaka • Shabda - samyaka • Sparsha - Samanya • Drik - Samanya • Akriti - Madhyam 	
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Samprapti Vighatana

Dosha - VatajaKaphaja

Dushya - Ras, Rakta,

Srotas - Pranavaha, Rasavaha

Adhithana - Uraha.

On the basis of above examination and signs and symptoms the patient was diagnosed with Chronic bronchitis/Tamakshwasa

Criteria for assessment

- All the signs and symptoms
- mMRC dyspnea scale.
- Pulmonary function test.
- Chest x ray.

Treatment Protocol

A. Nebulization with *Kantakari* aerosol 2.5 ml twice a day for 15 days.

B. Oral medications: *Agastyaharitaki Rasayana* 5 grams twice in a day after nebulization therapy for 1 month.

Results

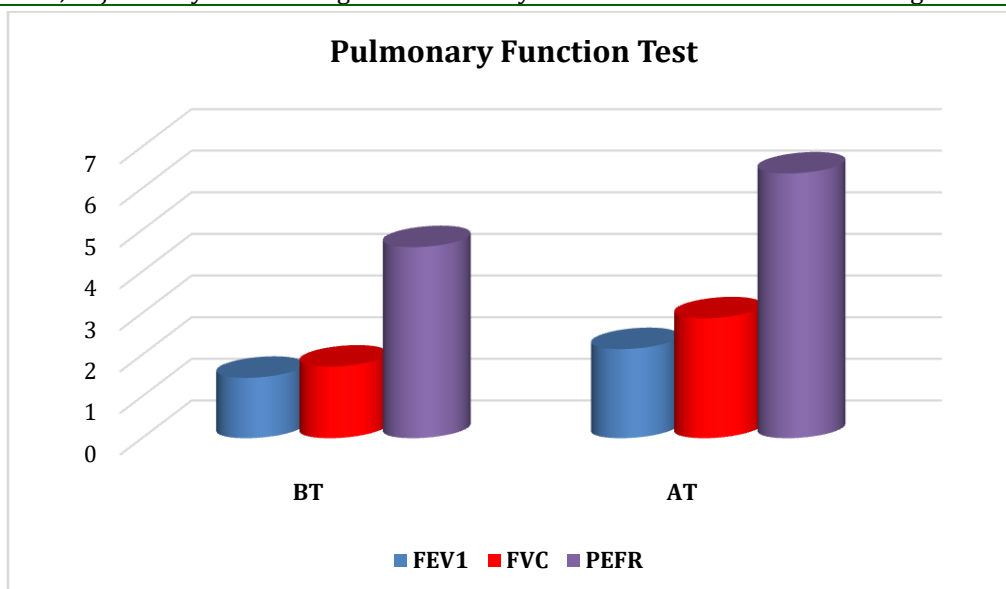
After the whole course of treatment the condition of the patient was improved.

Table 3: Major signs and symptoms

S. no	Signs and Symptoms	BT	AT
1	mMRC dyspnea scale	3	1
2	Cough	1	0
3	Wheezing	2	0
4	Frequency of attack	2	0
5	Chest pain	1	0

Table 4: Pulmonary function test(PFT), Complete blood count

S. no	Test	BT	AT
1	FEV1	1.45(l)	2.14(l)
2	FVC	1.72(l)	2.16(l)
3	PEFR	4.59 l/s	6.36 l/s
4	Hemoglobin	10.3g/dl	11g/dl
5	TLC	6500 /cmm	5700/cmm
6	ESR	18 mm/hour	12 mm/hour



DISCUSSION

Bronchitis is the term which involves inflammation in the bronchi and bronchioles. It can be acute or chronic. Acute bronchitis occurs due to the viral infections in the lining of the bronchi which leads to accumulation of the mucus over the bronchi and ultimately the narrowing of the airways which results in the dyspnea and cough. Smoking and environmental pollution are the main risk factors responsible for the development of the chronic bronchitis, cigarette smoke suppose to have toxic particles which enters upto the level of alveoli and cause major destruction over there also. These toxins enhance inflammation over the bronchi leads to activation of mast cells which release macrophages and there is hyper secretion of mucus over there. These toxins in the smoke also reduce the motility or the cilia present in the respiratory tract, these cilia helps in the elimination of the excessive mucus in the tract, in the case of bronchitis there is decrease activity of the cilia which results in the accumulation of the mucus and obstruction of the airways. Nebulization is a drug delivery mode in which drug is administered in to the lungs in the form of mist through nebulizer machine. Nebulization literary means to convert a liquid in to a fine spray or to atomize or to treat with a medical spray. It is a method to administer the medicine via inhalation. It is mainly done in various respiratory disorders like Nasopharyngitis Asthma, Chronic Obstructive Pulmonary Disease (COPD), Interstitial lung diseases, Pneumonias. Here in this case study also herbal aerosol prepared through hot percolation method was given through nebulization. The propabable mode of action of inhaled drug can be understood in a way that after inhalation, the drug directly enters the lung and helps in reducing the inflammation and removes the mucus present over there which

ultimately results in the relief in the symptoms. The drug is also supposed to have bronchodilator effects which results in decrease in the level of dyspnea and wheezing. The drug given through inhalation also absorbs to the systemic circulation through diffusion from the alveoli epithelium to the capillaries present in the lungs. Some part of the drugs goes to the gastrointestinal tract through oral cavity which ultimately reach the level of liver for metabolism and then systemic circulation. *Rasayana* refers to the flow of nutrients or more specifically to the acquisition of excellence of vital fluids of the body to achieve a state of positive health, youth and disease free living. Drug given in this case was *Agastyaharitaki Rasayana* which is a classical formulation prescribed for respiratory disorders according to Acharya charaka, this also acts as rejuvenating agent which helps in rehabilitation of the respiratory system along with prevention of the recurrence of the disease. *Thisrasayan* therapy overall improves the condition of the patient.

CONCLUSION

It can be concluded that *Kantakari* aerosol compound has the potential to treat the case of bronchitis. It can be further concluded that this compound can be used as therapeutic drug for the management of acute or chronic bronchitis. This case study gives a direction for searching new route of herbal drug administration.

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