



EFFECT OF VASA DHOOMAPANA (VASA NEBULIZATION) ON SERUM ALPHA-1 ANTI TRYPSIN WITH SPECIAL REFERENCE TO EARLY COPD - A CLINICAL TRIAL

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ABSTRACT

Introduction: Chronic obstructive pulmonary disease (COPD) is a diseased state characterized by progressive development of chronic air flow limitation that is not fully reversible. Incidence of Alpha-1 antitrypsin deficiency in patients persisting with COPD is associated with tobacco smoking and it is the single most important and the most prevalent risk factor for the development of COPD. *Dhoomapana* (herbal nebulization) has been advocated as an important treatment modality in Ayurveda. **Aim:** Present study was undertaken to evaluate the effect of *Vasa Dhoomapana* on serum Alpha-1 antitrypsin with special reference to early COPD. **Materials and methods:** 10 patients who were suspected to have COPD (*Tamaka Swasa*) were selected and estimation of serum Alpha -1 antitrypsin was done before and after 15 days of *Vasa* nebulization. Validation was done using BOLD COPD questionnaire and visual analogue scale. **Results:** Out of ten, seven cases showed improvement in the level of serum Alpha -1 antitrypsin. While all the ten cases showed improvement in terms of lung performance as measured by respirometer. **Conclusion:** *Vasa* nebulization is a simple, cost effective and safe procedure which can be used to improve the serum concentration of Alpha 1 antitrypsin, thereby reducing COPD symptoms. It also improves the lung performance effectively.

KEYWORDS: *Vasa*, Nebulization, *Dhoomapana*, BOLD questionnaire.

INTRODUCTION

The lack of effective drugs for COPD has limited the overall management of the disease. Active research is on for developing therapeutic agents targeting the key pathophysiological process. There is sufficient evidence that Alpha – 1 anti-trypsin deficiency, an anti-oxidant protein is a factor responsible for COPD.

There are few satisfactory agents for symptomatic relief of COPD targeting especially the inflammatory process. There is lack of suitable agents that improve the Alpha-1 antitrypsin.

The use of *Dhoomapana* (herbal nebulization) expands the scope of effective COPD management. To date, there are no examples of any drug that will improve the serum Alpha-1 antitrypsin concentration. Herbal nebulization has been found to be helpful in the management of airway diseases like asthma and COPD. A more systematic study is thus indicated to understand the benefits of this form of treatment. The clinical improvement noted could be the result of a bronchodilatory, anti-inflammatory or mucolytic effect. It could also help by strengthening the anti-oxidant system in the lungs.

The present study aims at providing new insights in establishing the possible positive effect of *Dhoompana* on clinical symptoms in COPD, lung functions and on serum Alpha-1 antitrypsin.

Scope of the project

The serum alpha-1 antitrypsin, an antioxidant protein is a factor responsible for causing COPD¹. Nebulization with *Vasa* (*Adathoda Vasika*) may play an important role in improving serum Alpha -1 antitrypsin.

The aim of the study is to understand the role of *Adathoda Vasika* in the form of nebulization. Also to study the level of serum Alpha-1 antitrypsin, and to observe the clinical signs and symptoms like cough, expectoration, breathlessness, wheezing and chest-tightness before and after herbal nebulization of *Vasa*.

METHODOLOGY

Objectives

To study the effect of *Vasa Dhoomapana* (herbal nebulisation) on serum Alpha-1 antitrypsin with special reference to early COPD.

Initially all the patients who were suspected to have *Tamaka Swasa*, after the evaluation and satisfying the inclusion and exclusion criteria, were referred to the Department of Pulmonology, JSS Medical college & Hospital, Mysuru, for detailed examination and diagnosis of early COPD. All the patients who were diagnosed to have COPD were sent for estimation of Serum Alpha-1 antitrypsin before starting *Vasa* nebulization. All the patients were instructed to undergo nebulization every day in the hospital for a period of 15 days. A patient symptoms Diary and Visual Analogue Scale for common respiratory symptoms were recorded every day. Patient evaluation was done according to validated, modified BOLD COPD questionnaire before starting nebulization.

Serum Alpha-1 Anti trypsin estimation and clinical signs and symptoms were recorded after 15 days of *Vasa* nebulization.

Type of study: A clinical trial

Site of the study: JSS Ayurveda Medical College Hospital, Mysuru

Sample size: 10

Table (1): Showing the average serum Alpha-1 anti-trypsin values before and after treatment.

Time	Average Serum Alpha-1 antitrypsin value in g/l
Before treatment	14.56g/l
After treatment	16.85g/l

All the 10 cases showed improvement in terms of lung capacity as measured by Respirometer.

Table (2): Showing the average lung capacity values before and after treatment.

Time	Average Lung capacity in cc/sec
Before treatment	4350 cc/sec
After treatment	6980 cc/sec

The clinical signs and symptoms of COPD were also reduced without any untoward effects.

DISCUSSION

Patients with COPD have symptoms of chronic bronchitis, emphysema and asthma which include productive cough; progressing to intermittent dyspnea in due course, frequent and recurrent pulmonary infections, progressive cardiac/respiratory failure over time with edema and weight gain. Most of the COPD is secondary to tobacco abuse and Alpha-1 antitrypsin deficiency. Patients with COPD are susceptible to many complications that can rapidly leads to acute deterioration. Progression of COPD is characterized by the accumulation of inflammatory mucous exudates in the lumens of small airways and thickening of the walls. These walls become infiltrated by adaptive and innate inflammatory immune cells. Tobacco smoking may overcome the body's natural mechanisms for limiting this immune response and this process continues in susceptible individuals even after stopping smoking

Study duration: 15 days

RESULTS

In order to evaluate the efficacy of *Vasa Dhoomapana (Adathoda Vasika)* on serum Alpha-1 antitrypsin concentration and in early COPD, the following methods were adopted:

1. Serum Alpha-1 antitrypsin level was estimated in a standard laboratory before and after treatment in selected 10 cases.
2. Respirometer was used before and after the treatment to check the improvement in lung capacity in cc/seconds.
3. Clinical signs and symptoms were assessed using BOLD questionnaire, Visual analog Scale and Likert scale, before the treatment.

With the overall assessment in 10 cases, 7 cases showed improvement in the level of Serum alpha-1 antitrypsin, no change in 1 case and 2 cases showed mild decrease in the value of serum Alpha-1 antitrypsin after the treatment.

Alpha-1 antitrypsin is a protein that is produced mostly in the liver and its primary function is to protect the lungs from neutrophil elastase that digests lung tissue.

Deficiency of alpha-1 antitrypsin leads to chronic, uninhibited lung tissue breakdown and eventually leads to characteristic manifestations of COPD.

Evidence has shown that cigarette smoke can result in oxidation of methionine 358 of alpha-1 antitrypsin leading to its impaired secretion. This inhibits the protective function of alpha-1 antitrypsin on lung tissue causing COPD in due course.

Adathoda vasika (Vasa) has been advocated in Ayurveda classics as an effective remedy for *Swasa* and *Kasa* in the form of *Dhoomapana*. The active principles of *Adathoda vasika*, Vasicine (Peganine) and Vasakin probably have stimulatory effects on lungs and liver, secreting more Alpha-1 antitrypsin that helps in protecting the lungs against the ill effects of tobacco smoke on the lung tissue thereby reducing the distressing symptoms of COPD.

CONCLUSION

The effect of herbal nebulization using *Vasa (Adathoda Vasika)* improves the value of serum alpha-1 antitrypsin in majority of cases. Also significant improvement in lung performance was noticed in all the cases. *Vasa* nebulization is a simple, cost effective and safe procedure which can be used to improve the serum concentration of Alpha 1 antitrypsin, thereby reducing COPD symptoms. It also improves the lung performance effectively.

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REFERENCES

1. API Text Book of Medicine.9th edition, (Vol.II): 1712.
2. API Textbook of Medicine.9th Edition, (Vol.II): 1716-1717.
3. Charaka Samhita, Chikitsa Sthana, 17th chapter.
4. Ashtanga Hridaya Chikitsa Sthana, 4th chapter; Hemadri.
5. Harrison Principles of internal medicine by Braunwald et.al-14th edition.
6. Medscape.