

## Efficacy of Steam Inhalation with Inhalant Capsules in Patients with Common Cold in a Rural Set Up

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**Abstract:** The common cold is the most frequent infectious disease in humans occurring with two to four infections in adults per year and its incidence has grown dramatically around the world. Steam inhalation is one of the most widely prevalent home made practices preferred in low income countries as its inexpensive and easily available. Decongestant inhalant capsules containing camphor, menthol, thymol, pine oil are readily commercially available. The aim of this study is to evaluate the efficacy of adjunct treatment of steam inhalation with inhalant capsules to relieve respiratory symptoms in common cold and to evaluate its side effects. 100 patients with common cold infection were taken up for study. 50 patients in study arm were given steam inhalation with inhalant capsules along with other medications. Remaining 50 patients in control arm were not given steam inhalation. Patients were evaluated after 1, 2 and 3 weeks for subjective relief of symptoms as well as endoscopic findings. The results showed that there was better and faster relief of symptoms in study group with steam inhalation than the control group without steam inhalation. The side effects of the same were also minimal. So it can be concluded that steam inhalation with inhalant capsules do have a role in treatment of common cold infection.

**Keywords:** camphor, common cold, menthol, pine oil, rhino virus, steam inhalation, thymol

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### I. Introduction

The common cold viral upper respiratory tract infection is a contagious viral infectious disease of upper respiratory tract system caused primarily by rhinovirus (30 – 50 %) and corona virus (10 – 15 %) [1]. A cold usually starts with trickle in the throat, a runny or stuffy nose and sneezing. It can lead to sore throat, cough, head ache, mild fever, fatigue, muscle aches and loss of appetite. Cold usually takes 7 to 14 days to recover. In case of added infection by the bacteria or complications like sinusitis, ear infection, laryngitis or bronchitis occurring the illness can be prolonged [2]. It is one of the most common problem that brings the patient to ENT OPD.

Treatments that are commonly used to alleviate symptoms include oral antihistaminics and decongestants, saline nasal drops, analgesics and anti pyretics [3][4]. But all the above treatment are not found to be very effective in providing fast relief to the symptoms and prevent complications.

Steam inhalation has been one of the most widely prevalent home based practices based on perception that warm humidified air provides subjective relief of respiratory symptoms by loosening respiratory secretions [5]. Steam inhalation is readily available, can be easily used at home even in rural areas. Due to lack of studies it is not known whether steam inhalation improves symptoms or shortens respiratory illness [6]. Advances in understanding of pathophysiology of respiratory infection illness and development of specific therapy makes it important to examine this age old remedy in the light of modern evidence based health care practice [7][8].

Decongestant inhalant capsules containing menthol, thymol, pine oil, terpineol provide fast acting, long lasting, effective relief for blocked noses, head colds and tight chests. Various decongestant inhalant capsules are readily available in the market even in rural areas. This study aims to evaluate the efficacy of adjunct treatment of steam inhalation with decongestant inhalant capsules to relieve respiratory symptoms in common cold and to evaluate its adverse effects.

### II. Materials And Methods

This study was conducted in Department of ENT of our medical college and hospital which is established in a rural area from July 2013 to June 2014. 100 patients with symptoms of common cold aged between 18 to 60 years were enrolled for the study after obtaining written consent from the patients. The approval of the local ethics committee was taken. The inclusion criteria was the patients who had mild to moderate nasal discharge, nasal congestion and sneezing for 3 days or less. All the patients were examined and treated including followed up by the same ENT surgeon performing this study.

The patients were randomized alternatively into study group and control group. 50 patients taken in study group were given steam inhalation with commercially available decongestant inhalant capsules (karvol plus) along with saline nasal drops, oral antihistaminic decongestants and analgesics. Remaining 50 patients in

control group were given saline nasal drops, oral anti -histaminic decongestants and analgesics without steam inhalation. All the patients in both groups were put on same saline nasal drops, anti histaminic decongestant and analgesic. Steam inhalation with inhalant capsules was advised twice daily. The above treatment was given for 2 weeks ( 14 days ).

The procedure of steam inhalation explained to the patient was –

“Pour hot water into a bowl and add one capsule of decongestant inhalant capsules into it. Place your head about 12 inch above bowl and cover your head with a towel in such a way that the sides are totally closed and you form a tent over the bowl. Keep your eyes shut and breathe deeply through your nose for 1 to 2 minutes. If you feel that the treatment is getting too much for you, raise the towel so that the fresh air is brought into the area and breathe through your mouth a couple of times and then resume your treatment. Continue the treatment for 12 to 15 minutes or till you feel uncomfortable. Make sure you don’t get too close to the bowl to burn yourself.”

The patients were assessed after 1 week, 2 weeks and 3 weeks after starting of treatment. The assessment points were –

1. Time to recovery – Time to resolution of all signs of common cold.
2. Complications – Incidence of patients getting complications of common cold like sinusitis, ear infections, laryngitis or bronchitis.
3. The patients were assessed for subjective symptoms like nasal congestion, nasal discharge, sneezing, sore throat at each visit.
4. The patients were examined using nasal endoscope at each visit for nasal discharge, size of turbinates and the condition of nasal mucosa.
5. Any adverse effects of steam inhalation were assessed.

### III. Results

100 patients who had given consent were enrolled in this study. All the patients came for regular follow up. Data was collected on all the patients. All the patients selected were in the age group of 18 to 60 years. 36 patients were of younger age group, 44 were of middle age group and the remaining 20 patients were of older age group. Male and female patients were almost equal (Table 1). These results show that common cold is equally prevalent in all the age groups with almost equal incidence in males and females.

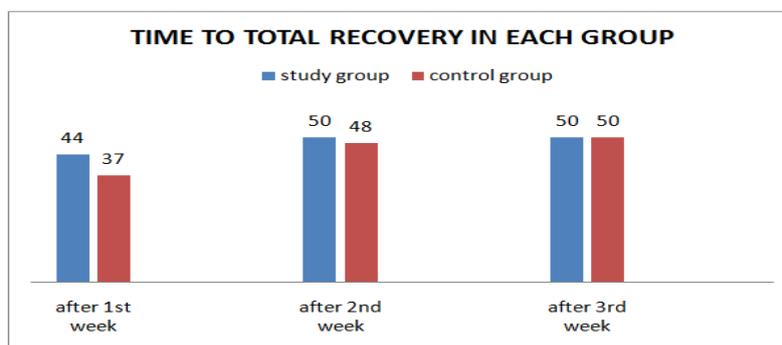
**Table 1: Age and Sex distribution**

Age Group	Male	Female	Total
18 – 30	19	17	36
31 - 50	20	24	44
51 – 60	12	8	20
Total	51	49	<b>100</b>

50 patients taken in study group were given steam inhalation with commercially available decongestant inhalant capsules ( karvol plus ) along with saline nasal drops, oral antihistaminic decongestants and analgesics. Remaining 50 patients in control group were given saline nasal drops, oral anti histaminic decongestants and analgesics without steam inhalation. The above treatment was given for 2 weeks (14 days). The patients were assessed after 1 week, 2 weeks and 3 weeks after starting of treatment.

Regarding time taken to total recovery it was found that in study group using steam inhalation 44 patients ( 88% ) had totally recovered after 1<sup>st</sup> week and 50 patients ( 100% ) had totally recovered after 2<sup>nd</sup> week. Whereas in control group 37 patients ( 74% ) had total recovery after 1<sup>st</sup> week, 48 patients ( 96% ) had totally recovered after 2<sup>nd</sup> week. All the patients had totally recovered at 3<sup>rd</sup> weekly visit ( Fig.1 ).

This shows that time to recovery is lesser in study group using steam inhalation with inhalant capsules as compared to control group without steam inhalation. Steam inhalation with inhalant capsules do have a role in faster recovery of patients suffering from common cold ( Fig.1 )



**Fig.1 Showing time taken to total recovery in study and control group ( Total patients 50 in each group )**

Nasal congestion was observed in 5, nil and nil patient of study group using steam inhalation with inhalant capsules at the end of 1 week, 2 weeks and 3 weeks respectively, whereas in control group without steam inhalation nasal congestion was observed in 12, 2 and nil patients at the end of 1 week , 2 weeks and 3 weeks respectively.( Table 2 )

Nasal discharge was present in 4, nil and nil patient in study group at the end of 1, 2 and 3 weeks respectively, while in control group it was evident in 10, 2 and nil patients respectively. (Table 2)

Sore throat was seen in 6, nil and nil patients in study group at the end of 1, 2 and 3 weeks respectively whereas in control group it was present in 12, 2 and nil patients at the end of 1, 2 and 3 weeks respectively.

None of the patients in both groups had sneezing or watering from eyes at any visit after starting the treatment.

These results show that steam inhalation with inhalant capsules gives better and faster symptomatic relief in patients with common cold.

**Table 2: Subjective symptoms in both groups after initiating treatment**

Group	At 1 <sup>st</sup> weekly visit			At 2 <sup>nd</sup> weekly visit			At 3 <sup>rd</sup> weekly visit		
	Sore throat	Nasal blockage	Nasal Discharge	Sore throat	Nasal blockage	Nasal Discharge	Sore throat	Nasal blockage	Nasal Discharge
<b>Study group Total patients - 50</b>	6	5	4	0	0	0	0	0	0
<b>Control group Total patients - 50</b>	12	12	10	2	2	2	0	0	0

On nasal endoscopic examination, nasal cavity was examined for degree of discharge, condition of mucosa whether congested or normal and condition of turbinates whether swollen or normal. (Table 3)

Regarding nasal discharge, in study group using steam inhalation with inhalant capsules 4 patients had nasal secretions pale in colour at first weekly visit while none of the patients had any nasal secretions at 2<sup>nd</sup> and 3<sup>rd</sup> weekly visits whereas, in the control group without steam inhalation nasal secretions could be seen in 10 patients at first weekly visit. They were pale to yellowish in colour. Yellowish secretions were also present in 2 patients at the second weekly visit in this group of patients. (Table 3)

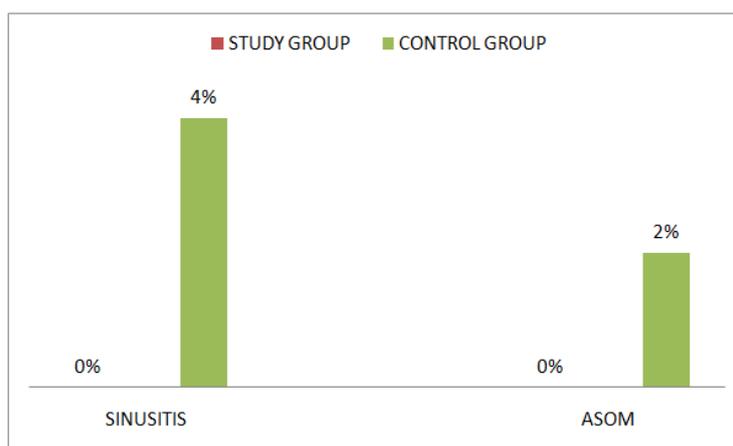
Regarding oedema of the turbinates, 7 patients in study group had oedema in the 1<sup>st</sup> weekly visit, while 1 patient had oedematous turbinate in 2<sup>nd</sup> weekly visit. None of the patients had oedema at the 3<sup>rd</sup> weekly visit whereas, in control group 15 patients had oedema at the 1<sup>st</sup> weekly visit, 4 in the 2<sup>nd</sup> weekly visit and 1 at the 3<sup>rd</sup> weekly visit. ( Table 3 )

Regarding condition of the nasal mucosa, in the study group using steam inhalation with inhalant capsules 8, 1 and nil patients had congested mucosa at 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> weekly visit respectively. In the control group without steam inhalation 15, 5 and 1 patients had congested nasal mucosa at 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> weekly visit respectively. (Table 3) These results show the role of steam inhalation in reducing nasal secretions, turbinate oedema and congestion of nasal turbinates. Steam inhalation with inhalant capsules reduces the recovery time from these signs of common cold disease.

**Table 3 – Endoscopic signs in both groups after initiating treatment**

Group	At 1 <sup>st</sup> weekly visit			At 2 <sup>nd</sup> weekly visit			At 3 <sup>rd</sup> weekly visit		
	Congested mucosa	Oedema of turbinates	Nasal Discharge	Congested mucosa	Oedema of turbinates	Nasal Discharge	Congested mucosa	Oedema of turbinates	Nasal Discharge
<b>Study group Total patients - 50</b>	8	7	4	1	1	0	0	0	0
<b>Control group Total patients - 50</b>	15	15	10	5	4	2	1	1	1

Regarding the complications of common cold, in the study group using steam inhalation with inhalant capsules none of the patients developed any complications, whereas in the control group without steam inhalation , 2 (4%) patients developed features of acute sinusitis while 1 (2%) patient developed acute infection of middle ear ( ASOM ). All these complications were observed at 1<sup>st</sup> weekly visit and were prevalent even at 2<sup>nd</sup> weekly visit. These complications were completely resolved at the 3<sup>rd</sup> weekly visit. None of the patients in both groups developed serious complications like pneumonia.



**Fig 2** Showing comparative results of complications of common cold in both groups

Regarding adverse effects of steam inhalation, only 1 patient in study group suffered minor burn injuries on his both hands due to pouring of hot water. No other adverse effect of steam inhalation or of decongestant inhalant capsules was observed. These results show the safety of steam inhalation with inhalant capsules in cases of common cold.

#### **IV. Discussion**

The role of steam inhalation with decongestant inhalant capsules in patients with common cold was investigated in this study. The primary aim of this study was to evaluate the efficacy of steam inhalant with decongestant inhalant capsules in reducing recovery time in patients suffering from common cold and its role in reducing the signs and symptoms of common cold. The second aim was to evaluate its advantage in preventing the complications of common cold. The study also aimed to study the adverse effects of steam inhalation and of decongestant inhalant capsules, if any.

We have used commercially available decongestant inhalant capsules in our study, each inhalant capsule containing camphor, chlorothymol, eucalyptol, terpinol and menthol. The criteria for the inclusion of patients was those who had mild to moderate nasal discharge, nasal congestion and sneezing for 3 days or less.

The common cold (also known as nasopharyngitis, rhinopharyngitis or acute coryza [9]) is a viral infectious disease of upper respiratory tract which primarily affects the nose. Symptoms most commonly seen are runny nose, sneezing, sore throat, blocked nose which takes 7 to 10 days to resolve and in few cases it may take 3 weeks. In our study also, most of the patients, 81% had resolved within 1 week and 98% within 2 weeks. Only 2% patients took 3 weeks to recover. Over 200 strains are implicated in the cause of common cold [10], the rhinovirus being the most common. No cure of common cold exists, but the symptoms can be treated. It is the most frequent infectious disease in humans and has been present since antiquity [11]. The symptoms of the common cold are primarily related to the immune response to the virus [12].

The common cold affects the people of all the age group across the globe. Both sexes are equally affected [13]. Similar results were obtained in our study, where it was equally prevalent among all the age groups and male to female ratio was almost equal (51:49).

Treatment to alleviate symptoms include analgesics, anti histaminics and decongestants [14]. In the studies available none of the above medications are effective to shorten the duration of illness [3].

Steam inhalation is a method of introducing warm moist air into the lungs via nose and throat for therapeutic benefit. The hot steam moistens the nasal passages, causes the temperatures to rise leading to dilation of blood vessels. This causes improvement in blood circulation leading to opening of blocked noses and restoring normal colour of nasal mucosa. This rise of temperature leads to increase in production and action of white blood cells leading to stronger resistance against bacteria and preventing complications of common cold [15]. In our study also we found that patients in study group had much lower complication rate (Fig 2).

The commercially available decongestant inhalant capsules offer fast acting, long lasting effective relief for blocked noses. Each capsule contains soothing aromatic oils, which when opened, natural vapours are released which help to breathe more easily. Menthol dilates the blood vessels, causing an analgesic effect and relieves itching. Thymol is anti bacterial and antifungal. Pine oil relieves nasal congestion. Cinnamon oil is anti microbial.

According to a study in literature, steam inhalation has proven benefit and number and extent of symptoms are reduced among patients of common cold [16]. The theoretical basis is that steam may help congested mucus drawn better and heat may destroy the cold virus as it does in vitro [7]. Another study shows

that steam had slight effect on viral shedding in volunteers with experiment rhinovirus cold [13]. In another study it was observed that steam inhalation improved mucociliary activity significantly [17]. Even in our study we have observed the faster and better recovery from the symptoms of common cold in study group using steam inhalation with inhalant capsules (Table 2). The endoscopic findings also show the faster recovery of congested nasal mucosa and oedema of turbinates (Table 3).

Steam inhalation with decongestant inhalant capsules is a safer method for the treatment of common cold. The only complication associated with it in literature available is burn injuries which is also very rare. In our study also only 1 patient (2%) suffered from burn injury. No other adverse effect was noted. This shows the safety of this method of treatment.

The above results show the effectiveness of steam inhalation with decongestant inhalant capsules as an adjuvant treatment in patients with common cold. Steam inhalation is easily available in every household in rural areas. Its side effects are also minimal as shown in our study. There is further scope of studies in paediatric and much older age groups especially regarding the side effects.

## V. Conclusion

Steam inhalation along with inhalant capsules when given as an adjunct treatment in patients suffering from common cold do have an effective role in alleviating the symptoms of common cold. This treatment also leads to faster recovery of patients suffering from common cold. It also reduces the complications of common cold and has minimal side effects. It is also easily available even in rural areas and is a simple procedure. There is scope of future trials along this line of management also involving the paediatric and older age groups.

## Acknowledgments

I would like to thank our institute for its support and the patients for cooperating with the study protocol.

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