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Case Report

Acute exacerbation of bronchial asthma with infective focus treated with holistic Ayurveda approach: A case report

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ABSTRACT

While there are numerous published clinical trials investigating the efficacy of Ayurveda in managing bronchial asthma, a paucity of published case reports, case series, or randomized controlled trials (RCTs) concerning Basti (medicated enema) therapy in conjunction with Dhumapana (fumigation therapy) exists on PubMed.This scarcity of data hinders the comprehensive evaluation of this specific Ayurvedic approach for asthma management.

A 69-year-old female patient with a known case of bronchial asthma and hypertension presented with complaints of breathlessness on and off for 3 years, cough, urgency of micturition, constipation for 7 days, and fever for 3 days. The patient was treated according to the treatment principles of *Tamakshwas* (bronchial asthma) and *Jwara* (fever). *Basti*, *Dhumapana*, and oral *Ayurvedic* formulations were administered. Significant improvements in symptoms, the mMRC dyspnea scale, and the pulmonary function test were observed.

This case provides new insight into clinical diagnosis and management through gut modulation in respiratory diseases and vice versa.

1. Introduction

Bronchial asthma is a lung disease characterized by inflammaton and narrowing of the air passages. According to the World Health Organization, globally, there were 250,000 deaths due to asthma in 2016 [1]. In developing countries, the prevalence of asthma has increased by 40 % every decade during the last 40 years [2].

Management of bronchial asthma includes long-acting beta-2 agonists, corticosteroids, and the avoidance of triggering factors. Inhalation therapy is widely used for the management of bronchial asthma and conditions like status asthmaticus [3]. The lung has a large surface area, extensive vascularization, and high permeability; this may facilitate the rapid pharmacological action of medicine delivered through the lungs [4].

Inhaled corticosteroids in patients with bronchial asthma show adverse effects such as hypothalamic-pituitary-adrenal axis suppression, osteoporosis etc. Long-term use of corticosteroids shows side effects such as infection, diabetes, hypertension, psychological disturbances, etc. [5, 6]. Recently inhaled pulmonary drug delivery is preferred as it acts on target organs and has a systemic effect as well. Safe herbal inhalation therapy may be better due to its multi-targeted action and minimum adverse effects [7–9].

Dhumapana is an Ayurvedic medication-based fumigation therapy. It is an important mode of drug administration in which medicine is delivered into the airways. In inhalation (nebulization) therapy, drugs are used in aerosol form, while in herbal fumigation therapy, herbal medicines are inhaled in a gaseous state. In *Dhumapana,* herbal fumes are inhaled through the nose and mouth while being exhaled through the mouth only [10].

There is an interlink between the gut and the lungs**.** An imbalance in gut microbiota is responsible for disturbances in respiratory immune response, barrier function, and inflammation. Some publications show that ,dysbiosis in the lungs microbiota causes aggravation of lung disease; and leads to intestinal dysfunction through the lymphatic system. In the same way, one can say that the correction of intestinal dysfunction may lead to the correction of lung microbiota dysbiosis. Fecal microbiota transplantation is used for the prevention of chronic lung disease [11].

A higher serum ferritin level causes a reduction in forced vital capacity (FVC). In bronchial asthma, there is a reduced FVC [12]. Tumor

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necrosis factor-alpha, interleukin 6, interleukin 8, and serum cortisol are raised in bronchial asthma patients [13,14]. *Basti* (medicated enema) can decrease the serum ferritin level, tumor necrosis factor-alpha, interleukin 6, interleukin 8, and serum cortisol [15].

There are various published clinical trials on *Ayurveda* management of bronchial asthma. Most of the clinical trials have explained the role of *Virechana* (purgation therapy) and *Shaman Chikitsa* (pacifying treatment) in bronchial asthma [16,17]. However, there is an unavailability of published case reports, case series, or clinical trials on PubMed about the management of bronchial asthma through *Basti* (medicated enema) along with *Dhumapana*. Here, we treated case of bronchial asthma through *Basti, Dhumapana,* and internal oral *Ayurvedic* formulations.

2.

2.1. Patient information

A 69-year-old female patient known case of bronchial asthma and hypertension presented with complaints of breathlessness on and off for 3 years, cough, urgency of micturition, constipation for 7 days, and fever for 3 days. The patient was on anti-hypertensive medication (tab Telmisartan 20mg) once a day. She had a family history of bronchial asthma. The patient was not taking any modern medicine for bronchial asthma. She was managed at the Government *Ayurved* College and Hospital in Nagpur, India through *Ayurvedic* treatment.

Table 1
Treatment plan and important events during the course of treatment

No. Of Days	Treatment plan	*Panchakarma*	Important events			
			Asthma symptoms in a day	Night awakening due to asthma symptoms	Relievers needed	Limitations to activities
Day 1	1. *Dashmularishta* 10ml BD 2. *Trishun Vati* 750MG BD 3. *Panchasakar Churna* 5GM BD 4. *Kanchanar Guggul* 250MG BD 5. *Sitopaladi Churna 3*GM + *Yashtimadhu churna* 2GM QID 6. *Trikatu Churna* 5GM BD 7. T. Telmisartan 20MG OD		6 times	4 times	Yes	Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 2	Ct all	*Dashmularishta Basti* Stat	6 times	4 times	Yes	Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 3	8. *Kantakari Churna* *Sunthi Churna* *Guduchi Churna* *Pippali Churna* Each 2 GM (40ML *Kwath* BD)	*Anuwasan basti* (*Kottamchukyadi tail* 100ml for 9 days)	5 times	4 times	Yes	Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 4	Hold 1, Ctall		4 times	3 times	No	Walking, Climbing the stairs, weight lifting(5L)
Day 13	Ct -all	*Dashmul niruha Basti* 700ml & *Anuwasan basti* with *Bruhatsaindhawadi tail* 60 ml (for 30 days)				Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 15–17	Ctall 11. *Dashmul Yawagu* 100ML with meals		3 times	2 times	No	Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 18–26	Ct-all		2 times	Once in week	No	Climbing the stairs, weight lifting(5L)
Day 27 To 34	Ct-all	*Kasaghna Dhumapana* OD (*Amalaki* +*Pippali*) for 32 days *Prushthavanshabasti* with *Til Tail* for 32 days	6 times in week			Talking, Walking, Climbing the stairs, weight lifting(5L)
Day 35–38	Ct-all		Once in a week			weight lifting(5L)
Day 39–44	1. *Sarwang Snehan Swedan* 2. *Panchasakar Churna* 5GM BD 3 *Kantakari Churna* *Sunthi Churna* *Guduchi Churna* *Pippali Churna* Each *2* GM (40 ML *Kwath* BD) 4. *Dashmul Yawagu* 100ML OD 5. *Yogaraj Guggul* 250MG BD		Once in week			weight lifting(5L)
Day 44–54	Ct-all	*Nasya* with *Anutail* For 15 days				weight lifting(5L)
Day 55–59	Ct-all	*Matrabasti* with *Bruhatsaindhavadi tail* 60 ml for 5 days				

2.1.1. Clinical findings

2.1.1.1. General examination. Patient's general condition was good; she was afebrile with a pulse of 100/min and a blood pressure of 120/90 mmHg. She was centrally obese, with a BMI of 27.7 kg/cm^2. Respiratory rate was 34/min, and Spo2 was 96 %.

2.1.1.2. Ashtavidha Parikshana. Her *Nadi* (pulse) was *Vatkaphaj*, *Malvibandha* (constipation) was present, she also had the urgency of micturition, her tongue was coated (*Sam*), *Shabda* (speech) was *Aspashta* (difficulty while talking due to breathlessness), the temperature was 100° F, *Drik* (vision) was normal with refraction correction, and her body built was overweight.

2.1.1.3. Dashavidha Parikshana. Dashavidha examination showed *Sar-Madhyam*, *Prakriti-VatKaphaj*, *Satva-Madhyam Samhanan-Madhyam*, *Satmya-Madhyam*, *Aaharshakti-Alpa*, *Vyayamshakti-Alpa*, *Desh-Sadharan*, *Vaya*-69 years, *Kal-Shishir Rutu.*

2.1.1.4. Systemic examination. Assessment of the respiratory system showed air entry was bilaterally unequal, and wheezes were present in bilateral lungs. The cardiovascular system examination was within normal limits. The patient was conscious and well-oriented, and pupillary reflexes were within normal limits. Deep tendon reflexes and superficial reflexes were also normal. *Adhmana* (bloating) was present.

2.1.1.5. Strotas Parikshana. Strotodushti was observed in *Pranavaha, Annavaha, Medovaha, Purishvaha, Swedovaha,* and *Mutravaha Strotas.*

2.1.2. Diagnostic assessment

The patient was diagnosed with an acute exacerbation of bronchial asthma with an infectious focus based on clinical findings and investigations. Measurements of peak expiratory flow rate (PEFR), sustained minimal inspiration (SMI), inspiration time, expiration time, and breath holding time are mentioned in Table 2.

A complete blood count showed an increase in white blood cell counts. The electrocardiograph (ECG) was within normal limits. An X-ray of cervical spine showed space reduction in the vertebrae. The pulmonary function test showed moderate obstruction with good reversibility. Detailed investigations are attached as supplementary material.

Breathlessness was assessed by a modified Medical Research Council dyspnoea scale (mMRC) [18]. Table 2 shows details of changes in dyspnoea. Control of bronchial asthma over the course of treatment was measured by guidelines for diagnosis and management of bronchial asthma released by the joint Indian Chest Society and National College of Chest Physicians (ICS-NCCP) (summarized in Table 1) [19].

2.1.3. ***Therapeutic intervention***

Initially, *Basti* (a medicated enema) of *Dashmularishta* 50 ml mixed with 500 ml of warm water was administered to relieve acute symptoms. Some published studies show that the alcohol percentage in *Dashmularishta* is less than 12 %; there is also the absence of microbes such as Escherichia coli, Salmonella species, and Staphylococcus aureus [20]. Hence, *Dashmularishta* was diluted with 10 times as much water. After relieving the acute symptoms, *Snehabasti* was administered.

Dashmularishta 10 ml twice in a day, *Trishun Vati* 500 MG BD, *Panchasakar Churna* 5 GM BD, *Kanchanar Guggul* 250 MG BD, *Sitopaladi churna* (3GM) + *Yashtimadhu churna* (Glycyrrhiza glabra) 2GM QID, *Trikatu Churna* (Zingiber officinale, Piper nigrum, Piper longum) 5GM BD, *Kantakari Churna* (Solanum xanthocarpum) + *Sunthi Churna* (Zingiber officinale) + *Guduchi Churna* (Tinospora cordifolia) + *Pippali Churna* (Piper longum) 40 ml of decoction were given orally. Table 1 summarizes the details of oral internal treatment. *Sarwang Abhyang Swedan* (external oleation and fomentation therapy) was given.

Kaphaghna Dhumapana (therapeutic inhalation of smoke from burning the herbs) was given for 32 days for the removal of *Linadosha. Dhumvarti* was prepared from *Amalaki* (Terminalia officinale) and *Pippali Churna* (Piper longum). Table 1 summarizes *Panchakarma* (detoxification therapy) and improvement in daily activities over the course of treatment. *Dashmul Yawagu,* 100 ml twice a day, is given as a dietary intervention to relieve dyspnea and cough. During the course of treatment, the patient complained of vertigo. *Anutail* was administered through the nasal route (*Nasya*).

2.1.4. Follow-up and outcomes

Initially, the patient experienced severe breathlessness, and bilateral wheezes. After a *Basti* of *Dashmularishta* mixed in hot water, acute symptoms were reduced in 2 hours. Overall a reduction in symptoms and improvement in pulmonary function tests were observed after the 3 days of treatment mentioned in Table 2. Assessment of dyspnea measured by the mMRC scale showed marked improvement, as mentioned in Table 2. Bronchial asthma control was adequately achieved, as mentioned in Table 1. *Dhumapana* therapy showed improvement in pulmonary function tests (Table 2).

3. Discussion

Dasmularishta mitigates *Vata Kapha Dosha. Dashmularishta* contains self-generated alcohol *(Madya)*. *The Vyavayi* and *Vikasi'* properties of *Madya* are responsible for the faster action of the formulation in acute symptoms. Considering the *Alpa Bal* of a patient, S*nehabasti* (oil enema) was used.

Bronchial asthma can be correlated with *Tamakshwas*. *Tamakshwas* is one of the most acute and fatal disease, as mentioned by *Charaka*. *Tamakshwas* is *Kapha-Vata* dominant. *Tamakshwas* originates from the upper abdomen (*Aamashay*), and its manifestation occurs in the chest, throat, and head (*Urah, Kanth,* and *Shir)*. *Strotas* involved in *Tamakshwas* are *Pranvaha Strotas* (respiratory system), *Udakavaha Strotas* (lymphatic system), *and Annavaha Strotas* (alimentary canal). Prolonged exposure to etiological factors causes vitiation of *Pran Vayu* along with *Kapha* and blocks the channels of *Vayu* that carry vital breath. Bloating of the abdomen, pain in the lateral side of the chest, a feeling of compression in the cardiac region, and mis-passage of vital breath are prodromal

Table 2
Measurements of PEFR, SMI , inspiration time, expiration time, and breath holding time, Respiratory Rate, SpO2, Pulse rate, mMRC dysnea scale during the course of treatment

No. of Days	1	10	13	15	20	27	31	32	33	34	35	36	37	38	39	40	41	43	45	51	55	59
PEFR (L/min)	60	60	80	86	88	80	89	70	80	86	83	88	86	81	88	88	88	90	80	88	90	90
SMI (seconds/200 cc)	0	0	0	4	3	1	2	1	2	2	2	2	3	3	24	2	2	1	1	2	2	2
Breath holding time(Seconds)	1	1	1	10	25	11	8	8	8	8	9	11	8	6	8	6	8	9	10	9	10	12
Inspiration time(Seconds)	1	1	1	2	3	25	1	1	1	1	1	1	1	2	1	1	1	1	2	1	2	2
Expiration time(Seconds)	1	1	1	1	2	1	2	2	2	2	1	1	1	1	2	1	1	1	1	1	2	2
RR(/min)	34	27	22	28	30	26	28	28	26	30	28	26	28	25	24	28	28	26	24	22	20	18
Spo2(%)	90	99	99	98	97	98	98	96	99	99	95	98	96	98	94	98	96	98	96	99	99	99
Pulse(/min)	92	82	80	64	64	67	68	72	26	68	74	68	68	68	74	68	70	68	68	70	72	70
mMRC dysnea scale	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1

symptoms of *Tamakshwas* [21].

Dashmularishta is indicated in *Shwas, Mandagni* [22]. *Trishun Vati* (containing extracts of *Sudarshan Churna* 600mg and *Tribhuwankirti Ras* 130 mg) was used for its action on *Amashay*. *Panchasakar Churna* mitigates *Vata* and *Kapha Dosha*. *Sitopaladi churna* is indicated in *Shwas* and *Mandagni*. *Trikatu Churna* acts as *Dipan* and *Kaphaghna* and is used in *Sam Dosha* conditions [23]. *Kantakari Churna* +*Sunthi Churna* + *Guduchi Churna* + *Pippali Churna* (Piper longum) decoction is indicated in *Shwas, Kasa* (cough), *Parshwashul* (lateral side chest pain), and *Jwar* [24].

Dhumapana is indicated to remove the remaining *Linadosha* after *Shodhana*. *Vagbhat* quotes that regular practice of healthy, medicated *Dhumapana* can eliminate various diseases like *Kasa, Tamakshwas,* etc. *Dhumapana* treatment can be used as a preventive modality for the treatment of *Tamakshwas* [25].

Various published studies show that nasal inhalation of different materials can impact the gut microbiome. Air pollution causes systemic inflammation and altered metabolism in the body. Some studies show that air particles can enter the gastrointestinal system through inhalation from terminal bronchi via blood circulation [26].

The human microbiota comprises various microbes present in the gut, lungs, airways, mucosa, vagina, etc., but the majority of microbes are present in the gastrointestinal system. Short-chain fatty acids are produced in the gut and systematically distributed. Short-chain fatty acids are responsible for promoting immune responses and anti-inflammatory effects [11]. Short-chain fatty acids and gut microbiota play an important role in bronchial asthma [27]. Short-chain fatty acids are absorbed from the colon. Various medicines used in medicated enemas, such as rock salt, honey, oil, and decoction, are absorbed from the gut [28].

The gut microbiota influences immune responses as well as metabolic functions. Metabolites produced in the gut modulate the gastrointestinal system and also impact other organs, such as the lungs and brain. The gut microbiota acts by microaspiration or sensitization to immune responses through the lymphatic system or blood circulation. It is responsible for the effects of various treatment modalities on various respiratory diseases through the gut-lung axis [29]. Consequently, it can be suggested that both Dhumapana and Basti therapies, through their potential modulation of the gut microbiome, may exert effects on the lungs and airways via the gut-lung axis.*Basti* and *Dhumapana* are important *Ayurvedic* treatment modalities for *Tamakshwas which*can modulate the gut-lung axis. Future studies in this direction are needed.

Patient perspective

Initially, I was severely breathless for 3 days and got symptomatic relief just 2 hours after administration of the enema. So I decided to continue *Ayurveda* treatment. I did herbal smoking and took oral medications along with different types of enemas. I give my full consent for the scientific utilization of my case. I advised all people to try *Ayurveda* treatment at least once in their lifetime.

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Declaration of competing interest

Nil.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jaim.2023.100824.

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