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CLINICAL EVALUATION OF *DASAMUL KWATH* AND *KATPHAL* (*MYRICA ESCULENTA*) *CHURNA* FOR MANAGEMENT OF *TAMAK SVASA* (BRONCHIAL ASTHAMA)

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ABSTRACT

Background: Bronchial asthma is a global problem which creates a substantial burden on individuals and families restricting individual activities for a lifetime. WHO estimated that 262 million people suffer from asthma of which 455,000 people died globally in 2019. The clinical features of bronchial asthma are very much alike to disease *Tamak svasa* according to Ayurvedic system of medicine. There are several medicines which have been mentioned in the classical texts for the treatment of *Tamak Svasa*. The present clinical study was furnished to establish the effect of *Dasamula kwath* and *Katphal churna* (*Myrica esculenta*) in Tamaka Swasa vis-à-vis bronchial asthma. The goal of treatment is to control the symptoms of the disease effectively in a long run in a scientifically and methodical manner. **Methods:** Total 56 patients of *Tamaka Swasa* (Bronchial asthma) were selected and out of them clinical trial was performed with 30 patients. These 30 patients were selected after implying the inclusion & exclusion criteria and randomly categorized into three groups i.e. group A, B and C as per their treatment schedule. Patients of group 'A' (n = 06) were treated with 3 gm of *Katphala churna* along with 1gm of *Pippali churna*, group 'B' patients (n = 10) were treated with 20 ml of *Dasamula kwath* twice daily with 1gm of *Pippali churna* and group 'C' patients (n =

14) were simultaneously treated with 20 ml of *Dasamula kwath* with 3 gm of *Katphala churna* with 1gm of *Pippali churna*. All the treatments were continued twice per day for a period of 3 months (90 days). Signs, symptoms, pick expiratory flow rate, breath holding time and hematological parameter (routine blood examination) and chest skiagram were studied before and after treatment. **Results:** It was observed from the study that there were very close results in three groups of treatment where the per cent reduction of mean score of the symptoms in groups 'A', 'B, and 'C, were 48.31%, 44.45% and 53.92% respectively, PEFR reduction rate in these groups were 48.31%, 40% and 58.66% respectively while breath hold time (BHT) were 47.1%, 44% and 53.82% respectively. No significant changes of hematological parameters were observed in any groups. **Conclusion:** Combination of Ayurvedic management with Dasamula Kwath and Katpha Churna for the management bronchial asthma was found satisfactory.

KEYWORDS: *Tamak svsas*, Bronchial asthma, *Dasamula kwath, Katphal churna*.

INTRODUCTION

Bronchial asthma is prevailing globally that results substantial burden on individuals and families restricting individual activities for a lifetime. Its' effect is 1 in 20 all over the population, but the incidence rate is high in children as reported 1 in 10 children. WHO estimates that 262 million people suffer from bronchial asthma of which 4,55,000 people died globally in 2019.[1] Bronchial asthma is a chronic inflammatory disease of the airways characterized by bronchial hyperactivity and a variable degree of airway obstruction.[2]

GINA (Global Initiative for Asthma) describes asthma as a common and potentially serious chronic disease that can be effectively treated to control symptoms and minimize the risk of flare-ups (exacerbations). Asthma is usually characterized by chronic airway inflammation associated with a history of variable respiratory symptoms such as wheezing, shortness of breath, chest tightness, cough and variable expiratory airflow limitation.[3] The World Health Organization (WHO) estimated that most deaths occur in older adults.[4] GINA reported that in 2020, asthma affects 1%–18% of populations in different countries and its prevalence has been increasing around the world.[5] Worldwide, it is estimated by WHO that approximately 334 million people are currently suffering from asthma and 250,000 deaths are attributed to the disease each year. The prevalence of the disease is continuing to grow, and the overall prevalence is estimated to increase by 100 million by 2025.[6]

Public attention in the world has been focused on the life-threatening disease bronchial asthma because of its rapidly increasing prevalence. This morbidly increasing prevalence is attributed to environmental and social changes. It includes many factors such as increase exposure to indoor allergens & occupational exposure to many pollutants, atmospheric pollution, etc. Along with those, the disease can be triggered by respiratory infection, exercise, cold air, tobacco smoke, pet dander, dust mites, cockroach allergens, moulds or pollens, and other pollutants. Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDS) provoke asthma in some patients.[7] Pathological changes of respiratory airway include bronchial smooth muscle inflammation, tenacious mucus secretion and plaguing of the lumen. Pathophysiologic hallmark of asthma is a reduction in airway diameter brought about by contraction of smooth muscle, vascular congestion, edema of the bronchial wall, and thick tenacious secretion.[8]

Airway wall thickening is greater in the asthmatic patients than normal subjects, and severe patients have greater pathogenesis.[9] This thickness is due to an increase in airway smooth muscles (ASM) mass and mucous glands.[10] The airflow limitation is also compounded by the presence of increased mucous secretion and inflammatory exudates.[11] Thus, the results from many studies have supported that airway remodeling related to airway inflammation. Surprisingly, physical force generated by ASM in broncho-constriction without additional inflammation induces airway remodeling in patients with asthma.[12] In *Ayurveda*, *Tamak svasa* is a type of *Svasa roga* (respiratory disorder) affecting the *pranavaha srota* clinically characterized by severe cough, rapid respiration, dyspnoea and distress due to inability to expectorate, prolonged expiration, etc.[13] which are very much identical to the symptoms of Bronchial Asthma of modern medicine.

Many drugs has been designed for the treatment of bronchial asthma in allopathic system of medicine such as Isoprenaline, bronchodilators like Salbutamol, Theophylline, anticholinergics, Ketotifen, inhaled corticosteroids, etc. But most of these medicine lack satisfactory success due to their adverse effect. According to Ayurveda system of medicine some plants are also effectively used in bronchial asthma. Commonly used Ayurvedic medicinal plants for treatment of bronchial asthma are *(Aerva lanta linn, Ageratum conyzoides L, Argemone mexicana, Asystasia gangetica T. Adams, Bacopa monnieri L., Cassia sophera, Casuarina equisetifolia Linn, Clerodendrum Serratum Linn, Cnidium monnieri, Crinum glaucum, Curculigo orchioides Gaertn, Eclipta alba Linn, Euphorbia*

hirta, Ficus bengalensis Linn, Hemidesmus indicus R. Br., Amburana cearensis, Lepidium sativum Linn, Mentha spicata L, Momordica dioica, Mucuna pruriens, Nyctanthes arbortristis, Olea europea, Piper betel Linn, Striga orobanchioides Benth, Sphaeranthus indicus Kurz, Cynodon dactylon[14] including *Dasamul* (*composiytion* of ten Ayurvedic plants) and *Katphala* (*Myrica esculenta*). No report is available regarding the clinical trial of *Katphala* (*Myrica esculenta*) and or *Dasamula kwath* (decoction) till date for the management of bronchial asthma. Objective of the work was clinical evaluation of current research *Myrica esculenta and Dasamula kwath* in single and combined form on selected case of Bronchial Asthma.

MATERIALS AND METHODS

The study was performed by the help of basic material i.e. patients, drugs and other accessories. Initially 56 patients were selected cases of asthma patients were selected form OPD of the Institute of Post Graduate Ayurvedic Education & Research at SVSP Hospital, 249/3/1, A.P.C Road, Kolkata- 9, irrespective of their age, gender, religion, income status, educational qualifications and different occupation groups after confirm diagnosis and finally 26 patients were excluded due to non-fulfillment of inclusion criteria. The inclusion criteria are the age of patient in between 16 - 70 years of either sex who are not dependent with other drugs and having the symptoms like cough accompanied with rattling sound, running nose, dyspnea of exceedingly deep velocity, aggravation of dyspnea especially in cloudy weather, eyeballs become prominent & sweating over forehead, mouth becomes dry, fine momentary comfort after expectoration, unable to breathe while lying find comfort in sitting. Exclusion criteria includes patient with acute and chronic bronchitis, Tropical Eosinophilia, allergic Aspergillosis, cardiac asthma, acute bronchopneumonia, pneumoconiosis, pulmonary tuberculosis, lung cancer, patients having complications like bronchiectasis, cor pulmonale, severe emphysematous changes, etc. and the *Tamak Svasa* (Bronchial Asthma) appearing along with the diseases like chemical Bronchitis, Reactive airway dysfunction syndrome, Endobronchial sarcoidosis, Endobronchial amyloidosis, Bronchopulmonary dysplasia, cystic fibrosis, Loeffler syndrome etc. It is noteworthy that all the data of the patients were collected with the help of a special scientific proforma based on Ayurveda and Western medicine. *Katphala bark, Dasamula* and *Pippali* (*Piper longum*) fruits were supplied by the Apothecary department of IPGAE & R at SVSP Hospital identified and verified by Ayurvedic experts. The whole material was washed and dried in sun light. Finally 30 patients were selected after fulfilling the inclusion criteria and randomly categorized into three groups i.e., group A, B

and C. These grouping of the patients were done as per treatment administered. In group A, a total number of 14 patients were treated with 3 gm of *Katphala churna* along with 1gm of *Pippali churna* as *anupana* (adjuvants) twice daily after breakfast and evening tiffin for 3 months. In Group B, 10 patients were selected randomly to treat with *kwath* or decoction of *Dasamula* along with *Pippali churna* as *anupana*. The dose of *Dasamula kwath* was 20 ml twice daily with 1gm of *Pippali churna* after breakfast and evening tiffin for 3 months and 6 patient included under group C who were treated combinedly with *Dasamula kwath* 20 ml and *Katphala churna* 3gm along with *anupana Pippali churna* 1gm twice daily after breakfast and evening tiffin for 3 months. Consent was taken from each patient in a prescribed trilingual written format as per the guideline of WHO-Helsinki protocol and explained about the clinical research before administration of treatment. Selection of the patients for clinical trial was done after proper screening. First of all, the patient having complaints like dyspnoea, wheezing, cough, history of momentary comfort in expectoration and changing of posture, were emphasized. Such patient presented the findings in auscultation of chest some adventitious sound was considered as hallmark for clinical diagnosis. The expiratory and inspiratory rhonchi all over the chest and coarse basal crepitations were also major criteria for selection. The prepared medicines were administered orally in each subject along with the *Pippali* powder in the form of vehicle or adjuvant. *Katphala bark* and *Pippali* fruits were made fine powder separately and made packets. *Dasamula*- the roots of ten herbs i.e. *Bilva* (*Aegle marmelos* Corr), *Agnimanth* (*Premna mucronata* Roxb), *Patala* (*Stereospermum suaveolens* DC), *Gambhari* (*Gmelina arborea* Linn), *Sonyak* (*Oroxylum indicum Vent*), *Salaparni (Desmodium gangeticum DC), Prisniparni (Uraria Picta* Desv*), Brihati (Solanum torvum* Swartz*), Kantikari (Solanum xanthocarpum)* and *Goksura* (*Tribulus terresteris* Linn.) were taken in same quantity and powdered coarsely, then the powder soaked into 16 times more water than itself (powder: water =1:16) and kept for 24 hours, then boiled it in an earthen pot with mild fire till the liquid is reduced to 1/8th of the original quantity. Then the mixture was cooled down and filtered. The process was followed as per the description of classical Ayurvedic texts. An amount of 300 ml *Dasamula kwath* was filled in sterilized plastic bottles for the patient convenience and for appropriate dosing. Precautions measures related to habit and foods were advised to the patients of all groups during the course of clinical trial. The habit like exposure to cold, dust, smoke, day sleep, night awakening, cold-water bathing, running in the sun, walking on moist area without shoe etc. were restricted. The foods like curd, ice-cream, cold drinks, spicy food, taking of food before digestion of previous were prohibited. The

lukewarm water was prescribed to all the patients at the time of taking medicine. Emergency measure like moist oxygen inhalation and modern bronchodilator group of drugs were advised for some patients where the clinical features were aggravated. The bronchodilators like theophylline were withdrawn within three days after the emergency period was over. Such attack was found in the very early stage of the clinical trial but no longer came after fifteen days of starting trial. The treatment group is being depicted in table 1.

Table 1: Grouping the of the patients as per their treatment schedule with doses.

Group	***Drug***	***Dose***	***Anupan with its dose***	***Duration***
A	*Katphala churna*	*3gm*	*Pippali churna -1gm*	*3 months*
B	*Dasamul kwath*	*20 ml*	*Pippali churna -1gm*	*3 months*
C	*Dasamul kwath & Katphala churna*	*20 ml & 3gm accordingly*	*Pippali churna -1gm*	*3 months*

Assessment of effect of different treatments in Tamaka Swasa (bronchial asthma) were done on the basis of an arbitrary scoring on changes of different clinical features as indicated in table 2 following the conventional technique.[15]

Table 2: Arbitrary scoring for assessment of effects of treatment on clinical features of bronchial asthma.

Clinical Presentation with severity	**Score**
I] Dysponea (difficulty in breathing)	
i) No difficulty	0
ii) Mild difficulty	1
iii) Moderate difficulty	2
iv) Severe difficulty	3
II] Cough	
i) Absence	0
ii) Mildly present	1
iii) Moderately present	2
iv) Severely present	3
III] Wheezing	
i) No	0
ii) Mild	1
iii) Moderate	2
iv) Severe	3
IV] Feeling comfort (in relation to expectoration)	
i) Sufficient	0
ii) Moderate	1
iii) Mild	2
iv) No	3
V] Feeling comfort (in relation to change of posture)	
i) Sufficient comfort in all posture	0
ii) Discomfort in laying down posture	1
iii) Comfort in propped -up posture	2
iv) Discomfort in all posture	3

RESULTS

Physical parameter. It was observed that the mean score of feature of dyspnoea in group 'A' was 2.43 before treatment which was reduced to 0.93 after treatment (61.73%). Similarly in this group mean score of wheezing was 2.07 before treatment and reduced to 0.57 after 3 months of treatment (72.46%) in this group. Mean score of cough was 1.86 before treatment which was also reduced to 0.71 after 3 months of treatment (61.83%). Mean score of comfort with expectoration was 2.07 before treatment which was also reduced to 1.07 after 3 months of treatment (48.31%). Mean score of comfort with change of posture was 2.21 before treatment which was also reduced to 0.86 after 3 months of treatment (61.09%). Mean score of rhonchi was 2.14 before treatment which was also reduced to 0.43 after 3 months of treatment (80%). Mean score of Crepitations was 1.93 before treatment which was also reduced to 0.93 after 3 months of treatment (51.82%). Mean score of PEFR was 2.07 before treatment which was also reduced to 1.07 after 3 months of treatment (48.31%). Mean score of BHT was 2.29 before treatment which was also reduced to 1.21 after 3 months of treatment (47.17%). It was observed that the mean score of feature of dyspnoea in group 'B' was 2.00 before treatment which was reduced to 1.30 after treatment (35%). Similarly in this group mean score of wheezing was 1.80 before treatment and reduced to 1.00 after 3 months of treatment (44.45%) in this group. Mean score of cough was 2.30 before treatment which was also reduced to 1.30 after 3 months of treatment (43.48%). Mean score of comfort with expectoration was 2.00 before treatment which was also reduced to 1.20 after 3 months of treatment (40%). Mean score of comfort with change of posture was 1.50 before treatment which was also reduced to 1 after 3 months of treatment (33.34%). Mean score of rhonchi was 2.20 before treatment which was also reduced to 1.20 after 3 months of treatment (45.46%). Mean score of Crepitations was 1.50 before treatment which was also reduced to 0.90 after 3 months of treatment (40%). Mean score of PEFR was 2.50 before treatment which was also reduced to 1.50 after 3 months of treatment (40%). Mean score of BHT was 2.50 before treatment which was also reduced to 1.40 after 3 months of treatment (44%). It was observed that the mean score of feature of dyspnoea in group 'C' was 4.00 before treatment which was reduced to 0.67 after treatment (83.25%). Similarly in this group mean score of wheezing was 2.17 before treatment and reduced to 0.67 after 3 months of treatment (69.13%) in this group. Mean score of cough was 1.67 before treatment which was also reduced to 0.50 after 3 months of treatment (70.06%). Mean score of comfort with expectoration was 2.17 before treatment which was also reduced to 1.00 after 3 months of treatment (53.92%). Mean score of comfort with change of posture was 1.67 before treatment

which was also reduced to 0.50 after 3 months of treatment (70.06%). Mean score of ronchi was 2.33 before treatment which was also reduced to 0.33 after 3 months of treatment (85.84%). Mean score of Crepitations was 1.50 before treatment which was also reduced to 0.50 after 3 months of treatment (66.67%). Mean score of PEFR was 2.83 before treatment which was also reduced to 1.17 after 3 months of treatment (58.66%). Mean score of BHT was 2.50 before treatment which was also reduced to 1.17 after 3 months of treatment (53.20%).

Heamtological parameter and chest skiagraphy. No such significant changes in blood picture or in chest skiagram were found, so statistical analysis of the same not been performed. Therefore, all mean data of routine blood examinations in different treatment groups are described.

Table 2: Effect of different treatment in patients of Bronchial Asthma on the basis of different physical parameters.

Gr.	Physical parameters on clinical signs										Change on clinical features				Changes of lung function capacity			
	Dyspnoea mean ±SE		Wheezing mean ±SE		Cough mean ±SE		CWE mean ±SE		CWCP mean ±SE		Ronchi mean ±SE		Crepitations mean ±SE		PEFR mean ±SE		BHT mean ±SE	
	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE	BT± SE	AT± SE
A (n = 06)	2.43 ± 0.17	0.93 ± 0.21	2.07 ± 0.21	0.57 ± 0.17	1.86 ± 0.27	0.71 ± 0.24	2.07 ± 0.16	1.07 ± 0.16	2.21 ± 0.15	0.86 ± 0.14	2.14 ± 0.22	0.43 ± 0.13	1.93 ± 0.21	0.93 ± 0.15	2.07 ± 0.24	1.07 ± 0.19	2.29 ± 0.21	1.21 ± 0.15
B (n = 10)	2.00 ± 0.24	1.30 ± 0.20	1.80 ± 0.19	1.00 ± 0.2	2.30 ± 0.25	1.30 ± 0.28	2.00 ± 0.2	1.20 ± 0.27	1.50 ± 0.32	1.00 ± 0.24	2.20 ± 0.19	1.20 ± 0.23	1.50 ± 0.32	0.90 ± 0.26	2.50 ± 0.26	1.50 ± 0.21	2.50 ± 0.27	1.40 ± 0.21
C (n = 14)	4.00 ± 0.30	0.67 ± 0.30	2.17 ± 0.28	0.67 ± 0.31	1.67 ± 0.38	0.50 ± 0.20	2.17 ± 0.37	1.00 ± 0.25	1.67 ± 0.38	0.50 ± 0.20	2.33 ± 0.30	0.33 ± 0.19	1.50 ± 0.46	0.50 ± 0.31	2.83 ± 0.28	1.17 ± 0.28	2.50 ± 0.31	1.17 ± 0.28

Legend : CWE = Comfort with expectoration, CWCP = Comfort with change of posture, PEFR = Pick expiratory flow rate, BHT = Breath holding time.

Table 3: Effect of different treatment in patients of Bronchial Asthma on the basis of different hematological parameters.

Gr.	Heamatological parameters																			
	ESR (mm/hr)			TLC			Neutrophil			Eosiniphil			Basophil			Lymphocyte			Monocyte		
	BT	AT	%	BT	AT	%	BT	AT	%	BT	AT	%	BT	AT	%	BT	AT	%	BT	AT	%
A (n = 06)	39	27	30.76	6300	7100	-12.7	61	59	3.28	8	7	12.5	1	1	0	28	31	-10.71	2	2	0
B (n = 10)	28	24	14.28	6800	6300	7.35	58	54	6.9	7	6	14.28	2	3	-50	32	35	-9.38	1	2	-100
C (n = 14)	43	26	39.53	7400	6900	6.76	67	60	10.44	8	6	25	1	1	0	23	31	-34.79	1	2	-100

Legend: ESR = Erythrocyte sedimentation rate, TLC = Total leucocytic count, BT = Before treatment, AT = 3 months after treatment

DISCUSSION

Asthma is a chronic inflammatory disorder of the airways, in which many cells and cellular elements play key role. Chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night and in the early morning. These episodes are usually associated with widespread but variable air flow obstruction within the lung that is often reversible, either spontaneously or with treatment. The prevalence of asthma increased steadily over the latter part of last century. As asthma affects all age groups, it is one of the most common and important long-term respiratory conditions in terms of global years lived with disability. It is reported that the disease is prevalent in female more than the male up to the age of 15 years, thereafter becomes almost equal in both sexes but the prevalence become reverse above the age of 45 years. The main goal of therapy for this disease in modern medicine is done in three steps as initially with preventive therapy, secondarily initial add-on therapy and tertiary additional add-on therapy.[16]

The disease bronchial asthma can be compared with *Tamaka Swasa* according to Ayurveda on the basis of the similarities in clinical manifestations. The disease is considered to be influenced with involvement of aggravated states of two dosas *viz*. Vata and Kapha. The treatment principles, therefore, is oriented to pacify these two dosas. In current study promising results were observed in combination of treatment of Dasamula Kwath (200 ml), Katphal Churna (3 g) and Pippali Churna (1 g) with lukewarm water twice a day for a period of 3 months. Dsamula Kwatha, prepared with ten Ayurvedic medicinal plants, is mainly indicated for management of diseases due to influence of aggravated Vata dosa. Among ten plants of this formulations, three important members like Shyonaka (*Oroxylum indicum*) and Kantikari (*Solanum xanthocarpum*) are specifically indicated for the treatment of Swasroga vis-à-vis bronchial asthma.[17] The studies on the antiallergic and antiasthmatic effect of *Oroxylum indicum* was conducted in female Balb/c mice and cultured rat RBL-2H3 mast cells. The maximum degranulation and β-hexosaminidase release were estimated at a concentration of 30 µ M oroxylin A in RBL-2H3 mast cells. This activity supports the anti-asthmatic property of *O. indicum.*[18] The plant *S. xanthocarpum* also possess potent anti-allergic and anti-asthmatic activity. A study was conducted in Guinea pig model with atomised fine mist of 2% histamine dihydrochloride aerosol (dissolved in normal saline) as well as exposing to aerosol of 0.5% acetylcholine. The result shows that there was significant bronchodilator activity on histamine-induced bronchospasm which prevents airway

constriction and reversed the allergen-induced bronchospasm.[19] Anti-allergic activity of *Myrica esculenta* is also scientifically established where the plant showed such activity allergic pleurisy and vascular permeability induced by acetic acid in mice. The plant at the dose of 75 mg/kg and 150 mg/kg, p.o. as pre-treatment significantly inhibited the eosinophil accumulation ($P<0.01$) respectively in the pleural cavity.[20] In another study, petroleum ether and alcoholic extract as well as decoction of the fruits of the *Piper nigrum* showed significant protection ($p<0.01$) of histamine induced bronchospasm in Guinea pig model.[21]

The other plants may have a combined synergistic activity, either to promote anti-asthmatic and anti-allergic activity of specified plants or may prevent untoward effect. However, detail research is needed to establish the modus operandi of the combined formulation at pharmacological and clinical levels.

CONCLUSION

The clinical study of combination of Ayurvedic formulation Dashamula Kwath, Pippali (*Piper nigrum*) churna and Katphala (*Myrica esculenta*) on selected cases of bronchial asthma showed potent anti-asthmatic and anti-allergic effect. The study proves the rationality of traditional Ayurvedic formulation for their clinical efficacy in a specific disease like bronchial asthma vis-à-vis Tamaka Swasa.

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