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Research Article

MANAGEMENT OF CHRONIC BRONCHITIS: A CLINICAL STUDY

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*Correspondence	Abstract						
S. Geetha Kumari	Chronic Bronchitis is a common condition which is characterized by persistent cough, with expectoration for at						
Research Scholar, Department of PG	least three months of the year for two consecutive years. It is more prevalent these days because of the exposure						
Studies in Kayachikitsa, Government	to both active and passive smoke, air pollution, occupational hazards etc; Prevalence is directly related to that of						
Ayurveda Medical College, Mysore,	tobacco chewing, smoking and excess usage of biomass fuels especially in low and middle income countries.						
Karnataka. India	Current estimate suggest that 80 million people worldwide suffer from moderate to severe chronic obstructive						
	bronchitis. In India this is the second most common disorder after pulmonary tuberculosis. Kaphaja Kasa, a Vata						
	Kapha pradhana pranavaha srotovikara, bears a greater resemblance with Chronic Bronchitis. In the present						
DOI: 10.7897/2321-6328.01405	situation as there is a need to come up with a more comprehensive, economical and safe medication, a clinical						
2011 101 071 / 2021 0020101100	observational study was conducted to evaluate the combined effect of Pippalyadi Qwatha, Shatyadi leha and Vasa						
	Swarasa in the management of chronic bronchitis. Total 50 patients were incidentally selected and assigned into						
	single group. All patients were administered with Pippalyadi qwatha, Shatyadi leha and Vasa Swarasa for 48						
	days. Data was collected on 0 day, 15 th day, 30 th day and 48 th day of study period. Results were statistically						
Article Received on: 02/11/13	analyzed before and after the treatment. Combined effect of drugs showed statistically highly significant results						
Accepted on: 10/12/13	with 'P' value 0.000. Overall assessment showed marked relief in 22 patients followed by 26 patients with						
	Moderate relief and 2 patients with no relief.						
	Keywords: Chronic Bronchitis, Kaphaja Kasa, Pippalyadi Qwatha, Shatyadileha, Takrodaka, Vasa Swarasa.						

INTRODUCTION

Chronic bronchitis is a major cause of concern towards health care worldwide, as the subjects are more and more exposed to atmospheric pollution, occupational dust, noxious gases, active and passive smoking. Inhalation of smoke causes hyper secretion of mucus in large airways and alterations in the small airways of the lung which results in the manifestations of chronic airway obstruction. Clinically persistent cough with copious expectoration, dyspnoea and recurrent respiratory infections are common. Chronic Bronchitis has the greater resemblance with Kaphaja Kasa with respect to nidanas like raja and dhuma sevana, vatakapha prakopaka ahara vihara, and lakshanas like kasa with kapha shteevana, shwasakrichrata, shukapurnagalasyata etc;¹ There is considerable overlap of clinical features of chronic bronchitis and pulmonary emphysema, as quite often the two conditions co exist. For the present study, cases of chronic bronchitis without emphysematous changes with Forced expiratory volume < 80 % are taken. In order to manage chronic bronchitis with special reference to kaphaja

kasa, formulations like Pippalyadi Qwatha, Shatyadileha and Vasa Swarasa which are mentioned in the context of Kaphaja Kasa are taken and evaluated their combined efficacy in the management of Chronic Bronchitis.

MATERIALS AND METHODS

The materials taken for the clinical study: Pippalyadi Qwatha² Shatyadi leha³ Vasa Swarasa⁴

Pippalyadi Qwatha

Ingredients

Pippali, Katphala, Shunti, Karkatakashringi, Bharangi, Maricha, Karavi, Kantakari, Nirgundi, Yavanika, Chitraka, Vasaka; Each one part

Method of Procure

Procuring the raw drugs and the preparation of quatha was done in NKCA pharmacy Mysore, Karnataka, India.

Shatyadi Leha

Ingredients

Shati, Ativisha, Musta, Karkatashringi, Haritaki, Shunti each 1 part. Prakshepaka Dravyas- Hingu and Saindhava, Anupana-Takrodaka.

Method of Procure and administration

Churna's of drugs are procured and prepared from NKCA pharmacy, Mysore, Karnataka, India. The above mentioned churnas of Shati, Ativisha, Musta, Karkatashringi, Haritaki, Shunti are mixed and made into a paste (leha) by adding Hingu and saindhavayukta Takrodaka. In this form, this yoga is made to lick by the patient and hence the name shatyadi leha.

Vasa Swarasa

It includes single drug Vasa.

Method of Procure

Fresh leaves of vasa were collected daily from GAMC herbal garden and swarasa was extracted.

Methods

Ethical clearance number: EC- 2009/KC-6

Objectives of the Study

To evaluate the combined effect of Pippalyadi Qwata, Shatyadi Leha and Vasa Swarasa in the management of Chronic Bronchitis

Source of Data

Patients of either sex diagnosed to be suffering from Chronic Bronchitis were selected incidentally from OPD and IPD, GAMC and Hospital, Mysore, Karnataka, India and also patients from other referrals who fit into the diagnostic criteria were taken for the study.

Sampling Data

Patients were assigned into a single group consisting of 50 patients excluding dropouts.

Inclusion Criteria

- Patients between the age of 35-75 years were selected for the study.
- Patients irrespective of Sex, religion, occupation were selected for the study.

• Patients with the signs and symptoms of Chronic Bronchitis were selected for the study.

Exclusion Criteria

- Patients with Chronic bronchitis suffering from Tuberculosis, Carcinoma of Lung, bronchial asthma were excluded.
- Patients with major systemic disorders which interfere with the treatment were excluded.

Diagnostic criteria

Primary Criteria

Spirometry, i.e. Forced Expiratory Volume in 1 Sec (FEV1) $< 80 \ \%$

Secondary Criteria

Symptoms and signs of Chronic Bronchitis

Symptoms

Chronic Cough with sputum production for 3 months consecutive for 2 years, Breathlessness

Signs

On auscultation; Ronchi, Crepitations

Chest X-Ray was taken for the diagnosis of chronic obstructive bronchitis and to exclude other diseases.

Research Design

Total 50 patients were assigned into single group. Data were collected as per the Performa of the case sheet. The study was an observational with pre and post test design.

Intervention

- Patients were administered with Pippalyadi Qwatha 15 ml TID after food along with 15 ml of ushna jala.
- Shatyadi Leha 6 g TID after food along with 5-10 ml of Takrodaka
- Vasa Swarasa 20 ml OD along with 6 ml of honey early morning in empty stomach.
- Duration 48days

Investigations

- Spirometry- FEV1 (Before and After Treatment)
- Chest X-ray
- Blood- Hb%. TC, DC, ESR, AEC
- Sputum for AFB

Parameters of the Study

Table 1: Primary Criteria

S. No.	Spirometry- FEV1	Grading
	FEV1 > 80 %	0
	FEV1 50-80 %	1
	FEV1 30-49 %	2
	FEV1 < 30 %	3

Table 2: Secondary Criteria

S. No.	Symptoms	Grading
1.	Cough	
	No Cough	0
	Mild cough once or twice in 24 h without exhaustion	1
	Moderate Cough 5 - 6 times in 24 h without exhaustion.	2
	Severe Cough, > 6 in 24 h with exhaustion.	3
2.	Sputum Production	
	No Sputum	0
	5-20 ml per day	1
	>20 ml – 50 ml thick per day	2
	Above 50 ml thick tenacious per day	3
3.	Dyspnoca	
	No breathless except with sternous exercise	0
	Breathlessness when hurrying on the level or walking up a slight hill	1
	Walks slower on level ground because of breathlessness or has to stop for breath when walking at own pace. Stops for breath after walking about 100 m or after few minutes on level ground	2
	Too breathless to leave the house, or breathless when dressing or undressing	3

Table 3: Signs

S. No.	Signs	Grading
1	Ronchi	
	No ronchi	0
	Present either on one side of chest or both in 1-2 auscultatory areas	1
	Present either on one side of chest or both in 4-5 auscultatory areas	2
	Present all over auscultatory areas.	3
2.	Crepitations	
	No crepitations	0
	Present either on one side of chest or both in 1-2 auscultatory areas	1
	Present either on one side of chest or both in 4-5 auscultatory areas	2
	Present all over auscultatory areas.	3

Assessment of Severity of Cases

- If the total grading ranges between 13-18, is considered as Severe
- If the total grading ranges is between 7-12, is considered as Moderate
- If the total grading ranges between 1-6, is considered as Mild

Assessment criteria

- The results were assessed on the basis of severity of Signs and Symptoms on 0th, 15th, 30th and 48th day.
- FEV1 is assessed through Spirometry before and after treatment.

Overall Assessment of the Treatment

The overall assessment of the results in this clinical study was grouped under 3 categories.

- 1. Marked Relief: If the total Grading of Severity has come down to 3 and less than 3.
- 2. Moderate Relief: If the total Grading of Severity is between 4-6
- 3. No Relief: If the total Grading of Severity is above 6

Data regarding the above factors were collected before, during and at the end of the treatment. Improvement was graded and results were statistically analyzed using Contingency coefficient test, Chi square test and descriptive statistics using SPSS for windows software.

RESULTS

Table 4: Showing the Incidence and Results on Cough, Sputum Production, Dyspnoea, Ronchi and Crepitations

		Duration																		
	0 th day						1	15 th da	у				30 th da	ıy				48 th d	ay	
	С	S	D	R	cr	С	S	D	R	cr	С	S	D	R	Cr	С	S	D	R	Cr
Ab	0	0	1	4	4	0	2	3	13	12	15	12	13	28	31	25	22	26	41	40
Mi	0	2	2	9	12	18	17	12	26	35	28	30	32	20	16	23	27	22	9	8
Мо	9	37	6	32	30	27	31	32	11	3	6	8	5	2	3	2	1	2	0	2
Se	41	11	41	5	4	5	0	3	0	0	1	0	0	0	0	0	0	0	0	0
Tot	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Ab-Absent; Mi-Mild; Mo-Moderate; Se-Severe; C-Cough; S-Sputum Production; D-Dyspnoea; R-Ronchi;Cr-Crepitations

Cough

In the present study it was observed that maximum of 41 (82.0 %) patients had Severe Cough, most of the times in 24 h with exhaustion and 9 (18.0 %) patients had Moderate Cough 3-4 times in 24 h without exhaustion before treatment. After the treatment, maximum of 25 (50.0 %) patients had no cough followed by 23 (46.0 %) patients with mild cough, 2 (4.0 %) patient with moderate cough and no patient had severe cough. The result on cough showed statistically highly significant with P value 0.000

Sputum Production

In the present study it was observed that maximum of 37 (74.0 %) patients had moderate i.e., 20-50 ml/day sputum production, followed by 11 (22.0 %) patients with severe sputum production of more than 50 ml/day and 2 (4.0 %) patients had mild i.e., 5-20 ml/day sputum production, before treatment. On 48^{th} day, maximum of 27 (54.0 %) patients had mild sputum production, followed by 22 (44.0 %) patients with no sputum production, 1 (2.0 %) patient with moderate sputum production and no patient with severe sputum production. The result on Sputum production showed statistically highly significant with P value 0.000

Dyspnoea

In the present study it was observed that maximum of 41 (82.0 %) patients had severe dyspnoea, followed by 6 (12.0 %) patients with moderate dyspnoea, 2 (4.0 %) patient with mild dyspnoea and 1 (2.0 %) patient with no dypsnoea before treatment. On 48th day, maximum of 26 (42.0) % patients had no dyspnoea followed by 22 (44.0 %) patients with mild dyspnoea, 2 (4.0 %) patient with moderate dyspnoea and no patient with severe dyspnoea. The result on Dyspnoea showed statistically highly significant with P value 0.000

Ronchi

In the present study it was observed that maximum of 32 (64.0 %) patients had moderate ronchi, followed by 9 (18.0 %) patients with mild ronchi, 5 (10.0 %) patients with severe ronchi and 4 (8.0 %) patients with no ronchi before treatment. On 48^{th} day, maximum of 41 (82.0 %) patients had no ronchi followed by 9 (18.0 %) patients with mild ronchi, no patient

with moderate and severe ronchi. The result on Ronchi showed statistically highly significant with P value 0.000

Crepitation

In the present study it was observed that maximum of 30 (60.0 %) patients had severe crepitations, followed by 12 (24.0 %) patients with mild crepitations, 4 (8.0 %) patients with severe crepitations and 4 (8.0 %) patients with no crepitations before treatment. On 48^{th} day, maximum of 40 (80.0 %) patients had no crepitations followed by 8 (16.0 %) patients with mild crepitations, 2 (4.0 %) patients with moderate crepitations and no patient had severe crepitation. The result on Crepitations showed statistically highly significant with P value 0.000

Table 5: Showing the Ind	cidence and Results on	Mean Respiratory Rate
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Respiratory Rate	Mean	Std. Deviation	Ν
0 th Day	24.8571	4.24018	42
15 th Day	23.8333	3.60837	42
30 th Day	21.9286	3.16531	42
48 th Day	20.1905	2.69813	42

In the present study it was observed that Mean Respiratory rate on 0^{th} day i.e., before treatment was 24.8571 with a standard deviation of 4.24018. On 48^{th} day the Mean Respiratory Rate came down to 20.1905 with a standard deviation of 2.69813. The result on Mean Respiratory rate showed statistically highly significant with P value 0.000

Table 6: Showing the Incidence and Results on Spirometry (FEV1)

Spirometry (FEV1)	Mean	Std. Deviation	Ν
Before treatment	34.0952	11.99758	42
After treatment	51.7381	15.56741	42

In the present study it was observed that on 0^{th} day Mean Forced Expiratory Volume in 1 sec was 34.0952 with standard deviation of 11.99758. On 48^{th} day, Mean Forced Expiratory Volume in 1 sec was improved to 51.7381 with standard deviation of 15.56741. The result on Mean Expiratory Volume in 1 sec showed highly significant statistically with P value 0.000

Fable 7: S	Showing the	Incidence and	Results on	Overall	Assessment	after '	Treatment
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Overall Assessment After Treatment	Frequency	Valid Percent	Cumulative Percent
No relief	2	4.0	4.0
Moderate	26	52.0	56.0
Marked	22	44.0	100.0
Total	50	100.0	

Out of 50 patients, maximum of 26 (52.0 %) patients got Moderate relief, 22 (44.0 %) patients got Marked relief and 2 (4.0 %) patients got no relief.

DISCUSSION

Cough

The result on relief of cough showed statistically highly significant effect with P value 0.000. This might be due to anti-inflammatory and anti-oxidant action of the drugs in Pippalyadi Qwatha which reduces the inflammation in the airways. It might also be due to Vasa which help in the expectoration of mucus plugs. Abstinence from smoking also reduces the irritation to the bronchioles.

Sputum Production

The result on controlling Sputum production showed statistically highly significant effect with P value 0.000. This might be due to mucolytic expectorant action of Vasa, Shati, Kantakari, Bharangi which helps in thinning the tenacious mucus plugs and in easy expectoration.

Dyspnoea

The result on relief of dyspnoea showed statistically highly significance with P value 0.000. This might be due to relief from obstruction of airflow and reduction in airway narrowing due to bronchodilatory action of the drugs like

vasa and by Bharangi and kantakari, present in pippalyadi Qwatha.

Ronchi and crepitation

The result on ronchi and crepitation showed statistically highly significance with P value 0.000. This might be due to relief from airway narrowing due to bronchodilatory effect of drugs and as most of the drugs in pippalyadiqwatha and shatyadileha have anti-oxidant and anti-inflammatory action, they prevents the further tissue damage and checks the progression of fibrosis.

Mean Respiratory Rate

The result on Mean Respiratory Rate showed statistically highly significance with P value 0.000. Increased Mean Respiratory rate was reduced to normal due to mucolytic, expectorant, anti inflammatory action of the drugs present in Pippalyadiqwatha and Shatyadileha which reduced the increased inspiratory resistance.

Mean Forced Expiratory Volume in 1 sec

The result on Mean Forced Expiratory Volume in 1 Sec showed statistically highly significance with P value 0.000. Observing the increase in FEV1 we can say that combination of formulations i.e. vasa swarasa, pippalyadiquatha and shatyadi leha helps in reducing the airway obstruction and thus in turn helps in improving the function of the lungs.

Probable mode of action

The combination of drugs taken for the study helps in Samprapti Vighatana of Kaphaja Kasa. These drugs together act by agnideepana, amapachana, vatanulomana, hridya, lekhana, chedana, kaphanissarana, srotoshodhana and vyadhipratyanika properties. Smoking causes release of free radicals. Drugs like shunti⁵, Bharangi⁶, Karavi⁷ of pippalyadiqwatha and Shati, Musta⁸ of shatyadileha have anti-oxidant properties. These drugs help in scavenging free radicals by reacting with superoxide anion radical and hydroxyl free radicals. Thus helps in preventing the tissue damage. Anti-inflammatory action of drugs like Pippali⁹, Katphala¹⁰, shunthi, karkatakashringi¹¹ and bharangi inhibits inflammatory mediators like leukotriene, Interleukens, Tumour necrosing factor, prostaglandins released by macrophages, T lymphocytes and neutrophils. Thus they reduce the mucosal edema the excess mucous secretion in the respiratory tract. They may also arrest the further progression of fibrosis in COPD. Mucolytic and mucokinetic action of drugs such as Bharangi, Shati¹² depolymerises the mucopolysaccharides and liberates lysosomal enzymes which break the tenacious mucus plugs present in respiratory tract and causes expectoration of Sputum. Bronchospasm caused due to hype responsiveness is relieved by mast cell stabilizing action of drugs like Kantakari¹³, Bharangi¹⁴ and Nirgundi¹ Dattura¹⁶ vasa and yavanika¹⁷ helps in relieving the narrowing of airways by their Bronchodilatory action. Vasa, Bharangi, Kantakari and Shatavari¹⁸ help in relieving the cough due to their anti-tussive action. Pippali and Maricha have bioavailability enhancing property¹⁹. They induce alterations in membrane dynamics and permeation characteristics in structurally and therapeutically diverse constituents of the drugs such as vasicine etc.

CONCLUSION

The study was an observational, which was conducted on 50 patients. Incidence was noticed more in the age group of 65-75 years. Maximum number of patients in the study had the history of smoking for minimum of 10 years. Statistically results on all parameters showed highly significant effect at the end of treatment with the value of 0.000, Out of 50 patients, 22 patients got marked relief, 26 patients got moderate relief and only 2 patients found no relief. Increase in FEV1 which is assessed by Spirometer along with marked reduction in symptoms suggests the improvement in lung function. Most of the drugs in Pippalyadi qwatha and shatyadi leha have anti-inflammatory and antioxidant action which complement with each other. Along with Vasa they have bronchodilator, mucolytic and anti-tussive action which reduces cough, sputum production and breathlessness. They also prevent tissue damage by checking the progression of inflammation in respiratory epithelium. Hence, the yogas Pippalyadi qwatha, Shatyadi leha and vasa swarasa together in combination are very effective in the management of chronic bronchitis.

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