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SPIROMETRIC EVALUATION OF CERTAIN HERBAL PREPARATION IN THE MANAGEMENT OF TAMAKA SHWASA W.S.R. TO BRONCHIAL ASTHMA

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ABSTRACT

Tamaka shwasa is one of the most elaboratively described disease in *brihatrayi* (three major ayurvedic classics) because of the graveness of the disease. On the basis of features, *Tamaka shwasa* is commonly correlated with the modern entity Bronchial asthma. According to the **World Health Organization by the year 2020, asthma along with chronic obstructive pulmonary disease will become the third leading cause of death.** So, a clinical study was planned to evaluate the anti-asthmatic effect of certain herbal preparation on the basis of pre and post spirometric measurements of asthmatic patients. A total of 30 patients were divided into two groups having 15 patients each. Group A was given herbal ayurvedic preparation for a period of two months with 15 days follow up. Group B was given the same regimen after performing prior *Virechana karma* (ayurvedic purgation therapy). The spirometric evaluation was done before and after the treatment and it was observed that the increase in the FVC, FEV1 and PEFR was significant in both group A & B, but group B showed much better improvement than group A after completion of two months of trial. Hence, the study concluded that the ayurvedic preparation has anti asthmatic effect, but the improvement is much significant when *shodhana karma* (biopurification) is performed prior to *shamana therapy* (ayurvedic internal medicine).

KEYWORDS: *Tamaka shwasa, Bronchial asthma, spirometry, shodhana, shamana therapy.*

INTRODUCTION

Tamaka shwasa has been grouped amongst serious ailments. Though any disease can be fatal but there is none that terminates the patient's life so as *hikka* and *shwasa*.[1] According to *ayurveda* other diseases which develop in the end are hiccup and dyspnea. This passage denotes two clinical facts; firstly *shwasa roga* itself is a disease which is difficult to cure and have serious prognosis and secondarily *shwasa roga* may be terminal complication or sequel of many diseases before impending death. It similarise Bronchial asthma in modern medicine which is chronic disease of multifactorial origin like environmental pollution, mental stress, irregular & un-wholesome dietary habits & exposure to wide range of allergens. There is a noticeable increase in the health care burden from asthma in several areas of world. The increasing mortality rates and hospitalization related to asthma are a major cause of concern for physician. The current management of *Tamaka shwasa* (bronchial asthma) by modern medicine is not so safe, as it has adverse effect with systemic manifestation and as the chronicity set, drug dose dependency increases & dilates the lung tissue to such an extent that at last it leads to respiratory failure. According to *Ayurveda*, *Shwasa* is a *kapha-vataja* disease which is originated from *pittasthana*.[2] Whenever there is obstruction of *pranavayu* by *kapha*, the vitiated *vayu* gets *pratiloma* to produce *shwasa*/breathlessness.[3]

With the explosion of the knowledge in the 21st century a new concept of multi factorial causation of a disease has arisen due to changing pattern of life styles, living standards, demographic factors, urbanization, medical intervention & wide effect of technology on ecology. Therefore, to deal with the newer challenges of 21st century, "*Panchakarma*" is proving one of the most effective & complete therapy in the management of the chronic disease such as *Tamaka shwasa* (Bronchial asthma). It not only helps in curing the root cause of the disease, but also essential for the maintenance in relation to the circadian & circannual variation of *dosha*.

Considering the *ayurvedic* concept of treatment of *Tamaka shwasa* it was decided to select two herbal preparations '*Shatyadi churna*'[4] & '*Bharangi Shunthi kwatha*'[5] in the management of bronchial asthma. Both the drugs were decided to given through oral route. The same regimen was clubbed with *virechana*[6] therapy to evaluate the efficacy of *shodhana* karma in the management of bronchial asthma. Results were obtained and interpreted on the basis of pre and post spirometry along with symptomatic relief.

AIMS AND OBJECTIVES

- To assess clinically the efficacy of "***Shatyadi Churna & Bharangi Shunthi Kwatha***" in the management of *Tamaka Shwasa*.
- To assess the efficacy of ***Virechana Karma*** in the management of *Tamaka shwasa*.
- To compare the efficacy of ***Shodhana Poorvaka Shamana Chikitsa And Shamana Chikitsa*** in the management of *Tamaka Shwasa.*

MATERIALS AND METHODS

Selection of Patients

This study was carried on 30 patients of *Tamaka shwasa*, the patient who fulfilled the clinical diagnostic criteria of *Tamaka shwasa* (Bronchial Asthama) were randomly selected, irrespective of their sex, religion, occupation etc. from the OPD & IPD wing of Departement of *Kayachikitsa* S.S. Hospital, IMS, BHU, Varanasi.

Selection of Sample

Randomized Sampling {Unrestricted Randomized Stratified Method}

Nature of Study: Control Study.

Trial Methodology: Open Trial.

For this study, 30 clinically diagnosed and confirmed patient of *Tamaka shwasa* (bronchial asthma) were divided into four groups:

- **Group A:** 15 registered patients of *Tamaka shwasa* were given "***Shatyadi Churna" and "Bharangi Shunthi Kwatha***" as anupana for two months with 15 days follow up.
- **Group B:** 15 registered patients of *Tamaka shwasa* were given above "***Shodhana Pooravaka Samana Chikitsa"*** for two months, with 15 days follow up.

Exclusion Criteria

Patients having following criteria

- Bronchial Carcinoma
- Emphysema
- Chronic Pulmonary Obstructive Disease
- Pleural Effusion
- Tuberculosis
- Status Asthamaticus

- Cardiac Asthma.

Patients who are not able to tolerate *Shodhana* therapy are not taken in *Shodhana group.*

Discontinuation criteria

- Patient who developed hypersensitivity for any constituent of the selected formulation.
- Patient who discontinue the treatment themselves due to any reason.

Inclusion Criteria

- Newly onset uncomplicated Bronchial Asthma.
- Mild & Moderate Bronchial Asthma.

The treatment schedule for each group is classified as follows:

Group	No. of pts	Drugs	Dose	Duration
A	15	*Shatyadi churna* *Bharangi shunthi kwatha*	3 gms thrice a day 30 ml as anupana	2 months
B	15	*Chitrakadi vati* *Go ghrita* *Bahya abhyanga & swedana* *Virechana aushadhi* *Sansarjana karma* *Shaman chikitsa*	2 tab thrice in a day 30ml to 210ml As per group B	3 days 3 to 7 days 3 days 1 day 3, 5 or 7 days Till completion of course

Table no. 1: Symptom grading scale.

S. no.	Grade	Percentage	Number	Sign of grade
1	Nil	0%	0	-
2	Mild	25%	1	+
3	Moderate	50%	2	++
4	Severe	75%	3	+++
5	Agonizing	100%	4	++++

The details of the assessment of symptoms rating is given below

1. Dyspnoea (Breathlessness)

1	Not troubled by shortness of breath on level or uphill.	None	0
2	Troubled by shortness of breath on level or uphill	Mild	1
3	Walks slower than person of same age (Breathlessness at the time of simple walking)	Moderate	2
4	Stops after walking 100 yards	Severe	3
5	Breathlessness at rest	Agonizing	4

2. Cough

1	No cough	None	0
2	Coughing for 2-5 min, frequency 1-2 times/day, without pain, wet with easy expectoration.	Mild	1
3	Coughing for more than 10 min, frequency more than 5-10 times/day, with pain, expectoration with slight difficulties, disturbed sleep	Moderate	2
4	Coughing for more than 15 min, frequency 5-10 times/day, with pain, feeling of restlessness due to difficulty in expectoration, marked disturbance in sleep	Severe	3
5	Frequent coughing due to which patient becomes unconscious	Agonizing	4

3. Wheezing

1	No wheezing	None	0
2	Intermittent wheezing present only during attack	Mild	1
3	Wheezing only at early morning or during physical exertion	Moderate	2
4	Constant wheezing throughout day	Severe	3
5	Constant wheezing along with added respiratory sound	Agonizing	4

4. Chest tightness

1	No chest tightness	None	0
2	Only during attack	Mild	1
3	Very often even without attack, relieves without medication	Moderate	2
4	Persistent chest tightness	Severe	3

Laboratory Investigation

Respiratory function tests were repeated during the treatment.

- **Spirometry**
- FVC (Forced vital capacity).
- FEV1 (Forced expiratory volume in one second).
- PEFR (Peak Expiratory Flow Rate).
- **Haemogram:** Hb%, TLC, DLC, ESR- mainly for raised eosinophils count
- **Absoulute eosinophilic count**
- **Chest X ray (Radiography)-** to look for any cavity, consolidation, fibrosis, to rule out other pathologies.

Statistical Analysis

The information collected on the basis of observation made during the treatment were analysed on statistical criteria in terms of mean score (X), standard deviation (S.D), Standard error (S.E.) and Paired T Test, thus the obtained results were interpreted as;

P > 0.05 No improvement

P < 0.05 Improvement

P < 0.01 Significant Improvement

P < 0.001 Highly Significant.

OBSERVATION AND RESULTS

The observations were analysed using SPSS software 16.0 and results obtained.

Status of the 30 Patients of Tamaka Swasa.

Group	Total registered	Drop out	Completed
Shatyadi churna+bharangi shunthi kwatha	15	01	14
Shodhana purvaka shaman therapy	15	02	13
Total	30	03	27

Observation Table no. 1: Showing the effect on FVC in different groups before and after the treatment.

Groups	FVC Mean+SD		Within the group comparison Paired T test
	BT	AT	
A	64.055±10.778	79.937±8.095	-14.461±7.054 t= -7.391 p= .000
B	61.142±18.084	78.017±17.976	-16.928±8.982 t= -7.852 p= .000
Between the group comparison (one way ANOVA)	F = 4.156 p = .011	F = 1.059 p = .376	
Post HOC test Significant pairs (p<0.05)	-	-	

Observation Table no. 2: Showing the effect on FEV1 in different groups before and after the treatment.

Groups	FEV1 Mean+SD		Within the group comparison Paired T test
	BT	AT	
A	55.928±17.7349	68.142±19.899	-12.214±11.314 t= -4.039 p= .001
B	58.944±13.330	74.437±11.831	-11.692±7.993 t= -5.274 p= .000
Between the group comparison (one way ANOVA)	F = 1.666 p = .187	F = 1.166 p = .333	
Post HOC test Significant pairs (p<0.05)	-	-	

Observation Table no. 3: Showing the effect on PEFR in different groups before and after the treatment.

Groups	PEFR Mean+SD		Within the group comparison Paired T test
	BT	AT	
A	54.500±16.942	65.642±17.059	-11.142±11.175 t= -3.731 p= .003
B	47.6667±14.943	62.375±8.943	-12.307±9.758 t= -4.547 p= .001
Between the group comparison (one way ANOVA)	F = 4.649 p = .006	F = 5.331 p = .003	
Post HOC test Significant pairs (p<0.05)	-	-	

Observation Table no. 4: Showing the effect on Dyspnea in different groups before and after the treatment.

Dyspnea		No. and % of groups					Within the group comparison (Friedman test)
	Grade	BT	F1	F2	F3	F4	
Group A	1	0 0.0%	5 35.7%	7 50%	10 71.4%	11 78.6%	χ^2= 38.455 p= 0.000
	2	10 66.7%	6 42.9%	6 42.9%	3 21.4%	3 21.4%	
	3	4 26.7%	3 21.4%	1 7.1%	1 7.1%	0 0.0%	
	4	1 6.7%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	14	14	14	14	
Group B	1	0 0.0%	3 23.1%	10 76.9%	12 92.3%	12 92.3%	χ^2= 40.503 p= 0.000
	2	11 73.3%	9 69.2%	2 15.4%	1 7.7%	1 7.7%	
	3	4 26.7%	1 7.70%	1 7.7%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.00%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.00%	0 0.0%	0 0.0%	0 0.0%	
Total		15	13	13	13	13	
Between the group comparison (kruskal wallis test)		χ^2= 11.786 p= .008	χ^2= 3.559 p= .313	χ^2= 3.054 p= .383	χ^2= 4.775 p= .189	χ^2= 1.909 p= .592	

Observation Table no. 5: Showing the effect on wheezing in different groups before and after the treatment.

Wheezing		No. and % of groups					Within the group comparison (Friedman test)
		BT	F1	F2	F3	F4	
Group A	1	5 33.3%	10 71.4%	12 85.7%	14 100.0%	14 100.0%	χ^2= 30.452 p= 0.000
	2	7 46.7%	3 21.4%	2 14.3%	0 0.0%	0 0.0%	
	3	3 20.0%	1 7.1%	0 0.0%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	14	14	14	14	
Group B	1	9 60%	11 84.6%	12 92.3%	12 92.3%	13 100.0%	χ^2= 10.222 p = .037
	2	6 40%	2 15.4%	1 7.7%	1 7.7%	0 0.0%	
	3	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	13	13	13	13	
Between the group comparison (kruskal wallis test)		χ^2= 10.717 p= .013	χ^2= 2.223 p= .527	χ^2= 2.026 p= .567	χ^2= 3.077 p= .380	χ^2= 3.417 p= .332	

Observation Table no. 6: Showing the effect on cough in different groups before and after the treatment.

Cough		No. and % of groups					Within the group comparison (Friedman test)
		BT	F1	F2	F3	F4	
Group A	1	1 6.7%	6 42.9%	6 42.9%	7 50%	9 64.3%	χ^2= 26.241 p = .000
	2	10 66.7%	6 42.9%	7 50%	6 42.9%	5 35.7%	
	3	4 26.7%	2 14.3%	1 7.1%	1 7.1%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	14	14	14	14	

Group B	1	0 0.0%	3 23.1%	9 69.2%	12 92.3%	12 92.3%	χ^2= 33.943 p = .000
	2	14 93.3%	10 76.9%	4 30.8%	1 7.7%	1 7.7%	
	3	1 6.7%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	13	13	13	13	
Between the group comparison (kruskal wallis test)		χ^2= .951 p= .831	χ^2= 3.087 p= .378	χ^2= 3.784 p= .286	χ^2= 10.451 p= .015	χ^2= 5.872 p= .118	

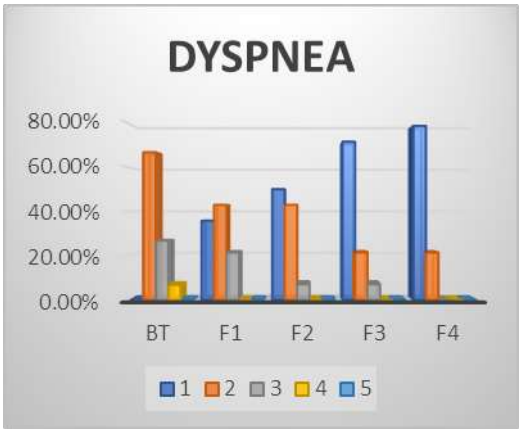
Observation Table no. 7: Showing the effect on chest tightness in different groups before and after the treatment.

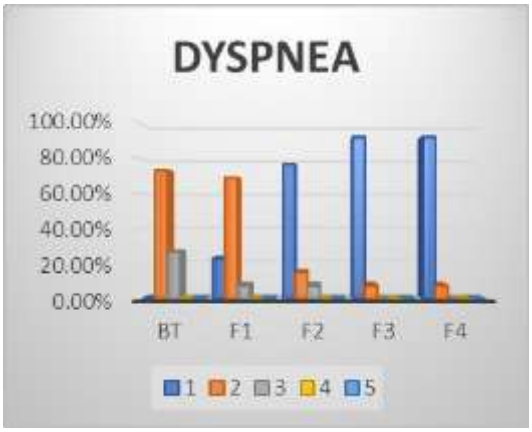
Chest tightness		**No. and % of groups**					**Within the group comparison (Friedman test)**
		BT	**F1**	**F2**	**F3**	**F4**	
Group A	1	6 40%	10 71.4%	12 85.7%	13 92.9%	11 78.57%	χ^2= 23.223 p = .000
	2	8 53.3%	3 21.4%	2 14.3%	1 7.1%	3 21.4%	
	3	1 6.7%	1 7.1%	0 0.0%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	14	14	14	14	
Group B	1	5 33.3%	11 86.4%	11 86.4%	12 92.3%	12 92.3%	χ^2= 23.200 p = .000
	2	10 66.7%	2 15.6%	2 15.6%	1 7.7%	1 7.7%	
	3	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	4	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
	5	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Total		15	13	13	13	13	
Total		15	14	14	14	14	
Between the group comparison (kruskal wallis test)		χ^2=1.258 p=.739	χ^2=6.763 p= .080	χ^2=9.401 p=.024	χ^2=4.286 p= .232	χ^2= 7.382 p= .061	

Showing the effect of therapy on FVC.

Showing the effect of therapy on FEV1.

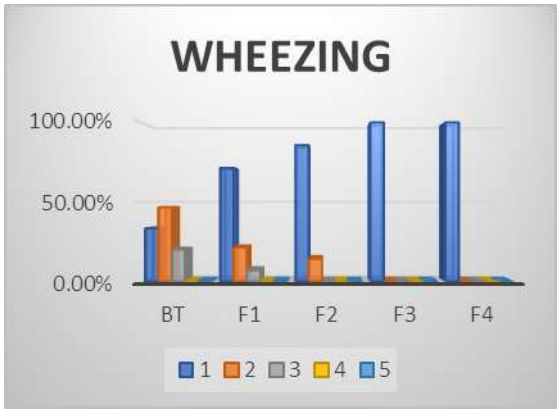
Showing the effect of therapy on PEFR.

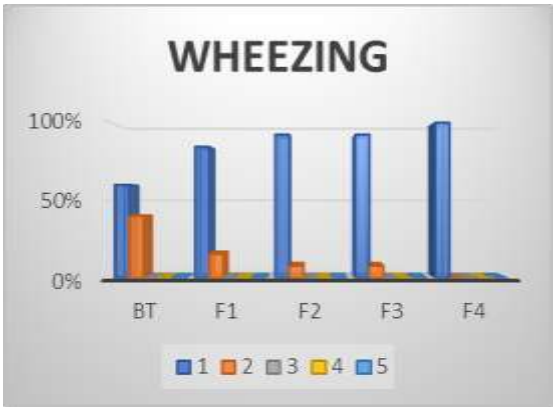




GROUP A **GROUP B**

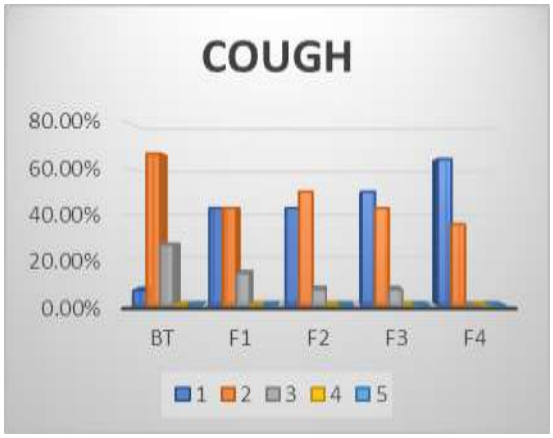
Showing the effect on Dyspnoea in different groups.

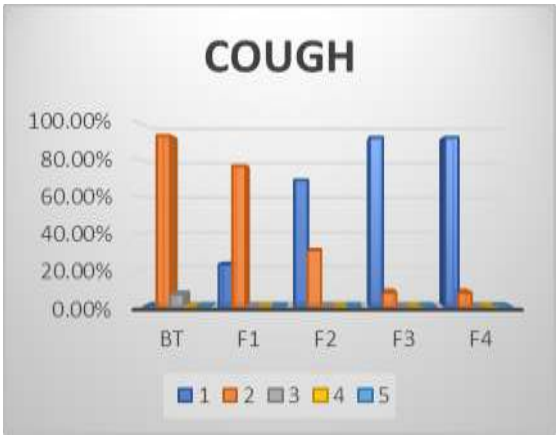




GROUP A **GROUP B**

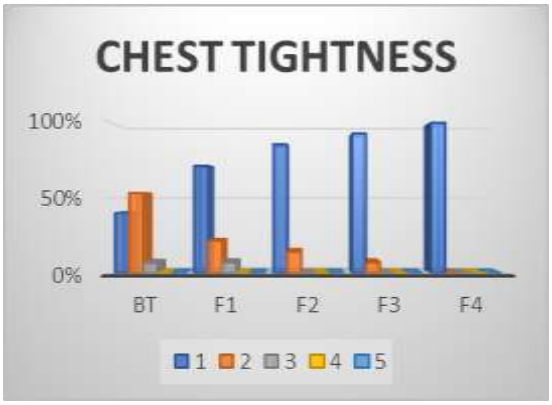
Showing the effect on Wheezing in different groups.

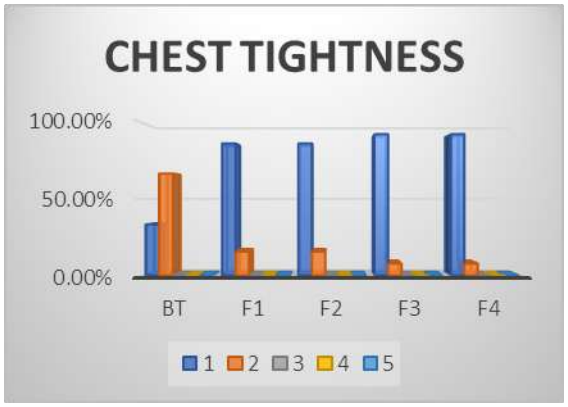




GROUP A **GROUP B**

Showing the effect on Cough in different groups.





GROUP A **GROUP B**

Showing the effect on Chest tightness in different groups.

DISCUSSION

As we have already discussed, *Tamaka shwasa* is a chronic disease of *Pranavaha Srotasa*.[7] It is included among the five varieties of *Shwasa*.[8] *Acharya charaka* has explained *Tamaka shwasa* as *vata kapha* prominent disease, while *achaya Sushruta* has mentioned it as *Kapha* dominant disease. *Tamaka shwasa* is considered as *Kashta sadhya* in earlier stage but later on becomes *Yapya*.[9] *Aacharya* has described various guideline principles for management. Treatment modality mainly includes *Shodhana* & *Shamana* therapy. Literary simulation of *Tamaka shwasa* coincides with the description of bronchial asthma as described in modern literature. Though *Tamaka shwasa* is not merely bronchial asthma, umbrella of *Tamaka shwasa* covers all the types of manageable dyspnoea including cardiac, renal and pulmonary asthma. It also includes other pulmonary causes of dyspnoea such as COPD. In the present study it is desired to evaluate the effect of drug on bronchial asthma rather than on *Tamaka shwasa*.

Forced vital capacity (FVC) is the total volume of air expired with a maximum effort after deep inspiration.[10] Since FVC can be decreased similarly in both obstructive and restrictive lung diseases, it is often most helpful when used as a ratio with the amount of air which can be forcefully exhaled in one second.[11] In the present study the mean score of FVC before treatment in Group A and Group B were 61.14% & 61.05% respectively. There is significant increase in mean after treatment in both the Groups i.e. (78.01%), (79.93%). Within the Group comparison (BT-AT) by paired T-test shows significant increment in both Groups. Inspite of positive result in all both Groups, Group B resulted in more increment in FVC after completion of two months of treatment.

In case of FEV1 also there is significant increase in mean after treatment in Group A (68.14%) and Group B (74.43%). In Group B highly significant changes has been observed as the mean value of FEV_1 was least and the percentage increase is more than the other Group.

Peak Expiratory Flow Rate (PEFR) measures maximum volume of air forcibly expired during first 10 seconds after deep inspiration.[12] PEFR is used for monitoring the severity of airway obstructive disease and their response to therapy.[13] PEFR is the single best test for the ventilator function. Results are compared with tables prepared on normal controls according to age, height, sex and race.[14] Observation of our study depicts that the mean score of PEFR

before treatment in Group A & Group B were 54.5% and 47.66% respectively. There is significant increase in mean after treatment in both the groups.

This result signifies that the *Ayurvedic* drugs have shown their effect on enhancing the lung function and compliance. The probable mode can be anti-inflammatory, anti-spasmodic and bronchodilator effect of contents present in the drug.

Among the four cardinal symptoms of bronchial asthma, significant relief was observed in both the groups, but the improvement was more prominent in group B. Both the *polyherbal* compounds prove their efficacy in the management of *Tamaka shwasa* and their combination with *Virechana* therapy is equivalent to modern medicine. Subjective improvement in symptoms and significant changes in lung function test suggest that drugs have promising effect in the management of bronchial asthma. Group B showed significant result and this data ascertain the importance of *Sodhana purvaka Shamana* in relieving the cardinal symptoms in *Tamaka shwasa*.

CONCLUSION

On the basis of the findings and the result it can be concluded that the trial drugs *Shatyadi Churna* & *Bharngi Shunthi Kwatha* possess moderate degree of anti-asthmatic effect and they are extremely effective in bronchial asthma when preceded by *Virechana* Therapy. They can be safely use in practice in moderate degree of bronchial asthma.

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