

**ROLE OF *PATHYAPATHYA* AND YOGIC PRACTICES IN
MANAGEMENT OF *TAMAKA SHWASA* (BRONCHIAL ASTHMA)**

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Article Received on
4 Aug 2015,

Revised on 24 Aug 2015,
Accepted on 13 Sep 2015

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ABSTRACT

Shwasa is a disease which severely afflicts the Prana the essence of life. All the five types of *Shwasa* are dreadful including *Tamaka Shwasa*, because *Ambara Piyusha* or *Pranashakti* required for the optimum functioning of the body does not reach up to the needy parts. Asthma is also a frightening condition, which can seriously impede one's ability to breathe, and suddenly rob the individual from the most important nutrient - oxygen. Asthmatics have real trouble even taking a single breath. Hence *Tamaka Shwasa* is correlated with Bronchial asthma. The incidence of Bronchial Asthma is on an increasing trend. In 2009, 300 million people worldwide were affected by asthma leading to approximately 250,000 deaths per year. It is estimated that asthma has 7-10% prevalence worldwide. In the light of the principles

of *Pathya - Apathya* and yogic practices the present study has been designed. It is a short step to re-establish the facts given in classics regarding *Pathya - Apathya* and Yogic practices on the basis of scientific parameters. About 60 *Shwasa* patients were registered from *Swasthya Rakshana* OPD and Kayachikitsa OPD, Sir Sunderlal Hospital, B.H.U., Varanasi and randomly allocated in three groups. Further the patients were administered *Mudgadi Yusha* and regular practice of set of *Asanas*, *Pranayama* and *Shatkarma* suitable for *Tamaka Shwasa*. The patients were assessed on the basis of subjective parameters, alleviation of symptoms, blood tests and Spirometry. On comparison in all the three groups significant

results were found with respect to objective parameters and most of the subjective parameters. Among three groups, Group B treated with *Yogic* practices and *Pathya-Apathya* was most effective showing the additional effect of Yoga and *Pathya apathya*. The treatment is non-pharmacological, cost effective and devoid of side effects, so it can be applied in the community.

KEY WORDS: *Tamaka Shwasa, Mudga Yusha, Yogic practices, Pathya-Apathya.*

INTRODUCTION

The word *Tamaka Shwasa* consists of two words, “*Tamaka*” means fainting/darkness in front of eyes and “*Shwasa*” refers to breathe. *Shwasa* is the function of *Prana Vayu*, in *Tamaka Shwasa* this physiological respiration is impeded due to vitiation of *Prana, Udaka* and *Annavaha Srotases* by aggravated *Vata* and *Kapha* especially in *Urah Pradesh* or lungs. It is also a frightening condition, which can seriously impede one’s ability to breathe, and suddenly rob the individual from the most important nutrient - oxygen. The prevalence of asthma has risen in affluent countries over the last 30 years but now appears to have stabilized, with approximately 10-12% of adults and 15% of children.^[1] The WHO reports that some 10% of the Swiss population suffers from asthma today, compared with just 2%, 30 years ago.^[2] Currently asthma is reported as 1.2 to 6.3% in adults in most countries. Asthma (*i.e.* asthma ever diagnosed by a clinician) in adults is generally reported as 2.7 to 4.0% in most European countries, 12.0% in England and 7.1% in the US and 10% in Australia.^[3] A study by Aggarwal et al, has estimated that about 2.38% of Indian population suffers from asthma. According to the same study it was concluded that out of total asthmatics there was 52% men and 48% women.^[4] Asthma is not just a public health problem for developed countries even in developing countries, the incidence of the disease varies greatly.

Aims and objectives

1. To study the efficacy of *Pathya Apathya* in *Tamaka Shwasa*
2. To study the effect of *Yogic Practices*
3. To study the beneficial and adverse effect of *Pathya Apathya* and *Yogic Practices*, if any.

MATERIAL AND METHODS

Approval was obtained from the departmental research committee and ethical committee of the institute. About 60 patients suffering from *Tamaka Shwasa* (Bronchial Asthma) were

registered from Swasthya Rakshana OPD and Kayachikitsa OPD, Sir Sunderlal Hospital, B.H.U., Varanasi and randomly allocated in to three groups after taking a written informed consent from the patients participating in the study. After the completion of the treatment the data was computed into master chart and an intra-group comparison of before treatment and after treatment, as well as inter-group comparison between groups A, B and C respectively was made by using SPSS software. It was an open, prospective and randomized clinical trial.

INCLUSION CRITERIA

1. Age: 18-60 years
2. Patient willing to undergo treatment
3. Patients showing the specific clinical features of Tamaka Shwasa.

Exclusion Criteria

1. Age below 18 years and above 60 years
2. Patients with hypertension, cardiac diseases and metabolic disorders
3. Patients with restrictive lung diseases, malnourished and debilitated.

Study design and treatment schedule

In this study 60 patients were selected regardless of their sex and socio-economic considerations, but fully satisfying the diagnostic criteria for *Tamaka Shwasa* as per modern criteria and *Ayurvedic* criteria. The patients were allocated randomly into three groups each having 20 patients.

Group A - Treated with *Mudgadi Yusha* and general *Pathya-Apathya*.

Group B - Treated with Yogic practices and general *Pathya-Apathya*.

Group C - The patients were treated with standard drug therapy (Salbutamol). It was control group.

Group A

The patients in group A were treated with *Mudgadi Yusha* and advised general *Pathya-Apathya* as per classics. Patients were provided with powdered *Mudgadi* combination comprising of *Trikatu* (*Sunthi*, *Maricha* and *Pippali* each 1g) – 3g, *Brihati* (*Solanum anguivi* Linn.) –3g, *Mudga* –4gm. They were instructed to prepare *Yusha* by adding 200ml of water to 10 gm of powder and boiling for 15 minutes on mild fire. They were advised to take *Yusha* in two divided dose. Combination was given for 1 month as per dose of total 10 g/day and again

at subsequent follow ups. Along with the above *Yusha* they were also suggested to take *Pathya Ahara* and avoid *Apathya*.

Pathya

Yava (barley), *Godhuma* (wheat), *Mudga* (green gram), *Mulaka* (radish), *Patola* (gourd), *Amalaka* (Indian gooseberries), *Ushnodka* (hot water), *Sharkara* (sugar), *Madhu* (honey), cow's milk, ghee.

Apathya

Masha (black gram), mustard, meat of fish, sheep, cold water, and other cold items as ice creams etc.

Group B

The patients belonging to group B were treated with *Yogic* practices and suggested general *Pathya-Apathya* as mentioned in group A. Patients of this group were advised to practice the following yoga schedule.

Yoga Schedule

- (A) Joint Movement: 5 rounds each / day
 - Toes, Foot, Fingers, Elbow: Flexion and extension
 - Ankle, Knee, Hip, Wrist, Shoulder, Neck: Rotation
- (B) Asanas
 - (I) Standing *Asanas Padahastasana* and *Trikonasana*: 5 rounds / day
 - (II) Sitting *Asanas Shashankasana*: 5 rounds / day and *Vajrasana*: 10 breaths / day
 - (III) Lying position *Bhujangasana* and *Pawanamuktasana*: 5 rounds / day
 - (IV) Relaxing *Asanas Shavasana*: Minimum –10 min /day after performing above asanas
 - (V) *Shat Karma Kapalabhati*: Upto 100 rounds / day
 - (VI) Pranayama *Nadishodhana Pranayama* and *Bhramri Pranayama*: 10 rounds / day
 - (VII) *Dhyana* 10 *Omkar Dhyana* : 15 minutes / day

Group C

The patients in group C were administered standard drug therapy (Salbutamol) till the symptoms subsided.

Assessment Criteria: Assessment Criteria

The assessment of the treatment was based on both subjective and objective parameters.

Subjective Assessment

Following symptoms were assessed on the grading score.

(A) Rhinorrhoea

- 0 - Absent
- 1 - Mild (1-2 times/day)
- 2 - Moderate/3-6 times/day
- 3 - Severe / During whole day and night

(B) Cough

- 0 - Absent
- 1 - Mild/Occasionally without exhaustion
- 2 - Moderate/3-6 times/day, with or without exhaustion
- 3 - Severe / More then 6 times/day with exhaustion

(C) Wheeze

- 0 - Absent
- 1 - Mild (1-2 times/day)
- 2 - Moderate/ During night
- 3 - Severe/ Whole day and night

Following symptoms were assessed on the presence or absence basis

Tachypnoea, Breathlessness, Orthopnoea, Nocturnal Dyspnoea, Soreness of throat, Sweating on forehead, Dry mouth, Tightness in chest, Heaviness in head, Disease precipitation by cold wind, Anorexia were assessed by grading scores i.e. 0-Absent, 1-Present.

Objective Assessment

Investigation– Hb%, TLC, DLC, ESR

Spirometry– Respiratory rate, FEV1, FVC

OBSERVATION AND RESULTS

The collected data was computed in Microsoft excel sheet showing various variables and analysis was done using statistical software SPSS version 16.0. The demographic profile and personal characteristics were summarized. Intra group comparison was done by paired t test

to compare initial and various follow ups. Independent sample t test and difference of means of two independent groups were done for intergroup comparison.

Demographic data

Maximum patients i.e. 56.6% belonged to 45-60 year **age group**. This shows an increased tendency of asthma with advancing age. About 51.7% were female as compared to 48.3% male. That is **gender** is not a very significant factor. Most patients i.e. 81.7% were married. Regarding **literacy rate** 60% were literate and only 40% were illiterate. This reflects that awareness regarding disease is not the only determining factor, but allergy also is an important causative factor which is usually difficult to avoid. With respect to **religion** 96.7% were Hindus and only 3.3% were Muslims which clearly shows predominance of Hindu religion in and around Varanasi. About 76.7% were having no addiction, followed by 21.7% having smoking history and only 1.7% having smoking and alcohol addiction. This shows that the awareness among the educated people prevented them from getting addicted.

Family history was negative in majority of patients i.e. 63.3% followed by 36.7% with positive family history. This data contradicts to a study.^[5] in which maximum patients were having positive family history. It signifies that even though the genetic factors also contribute towards allergy, factors like surrounding pollutions and environmental factors also act as major contributors. Also higher negative family history reflects the increment of new cases due to changing environmental condition or it may be due to small sample size.

Regarding **Prakriti** maximum i.e. 41.7% were of *Kapha Vata Prakriti*, followed by 33.3% *Pittakapha Prakriti* and 25% with *Vata Pitta Prakriti*. As *Tamaka Shwasa* is a *Vata Kaphaja* disorder people with *Kapha Vata Prakriti* are more prone towards it as compared with other people. Regarding **Satmya** about 50% were having *Madhyama Satmya*. Followed by 28.3% patients with *Pravara Satmya* and 21.7% were having *Avara Satmya*. Similarly 53.3% were having *Madhyama Vyayama Shakti* then 28.3% with *Pravara Vyayama Shakti* and least i.e. 18.3% with *Avara Vyayama Shakti*. It means maximum patients were having *Madhyama, Satmya* and *Vyayama Shakti* i.e. they were capable of doing advocated Yogic practices and intake of all *Rasas* which are *Pathya* to them. Regarding appetite maximum i.e. 53.3% were having poor appetite followed by normal appetite 28.3% and then 18.3% with increased appetite. As most patients were of adult age group i.e. 45-60 and with advancing age appetite is reduced. It also signifies production of *Ama* due to *Mandagni* which is a feature of *Kapha* predominance and is also an important phase in *Samprapti* of *Tamaka Shwasa*.

Clinical data

On intra group comparison it is clear that initially in Group A 90% of patients were having moderate to severe rhinorrhea, which was reduced to only 2% at third follow up. It was statistically highly significant $p < 0.001$. Similarly in Group B there was decrease in severity of symptoms which was highly significant ($p < 0.001$). In Group C it also showed mild decrease in severity of symptoms but was statistically highly significant ($p < 0.001$) (Table 1).

With respect to cough in Group A and group B there is decrease in severity of cough as symptom from severe to mild or absence of cough which is highly significant ($p < 0.001$). In Group C the decrease was less as reduction of moderate and severe symptoms was from 86.7% before treatment to 38.9% after treatment (Table 2).

In group A there was decrease in wheeze from 90% of patients with severe to moderate symptoms to only 20% of patients with severe to moderate symptoms which was highly significant ($p < .001$). In group B also there was decrease in the severity of wheeze which was highly significant ($\chi^2 = 44.15, p < .001$) (Table 3).

With respect to Tachypnoea Group A showed a decreasing trend which was highly significant ($p < .001$). In Group B also initially 75% of patients were having Tachypnoea which was reduced to only 11.1% which was highly significant ($p < 0.001$). In Group C there was decrease from 55% to 44.4% of patients with tachypnoea which was not significant ($p > .05$) (Table 4).

It is evident from the Table that in Group A BT 95% were having breathlessness, which was reduced to 25% and was highly significant ($p < 0.001$). In Group B the decrease was from 80% to 5.6% of patients and was highly significant ($p < 0.001$). In Group C there was no significant change ($\chi^2 = .00, p > 0.05$) (Table 5).

In Group A, BT 85% of patients were having orthopnoea which was reduced to 15% and was highly significant ($p < 0.001$). Similarly in Group B also patients with orthopnoea was reduced from 85% to 5.6% and was highly significant ($p < .001$). But in Group C there was no significant improvement ($p > 0.05$) (Table 6).

From intra comparison group it is clear that Group A and Group B showed a decreasing trend in Nocturnal Dyspnoea. In Group A initially 70% were having Nocturnal Dyspnoea which

was reduced to 25% and was highly significant ($p < 0.001$). In Group B also the reduction was from 90% to 16.7% ($p < .001$) and was highly significant. In Group C the reduction was from 65% of patients with Nocturnal Dyspnoea to 38.9% which was significant ($p < .05$)^(Table 7).

With respect to Sore throat on intra group comparison it is evident that in Group A BT 45% of patients were having sore throat which was reduced to 10% and was significant ($p < 0.05$). In Group B, 70% of patients with sore throat was reduced to 0% which was highly significant ($p < 0.001$). Yet Group C showed no significant reduction in sore throat as symptom ($p > 0.05$)^(Table 8).

In Group A 65% of patients were having sweating on forehead BT which was reduced to 20% and was highly significant ($p < 0.001$). In Group B the decrease was significant ($p < 0.05$) while in Group C the result was highly significant ($p < 0.001$)^(Table 9).

In Group A initially 70% of patients were having dryness of mouth which was reduced to 0% and was highly significant ($p < 0.001$). In group B, the decrease in symptom was from 70% of patients to 11.1% patient and was highly significant ($p < 0.00$). In Group C the reduction was also significant ($p < 0.05$)^(Table 10).

On intra group comparison it is evident that in Group A initially 90% of patients were having tightness in chest which was reduced to 38.9% and was highly significant ($p < 0.001$). Group B was also highly significant ($p < 0.001$) as reduction was from 75% to 22.2% of patients. In Group C comparison also show significant improvement ($p < 0.05$)^(Table 11).

With respect to heaviness in head on intragroup comparison, in Group A initially 65% of patients were having symptom which was reduced to (10.5%) and was highly significant ($p < 0.001$). Reduction of symptom in Group B was also highly significant ($p < 0.001$). In group C the symptoms were 75% which was reduced to 33.3% of patients and was significant ($p < 0.05$)^(Table 12).

On intra-group comparison in Group A initially 85% of patients showed increase of symptoms by cold wind which was reduced to 33.3% and was highly significant ($p < 0.001$). In Group B the feature show reduction from 75% of patients to 16.7% of patients which was highly significant ($p < 0.001$). In Group C 60% of patients were showing increase of symptoms on cold wind which was decreased to 33.3% and was significant ($p < 0.001$)^(Table 13). With respect to anorexia in Group A initially 70% were having anorexia which was reduced to

11.1% and was highly significant ($p < 0.001$). In Group B the reduction of anorexia as symptoms was from 60% to 11.1% and was highly significant ($p < 0.001$). Similarly Group C also show significant reduction ($p < 0.001$) (Table 14).

Table 1 -Effect of treatment on Rhinorrhea.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Friedman's test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	0	0	0	0	1	5	10	50	$\chi^2=47.21$ $p < 0.001$
	1	2	10	6	30	11	55	8	40	
	2	10	50	10	50	8	40	2	2	
	3	8	40	4	20	0	0	0	0	
B	0	0	0	0	0	3	15	12	63.2	$\chi^2=51.820$ $p < 0.001$
	1	0	0	4	20	13	65	7	36.8	
	2	7	35	14	70	4	20	0	0	
	3	13	65	2	10	0	0	0	0	
C	0	4	20	4	20	4	20	7	38.9	$\chi^2=24.778$ $p < 0.001$
	1	4	20	4	20	7	35	7	38.9	
	2	4	20	9	45	7	35	4	18.02	
	3	8	40	3	15	1	5	0	0	
Between the group comparison Pearson's Chi-square test		$\chi^2=0.16$ $p > 0.05$		$\chi^2=0.10$ $p > 0.05$		$\chi^2=6.9$ $p > 0.05$		$\chi^2=5.44$ $p > 0.05$		

Table 2 -Effect of treatment on Cough.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Friedman's test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	0	0	0	0	1	5	7	35.0	$\chi^2=48.23$ $p < 0.001$
	1	0	0	3	15	6	30	9	45.0	
	2	7	35	12	60	11	55	4	20.0	
	3	13	65	5	25	2	10	0	0.0	
B	0	0	0	1	5	2	10	10	55.6	$\chi^2=45.52$ $p < 0.001$
	1	3	15	4	20	10	50	8	44.5	
	2	7	35	11	55	7	35	0	0.0	
	3	10	50	4	20	0	0	0	0.0	
C	0	3	15	3	15	4	20	5	27.8	$\chi^2=25.5$ $p < 0.001$
	1	5	25	4	20	8	40	6	33.3	
	2	19	95	7	35	5	25	6	33.3	
	3	33	165	6	30	2	10	1	5.6	
Between the group comparison Pearson's Chi-square test		$\chi^2=9.7$ $p > 0.05$		$\chi^2=5.4$ $p > 0.05$		$\chi^2=7.3$ $p > 0.05$		$\chi^2=10.09$ $p > 0.05$		

Table 3-Effect of treatment on Wheeze.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Friedman's test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	0	0	0	0	1	5	7	35.0	$\chi^2=46.44$ $p<0.001$
	1	2	10	3	15	5	25	9	45.0	
	2	5	25	13	65	13	65	4	20.0	
	3	13	65	4	20	1	5	0	0.0	
B	0	0	0	0	0	0	0	6	33.3	$\chi^2=44.15$ $p<0.001$
	1	1	5	3	15	8	40	10	55.6	
	2	9	45	12	60	11	55	2	11.1	
	3	10	50	5	25	0	0	0	0.0	
C	0	3	15	3	15	4	20	6	33.3	$\chi^2=25.58$ $p<0.001$
	1	1	5	2	10	5	25	4	22.2	
	2	6	30	10	50	7	35	7	38.9	
	3	10	50	5	25	3	15	1	5.6	
Between the group comparison Pearson's Chi-square test		$\chi^2=8.3$ $p > 0.05$		$\chi^2=6.7$ $p > 0.05$		$\chi^2=11.6$ $p > 0.05$		$\chi^2=7.8$ $p > 0.05$		

Table 4-Effect of treatment on Tachypnoea.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	2	10.0	7	35.0	10	50.0	16	80.0	$\chi^2=27.4$ $p<0.001$
	1	18	90.0	13	65.0	10	50.0	4	20.0	
B	0	5	25.0	7	35.0	13	68.4	16	88.9	$\chi^2=26.00$ $p<0.001$
	1	15	75.0	13	65.0	6	31.6	2	11.1	
C	0	9	45.0	9	45.0	8	42.1	10	55.6	$\chi^2=6.0$ $p>0.05$
	1	11	55.0	11	55.0	11	57.9	8	44.4	
Between the group comparison Pearson's Chi-square test		$\chi^2=6.3$ $p < 0.05$		$\chi^2=.56$ $p > 0.05$		$\chi^2=2.57$ $p > 0.05$		$\chi^2=.57$ $p > 0.05$		

Table 5-Effect of treatment on Breathlessness.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	1	5.0	4	20.0	10	50.0	15	75.0	$\chi^2=29.25$ $p<0.001$
	1	19	95.0	16	80.0	10	50.0	5	25.0	
B	0	4	20.0	8	40.0	11	57.9	17	94.4	$\chi^2=27.99$ $p<0.001$
	1	16	80.0	12	60.0	8	42.1	1	5.6	
C	0	10	50.0	10	50.0	9	47.4	9	50.0	$\chi^2=0.00$ $p>0.05$
	1	10	50.0	10	50.0	10	52.6	9	50.0	
Between the group comparison Pearson's Chi-square test		$\chi^2=11.2$ $p < 0.001$		$\chi^2=4.0$ $p > 0.05$		$\chi^2=0.48$ $p > 0.05$		$\chi^2=9.1$ $p < 0.05$		

Table 6 -Effect of treatment on Orthopnea.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	3	15.0	8	40.0	13	65.0	17	85.0	$\chi^2=28.27$ $p<0.001$
	1	17	85.0	12	60.0	7	35.0	3	15.0	
B	0	3	15.0	10	50.0	14	73.7	17	94.4	$\chi^2=27.913$ $p<0.001$
	1	17	85.0	10	50.0	5	26.3	1	5.6	
C	0	8	40.0	9	45.0	9	47.4	9	50.0	$\chi^2=6.00$ $p>0.05$
	1	12	60.0	11	55.0	10	52.6	9	50.0	
Between the group comparison Pearson's Chi-square test		$\chi^2=4.6$ $p > 0.05$		$\chi^2=0.40$ $p > 0.05$		$\chi^2=2.9$ $p > 0.05$		$\chi^2=11.1$ $p < 0.001$		

Table 7-Effect of treatment on Nocturnal Dyspnoea.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	6	30.0	8	40.0	12	60.0	15	75.0	$\chi^2=18.87$ $p<0.001$
	1	14	70.0	12	60.0	8	40.0	5	25.0	
B	0	2	10.0	9	45.0	10	52.6	15	83.3	$\chi^2=27.54$ $p<0.001$
	1	18	90.0	11	55.0	9	47.4	3	16.7	
C	0	7	35.0	7	35.0	8	42.1	11	61.1	$\chi^2=9.92$ $p<0.05$
	1	13	65.0	13	65.0	11	57.9	7	38.9	
Between the group comparison Pearson's Chi-square test		$\chi^2=3.7$ $p > 0.05$		$\chi^2= .417$ $p > 0.05$		$\chi^2=1.2$ $p > 0.05$		$\chi^2=2.3$ $p > 0.05$		

Table 8-Effect of treatment on Sore Throat.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	11	55.0	11	55.0	12	60.0	18	90.0	$\chi^2=14.57$ $p<0.05$
	1	9	45.0	9	45.0	8	40.0	2	10.0	
B	0	6	30.0	10	50.0	16	84.2	18	100.0	$\chi^2=27.4$ $p<0.001$
	1	14	70.0	10	50.0	3	15.8	0	0.0	
C	0	11	55.0	11	55.0	11	57.9	10	55.6	$\chi^2=0.00$ $p>0.05$
	1	9	45.0	9	45.0	8	42.1	8	44.4	
Between the group comparison Pearson's Chi-square test		$\chi^2=3.3$ $p > 0.05$		$\chi^2= .13$ $p > 0.05$		$\chi^2=3.7$ $p > 0.05$		$\chi^2=13.4$ $p < 0.001$		

Table 9- Effect of treatment on Sweating of Forehead.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	7	35.0	12	60.0	13	65.0	16	80.0	$\chi^2=18.0$ $p<0.001$
	1	13	65.0	8	40.0	7	35.0	4	20.0	
B	0	14	70.0	14	70.0	17	89.5	18	100.0	$\chi^2=14.72$ $p<0.05$
	1	6	30.0	6	30.0	2	10.5	0	0.0	
C	0	6	30.0	6	30.0	9	47.4	13	72.2	$\chi^2=18.85$ $p<0.001$
	1	14	70.0	14	70.0	10	52.6	5	27.8	
Between the group comparison Pearson's Chi-square test		$\chi^2=7.6$ $p > 0.05$		$\chi^2=6.9$ $p > 0.05$		$\chi^2=7.7$ $P < 0.05$		$\chi^2=5.5$ $p > 0.05$		

Table 10-Effect of treatment on Dryness of Mouth.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	6	30.0	10	50.0	2	12.5	20	100.0	$\chi^2=31.44$ $p<0.001$
	1	14	70.0	10	50.0	14	87.5	0	0.0	
B	0	6	30.0	9	45.0	5	33.3	16	88.9	$\chi^2=20.471$ $p<0.001$
	1	14	70.0	11	55.0	10	66.7	2	11.1	
C	0	9	45.0	9	45.0	10	52.6	13	72.2	$\chi^2=11.82$ $p<0.05$
	1	11	55.0	11	55.0	9	47.4	5	27.8	
Between the group comparison Pearson's Chi-square test		$\chi^2=1.3$ $p > 0.05$		$\chi^2= 1.3$ $p > 0.05$		$\chi^2=6.8$ $p < 0.05$		$\chi^2=6.7$ $p < 0.05$		

Table 11-Effect of treatment on Tightness of Chest.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	2	10.0	4	20.0	8	44.4	11	61.1	$\chi^2=18.87$ $p<0.001$
	1	18	90.0	16	80.0	10	55.6	7	38.9	
B	0	5	25.0	9	45.0	13	68.4	14	77.8	$\chi^2=21.51$ $p<0.001$
	1	15	75.0	11	55.0	6	31.6	4	22.2	
C	0	9	45.0	11	55.0	11	57.9	13	72.2	$\chi^2=9.75$ $p<0.05$
	1	11	55.0	9	45.0	8	42.1	5	27.8	
Between the group comparison Pearson's Chi-square test		$\chi^2=6.3$ $p < 0.05$		$\chi^2=5.4$ $p > 0.05$		$\chi^2=2.17$ $p > 0.05$		$\chi^2=1.2$ $p > 0.05$		

Table 12- Effect of treatment on Heaviness in Head.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	7	35.0	10	50.0	15	75.0	17	89.5	$\chi^2=20.47$ $p<0.001$
	1	13	65.0	10	50.0	5	25.0	2	10.5	
B	0	4	20.0	11	55.0	12	63.2	18	100.0	$\chi^2=27.27$ $p<0.001$
	1	16	80.0	9	45.0	7	36.8	0	0.0	
C	0	5	25.0	8	40.0	10	52.6	12	66.7	$\chi^2=11.07$ $p<0.05$
	1	15	75.0	12	60.0	9	47.4	6	33.3	
Between the group comparison Pearson's Chi-square test		$\chi^2=1.2$ $p > 0.05$		$\chi^2=.93$ $p > 0.05$		$\chi^2=2.1$ $p > 0.05$		$\chi^2=8.4$ $p < 0.05$		

Table 13-Increase of Symptoms on Exposure to Cold Wind.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	3	15.0	6	30.0	8	44.4	12	66.7	$\chi^2=17.69$ $p<0.001$
	1	17	85.0	14	70.0	10	55.6	6	33.3	
B	0	5	25.0	8	40.0	11	57.9	15	83.3	$\chi^2=19.87$ $p<0.001$
	1	15	75.0	12	60.0	8	42.1	3	16.7	
C	0	8	40.0	12	63.2	12	63.2	13	72.2	$\chi^2=12.00$ $p<0.001$
	1	12	60.0	7	36.8	7	36.8	5	27.8	
Between the group comparison Pearson's Chi-square test		$\chi^2=3.2$ $p > 0.05$		$\chi^2=1.6$ $p > 0.05$		$\chi^2=1.38$ $p > 0.05$		$\chi^2=1.4$ $p > 0.05$		

Table 14-Effect of treatment on Anorexia.

Group	Grade	BT		F ₁		F ₂		F ₃		Within the group comparison Cochran's Q-test
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	
A	0	6	30.0	10	50.0	10	55.6	16	88.9	$\chi^2=20.419$ $p<0.001$
	1	14	70.0	10	50.0	8	44.4	2	11.1	
B	0	8	40.0	11	55.0	13	72.2	16	88.9	$\chi^2=18.00$ $p<0.001$
	1	12	60.0	9	45.0	5	27.8	2	11.1	
C	0	6	30.0	7	35.0	10	52.6	12	66.7	$\chi^2=15.72$ $p<0.001$
	1	14	70.0	13	65.0	9	47.4	6	33.3	
Between the group comparison Pearson's Chi-square test		$\chi^2=0.6$ $p > 0.05$		$\chi^2=1.7$ $p > 0.05$		$\chi^2=1.7$ $p > 0.05$		$\chi^2=3.92$ $p > 0.05$		

Table 15-Effect of treatment on respiratory rate.

Group	BT (Mean \pm S.D.)	F ₁ (Mean \pm S.D.)	F ₂ (Mean \pm S.D.)	F ₃ (AT) (Mean \pm S.D.)	BT – AT (Mean \pm S.D.)	Intragroup comparison Paired t-test Friedman's test
A	20.40 \pm 2.624	19.4 \pm 2.5	18.61 \pm 2.2	17.67 \pm 1.72	3.05 \pm 1.55	t=8.35 $p<0.001$
B	21.75 \pm 2.573	20.70 \pm 2.32	20.001 \pm 2.765	18.28 \pm 1.8	3.667 \pm 1.68	t=9.26 $p<0.001$
C	21.8 \pm 2.262	21.65 \pm 2.207	21.74 \pm 2.377	21.67 \pm 2.086	0.111 \pm 2.055	t=0.229 $p>0.05$
Post Hoc Test Significant Pairs		A, C (0.011)	A, C (0.001)	A, C (0.000) B, C (0.000)		

Table 16-Effect of treatment on FEV1.

Group	BT (Mean \pm S.D.)	F ₁ (Mean \pm S.D.)	F ₂ (Mean \pm S.D.)	F ₃ (AT) (Mean \pm S.D.)	BT – AT (Mean \pm S.D.)	Intragroup comparison Paired t-test Friedman's test
A	523.40 \pm 69.915	553 \pm 66.248	592.67 \pm 61.63	653.56 \pm 63.82	-129.056 \pm 40.57	t=-13.494 $p<0.001$
B	399.89 \pm 112.458	465.05 \pm 103.57	552.88 \pm 110.954	631.35 \pm 88.75	-226.53 \pm 54.17	t=-17.24 $p<0.001$
C	521.0 \pm 82.369	529.33 \pm 71.67	550.50 \pm 71.859	553.08 \pm 71.55	-14.692 \pm 36.69	t=-1.44 NS
Post Hoc Test Significant Pairs	A, B (0.000) A, B (0.000)	A, B (0.005)		A, C (0.002) B, C (0.02)		

Table 17-Effect of treatment on FVC.

Group	BT (Mean ±S.D.)	F ₁ (Mean ±S.D.)	F ₂ (Mean ±S.D.)	F ₃ (AT) (Mean ±S.D.)	BT – AT (Mean ±S.D.)	Intragroup comparison Paired t-test Friedman's test
A	1863.75 ±129.855	1919.65 ±152.624	2013.06 ±168.025	2113.78 ±161.969	-241.838 ±102.292	t=-10.03 p<0.001
B	1841.84 ±161.198	1990.47 ±228.209	2101.35 ±173.833	2422.53 ±200.854	-561.059 ±191.245	t=-12.096 p<0.001
C	1881.43 ±160.063	1918.29 ±157.102	1954.69 ±160.627	2012.67 ±166.771	-96.083 ±76.638	t=-4.343 p<0.001
Post Hoc Test Significant Pairs				A, B (0.000) B, C (0.000)		

Table 18-Effect of treatment on Total leuckocyte count.

Group	BT (Mean ±S.D.)	F ₁ (Mean ±S.D.)	F ₂ (Mean ±S.D.)	F ₃ (AT) (Mean ±S.D.)	BT – AT (Mean ±S.D.)	Intragroup comparison Paired t-test Friedman's test
A	12145.50 ±1526.377	11755 ±1532.77	11398.89 ±1228.28	10898.8 ±1197.75	1096.11 ±691.85	t=6.72 p<0.001
B	12291.60 ±1236.198	11653.6 ±1174.53	10870.80 ±1327.10	10039.05 ±1459.65	2252.55 ±881.107	t=11.433 p<0.001
C	11343.40 ±1235.965	11226.15 ±1269.449	11077.32 ±1131	11076.56 ±1157.746	332.78 ±778.77	t=1.813 NS
Post Hoc Test Significant Pairs				B, C		

Table 19-Effect of treatment on ESR.

Group	BT (Mean ±S.D.)	F ₁ (Mean ±S.D.)	F ₂ (Mean ±S.D.)	F ₃ (AT) (Mean ±S.D.)	BT – AT (Mean ±S.D.)	Intragroup comparison Paired t-test Friedman's test
A	20.30±6.77	19.30±5.22	17.44±4.2	14.28±5.1	4.78±6.23	t=3.25 p<0.05
B	28.10±17.93	24.35±6.77	21.37±6.7	17.21±5.8	10.53±4.41	t=10.39 p<0.001
C	25.20±6.95	22.75±5.6	21.50±5.7	18.24±5.11	5.64±5.3	t=4.352 p<0.001
Post Hoc Test Significant Pairs	A, B (0.004)	A, B (0.02)				

Table 20-Effect of treatment on Haemoglobin.

Group	BT (Mean ±S.D.)	F ₁ (Mean ±S.D.)	F ₂ (Mean ±S.D.)	F ₃ (AT) (Mean ±S.D.)	BT – AT (Mean ±S.D.)	Intragroup comparison Paired t-test Friedman's test
A	12.80 ±1.67	12.25 ±1.52	12.433 ±1.23	12.48 ±1.29	0.1706 ±1.0757	t=0.654±0.523 NS
B	10.66 ±1.643	10.91 ±1.57	11.34 ±1.74	11.78 ±1.53	-1.0056 ±.6611	t=-6.45 p<0.001
C	12.15 ±2.102	12.01 ±1.88	12.08 ±1.74	11.88 ±1.71	0.235 ±.9513	t=1.02 NS
Post Hoc Test Significant Pairs	A, B (0.001) B, C (0.037)	A, B (0.040)				

DISCUSSION

Tamaka Shwasa is much similar to Bronchial Asthma. Clear cut description of clinical features of the *Tamaka Shwasa* has been given in *Ayurvedic* texts, which is almost similar to Bronchial Asthma. The descriptions include not only the clinical features, but also the relieving factors and the aggravating factors, so that the diagnosis could be done without any difficulty. The most important relieving factors are expectoration and sitting position, which helps in diagnosing the disease. Similarly the triggering factors are cloudy season, exposure to water, easterly wind and *Kaphaja* diet and life styles. These symptoms help in differentiating *Tamaka Shwasa* from other types of *Shwasa*.

All the patients when assessed, showed improvement in symptoms after 3 months of treatment. with respect to **rhinorrhea, cough and wheeze**, the severity of symptoms decreased markedly in all the groups but inter group comparison by Chi-square test no significant difference was seen (as $p > 0.05$) BT and on at subsequent follow-ups. Intergroup comparison with respect to **Tachypnoea** group A was more effective than group B based on percentage of improvement from initial to III follow up. Further group C was least effective. Similarly regarding **breathlessness** on inter group comparison before treatment more patients in group A (95%) were having breathlessness as symptom compared to group B (80%) and least in group C (50%). After treatment the relieved patients 75% in group A, 94% in Group B and only 50% in group C. On inter group comparison with respect to **orthopnoea** a significant improvement was seen ($p < 0.005$) in group B (94.4%) as compared to group A (85%) and least improvement in group C (50%). The above said observation in group A may be due to the effect of *Mudgadi Yusha* containing *Trikatu* and *Brihati* (*Solanum anguivi*

Linn.) which are said to be *Ushna*, *Kaphavatahara* and alleviate *Kasa* and *Shwasa*. Further the result in Group B was due to Yogic practices like Pranayama which increases the lung efficiency while *Asanas* by systematic contraction and relaxation of pectoral muscles improve the lung function by strengthening them.

On inter group comparison no significant difference was found regarding **Nocturnal Dyspnoea and precipitation of symptoms on exposure to cold winds**. But with respect to **dry mouth** and **heaviness in head** a significant improvement ($p < 0.05$) was observed. On the basis of percentage improvement group A and group B were equally effective when compared to group C. This is due to the *Kaphavathara*, *Srotoshodhana* and *Amapachana* action of *Trikatu* and *Brihati* (*Solanum anguivi* Linn.) present in *Mudgadi Yusha*. While in group B the *Shatkarma* like *Kapalabhati* and *Nadishodhana Pranayama* clear the channels carrying *Prana* and reduces *Kapha*, so heaviness in the head and dryness of the mouth are reduced.

With respect to **soreness of throat** inter group comparison showed significant difference, as group A and group B were having higher percentage of improvement in patients when compared to group C. As group A treated with *Mudgadi Yusha*, *Trikatu* is having anti-inflammatory effect thus reducing soreness of throat, while in group B yogic practices reduces *Kapha*. Similarly **sweating on forehead** was significantly reduced in group A, followed by group B and least in group C. The result would be due to relief in strenuous breathing, due to reduction in dyspnoea and physical stress. Anorexia showed highly significant results in all the three groups. It may be due psychological factor as after repeated follow-ups patient may be feeling better.

The effect of therapy was significant with respect to respiratory rate as the values reduced in all the three groups the difference in means (BT-AT) was highest in Group B followed by Group A and Group C respectively (Table 15). In patients of bronchial asthma respiratory rate remains high to overcome the effect of impaired lung function. As the lung function improved the value became normal. Based on difference of mean (BT-AT) the result was maximum in patients treated with yogic practices i.e. group B. This shows that yogic practices especially Pranayama do marked improvement in lung function.

With respect to FEV1 and FVC the values increased in all the three groups, but the lung function improvement was comparatively more in group B treated with yogic practices as the difference of mean was higher in group B compared with group A and group C (Table 16-17).

With respect TLC value, highly significant ($p < 0.001$) improvement was observed in Group A and Group B and it was not significant in Group C. On comparing the difference of means group B showed better improvement than group A (Table 18). TLC increases in bronchial asthma due to inflammation and infection, as inflammation is reduced with therapy TLC decreases towards normal. The significant result seen in group A would be due to marked anti-inflammatory action of *Pippali* (*Piper longum* Linn.).^[6-7] *Shunthi* and *Maricha*.^[8] The improvement seen in group B would be due to the relaxation methods in Yogic practices. It can be compared with the study.^[9] in which it was found that by practicing of Transcendental Meditation there is decrease in WBC count.

In bronchial asthma ESR value becomes high due to chronicity of disease and it showed a decreasing trend in all the three groups. On the basis of difference of means group B had better results than group A (Table 19). This shows that Yogic practices have better results as compared to *Mudgadi Yusha* and standard drug therapy. It can be explained on the basis of increase of immunity by Yogic Practices. According to Elizabeth *et al.* in Journal of Living the *Asanas* help in drainage of lymph as their movement is based on muscular contractions. Lymph is the fluid, which picks up bacteria and viruses and drains them via lymph nodes.

With respect to haemoglobin, it showed very mild increase in group B and little decreases in group A and group C, which is not significant in any group (Table 20). It shows that the therapies have no significant effect on haemoglobin.

Mode of action of Mudgadi Yusha

Most health problems develop due to wrong eating habits and cooking methods. Charaka has said that body as well as diseases are formed by food. Wholesome and unwholesome foods are responsible for happiness and misery respectively.^[10] Ayurveda gives highest importance to *Pathya-Vyavastha* in a very scientific and holistic way. Intake of medicine for a long time produces side effects. So the *Pathya-Apathya* can be utilized rationally in the form of diet. It is said that disease can be cured without any medicine, by just following wholesome regimen. Whereas hundreds of medicine cannot cure a disease in the absence of wholesome diet. Hence *Mudgadi Yusha* as a *Pathya Kalpana* along with general rules and regulations was

advocated in this study. *Trikatu*(*Sunthi*, *Maricha* and *Pippali*) and *Brihati* (*Solanum anguivi* Linn.).^[11] were the components of *Yusha* which is having *Ushna Guna*. By its *Ushna Guna* it pacifies *Vata* and *Kapha* as these *Doshas* have *Sheeta* property and *Tamaka Shwasa* is a *Vatakaphaja* disorder thus *Yusha* can be curative also. They are also specifically *Shwasahara* (*Sunthi*).^[12] *Maricha*.^[13] *Pippali*.^[14] Thus *Mudgadi Yusha* containing *Trikatu* and *Brihati*(*Solanum anguivi* Linn.) which are said to be *Ushna*, *Kaphavatahara* and alleviate *Kasa* and *Shwasa*.

Mode of action of Yogic practices

Yogic practices help in purification of the *Srotases* (channels) which are filled with impurities in the form of pollutants or phlegm. When fat and mucus are excessive, the *Shatkarma* or six cleansing techniques should be performed prior to practice of *Yoga*.^[15] The practice of *Neti Kriya* relieves respiratory ailments as asthma, bronchitis, pneumonia etc. Through the frictional massage of the airways, the membranes are purified and are able to work more efficiently as to clean, warm, humidified and disinfected air reaches the lungs; so that the air reaching the lungs are optimally conditioned. *Sutra neti* clears away dried up mucous deposits and foreign bodies and it should be followed by *Jala neti* to clear away the passage. *Kapalabhati* is a breathing technique for purifying the frontal region of the brain. It destroys all the mucous disorders.^[16] *Kapalabhati* has a cleansing effect on the lungs and is a good practice for respiratory disorders. It reduces the *Kapha*, which is the chief culprit in *Tamaka Shwasa*. The set of *Asanas* prescribed not only help in general toning of the body but also specifically act on pectoral region, enhancing function of lungs. In *Padahastasana* there is contraction of abdomen which expels maximum amount of air from the lungs. In *Trikonasana* chest expands during practice leading to strengthening of lungs. *Vajrasana* increases the efficacy of the entire digestive system, relieving stomach ailments such as hyperacidity which in turn will be beneficial for asthmatics as Gastro-oesophageal reflux is also one of the causative factors of asthma. In *Shashkanasana* and *Bhujangasana* there is synchronization of breath with physical movement, hence improves the lung efficacy. *Shavasana* concentrates mind on each breath deepens the respiration and normalizes the respiratory rate. It relieves the mental stress, tension etc. thus helping in counteracting the psychological aspect in *Tamaka shwasa*. *Anuloma viloma Pranayama* increases the lung efficiency which is a proven fact. *Bhramari* relieves stress and cerebral tension and so helps in alleviating anger, anxiety and insomnia. The vibration of the humming sound creates a soothing effect on the mind and nervous system. The results are similar to the earlier studies

as Singh V. *et al.*^[17] where the improvement in bronchial hyper responsiveness by Pranayama in the patients of bronchial asthma was observed. Even M. Thomas *et al.*^[18] and C.A. Slader *et al.*^[19] found improvement in the patients of bronchial asthma with some breathing techniques (Pranayama). These techniques by reducing the short acting β_2 agonist use improves the quality of life in asthmatics. The practice of *Omkar Dhyana* relaxes and meditates mind which help to calm the disturbed mind which is also one of the triggering factor for the diseases. They also boost up the immune system and help in prevention of recurrent attacks in *Tamaka Shwasa*.

CONCLUSION

All the 3 groups were highly effective on intra-group comparison parameter before and after intervention. Overall evaluation of all the groups show that there is marked improvement in symptoms in Group A (the *Mudgadi Yusha* and general *Pathya apathya*) and Group B (*Yogic* practices along with *Pathya-apathya*) has better results as compared Group C (Standard drug therapy Salbutamol). Further on the assessment of objective criteria, better improvement was observed in group B compared to group A. This means that the *Mudgadi Yusha* and *Pathapathya* relieved patients of their symptoms, but patients with *Yogic* practices are more effective. It shows that yogic practices advocated to the patients improves lung function. Further during trial period no side effects were observed in either of the group. It can be concluded that yogic practices with *Pathya-apathya* management should be incorporated in the routine treatment of *Tamaka Shwasa vis-à-vis* Bronchial Asthma.

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