International Research Journal of Ayurveda & Yoga
Vol. 6 (5),01-10, May,2023
ISSN: 2581-785X: https://irjay.com/
DOI: **10.47223/IRJAY.2023.6501**

A Clinical Evaluation of *'Sharngyadi Churna'* and Herbal Nebulizer in the Management of *Tamaka Shwasa* w.s.r. to Bronchial Asthma : A Research Article.

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Article Info

Article history:
Received on: 12-04-2023
Accepted on: 22-05-2023
Available online: 31-05-2023

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ABSTRACT:

Tamak shwasa is a type of *Shwasa Roga* in which patients feel excessive difficulty in breathing and drowning in the dark. It may be defined as a disease in which vitiated "*Pranvayu"* combines with deranged *"kapha dosha"* in the lungs, causing obstruction in the "*Pranavaha srotasa"* (respiratory passage). A number of indigenous drugs have been claimed in various text books of Ayurveda, to be effective in the treatment of *Tamak shwasa* (Bronchial asthma). The *shrangyadi churna* is one of them. Nebulizer, a drug delivery system is based on aerosol principal and plays a very important role in asthma treatment; especially it is better for children, elderly patients, disabled individuals or those with diseases that make using their hands and taking deep breaths impossible. It delivers medication directly to the lungs. In aerosol through a nebulizer medicines passes straight into lungs and takes less time to work than orally medications. So a study was planned to evaluate the role of *shrangyadi churna* as a safe formulation for *Tamak shwasa* (Bronchial asthma) and a formulation of herbal drugs (*Pushkar mulaadi yog*), in the form of alcohol based extract was planned for study as nebulizer medicine for the same purpose in this disease.

Keywords: *Tamaka shwash, Shrangyadi churna, Pushkar mulaadi yog*.

INTRODUCTION

Asthma is defined as a disorder characterized by chronic airway inflammation and increased airway responsiveness to a variety of stimuli. It is manifested physiologically by a widespread narrowing of air passage which may be relieved spontaneously or as a result of therapy and clinically by paroxysms of dyspnea, cough and wheezing.

Asthma is an episodic disease with acute exacerbations interspersed with symptom free episodes. This phase may be mild with or without super imposed severe episodes or much more serious with severe obstruction persisting for weeks; the latter condition is known as "status asthmatics" a life-threatening condition.[1]

Need of study:

As stated by WHO 100-150 million of global population are suffering from Bronchial Asthma is increasing everywhere. Current estimates suggest that 300 million people worldwide suffer from Asthma and an additional 100 million may be diagnosed with Asthma by 2025.[2] According to the who by the year 2020 Asthma along with chronic obstructive pulmonary disease will become the third leading cause of death. It is a male predominant disease. Male and Female ratio is 2:1. this is alarming rise in the prevalence of *Tamaka shwasa* can be accounted to factors such as Atmosphere pollution, rapid environmental changes, adaptation of newer dietetic preparations and tremendous psychological stress.

Barring the data collected by the National Family Health survey-2 (NFHS-2) during 1998-1999, the estimated prevalence of Asthma in India is 2648 per 10000 persons, the prevalence was higher in rural areas than in urban areas. The prevalence among male are slightly higher than among females. Though the prevalence is higher amongst men it is women who suffer the most from asthma. The prevalence severe asthma increased from 20% to 27.5% and that of persistent severe asthma increased from 4% to 6.5% between 1994 and 1999.

The management of Bronchial asthma with Allopathic medicine is purely temporary and at times associated with serious toxic effects therefore considering the demand of society and taking the responsibility it was decided, to evaluate certain *Ayurvedic* management for chronic persistent Asthma as well as acute stage of Bronchial Asthma which is safe, effective, cheap and readily available.

AIMS AND OBJECTIVES-

- To evaluate the efficacy of the ***Shrangyadi churna*** in the management of ***Tamak shwasa*** **(Bronchial asthma)**.
- To frame out aetiopathogenesis, of ***Tamak shwasa*** **(Bronchial asthma)** as per *Ayurveda*.
- To evaluate the role of '***Pushkar mulaadi yog'*** on ***Tamak shwasa*** **(Bronchial asthma)** in the form of nebulizer medicine.
- To review and evaluate available literature related with as ***Tamak shwasa,*** **Bronchial asthma,** and **nebulization** as explained in *Ayurveda* and modern medical science.

Disease review :

Ayurvedic **review :**

Difficulty in breathing, labored breathing or defilation of normal process of respiration is known as *Shwasa roga* i.e. *Shwasa* is pathological condition in which the normal process of respiration is disturbed. In *Ayurveda Shwasa* said to be disorder of *pranavaha srotas* Vitiation of *pranavaha srotas* leads to *atisrishtha, atibaddha, kupita, alpa, sashbda shwasa*.[3] *Shwasa roga* as *Kapha-Vataja* disorder originated from *Pittasthana*.[4] When the normal passage of *Pranavayu* is obstructed by *Kapha (Avarana),* it gets vitiated and starts moving in opposite direction (upward), Which then unable to perform it normal physiological work and produces *Shwasa roga.*

The vitiated *Vata* is of *Pratilomagati* in its course in *Tamaka Shwasa*. The obstructed *vayu* in *Pranavaha Srotas* attains *Pratiloma Gati,* which aggravates the *Kapha Dosha*, there by entering into the *Greeva* and *Shiras* causing obstruction in *Greeva* and *Shiras* and also results in *Peenasa.*[5] Thus obstructed *Vayu* produces *Ghurghura Dhwani* and turns in to *Teevra vega Shwasa*.

Modern review :

Asthma is defined as disorder characterized by chronic airway inflammation and increased airway responsiveness resulting in symptoms of wheezing, cough, chest tightness, and dyspnea. It is characterized functionally by presence of airflow obstruction which is variable over short period of time or is reversible with treatment. It is not a uniform disease but rather a dynamic clinical syndrome which has a number of clinical patterns**.**[6]

Classification

According to etiology[7]

1. Allergic, Extrinsic or Early onset Asthma:- In extrinsic asthma, the asthmatic episode is typically initiated by a type I hypersensitivity reaction induced by exposure to an extrinsic antigens like pollens, moulds, house dust, mite etc.

2. Non –allergic, intrinsic or late onset asthma:- Although the majority of patients with asthma have atopy , in a proportion of patients with asthma there is no evidence of atopy with normal total and specific I_gE and negative skin tests. This so-called "intrinsic" asthma usually comes on later in life and tends to be more severe than allergic asthma The pathophysiology is very similar to that of allergic asthma and there is increasing evidence for local I_gE production, possibly directed at bacterial or viral antigen.

3. mixed type- A third type is a mixed pattern in which the features do not fit clearly into either of the two main types.

Symptoms:- The characteristic symptoms of asthma are wheezing, dyspnoea, and coughing which are variable,

both spontaneously and with therapy. Symptoms may be worse at night, and patients typically awake in the early morning hours. Patients may report difficulty in filling their lungs with air. There is increased mucus production in some patients, with typically tenacious mucous that is difficult to expectorate. There may be increased ventilation and use of accessory muscles of ventilation. Prodromal symptoms may precede an attack, with itching under the chin, discomfort between the scapulae, or inexplicable fear(impending doom)[3]. Asthmatics are frequently associated with other atopic conditions such as eczema, urticaria, allergic rhinitis and hay-fever.[8]

Signs:- Rhonchi are heard as the most prominent sign of asthma, especially during expiration. At the time asthma exacerbation signs such as increased respiratory rate, flaring of alae nasi, use of accessory muscles of respiration, and pulsus paradoxus may be detected.[9]

MATERIALS & METHODS

Drug review :

In Ayurvedic classics, the importance of *Aushadha* is described as "Nothing in the word exists which does not have therapeutic utility".

Herbal Nebulization- Contents of Nebulization drug (*pushkarmuladi yog*) Table 1

Preparation of Herbal neubalization

The drug was made by continuous hot percolation process known as Soxhlation process in which small volume of hot menstruum was passed over the drug time and again to dissolve out the active constituents until the drug was exhausted. 100 gm of crude drug in fine powdered from was taken in extraction chamber of soxhlate and moistened with water & alcohol in the ratio of 2:1 for few hours until the drug was totally moistened. Thimble made of filter paper was then placed into the wider part of the extractor. Thimble is used to prevent chocking of the lower part of the extractor by drug particles.

Menstruum i.e. distilled water (200ml) and absolute alcohol (100ml) was placed in the flask and boiled.

The vapours are allowed to pass through the side tube to the condenser where they are condensed and fall on to the packed drug through which it percolates and extract out the active constitutes. As the volume of menstruum in the extractor increase, the level of the liquid in the siphone also increase till it reaches the maximum point from where it is siphoned out into the flask.

On further heating, the menstruum vaporizes while the dissolved active constituents remain behind in the flask. The alternate filling and emptying of the body of the extractor goes on continuously till the drug is exhausted. Thus the same quantity of menstruum was made to percolate repeatedly, about 14 to 15 times through the drug and the active constituent were collected in the flask.

The extract carried out by this method was then dried to know the solid mass. Out of 100gm of crude drug, 30gm of dried solid extract was obtained. This extract was then dissolved in 2liter of distilled water & 1 liter of absolute alcohol. The drug was then packed in bottles in the dose of 2.5 ml. 2.5ml of the suspension contains 2.5 mg of drug.

Recommended Dose- 2.5ml of drug twice in a day in the form of nebulization.

***Shrangyadi churna*[10]** :- Table 2 **Ingredients :**

Clinical study

Patients were selected and registered randomly from OPD and IPD of University College of Ayurveda Hospital, Dr. Sarvepalli Radhakrishnan Rajasthan Ayurved University, Jodhpur. Irrespective of age, sex, religion, occupation etc. and full filing the criteria of selection were eligible for the study.

Ethical Clearance no. – Sr No./dsrrau/uca/iec/18-19/79

Sample Size :-45 patients (15 patients in each group) were randomly divided for plan study.

Informed Consent: Written informed consent was taken from each patient before starting the study.

Selection Criteria:

Inclusion criteria:-

1. Patients having signs and symptoms of ***Tamak shwasa* (Bronchial asthma).**
2. The patients between the age group of 16 to 70 years.
3. Patient willing to sign the consent forms.

Exclusion criteria:-

1. Pregnant women and lactating mother.
2. Non co-operative patient.
3. Patient having history of tuberculosis, bronchial carcinoma, COPD, cardiac asthma, emphysema, Status asthmaticus, plural effusion.
4. Patients having a history of untreated thyroid disorder and drug addiction.
5. Individual undergoing any other drug therapy.

Withdrawal criteria:

All the patients which may be found hypersensitive with the selected management were discarded from the study even after registration. At the same time the patient shown any allergic reaction with both of trial medicine or non-cooperative patients (either not following the instruction

and *pathya* / *apathya*) were removed during the course of treatment.

Plan of study:

The proposed study was exclusively based on clinical trials. Complete clinical study was disposed into 3 groups as per the approach**:-**

Total 45 Clinically diagnosed and registered patients of *Tamak shwasa* (Bronchial asthma) were divided into 3 groups with 15 patients in each group.

GROUP A: In this group, *Shrangyadi churna* was given to patients, 3 gm dose, twice a day, orally for 15 day.

GROUP B: In this group, *Shrangyadi churna* 3 gm dose, twice a day, orally for 15 day and **'***Pushkar mulaadi yog'* alcohol **based extract** in aerosol form by nebulizer in dose of **2.5 ml** –twice a day for 15 day were given to patients.

GROUP C: In this group, '*Pushkar mulaadi yog'* alcohol based extract was given to patients in aerosol form by nebulizer in dose of **2.5 ml** –twice a day for 15 day was given to patients.

Criteria for assessment:

All the patients registered for study was assessed on various subjective and objective parameters, before treatment, during treatment, and after the completion of treatment, for the assessment of improvement, on the following parameters.

Subjective parameters[11] :

- *Kasa* (Cough)
- *Urah shoola* (chest pain)
- *Shwas krichta* (dyspnea)
- *Ghur ghurahak shabda* (ronchi)
- *Kashta shleshma moksha* (difficult expectoration)
- *Anidra* (Insomnia)
- *Pinas* (nasal discharge)

The following symptom rating scale was used for the assessment of improvement. On this scale various symptoms were graded into different grades as per their severity as shown in Table 3

The details of the assessment of the symptoms rating is given below:

***Table 4 -Kasa*/ Cough**

***Table 5-Urahshula*/Chest Pain**

Table 6 ***Shwasa Kricchata*** (Dyspnoea)

Table 7 ***Ghurghurkam shabada***

Table 8 Expectoration

Table 9 ***Anidra*/Insomia**

***Table 10 Pinasa*/Nasal discharge**

Objective parameters:

The objective assessment of patients was done on the basis of the investigational reports of the laboratory parameters obtained before and after the trial, the evaluation was done and any changes were recorded and used to assess the progress in relation to the course of disease ***Tamak shwasa***. Following investigations were performed in all the patients.

- CBC
- ESR
- CHEST X RAY
- SPIROMETRY
  - FEV, l/sec
  - FVC, l/sec
  - PEFR, l/min

OBSERVATION & RESULT

- In the present study in age group of 16-30 years, in which 17 patients (37.77%). 08 patients(17.77%) from 31-40 years of age group, 08 patients (17.77%) from 41-50 years of age group, 05 patients(11.11%) from 51-60 years of age group, 07 patients(15.55%) from 61-70 years age group, It was observed that incidence of *Tamaka Shwasa* occurring in young age.
- In the present study in maximum of 27 patients (60%) This were reported to be males and 18 patient (40%) were females among the 45 patients of *Tamaka Shwasa* . It was observed max. patients male. In the present study in 33 Patients (73.33%) were Hindus where as 12 Patients (26.67%) belonged to Muslim community.
- In the present study maximum 28 Patients (62.22%) were married, 17 patients (37.78%) were unmarried.
- In present study of *Tamaka Shwasa* incidence of occupational status was maximum in service- 18 Patients (40%), followed by house wife 13 Patients(28.89%), 04 Patients(8.89%) were student, 05 Patient(11.11%) was Labour and 05 Patients (11.11%) were doing other types of work.
- In the present study in Educational Status, illiterate, Primary, secondary, and graduate or post graduate groups. The number and percentage of each category was 04(8.89%), 05(11.11%), 15(33.33%) 21(46.67%) respectively. Majority of cases were graduated.
- In this research work incidence of *tamaka shwasa* was highest in the patients who belonged to *Jangala Desha* i.e. 45 patients (100%).
- In the present study in 53.33% (24) Patients Sound Sleep while 46.67% (21) disturbed sleep.

- In the present study in maximum i.e. 75.56% patients had no addiction, 11.11% had tobacco addiction followed by 13.33% had tea addiction.
- In the present study in maximum no. of patients were having seasonal attacks i.e. 28 patients (62.22%), 13 patients (28.89%) were having irregular attacks and 04 patients (8.89%) were having regular attacks.
- In the present study in 18 patients (40%) were having *Mandagni*, and 12 patients (26.67%) were having *Vishamagni* , 11 Patients (24.44%) were having *Samagni* and 04 Patient (8.89%) was having *Tikshnagni*.
- In the present study in maximum number of patients 27 (60%) were of *Vata Kapha Prakriti*, 12 (26.67%) patients were of *Vata Pitta Prakriti* and 06 patients (13.33%) were *Pitta Kapha Prikriti*. It can be concluded from the table that *Vata Kapha Prakriti* people are more affected with *tamaka shwasa*.
- In the present clinical trial it was observed that 100% patients had dyspnoea, 60% patients had coughing, 44.44% had Chest Pain , 66.66% had wheezing, 53.33% had difficult expectoration, 31.11% had insomnia, 40% had nasal discharge.

Table No. 11 Showing effect of Therapy in Subjective Parameters in Intra Group.

Table No.12 showing effect of therapeutic trial on Laboratory Parameters in patients of *Tamaka Shwasa* (Bronchial Asthma) based on intra group comparision (Pair t-test)

RESULT:

Table no. – 13 showing result

- In Group A – 8.33% patients were found no relief, 16.67% were found mild relief, 25% were found moderate relief, 50% were found significant relief & no excellent relief was found.
- In Group B – 8.33% patients were found no relief, 8.33% were found mild relief, 66.67% were found moderate relief, 16.67% were found significant relief & no excellent relief was found.
- In Group C – 8.33% patients were found no relief, 16.67% were found mild relief, 25% were found moderate relief, 33.33% were found significant relief & no excellent relief was found.

DISCUSSION

All the observations obtained in clinical trial suggest that *Shringyadi churna* and Herbal nebulizer (*Pushkarmuladi yog*) produce symptomatic relief in *Tamak shwasa* (Bronchial asthma). Thus it is clear from the current research project that these *Shringyadi churna* and Herbal nebulizer (*Pushkarmuladi yog*) may be used as effective bronchodilator medicines in *Tamak shwasa* (Bronchial asthma).

CONCLUSION

A good result was found by the use of *Shrangyadi churna* in the management of *Tamaka Shwasa*. (GroupA).Herbal nebulization can play an important role in the treatment of *Tamaka Shwasa.* (Group C). Comparatively better result were found in the patients treated by combination of *Shrangyadi churna* & Herbal nebulization (Group B). The patients of *Tamaka Shwasa* need continuous treatment. As the treatment is withdrawn the symptoms may show recurrence. The 4 weeks follow up of patients of *Tamaka Shwasa* without treatment showed the recurrence of symptoms which confirms that *Tamaka Shwasa* is a *Yapya Vyadhi* (difficult to treat).This Clinical study proves that most of the *Ayurvedic* drugs used in this research project possess bronchodilator, anti-inflammatory, antihistamine and mucolytic properties. The drugs given in the said research work were well tolerated by all patients and no side effects were noted in any patient. Thus it can be concluded that *Shrangyadi Churna* & Herbal Nebulization can be used as safe and effective remedy for the management of *Tamaka Shwasa* (Bronchial Asthma) and can be considered as first line therapy in the management of *Tamaka Shwasa*.

Acknowledgment- Nil
Conflicts Of Interest- Nil
Source of finance & support – Nil

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How to cite this article: Prakash P, Sharma M, Sharma B "A Clinical Evaluation Of *'Sharngyadi Churna'* And Herbal Nebulizer In The Management Of *Tamaka Shwasa* W.S.R. To Bronchial Asthma : A Research Article" IRJAY. [online]2023;6(5);01-10.
Available from: https://irjay.com.
DOI link- https://doi.org/**10.47223/IRJAY.2023.6501**

Table 1 Herbal Nebulization- Contents of Nebulization drug (*pushkarmuladi yog*)

S.No.	Name of Drug	Botanical Name	Part used	Quantity
1.	*Pushkarmool*[12]	Inula racemosa	Root	20gm
2.	*Bharangi*[13]	Clerodendrum serratum	Root	15gm
3.	*Shati*[14]	Hedichium spicatium	Root	15gm
4.	*Tailparna*[15]	Eucalyptus globulus	Leaves	15gm
5.	*Madhuyashti*[16]	Glycyrrhiza glabra	Root	15gm
6.	*Tulsi*[17]	Ocimum santum	*Panchang*	20gm

Table 2 Ingredients *Of Shrangyadi churna* :-

S.N.	Sanskrit Name	Latin Name	Part used
1	*Karkatshrangi*	Pistacia integerrima	Gall
2	*Saunth*	Gingiber officinale	Tuber
3	*Marich*	Piper nigrum	Fruit
4	*Pippali*	Piper longum	Fruit
5	*Haritaki*	Terminalia chebula	Fruit
6	*Vibhitak*	Terminalia bellirica	Fruit
7	*Aamlaki*	Emblica officinalis	Fruit
8	*Kantkari*	Solanum surattense	Panchang
9	*Bharangi*	Clerodendrum serratum	Root
10	*Pushkarmool*	Inula racemosa	Root
11	*Saindhav lavan*	Sodium chloride	
12	*Sauvarchal lavan*	Sodium chloride	
13	*Sambhar lavan*	Sodium chloride	
14	*Samudra lavan*	Sodium chloride	
15	*Vid lavan*		

Table 3 On this scale various symptoms were graded into different grades as per their severity as shown below:-

S. No.	Grade	Number	Sign of grade
1.	Nil	0	-
2.	Mild	1	+
3.	Moderate	2	++
4.	Severe	3	+++
5.	Agonizing	4	++++

***Table 4 Kasa*/ Cough**

1	No Cough	0
2	Coughing for 2-5 min, frequency 1-2 time/ day without pain/ wet with easy expectoration	1
3	Coughing for more than 10 min, frequency more than 5-10 times/ day with pain expectoration with slight difficulties, disturbed sleep	2
4	Coughing for more than 15 min frequency more than 5-10 times/day, Marked disturbance in sleep, with pain/feeling of restlessness because of difficulty in expectoration	3
5	Frequent coughing due to which patients becomes unconscious.	4

Table 5 *Urahshula*/Chest Pain

1	No *Urahshula*	0
2	*Urahshula* during attack	1
3	*Urahshula* Very often even without attack, relieved by local *Snehana* & *Swedana*	2
4	Very often *Urahshula* even without attack and not relieved by local *Snehana* & *Swedana*	3
5	Persistent *Urahshula*	4

Table 6 *Shwasa Kricchata* (Dyspnoea)

1	Not troubled by shortness of breath on level or uphill	0
2	Troubled by shortness of breath on level or uphill	1
3	Walks slower than person of same age (Breathlessness at the time of simple walking)	2
4	Stop after waking 100 yards	3
5	Breathlessness at rest	4

Table 7 *Ghurghurkam shabada*

1	No wheezing	0
2	Wheezing only at early morning or during physical exertion	1
3	Intermittent wheezing present only during attack	2
4	Constant wheezing throughout day	3
5	Constant wheezing along with other added respiratory sound	4

Table 8 Expectoration

1.	No expectoration	0
2.	White in color, not more than 2-5ml/day	1
3.	Yellowish white in color and quantity more than 20ml/day	2
4.	Deep yellow in color and quantity more than 50ml/day	3
5.	Blood stained sputum	4

Table 9 *Anidra*/Insomia

1.	Sleeping Pattern normal	0
2.	Sleep disturbed 1-2time in night due to dyspnea	1
3.	Sleep disturbed 3-4times in night due to dyspnea	2
4.	Due to dyspnea patient's sleep disturbed throughout night	3
5.	Patients fear to sleep	4

Table 10 *Pinasa*/Nasal discharge

1.	No *Pinasa*	0
2.	*Pinasa* present before attack and subsides 1-2 days after the attack	1
3.	*Pinasa* before attack and persist for more than a week after attack	2
4.	*Pinasa* present often even without attack	3
5.	*Pinasa* always persisting	4

Table No. 11 Showing effect of Therapy in Subjective Parameters in Intra Group. (Wilcoxon matched-paired signed ranked test)

Variable	Gr.	Mean		Mean Diff.	% Relief	SD±	SE±	P	S
		BT	AT						
Kasa (Cough)	Gr.A	1.66	0.600	1.067	64.27%	0.961	0.248	0.001	ES
	Gr.B	2.00	0.866	1.133	56.65%	0.915	0.236	0.0005	ES
	Gr.C	1.80	0.733	1.067	59.27%	0.883	0.228	0.001	ES
Urah shola (Chest pain)	Gr.A	1.86	0.400	1.467	78.87%	1.187	0.306	0.0005	ES
	Gr.B	2.06	0.733	1.333	64.70%	0.975	0.252	0.0002	ES
	Gr.C	1.26	0.466	0.800	63.49%	0.774	0.200	0.002	VS
Shwas krichta (dyspnea)	Gr.A	1.46	0.333	1.133	77.60%	0.743	0.191	0.002	ES
	Gr.B	1.80	0.785	1.071	59.5%	0.997	0.266	0.002	VS
	Gr.C	1.26	0.333	0.933	74.04%	0.883	0.228	0.001	ES
Ghur ghurahak shabda (ronchi)	Gr.A	1.13	0.2000	0.933	70.15%	0.9612	0.2482	0.002	VS
	Gr.B	2.06	0.5333	1.533	74.41%	0.8338	0.2153	0.0001	ES
	Gr.C	1.33	0.066	1.267	95.26%	1.033	0.2667	0.0005	ES
Kashta shleshma moksha (difficult expectoration)	Gr.A	1.600	0.2667	1.333	83.31%	1.113	0.2873	0.002	ES
	Gr.B	1.667	0.2667	1.400	83.98%	0.9856	0.2545	0.0002	ES
	Gr.C	1.533	0.3333	1.200	78.27%	0.8619	0.2225	0.0002	ES
Anidra (Insomnia)	Gr.A	1.267	0.1333	1.133	89.42%	1.125	0.2906	0.0020	VS
	Gr.B	1.667	0.4667	1.200	71.98%	0.9411	0.2430	0.0005	ES
	Gr.C	1.600	0.4000	1.200	75%	0.7746	0.2000	0.0002	ES
Pinasa (nasal discharge)	Gr.A	1.533	0.2000	1.333	86.95%	1.047	0.2702	0.0005	ES
	Gr.B	1.800	0.4667	1.333	74.05%	1.175	0.3034	0.0010	ES
	Gr.C	1.333	0.1333	1.200	90.02%	1.082	0.2795	0.0010	ES

Table No.12 showing effect of therapeutic trial on Laboratory Parameters in patients of *Tamaka Shwasa* (Bronchial Asthma) based on intra group comparision (Pair t-test)

Variable	Gr.	Mean		Diff.	% Of Relief	SD±	SE±	T	P	S
		BT	AT							
Hb%	A	12.533	13.253	-0.700	5.5%	1.518	0.3918	1.787	0.0478	S
	B	12.913	13.793	-0.880	6.8%	1.408	0.3636	2.420	0.0148	S
	C	11.807	10.993	0.8133	6.8%	1.790	0.4621	1.760	0.0501	S
ESR	A	26.800	11.800	15.000	55.97%	9.047	2.336	6.421	0.0001	S
	B	25.667	12.067	13.600	52.98%	12.744	3.290	4.133	0.0005	S
	C	22.467	19.667	2.800	12.46%	11.027	2.847	0.9834	0.1710	NS
PEFR	A	145.33	266.67	-121.3	83.4%	61.513	15.883	7.639	0.0001	S
	B	114.00	216.67	-102.6	90%	62.274	16.079	6.385	0.0001	S
	C	128.67	208.67	-80.00	62.1%	55.934	14.442	5.539	0.0001	S
FVC	A	1.451	2.077	-0.626	43.1%	0.5323	0.1375	4.559	0.0002	S
	B	1.157	1.829	-0.672	58.0%	0.5439	0.1404	4.785	0.0001	S
	C	1.288	1.653	-0.364	28.2%	0.3848	0.0993	3.670	0.0013	S
FEV1	A	1.341	1.915	-0.573	42.7%	0.4194	0.1083	5.294	0.0001	S
	B	1.011	1.480	-0.468	46.2%	0.3596	0.0928	5.048	0.0001	S
	C	1.280	1.793	-0.512	40%	0.2876	0.0742	6.904	0.0001	S

Table no. –1 3 showing result-

Effects	**Group A**	**Group B**	**Group C**
No relief (0-25%)	8.33%	8.33%	8.33%
Mild relief (26-50%)	16.67%	8.33%	16.67%
Moderate relief (51-74%)	25%	66.67%	25%
Significant relief (75-99%)	50%	16.67%	33.33%
Excellent relief (100%)	0%	0%	0%