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Research Article

A COMPARATIVE CLINICAL STUDY ON THE EFFECT OF *KRISHNADI CHURNA* AND *VASADI KWATHA* IN THE MANAGEMENT OF *TAMAKA SHWASA* (BRONCHIAL ASTHMA)

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ABSTRACT

Background: Asthma is a chronic inflammatory airway disorder characterised by hyperresponsiveness and recurrent wheezing, breathlessness, chest tightness, and coughing. The rising burden of *Tamaka shwasa* (bronchial asthma) highlights the need for safe, effective, and integrative Ayurvedic interventions.

Objective: To evaluate and compare the effect of *Krishnadi churna* and *Vasadi kwatha* in the management of *Tamaka shwasa*.

Materials and Methods: A randomized clinical study was conducted on 30 patients with *Tamaka shwasa*, divided into two groups of 15. Group-A received *Krishnadi churna* (5g) with honey, and Group-B received *Vasadi kwatha* (50ml), administered twice daily on empty stomach for 30 days. Assessment was done using subjective clinical parameters, the Asthma Control Questionnaire (ACQ), and spirometric measures.

Results: Group-B showed significant improvements in *Shwasakrichhrata* (Mean difference± Standard deviation:1.60 ± 0.63), *Kasa* (1.33 ± 0.82), *Kaphanishthivana* (0.86 ± 0.52), *Nidralpata* (0.93 ± 0.46), and *Ghurghurakashabda* (0.53 ± 0.52). Group-A showed significant changes in *Ghurghurakashabda* (0.46 ± 0.53), *Anupashaya* (exacerbations due to cold exposure) (0.40± 0.507), and accessory muscle use (0.66 ± 0.62). Both groups demonstrated significant improvement in ACQ scores, Peak Expiratory Flow Rate (PEFR), Forced Expiratory Volume in one second (FEV_1), and pulse rate, while respiratory rate (0.73 ± 0.70) improved significantly only in Group-B. Intergroup differences were statistically non-significant ($P > 0.05$), though Group-B showed better percentage relief.

Conclusion: Both formulations were effective in managing *Tamaka shwasa*, with *Vasadi kwatha* showing greater improvement in symptoms and pulmonary function.

INTRODUCTION

Asthma is a chronic inflammatory airway disorder characterised by airway hyper responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment.[1]

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According to the World Health Organization (WHO), asthma affected approximately 262 million people and caused 455,000 deaths globally in 2019 with most deaths occurred in low- and lower-middle-income countries due to underdiagnosis and undertreatment.[2] In India, the National Family Health Survey-5 (NFHS-5) (2019-21) reported asthma prevalence of 1.61% among women and 0.52% among men aged 15-49, with a higher prevalence among women, individuals with less schooling and those residing in rural areas.[3]

Tamaka shwasa is considered analogous to bronchial asthma due to similarity in symptoms, onset, causes, precipitating factors and pathogenesis. In Ayurveda, *Vata* and *Kapha dosha* involved in the

Samprapti of *Tamaka shwasa*. The vitiation of these *dosha,* originating from *Pittasthana,* leads to *Rasa dhatudushti* and dysfunction of *Pranavaha srotas.* Although classical management emphasizes balancing *Vata dosha* through *Snigdha chikitsa* and *Kapha dosha* through *Ruksha chikitsa*, achieving this balance remains clinically challenging. Ayurvedic texts describe several herbal preparations for the management of *Tamaka shwasa*. Various *Acharyas* have given guiding principles for management of *Tamaka shwasa,* and the drugs having *Vata-kaphaghna, Ushna* and *Vatanulomana* properties are recommended. *Krishnadi churna* & *Vasadi kwatha* are among such preparations and are very much valued for its beneficial effects in cases of *Tamaka shwasa* (bronchial asthma). Both formulations predominantly possess *Katu- tikta rasa, Ushna veerya*, *Madhura* and *Katu vipaka*, *Laghu- tikshna- ruksha- snigdha guna*, thereby exerting *Kapha-vata shamaka* property. From modern pharmacological perspective, the ingredients exhibit anti-inflammatory, antioxidant, anti-allergic, immunomodulatory, broncho-dilatory, and antitussive effects. Although individual ingredients and formulations have demonstrated therapeutic potential in respiratory disorders, comparative clinical evidence evaluating their efficacy in *Tamaka shwasa* remains limited.

The present study was undertaken to evaluate and compare the clinical efficacy and safety of *Krishnadi churna* and *Vasadi kwatha* in the management of *Tamaka shwasa* (bronchial asthma) with anticipated outcomes of symptomatic relief, reduced frequency of attacks, and improved quality of life with minimal adverse effects.

MATERIALS & METHODS

The patient recruitment was from the outpatient department of the institute. The CONSORT statement guidelines were followed in the reporting of the study.

Trial Design

This was a prospective, randomized, open-label, parallel-group clinical study conducted to evaluate and compare the efficacy of *Krishnadi churna* and *Vasadi kwatha* in the management of *Tamaka shwasa* (bronchial asthma). After screening based on predefined inclusion and exclusion criteria, eligible participants were randomly allocated in a 1:1 ratio to either Group A or Group B. Participants in Group A received *Krishnadi churna*, while those in Group B received *Vasadi kwatha.*

Ethical consideration

The study was approved by the Institutional Ethics Committee (IEC) -(Approval No. 10(5)/EC/2014 /7219, dated 07.11.2014). Written informed consent was obtained from all participants prior to enrolment.

Criteria for Selection of Patients

A total of 30 patients aged 16-60 years of either sex, clinically diagnosed with *Tamaka shwasa* (bronchial asthma) based on Ayurvedic and modern diagnostic criteria, were recruited from the outpatient and inpatient departments (O.P.D./I.P.D.) of the hospital. Patients with other respiratory or systemic conditions such as tuberculosis, bronchogenic carcinoma, chronic obstructive pulmonary disease (COPD), pleural effusion, cardiac asthma, emphysema, status asthmaticus, renal failure, or malignant hypertension were excluded from the study.

Intervention

Group A received *Krishnadi churna* in a dose of 5 grams with *Madhu*, administered orally twice daily on an empty stomach for 30 days. Group B received *Vasadi kwatha*, prepared by decocting 50 grams of dry *Kwatha churna* in 400 ml water and reduced to 50 ml, administered orally twice daily on an empty stomach, for 30 days. The follow-up assessments were conducted on 7th day, 15th day, 22nd day and 30th day.

Trial Drugs

Krishnadi churna[4]

The contents of *Krishnadi churna* include *Pippali (Piper longum* L.*), Amalaki* (*Emblica officinalis* Gaertn.*), Shunthi* (*Zingiber officinale* Roscoe.*) & Sita (Saccharum officinarum* L.*)*.

1. *Pippali* **2. *Amalaki***

3. *Shunti* **4. *Sita***

Figure No. 1: Contents of *Krishnadi churna*

B. ***Vasadi kwatha***[5]

Vasadi kwatha comprises *Vasa (Adhatoda vasica* Nees*), Haridra (Curcuma longa* L.*), Dhanyaka (Coriandrum sativum* L.*), Guduchi (Tinospora cordifolia* Thunb.*), Bharangi (Clerodendrum serratum* L.*), Pippali (Piper longum* L.*), Shunthi* (*Zingiber officinale* Roscoe.*), Kantakari* (*Solanum xanthocarpum* Schrad.*),* with *Maricha* (*Piper nigrum* L.) as *Prakshepa Dravya*.


1. *Vasa*


2. *Haridra*


3. *Dhanyaka*


4. *Guduchi*


5. *Bharangi*


6. *Pippali*


7. *Shunthi*


8. *Kantakari*


9. *Maricha*

Figure No. 2: Contents of *Krishnadi churna*

Assessment criteria

Subjective symptoms such as dyspnoea, cough, fainting, sputum, difficulty in speech, night-time awakening, wheezing, exacerbations on exposure to cold, diet, and climate, and the use of accessory muscles, were scored using standard methods. Asthma control was assessed using Asthma Control Questionnaire.

Objective parameters included spirometric assessment of FEV_1 and PEFR, along with respiratory rate and pulse rate, measured before and after the treatment. ECG and chest X-ray were performed in all patients. Laboratory investigations including Total eosinophil count (TEC), hemoglobin percentage (Hb%), total leucocyte count (TLC), differential leucocyte count (DLC), fasting blood sugar (FBS), serum glutamic-oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), and serum creatinine were also assessed before and after the treatment.

Table 1: Grading for dyspnoea according to mMRC Dyspnoea scale [6]

Dyspnoea	Stage	Grade
Not troubled by breathlessness except on strenuous exercise	Normal	0
Short of breath when hurrying or walking up a slight hill	Mild	1
Walks slower than contemporaries on the level because of breathlessness or has to stop for breath when walking at own pace	Moderate	2
Stops for breath after walking 100 m or after a few minutes on the level	Severe	3
Too breathless to leave the house or breathless when dressing or undressing	Very severe	4

Table 2: Grading for Cough

Cough	Stage	Grade
No cough	Normal	0
Cough less than one third time of the day	Mild	1
Cough half of the time of the day	Moderate	2
Cough occurring three-fourths of the day	Severe	3
Cough throughout the whole day	Very severe	4

Table 3: Grading for Quality and Quantity of Sputum

Quantity of Sputum	Stage	Grade
No sputum	Normal	**0**
5 ml to10 ml per day, thin	Mild	1
Ranging from 10ml to25ml, thin	Moderate	2
25 ml to 50 ml per day, thick	Severe	3
50 ml to 100 ml per day, thick	Very severe	4

Table 4: Grading for Difficulty in Speech

Difficulty in Speech	Grade
Difficulty in Speech present/absent	1/0

Table 5: Grading for Night awakening

Night awakening	Stage	Grade
Sleep throughout night	Normal	0
Awakened once	Mild	1
Awakened twice or more	Moderate	2
Awakened most of the time	Severe	3

Table 6: Grading for wheezing

Wheezing	Grade
Absent / Present	0/1

Table 7: Grading for Fainting/Dizziness and Exacerbation on exposure to cold diet and climate

Fainting/Dizziness and Exacerbation	Stage	Grade
0 Symptom is not present at all	Normal	0
Symptom is present but not bothering	Mild	1
Symptom is bothering but tolerable	Moderate	2
Symptom is not tolerable and needs Medication	Severe	3
Symptom is not relieved at all	Very severe	4

Table 8: Grading for use of Accessory muscle

Use of Accessory muscle	Grade
None	0
Mild	1
Moderate	2
Marked	3

Table 9: Grading of ACQ (Asthma Control Questionnaire) score [7]

ACQ score	Interpretation
≤0.75	Well-controlled
0.76 to 1.49	Not well-controlled
≥1.5	Very poorly controlled

Table 10: Grading for PEFR

PEFR	Grade
Range from 350 – 500 liter per min	0
Range from 250 – 350 liter per min	1
Range from 150 – 250 liter per min	2
Range from 150 liter per min & below	3

Table 11: Grading for FEV_1

FEV_1 % Predicted (Pre-Bronchodilator)	Grade
>95%	0
95-90%	1
89-80%	2
79-70%	3
69-60%	4
59-50%	5
<50%	6

Table 12: Grading of Respiratory rate

Respiratory rate	Stage	Grade
Less than or equal to 30 breath/min	Normal	1
Ranging from 31 to 45 breath/min	Mild	2
Ranging from 46 to 60 breath/min	Moderate	3
More than 60 breath/min	Severe	4

Table 13: Grading on the Heart rate

Heart rate	Stage	Grade
72/min	Normal	0
100/min	Mild	1
100-110/min	Moderate	2
>120/min	Severe	3
Impending respiratory failure with relative bradycardia	Very severe	4

Following investigations were done to exclude various Cardiac & Pulmonary disorders: X-Ray chest -PA view**,** Electrocardiography**.**

A. Chest X-Ray (PA view)

Purpose: To rule out other pulmonary conditions that can present with symptoms similar to asthma such as pneumonia, pulmonary tuberculosis, interstitial lung disease, bronchiectasis, COPD (chronic obstructive pulmonary disease), tumors or mass lesions, pleural effusion.

Rationale: Asthma generally shows a normal chest X-ray, though sometimes mild hyperinflation may be seen in chronic cases. Any abnormalities suggest another pathology, and such patients should be excluded from an asthma study.

B. Electrocardiography (ECG)

Purpose: To rule out cardiac causes of breathlessness or wheezing, such as: Congestive heart failure, Coronary artery disease, Arrhythmias, Cor pulmonale, Pericardial effusion

Rationale: ECG helps screen for any ischemic changes, chamber enlargement, or rhythm disturbances that would exclude the patient from an asthma-focused intervention.

Outcome measures

Primary outcome: Improvement in clinical symptoms of *Tamaka shwasa*, including *Shwasakruchrata* (dyspnoea), *Kasa* (cough), *Pramoha* (fainting/ dizziness), *Kaphanishtivana* (expectoration), *Bhashana kruchrata* (difficulty in speech), *Nidralpata* (night awakenings), *Ghurghurakashabda* (wheezing), and *Anupashaya* (symptom aggravation due to cold food or climate exposure).

Secondary outcome: Changes in objective parameters, primarily spirometry and laboratory

findings, including PEFR, FEV_1, respiratory rate, and pulse rate.

Randomisation

Patients were randomly assigned to either group using a simple randomisation technique. This involved generating a random sequence of numbers, through a computer-generated random number table to allocate patients without bias. The process was performed by a third party who was not involved in patient recruitment or assessment, ensuring allocation concealment and reducing selection bias.

Statistical Methods

Data collected from various parameters were analyzed using GraphPad software. For non-parametric data, the Wilcoxon matched pairs signed-rank test was applied for within-group comparisons, and the Mann-Whitney test was used for intergroup comparisons. For parametric data, the paired t-test was used for within-group analysis, while the unpaired t-test was used for between-group comparisons. Results were interpreted at significance levels of $P < 0.05$ (significant), $P < 0.01$ and $P < 0.001$ (highly significant), and $P > 0.05$ (non-significant).

In the present study, an equal number of male and female patients were included. Most of them were married (96.66%), Hindu (80%), and had an education level ranging from primary to secondary school (66.66%). A majority were vegetarians (63.33%), belonged to the upper middle socio-economic class (53.33%), and were housewives (40%). Irregular bowel habits were observed in 50% of participants.

A predominance of *Vata-kapha prakriti* (46.66%) was noted, with most patients exhibiting *Madhyama sara* (50%), *Samhanana* (67%), *Satmya* (50%), *Satva* (56%) and *Ahara shakti* (46.66%), along with *Avara vyayamashakti* (70%). *Krura koshtha* (46.66%) and *Vishamagni* (50%) were common. A positive history of prior drug intake was observed in 63.33% of cases. Most patients had a disease duration of approximately one year (40%) and a normal body mass index (BMI) (63.33%). Excessive intake of *Madhura rasa* (73.33%), history of dust allergy (63%), and exposure to *Raja* (73.33%) and *Dhuma* (56.66%) were frequently reported. Most individuals exhibited the feature of *Shleshma vimokshante sukham* (ease after expectoration) in 93.33% of patients.

RESULTS

Table 14: Effect of therapy in subjective parameters. (Wilcoxon matched- pairs signed rank test)

Variable	Group	Mean		Mean Difference	% Relief	SD±	SE±	P value	Result
		BT	AT						
Shwasakrichhrata	A	2.80	1.40	1.40	50.00	0.507	0.130	<0.0001	**HS**
	B	2.66	1.06	1.60	59.99	0.632	0.163	<0.0001	**HS**
Kasa	A	2.80	1.46	1.33	47.60	0.617	0.159	<0.0001	**HS**
	B	2.60	1.26	1.33	51.26	0.816	0.210	<0.0001	**HS**
Kaphanishthivana	A	1.40	0.73	0.66	47.62	0.457	0.488	<0.001	**HS**
	B	1.64	0.60	0.86	59.07	0.516	0.133	<0.001	**HS**
Bhashanakrucchrata	A	0.66	0.40	0.266	40.00	0.593	0.153	>0.05	**NS**
	B	0.66	0.33	0.333	49.99	0.723	0.186	>0.05	**NS**
Nidralpata	A	1.86	0.93	0.93	49.98	0.457	0.118	<0.001	**HS**
	B	1.73	0.80	0.93	53.85	0.457	0.118	<0.001	**HS**
Ghurghurakashabda	A	0.80	0.33	0.46	58.33	0.516	0.133	<0.05	**S**
	B	0.80	0.26	0.53	66.66	0.516	0.133	<0.001	**HS**
Anupshaya	A	1.53	1.13	0.40	26.14	0.507	0.130	<0.05	**S**
	B	1.33	0.73	0.60	45.11	0.736	0.190	<0.05	**S**
Accessory muscle use	A	1.66	1.00	0.66	39.99	0.617	0.159	<0.001	**HS**
	B	2.00	0.93	0.06	53.35	0.593	0.153	<0.0001	**HS**
ACQ	A	2.26	1.33	0.933	41.16	0.258	0.066	<0.0001	**HS**
	B	2.40	1.26	1.13	47.20	0.351	0.090	<0.0001	**HS**

BT- Before treatment, AT- After treatment, SD- Standard deviation, SE- Standard error, ACQ-Asthma Control Questionnaire, HS- Highly significant, S- Significant, NS- Non-significant

Both groups showed statistically significant improvement in major subjective parameters. In group A, highly significant (P<0.001) result was observed in *Shwasakrichhrata*, *Kasa*, *Kaphanishthivana*, *Nidralpata*, accessory muscle use, and ACQ scores. Significant improvement was also noted in *Ghurghurakashabda* and *Anupashaya*.

Group B demonstrated highly significant improvement (P<0.001 to P<0.0001) in *Shwasak richhrata*, *Kasa*, *Kaphanishthivana*, *Nidralpata*, *Ghurghurakashabda*, accessory muscle use, and ACQ scores, with comparatively higher percentage relief across most parameters. Improvement in *Bhashana krucchrata* was statistically non-significant in both groups.

Intergroup comparison of subjective parameters (Mann-Whitney Test)

Intergroup comparison of all the subjective parameters revealed no statistically significant difference between the groups (P>0.05).

Table 15: Effect of therapy on objective parameters. (Paired 't' Test)

Parameter	Group	Mean		Mean Difference	% Relief	SD±	SE±	T	P	Result
		BT	AT							
PEFR	A	1.733	0.8667	0.8667	50.01%	0.5164	0.1334	6.500	<0.0001	**HS**
	B	1.400	0.4667	0.9333	66.66%	0.7037	0.1817	5.137	<0.0001	**HS**
FEV_1	A	2.200	1.467	0.7333	33.33%	0.5936	0.1533	4.785	<0.0001	**HS**
	B	2.200	1.133	1.067	48.50%	0.5936	0.1533	6.959	<0.0001	**HS**
Hb%	A	12.020	12.487	0.4667	3.88%	0.9803	0.2531	1.844	>0.05	**NS**
	B	13.313	13.293	0.020	0.150%	0.8903	0.2306	0.086	>0.05	**NS**
ESR	A	16.867	13.133	3.733	22.13%	13.614	3.515	1.062	>0.05	**NS**
	B	14.600	13.133	1.467	10.04%	8.585	2.217	0.661	>0.05	**NS**
TLC	A	6166.7	6153.3	13.33	0.210	1379	356.2	0.037	>0.05	NS
	B	6500.0	6373.3	126.6	1.948	1483	383.0	0.330	>0.05	NS
TEC	A	274.27	338.53	64.267	23.43%	171.19	44.200	1.454	>0.05	**NS**
	B	232.13	265.73	33.600	14.47%	187.22	48.340	0.695	>0.05	**NS**
FBS	A	90.733	89.667	1.067	1.17%	15.248	3.937	0.270	>0.05	**NS**
	B	88.333	93.800	5.467	6.18%	12.06	3.115	1.755	>0.05	**NS**
SGOT	A	36.467	41.200	4.733	12.97%	11.304	2.919	1.622	>0.05	**NS**
	B	38.333	43.200	4.867	12.69%	14.192	3.664	1.328	>0.05	**NS**
SGPT	A	25.000	25.667	0.667	2.66%	7.078	1.827	0.364	>0.05	**NS**
	B	24.333	30.133	5.800	23.83%	8.930	2.306	2.516	<0.05	**S**
Serum Creatinine	A	0.8200	0.7467	0.0733	8.94%	0.2463	0.0636	1.153	>0.05	**NS**
	B	0.9000	0.9400	0.0400	4.44%	0.2384	0.0615	0.649	>0.05	**NS**
Respiratory Rate (/min)	A	1.600	1.067	0.533	33.33%	0.639	0.165	3.230	<0.05	**S**
	B	1.800	1.067	0.733	40.74%	0.703	0.181	4.049	<0.001	**HS**
Pulse Rate (/min)	A	1.600	0.733	0.866	54.17%	0.516	0.133	6.511	<0.0001	**HS**
	B	1.600	0.666	0.933	58.33%	0.258	0.066	14.14	<0.001	**HS**

BT- Before treatment, AT- After treatment, SD- Standard deviation, SE- Standard error, ACQ-Asthma Control Questionnaire, HS- Highly significant, S- Significant, NS- Non-significant

Both groups showed highly significant improvement (P < 0.0001) in pulmonary function parameters, including PEFR and FEV_1. Group B demonstrated greater percentage improvement compared to Group A. Respiratory rate and pulse rate showed significant to highly significant improvement in both groups, with better outcomes observed in Group B.

Laboratory parameters such as Hb%, ESR, TLC, TEC, FBS, SGOT, SGPT, and serum creatinine did not show statistically significant changes in either group, except for a mild but significant increase in SGPT levels

in Group B ($P < 0.05$), which remained within normal physiological limits.

Intergroup comparison of objective parameters. (Unpaired 't' Test)

On intergroup comparison of all the objective parameters of both the group, there was no statistically significant difference ($P>0.05$).

DISCUSSION

The present study evaluated the therapeutic efficacy of *Krishnadi churna* and *Vasadi kwatha* in the management of *Tamaka shwasa*. The observed clinical improvements can be explained through Ayurvedic principles supported by modern pharmacological evidence.

In *Tamaka shwasa*, the vitiation of *Vata* and *Kapha dosha* leads to obstruction in *Pranavaha srotas.* The selected formulations, *Krishnadi churna* and *Vasadi kwatha,* predominantly possess *Tikta* and *Katu rasa* which help in alleviating *Kapha dosha*, while *Guru* and *Snigdha guna* aid in pacifying *Vata*. The *Tikshna guna* facilitates penetration through the *Sanga* created by the *Kapha*, while *Ushna veerya* counteracts the underlying pathogenesis by liquefying and mobilizing accumulated *Kapha*. The balanced presence of *Madhura* and *Katu vipaka* ensures pacification of both *Vata* and *Kapha* without agitating the other with its *Vipareetha guna*. *Shwasa-kasahara prabhava* of ingredients such as *Pippali, Shunthi*, *Haridra* and *Maricha* directly contribute to symptomatic relief.

The therapeutic action *Krishnadi churna* can be attributed to its overall *Vata-kapha shamaka* properties. The use of *Madhu* as *Anupana*, owing to its *Yogavahi*, *Lekhana*, *Chedana* and *Kaphanisaraka* properties, might have enhanced the bioavailability and targeted action of the formulation. *Pippali*, *Amalaki*, and *Shunthi* are *Vatanulomaka* and due to its *Vatanulomana* action, the formulation might have facilitated the *Anulomana* of *Apana vayu*, thereby correcting the *Pratilomagati* of *Prana vayu* and contributing to *Samprapti vighatana*. All the ingredients of *Krishnadi churna* are classically described as *Shwasahara,* supporting its efficacy in the management of *Tamaka shwasa*. Pharmacological evidence suggests that *Piper nigrum* L. acts as an antagonist of inflammatory mediators by reducing eosinophil infiltration, airway hyperresponsiveness, and inflammation through suppression of histamine, interleukin-4, interleukin-5, and immunoglobulin E, while also inhibiting acetylcholine-induced broncho-constriction and exhibiting bronchodilatory and anti-asthmatic activity.[8] *Zingiber officinale* Roscoe. also exerts anti-inflammatory effects in the lungs by attenuating tracheal hyperreactivity and inhibiting cyclooxygenase metabolites, prostaglandins, and leukotrienes involved in inflammation.[9] Sugarcane contains phenolic acids, flavonoids, and other phenolic compounds that may contribute to its antioxidant activity.[10]

The mode of action of *Vasadi kwatha* is primarily due to its *Vata-kaphashamaka* properties. *Vasa*, a key ingredient, exhibits *Kaphaghna* property and might have pacified the vitiated *Kapha dosha*, which is dominant in the pathogenesis, while also depleting the excessively produced *Rasamala-kapha*, thereby acting against the *Kaphapradhana* pathogenesis of *Tamaka shwasa*. *Shunthi* possesses *Guru* and *Snigdha guna* with *Madhura vipaka* and helped in *Vata shamana*. It is observed that the majority of the ingredients possess *Laghu-ruksha guna, Tikta-katu-kashaya rasa, Katu vipaka, Ushna veerya* and *Kapha-vata shamaka prabhava.* Collectively, these properties may explain the comparative superior clinical outcomes observed with *Vasadi kwatha. Clerodendrum serratum* L. showed significant anti-inflammatory action.[11] *Curcuma longa* L. (Curcumin) has been shown to inhibit a number of different molecules involved in inflammation including phospholipase, lipoxygenase, COX-2, leukotrienes, thromboxane, prostaglandins, nitric oxide, collagenase, elastase, hyaluronidase, MCP-1, interferon-inducible protein, tumour necrosis factor, and interleukin-12.[12] *Piper nigrum* L. significantly inhibited acetylcholine induced bronchoconstriction. It shows anti-asthmatic activity, which may be due to its bronchodilator property.[13] *Curcuma longa* L. and *Piper longum* L. show marked inhibition of histamine release from mast cells. [14,15] Curcumin present in *Curcuma longa L.* can inhibit both nonspecific and specific mast cell-dependent allergic reactions.[16]

The combined Ayurvedic pharmacodynamic properties and modern pharmacological actions of these formulations may explain the significant improvement observed in clinical symptoms, ACQ scores, and spirometric parameters in both groups. The comparatively better percentage relief observed with *Vasadi kwatha* may be due to its multidimensional action on inflammation, mucus clearance, bronchospasm, and immune modulation, which collectively target the multifactorial pathogenesis of *Tamaka shwasa*.

CONCLUSION

Shamana chikitsa in the form of *Krishnadi churna* and *Vasadi kwatha* was effective in the management of *Tamaka shwasa* (bronchial asthma) as evidenced by significant improvement in both subjective and objective parameters within each group. Intergroup comparison did not show a statistically significant difference between the two

therapies. However, clinically, patients in Group B who received *Vasadi kwatha* showed greater percentage improvement across most parameters compared to group A treated with *Krishnadi churna*. Thus, while both formulations were effective, *Vasadi kwatha* showed comparatively better clinical efficacy in the management of *Tamaka shwasa*.

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