REVIEW ARTICLE

A systemic review of Ayurvedic management in different clinical studies with special reference to *Tamaka Shwasa*

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Abstract

A chronic inflammatory condition affecting the airways leads to heightened sensitivity, frequent wheezing episodes, difficulty breathing, chest tightness, and coughing, especially during the night or early morning hours. A number of studies on treating *Tamaka Shwasa* using different shodhan and shamana regimen have been found in different journals with varying results, but an evidence-based systemic review of them is not available. Hence, for this total 24 articles were selected from different publication for the review. Out of 24 articles obtained, one study ($n = 24$) exclusively focused on *Shodhana Karma* (*Vamana* and *Virechana*), one study ($n = 24$) focused on *Snehana* and *Swedana* with *Shamana Chikitsa*, one study ($n = 24$) focused on *Shamans Chikitsa* with *Pranayama,* one study ($n = 24$) focused on *Shamana Chikitsa* with *Kunjal Karm*a, two studies ($n = 24$) focused on *Shamans Chikitsa* with nebulization, one study ($n = 24$) focused on *Ayurvedic* formulation as a adjuvants, one study focused on *Shamana* and *Shodhana Chikitsa*, and 16 studies ($n = 24$) focused only on *Shamana Chikitsa*. Out of 24 clinical studies, 11 studies showed highly significant result, one study showed comparatively insignificant result, and 12 studies showed significant result. This systemic review comprises different Ayurvedic management in *Tamaka Shwasa* in children under 15 year of age. It is proved to be beneficial the importance of *Virechana* and *Vamana Chikitsa* along with *Shamana Chikitsa.* To enhance the resultant effect, addition of *Kunjal Karma, Pranayam,* nebulization, *Snehana,* and *Swedana* can be done.

Key words: *Chikitsa*, children, management, *Pranayama, Samshodhana, Shamana, Tamaka Shwasa, Yoga*

INTRODUCTION

Previous studies have shown an increasing prevalence of childhood asthma, especially in urban areas. Although development is good for economy and health of the population, it comes with own pros and cons. Air pollution is one of the major side effects of the industrialization. The intensified industrial revolution has led to heightened production levels and increased combustion of coal and other fossil fuels, primarily through the operation of power plants. The Centers for Disease Control discovered that exposure to these harmful gases which contain carbon dioxide and sulfur dioxide released into the air over extended period results in the development of an excessively sensitive immune system that is poorly protected against allergies and asthma.

Rapid urbanization is the second element that increases asthma prevalence. Due to numerous lifestyle factors, urbanization is linked to a higher frequency of asthmatic population. Contrarily asthma prevalence was formerly thought to be low in developing nations.[1] Prior research has indicated a rising occurrence of childhood asthma, particularly in urban regions.[2] Recent research on the prevalence of childhood asthma has corroborated the disparities between urban and rural areas but has revealed a significantly smaller disparity. This may be caused more exposure to chemicals and irritants used in agriculture as well as adoption of more westernized

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way of life. Urban living is not only about getting older but also about getting stressed. Asthma is well known to be brought on by heightened emotions and stress. Although the results are occasionally erratic, there is evidence of a connection between asthma, anxiety, and depression. Poor asthma control may be linked to sadness and anxiety.

Allergen exposure, especially indoor allergens, increases allergic asthma risk.[3] Food allergies with skin, gastrointestinal, and respiratory symptoms are more common than inhalant allergies in infants.[4] Food allergies increase the risk of asthma symptoms in children over 4 years old.[5] In children, respiratory viral infections are the most common asthma trigger. Infants often develop severe respiratory symptoms from the respiratory syncytial virus[6] and recurrent severe respiratory infections may cause asthma in children.[7] Besides the respiratory illness pollutant,[8] cooking with firewood,[9] exposure to heavy traffic,[10] lack of nutrition,[11] obesity,[12] excess consumption of junk food,[13] dampness in the home,[14] excess exposure to the use of paracetamol/antibiotics,[15] and irritant weather[16] and stress are also countable causes for asthma in childhood age group.

The global strategy for asthma management and prevention guidelines defines asthma as a chronic inflammatory disorder of the airway associated with increased airway hyper-responsiveness, recurrent episodes of wheezing, breathlessness, chest tightness, and coughing particularly in night/early morning. Airway inflammation produces airflow limitation through acute bronchoconstriction, chronic mucus plug formation, and airway wall swelling and remodeling. Poor asthma control contributes to unnecessary morbidity, limitations to daily activities, and impairments in overall quality of life (QOL).[17]

According to the WHO asthma is one of the most common chronic diseases among children worldwide. Asthma affected an estimated 262 million people in 2019 and caused approximately 461000 deaths. In 2019, the global prevalence estimates of asthma in people aged 5–6 years by various definitions, namely, current wheezing, ever wheezing, current asthma, and ever asthma were 11.5%, 17.9%, 5.4%, and 9.8%, respectively.[18] The prevalence of current wheeze in the 6–7 years, 13–14 years, and adults was 3.16%, 3.63%, and 3.30%, respectively.[19] Almost 82% of current wheezers and 70% of subjects with symptoms of severe asthma were not clinically diagnosed as having asthma. The daily use of inhaled corticosteroids (ICSs) was <2.5% in subjects with current wheeze and those with symptoms of severe asthma but <1% used daily ICS when asthma remained undiagnosed. Even after the advancement of medical science, the current prevalence of childhood asthma in Jaipur city is 18.2 % in the children age group of 5–15 year which is on a rapidly rising trend, but despite its high prevalence physician-diagnosed asthma remains just 6.2%.[20]

In children, treatment for asthma can be given orally, inhaled, or parenterally (By subcutaneous, intramuscular, or intravenous injection). Inhaled medication includes glucocorticoids (Beclomethasone dipropionate, budesonide, and fluticasone propionate), Short-acting beta agonists such as salbutamol, anticholinergic drugs, mast cell stabilizers, leukotriene modifiers (montelukast, pranlukast, and zafirlukast), long-acting beta 2 agonists, anti-IgE (Omalizumab), systemic glucocorticoid other therapies include methotrexate,[21] cyclosporine,[22] and gold.[23] Long-term treatment with high doses of inhaled glucocorticoids causes easy bruising,[24] cataracts,[25] adrenal suppression,[26] diminished bone mineral density,[27] and glaucoma in cross-sectional studies.[28] Long-term treatment with oral or parenteral glucocorticoid treatment can cause osteoporosis, arterial hypertension, diabetes, obesity, skin thinning, cutaneous striae, and muscle weakness.

The clinical presentation and symptoms of bronchial asthma have similarities with the symptoms of *Tamaka Shwasa*; thus, bronchial asthma can be correlated with *Tamaka Shwasa*. The word *Tamak* indicates darkness which happens in severe cases. There is darkness in front of the eyes. *Tamaka Shwasa* is one of the five types of *Shwasa* disease. Varieties of *Shwasa* are *Urdhwa*, *Mahashwasa, Chinna Shwasa, Tamak Shwasa*, and *Sudra Shwasa*. The origin of *Tamak Shwasa* is *Pitta Sthana Samudbhava* and the predominant *Doshas* are *Vata-Kapha*. In treating *Tamaka Shwasa*, medication with properties of *Vata Kaphaghna, Ushna, Vatanulomna, Deepana, Pachana, Shothhara, Srotoshodhak* and *Rasayana qualities* are employed.

Data Sources and Review Process

Four internet search engines were used to look for subject-related published research publications from reputable journals: PubMed, Google Scholar, the AYUSH research portal, and DHARA online. Through the associated publication websites, the full text of those researches is accessible in PDF format. Standard biomedical literature from various life science journals is included in the international databases PubMed and Google Scholar.[29] The Ministry of AYUSH, the Government of India, and the AVT Institute for research, respectively, operate the AYUSH research portal and Digital Helpline for Ayurveda Research Publications (DHARA), complete online indexing services for the articles published in the field of Ayurveda. *Tamaka Shvasa, Tamak Shwasa,* children, bronchial asthma, clinical trial, *Shirish, Shwasa Kuthar Rasa, Somasava, and Kanakasava* were the main words in our study. The two main keywords, clinical study, and *Tamaka Shwasa*, were mixed individually with other keywords. For instance, case studies of *Shwasa Kuthar Rasa* in children with *Tamak Shwasa*, bronchial asthma, etc., were employed. Articles that met the search parameters were put through a review procedure, and the entire texts gathered under the criteria were evaluated once more.

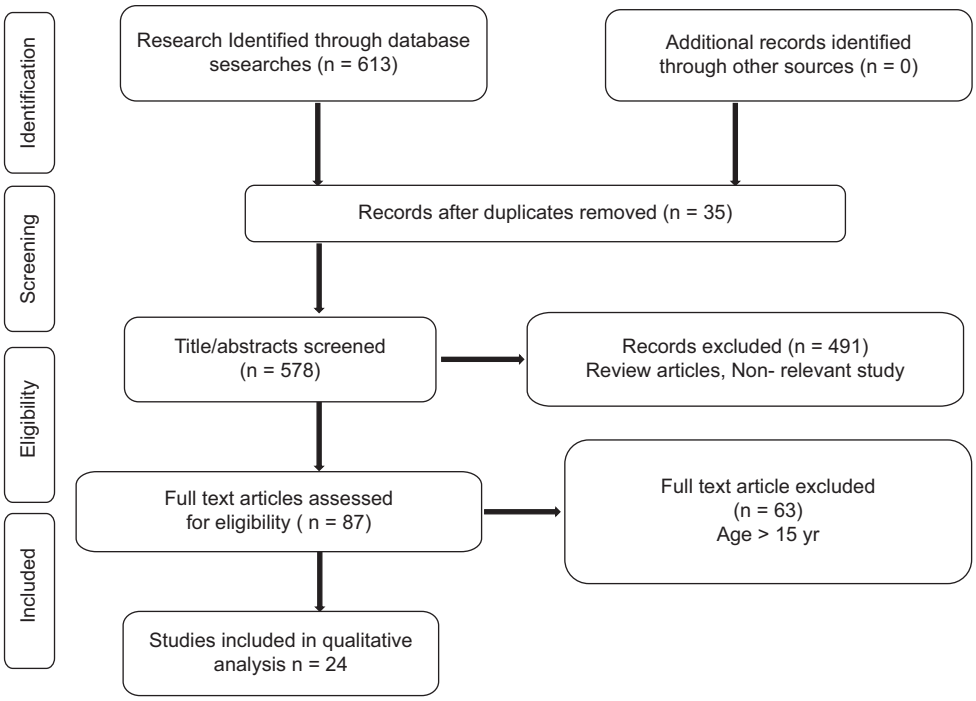

Figure 1: PRISMA flow chart illustrating study inclusions through the stages of the systemic review

SEARCH STRATEGY

Source of Evidence Screening and Selection

The articles found through manual and computerized searches were examined, and duplicates were eliminated. Then, after reviewing the titles and abstracts of pertinent articles, the entire texts of the chosen studies were studied while using inclusion and exclusion criteria. Only 24 studies were included and reviewed after reading the complete text [Table 1].

Types of Studies

This evaluation only considered clinical trials that were properly described scientifically. In the evaluation, studies evaluating the safety and effectiveness of ayurvedic formulations for treating childhood asthma were considered, whether they were randomized or not, open-label, single- or double-blinded, pilot studies, or case reports.

Types of Participants

Studies conducted with up to 15 years age group children were included in the review. The selection criteria for patients varied from study to study based on the conditions.

Types of Interventions

Studies designed to treat bronchial asthma by different *Panchkarma* procedures along with oral medication or only oral medication are included in the review.

Data Extraction

Data from the included studies were charted in the performed table.

Types of Outcome Measurement

Evaluation of the intervention both before and after was crucial for the outcome measurement, as was a follow-up time. Subjective criteria, such as the modification of the *Tamak Shwasa's* cardinal feature grading system and hematological and biochemical studies, have been used as a precaution.

STUDY SELECTION AND EXCLUSION

A total of 613 records were found in the database search, namely, 493 from Google scholar and 13 from PubMed, 107 from Google Scholar search. On elimination of duplicates, a total of 578 records were screened. Total of 491 articles were excluded. As they were review articles and not relevant to this study, so total 87 full-text articles matched the eligibility. Out of 87, total of 63 records were excluded since, in those study, age criteria were above 15 year and they were *in vitro* study, toxicity study, and *in vivo* study. A total of 24 records were found meeting up the eligibility criteria and were finally selected for the current systematic review process [Figure 1].

In a study conducted by Rosylin *et al*., (2021) a randomized and open-label clinical trial with pre-and post-tests was undertaken on 30 patients age ranging from 10 to 70 years of either gender. *Krisnadi Churna*[53] 2 g with *Madhu* (lukewarm

Table 1: PICO strategy for selection

Population	Intervention	Comparison/control	Outcomes
Tamaka Shwasa, Pratisayaha, Kasa, Peenasa, Bronchial asthma, Hyperreactive allergic disorder, Bronchitis	Ayurvedic intervention, Ayurvedic therapy, Ayurvedic treatment, panchkarma, Abhyanga, Snehana, Swedana, Inhalation, Vaman, Virechana, Nasya, Pranayama	No treatment, non-nas/ or Ayurveda therapy, non-Ayurveda treatment, non-Ayurveda interventions.	Change in grading system in subjective parameters, Objective parameters (CBC, IgE, TEC, ESR, Spirometry), QOL parameters for Asthma patients ACQ for short term control ACT for intermediate control GINA

CBC: Complete blood count, TEC: Total eosinophil count, ESR: Erythrocyte sedimentation rate, QOL: Quality of Life, ACQ: Asthma control questionnaire, ACT: Asthma control test, GINA: Global initiative for asthma

water) were administered twice daily for 2 months. The patient was evaluated based on both objective and subjective standards. After 60 days of treatment for all 30 patients, the statistical analysis reveals that *P* values for all criteria are <0.001, indicating that the outcome is highly significant.

In a study conducted by Yadav *et al*., (2019) a total of 32 out of 36 patients (age group 5–16) were completed the trial. In these patients, *Yoga Pranaaspanchkam* was administered. The syrup formulation administered at a dosage of 1 mL/kg in two divided doses. The trial lasted in 6 months, with a 3-months post follow-up period. The overall therapeutic effect reveals that 4 (12.5%) patients get relieved and 20 (62.5%) were moderately improved. Eight (25.0%) patients showed slight improvement.

A total of 17 patient out of 19 participants finished their treatment trial and follow-up in a study by Gaur *et al*. The test substance was *Chitraka Haritaki Avaleha*, which was administered for six weeks. An 8-week follow-up period was used. Improvement in the subjective criteria (*Rogabala, Agnibala, Dehabala, and Sattvabala*) and objective criteria (Positive changes in blood picture, reduction in eosinophil count, asthma control questionnaire [ACQ], asthma control test [ACT], and QOL) served as the basis for evaluation. After evaluation, it was found that the test substance shows effectiveness: 11.11% of patients showed a significant improvement, 66.66% showed a moderate improvement, and remaining 22.22% showed a mild improvement.

In research conducted by Sagar *et al*., a male 11-year-old was given *Samshodhana* treatment. On Day 1, *Deepana, Paachana* was done with *Chithrakadi vati* 125 mg and 35 mL *Panchakola Phanta* 3 times before food, followed by *Snehapana* with 30 mL *Dadimadi Ghrita* along with *Ushna Jala Pana* from day 2 to day 6 in increasing order. On 7th, 8th, 9th day *Sarvanga Abhyanga* with *Brihat Saindhavadi Thaila* and *Nadi Sweda* was done. On day10th *Saravanga Abhyanga* with *Brihat Saindhavadi tail* and *Nadi Sweda*, followed by *Virechana* with 60 g *Trivrit Leha* and 100 mL *Draksha Rasa* was done. The total number of *Virechana Vegas* was 10. At the time of discharge *Samsarjana Krama* for 5 days followed by *Swasakutara Rasa* 125 mg, 5 g *Agasthya Rasayana*twice before food and *Kanakasava* 7.5 mL twice after food with equal amount water were given. The patient was evaluated based on the reduction of clinical symptoms. All clinical symptoms were reduced with significant decrease in wheezing after the *Virechana karma.*

In a study by Anju and Kumar (2019), a total 20 patient out of 22 cases were received (age range: 3–10 years) *Shirish Twak Churna* 120 mg/kg BD with *Madhu* in a single group for 45 days. The following subjective parameters were used to evaluate the patient: coughing, wheezing, dyspnea, rhinorrhea, use of accessory muscles, physical activity, disturbed sleep, and restlessness. Complete blood count, absolute eosinophil count (AEC), LFT, blood urea, and PEFR measurements are objective parameters. Patients were monitored for 2 months at monthly intervals. In the laboratory examination, all hematological parameters-aside from the eosinophil count and the AEC count-were within normal ranges both before and after the therapy, and statistically insignificant changes ($P > 0.05$) were seen in these values after the therapy was finished.

In a study by Bhaskar *et al*., (2019) a 12-year-old Hindu male patient was enrolled for complaints of*Tamaka Shwasa*. For 8 weeks, *Jivantyadi Churna* was administered orally in three divided doses of a total of 8 g (2.6 g each) with *Madhu* (Honey) after meals. The follow-up was done every fortnight for an additional 8 weeks. The dose of drug administered was calculated based on the Sharangadhara Samhita dose fixation guidelines, that is, Adult Dose/16 X Age of the child (in years). After taking the medication, the patient was advised not to eat or drink anything for at least 30 min. The patient was evaluated for both subjective and objective criteria. After 8 weeks, there was a significant improvement in breathlessness, coughing, wheezing, night awakenings, and breath holding time. After 8 weeks of treatment, there was a significant reduction in AEC count (23%), erythrocyte sedimentation rate (ESR) (60%), and improvement in ACQ (77.77%), ACT (70%), and global initiative for asthma (66.66%).

Bhaskar *et al*. conducted a study (2019). A 12-year-old male (pre-diagnosed case of bronchial asthma) was enrolled. 8 g of *Shwasahara Dashemani* Churna was given orally in three separate doses with Madhu (honey) for an 8-week period (the dose was determined using Sharangadhara Samhita). The patient was advised not to eat or drink for at least 30 min after

Table 2: Previous researches done on Ayurvedic management of *Tamaka Shwasa*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
1.	Role of *krisnadi churna* in the management of *Tamaka Shwasa* (bronchial asthma)[30]	1. T. Rosylin L. Mawlong 2. Bishnu Prasad Sarma Publication:- 2021	Subjective criteria Assessment was done keeping in view of clinical and symptomatic improvement of the subject. Objective assessment Pulmonary function test, S.IgE, total Eosinophil count before and after treatment at 30th and 60th day, respectively	A randomized open clinical trial was conducted with pre-test and post-test on 30 patients Drug-*Krisnadi Churna* Dose-2 gm twice daily Anupan-Madhu/ lukewarm water	The statistical analysis showed that *P* values of all subjective criteria are <0.001 and hence the result is highly significant. And in objective criteria S. IgE, TEC, PEFR showed highly significant result (*P*<0.001)
2.	A clinical study on the efficacy of *Parnas Panchakam yoga* in the management of *Tamaka Shwasa* with special reference to childhood asthma[31]	1. Sonam Yadav 2. Mithilesh Verma Year of Publication:- 2019	Subjective criteria relief in the signs and symptoms before and after treatment on the basis of grading scale framed for the disease. Objective Criteria 1. PEFR 2. AEC	Single group Age between 5 and 16 years Drug: *Parnaspanchakam yoga* Form: syrup formulation Dose: 1 mL/kg in 2 divided dosage	All subjective parameters except *lalata Sweda* and *Asino labhate Saukhyam* showed highly significant result. Change in PEFR and AEC showed highly significant result after treatment. Overall effect of therapy showed 4 (12.5%) patients were relieved 20 (62.5%) patients were moderately improved. 8 (25.0%) patients were mildly improved.
3.	Efficacy of *chitrakaharitakiavaleha* on *tamakashwasa* (bronchial asthma) In children[32]	1. Poonam Gaur 2. Shivam Chaubey 3. K. S. Patel Year of Publication:- 2019	Subjective criteria Change in sign and symptom of Tamaka Shwasa. Objective criteria (Positive changes in blood picture, reduction in eosinophils count, ACQ 9 Asthma control questionnaire), ACT, QOL (quality of life)	Drug: *Chitraka Haritaki Avaleha* Dose-Calculated by Young's formula	CHA showed moderate improvement in mostly parameters to reduce the sign and symptoms of *Tamaka Shwasa.* The entire Asthma Control Questionnaire (ACQ), Quality of Life (QOL) and other general parameters Physical, Psychological, Social, and Environmental were statistically significant.
4.	Ayurvedic understanding and management of *Tamak Shwasa* (Childhood Asthma) in children-a case Report[33]	1. Kannan Sagar 2. Shailaja. U 3. Anoop. A.S 4. Reshma K. Raj 5. Jugal Kishore Year of Publication: 2019	1. Subjective criteria • Breathing difficulty associated with wheezing, • Productive cough and running nose. • Appetite • General health condition and immunity • Interest in surrounding.	Drug: 1. *Samshodhana Virechana* with *Trivit Leha* (60 gm) and *Draksha Rasa* 100 ml. 2. *Samshamana Aushadhi* • *Swasakuthara rasa* (1-0-1)	• -Breathing difficulty, Wheezing, Productive cough, running nose reduced significantly after Virechana. • Chest was clear. • Child was totally well without even a single attack for near about 6 months.

(Contd...)

Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
				• *Agasthya Rasayana* (1 Tsf BD) • *Kanakasava* 7.5 ml bd after Food	• Child gradually developed interest in surroundings, friends, studies, which once was compromised once due to his illness
5.	An Appraisement of Efficacy of *Shirish Twak Churna* in the Management of Childhood Bronchial Asthma-A Clinical Study[34]	1. Anju 2. Lalit Kumar Year of Publication :- 2019	1. Subjective Criteria 2. Objective criteria Hb gm%, TLC, DLC, ESR, AEC, SGOT, SGPT, Blood Urea, Serum Creatinine, Serum bilirubin, PEFR	Drug: *Shirish (Albizzia lebbeck) Twak churna* Dose: 120 mg/kg BD. *Anupana*:-*Madhu*	• The study showed highly significant results in all the clinical features of asthma. • Except for Eosinophil count and AEC count the hematological parameters were within normal limits both before and after the therapy and statistically insignificant changes (P>0.05) were observed. • Significant reduction was observed in PEFR.
6.	Role of *Jivantyadi Churna* in managing *Tamaka Shwasa* (Bronchial asthma)[35]	1. Chuman Lal Bhaskar 2. Kuldeep K Soni 3. Vishal Prajapati 4. Kalpana S Patel 5. Virendra K Kori Year of Publication:- 2019	Objective parameter: Hematological parameters, namely, lymphocyte, eosinophil, ESR and AEC. Objective Criteria of assessment 1. Positive changes in blood picture, including AEC 2. QOL (Quality of Life) parameters for Asthma patients 3. ACQ (Asthma Control Questionnaire) for short term control 4. ACT (Asthma Control Test) for intermediate control 5. GINA (Global initiative for asthma)	Drug: *Jivantyadi Churna* Dose: 8 g total in 3 divided doses (2.6 g each, after meal Anupana: *Madhu* (honey)	• Significant result was found in all subjective parameters. • Significant reduction in AEC Count (23%), ESR (60%), and improvement in ACQ (77.77%), ACT (70%) and GINA (66.66%), Spirometry showed improvement in FEV1 of 2%.
7.	A case study on the management of *Tamaka Shwasa* in children with polyherbal formulation[36]	1. Chuman Lal Bhaskar 2. Kuldeep Kumar Soni 3. Vishal Prajapati 4. K.S Patel 5. V.K. Kori Published in -2019	Subjective Critea 1. *Rogabala* (Cough, wheezing, trouble breathing, activity limitation, etc.) 2. *Agnibala* (*Abhyavaharana Shakti*, *Jarana Shakti, Kshudha,* etc.) 3. *Dehabala* (*BalaVriddhi*, *Svaravarna yoga,* etc.)	Drug: *Shwasahara Dashemani Churna*	-Showed better improvement in all parameters like physical, social, psychological, environmental, WHO-QOL and other general parameters. - Peak expiratory flow rate was increased from 210 to 320 L/min.

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Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
			4. *Satvabala* (*Nidralabho Yathakalam,* etc.) Objective Criteria of assessment 1. Positive changes in blood picture, including AEC 2. QOL (Quality of Life) parameters for Asthma patients 3. ACQ (Asthma Control Questionnaire) for short term control 4. ACT (Asthma Control Test) for intermediate control 5. GINA (Global initiative for asthma)	Dose: 8 g in 3 divided doses orally with Anupana :-*Madhu* (honey)	-Level of AEC was reduced from 1210 cell/microL to 210 cells/microL -ESR was reduced from 10 mm/hr to 04 mm/hr. - Results showed improvement in AEC, ACQ, GINA and Spirometry showed improvement in FEV1 of 1%.
8.	A case study on *Ritukala Shodhan* (seasonal purification therapy) in childhood bronchial asthma[37]	1. Priyanka Shelotkar 2. Swapnil Borage Published in-2018	Subjective parameters - for the assessment of response to the treatment on signs and symptoms of *Tamaka Shwasa*	Drug and doses: Day– 1-*Aamapachaka Vati* 500 mg (BD) with Luke warm water 7 days 2. *Shwasakuthara Rasa* 250 mg (BD) with Honey 7 days 3. *Avipattikar Churna* 1gm (Bed time) with Luke warm water Next 8 days-*Shehapana-Panchatikta Ghrita* 30 mL on 1st day, increased with 10ml each day *next 4 days (Total 5 days). *Virechana Yoga-Aaragvadha Manukaphant* 100 mL and *Icchabhedi Rasa* 250 mg In 2017 On 204 days-*Shehapana-Panchatikta ghrita* 30 mL on 1st day, increased with 10 mL each day *next 4 days (Total 5 days).	In 1 follow up after *Shamana Chikitsa*-mild relief in *Kasa* only. after *Virechana-marked relef in all symptom.* In next follow up i.e after *Shamana* followed by *Vamana* there was complete relief in all the sign and symptom

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Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
				Vamana Yoga-Vacha Siddha Dugdha 100 mL, *Madanphala Phanta*-100 mL, *Vamanartha Dravya* - *Yashtikwatha* - 4 lit and *Saindhava Jala*-4 lit	
9.	A comparative clinical study of *Bharangiguda Avaleha* and *Bharangyadi Arishta* in the management of *Shwasa*[38]	1. Alpesh T Jarsania 2. Nipa A Jarsania Publication-2017	Subjective criteria: A subjective criteria like sign and symptoms of patient by scoring pattern was applied. Objective criteria: Biophysical parameters like pulse rate, respiratory rate, blood pressure, body weight, etc., were observed before and after treatment.	Group-A *Bharangiguda Avaleha*- dose 12 g b.i.d. with lukewarm water Group-B*: Bharangyadi Arishta*-dose 20 ml b.i.d. with equal quantity of water	Both the formulations had shown statistically highly significant results on cardinal symptoms. But by inference from all observation of clinical data it revealed that *Bharangiguda Avaleha* had more significant effect in treating the disease *Shwasa* as compared to *Bharangyadi Arishta.*
10.	Clinical efficacy of *kapha Ketu Rasa* on Tamak Shwasa[39]	1. Anuroopa HK, 2. Shankar Gouda, 3. Madhava Diggavi Year of Publication 2016	Subjective parameters: For the assessment of response to the treatment on signs and symptoms of Tamaka Shwasa, Objective parameter: Hb%, TLC, DLC, ESR, RBS, Urine; Sugar, Albumin, Microscopy, PEF.	Drug: Kapha Ketu Rasa Dosage: 125 mg 3–4 times a day .*Anupana*: *Ardraka Swarasa*	The clinical study showed statistically highly significant improvement in both subjective and objective parameters viz. *Kasa* (91%), *Ghurghurata* (83%) and *Swasakruchrata* (82%) including decrease in AEC, ESR, Differential eosinophil count and PEF was also statistically significantly improved.
11.	Role of *Shirishadi Kashaya* on bronchial asthma -a clinical study[40]	1. Sharma Deepa 2.Vishwakarma Pawan Kumar 3. Dwivedi Onkar Nath 4. Kushwaha Rajeev Year of Publication 2015	1. Subjective parameter 2. Objective parameter PEFR every week	Drug Group I-*Shirishadi kashaya* along with bronchodilator (if required) Group II-only *Shirishadi kashaya*. Dose: 25 mL twice daily	Highly significant result was found in reduction of days, frequency of Asthma attacks per week in both groups and in severity of asthma attacks per week in Group I. Highly significant result is found in PEFR in group-II
12.	Efficacy of *Vasa Avaleha* and its granules on *Tamaka Shwasa* (bronchial asthma): Openlabel randomized clinical study[41]	1. Ankit M. Paneliya 2. Biswajyoti Patgiri, 3. Galib R., 4. Pradeep Kumar Prajapati Published in-2015	Objective parameters: 1. Routine hematological 2. AEC 3. Urine examination 4. Random blood sugar 5. Serum glutamic pyruvic transaminase	Drug Group-A-*Vasa avaleha*-with Group-B-*Vasa Avaleha*	Statistically highly significant results were observed in all the cardinal symptoms. Group A showed better improvement than Group B in breathlessness, frequency and intensity of attack and cough whereas in Group B, better effect

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Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
			6. Serum glutamic oxaloacetic transaminase 7. Breath holding time (BHT) 8. Peak expiratory flow rate (PEFR) 9. X-ray Chest	granules-6 g twice a day with luke warm water. Dose: 6 g twice a day *Anupana:* luke warm water	on duration of attack, wheezing, tachypnea, and night symptoms was found. Both groups showed highly significant results in objective parameters. ACT showed highly significant results in both groups whereas ACQ showed significant results in both groups
13.	Comparative clinical efficacy of *Ashtangavaleha* and *Vyaghreehareetakee Avaleha* on *Tamaka Shwasa* (bronchial asthma) in children[42]	1. Arvind Kumar Dubey 2. S. Rajagopala 3. Kalpana S. Patel Year of Publication: 2014	1. Subjective Criteria 2. Objective criteria-CBC, TEC, Serum IgE • PEFR • Urine examination routine and microscopic • Stool examination routine and microscopic (in suspected cases of worm infestation only).	Drug: Group I (Intervention agent): *Ashtangavaleha* (AG) Group II (Comparator agents): *Vyaghreehareetakee Avaleha* (VG). Dose: 5–15 g for both groups depending on the age	-statistically insignificant variation was found in between the groups on Asthma Control Questioner (except in awakening in night due to asthma) and in PEFR, FEV1, Hematological parameters (Except TRBC). -significant result was found in level of asthma control (<0.001) and asthma control test (ACT) score (<0.05) in Group 1
14.	Role of *Dhumapana* (nebulization) and pana with Ardraka Arka in the management of *Tamaka Shwasa*[43]	1. Sushma Pujari, 2. Mamatha K.V 3. Kiran M Goud 4. Baidyanath Mishra Published in-2014	1. Subjective Criteria -Wheeze -Sputum 2. Objective Criteria -Respiratory rate---Heart rate -Ronchi -Peak expiratory flow	Drug: Group-A-*Adrak Arka* nebulization Group-B-*Adrak Arka* internally Dose: Nebulization-5 mL Internally-One Pala (48 mL) of Adraka Arka internally in single dose	Group A showed highly significant results with *P* value (*P*<0.001) in wheeze, respiratory rate, highly significant results with *P* value (*P*<0.01) in PEF, heart rate and Sputum whereas significant results (*P*<0.05) in rhonchi.
15.	Clinical and metabolic markers based study of *Shwasa Kasa Chintamani Rasa* (An Ayurvedic herbo-metallic preparation) in childhood bronchial asthma (Tamak Shwasa)[44]	1. Yogesh Kumar 2. Brij Mohan Singh 3. Prashant Gupta Year of Publication:- 2014	1. Subjective Criteria Modified Asthma Scale 2. Objective criteria -Blood chemistry: (Hb gm/%), (TLC), (DLC), (ESR), (AEC), (LFT), SGOT, SGPT, alkaline phosphatase, serum bilirubin, serum protein and serum albumin, blood urea and serum creatinine • X-ray chest P.A. view • Monteux test • Urine (Routine and microscopic).	Drug: *Shwasa Kas Chintamani Rasa* Dose: of 4 mg/kg/dose×12 hourly *Anupana:* garlic, ginger and honey in ratio of 1:2:4.	In Groups A and C) AEC changes in terms of difference, mean and paired "t" were found significant (*P*<0.05). -Mean difference of all parameters of in the subgroups A, B, and C were found statistically insignificant. -On intergroup comparison of all investigations, there was no significant change was observed in alkaline phosphatase, Bollod urea and S. creatinine. This study finding suggested thatthere is no hepatotoxicity and renal toxicity.

(Contd...)

Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
16.	Clinical study of *Tamraparna* (*nicotiana tabacum* linn.) W.s.r. To *Swasahara karma* (anti-asthamatic effect)[45]	1. Buddhadev SG 2. Sharma Year of Publication:- 2014	Subjective Criteria: Criteria of assessment were kept on the bases of relief in the signs and symptoms of the disease Tamaka Shwasa on the basis of scoring system.	Drug :- Group-1 Group-A-*Nicotiana tabacum* (D.G.1) Capsule Group-B-Nicoasthama oral spray (D.G.2) Group 2: Placebo group rostedsuji (P.G.) Dose: *Nicotiana tabacum* (D.G.1) Capsule-1 Capsule thrice a day *Nicotiana tabacum* (D.G.2)-One puff thrice a day-in every puff the liquid drug is 0.14 mL Placebo group rostedsuji (P.G.) One capsule thrice a day-in one capsule 200 mg	The study showed that the effect of *Nicotiana tabacum* Linn. rota caps-The drug was highly significant i.e., $P<0.001$ in reducing cardinal feature of *Tamak Shwasa*. Significant result was found in *Grivagrah*a ($P<0.01$) Nicoasthma oral spray-The drug was highly significant in reducing cardinal feature of *Tamak Shwasa*. i.e., $P<0.001$. Significant result was found in *Grivagrah*a ($P<0.01$). Placebo-The study shows the effect of placebo drug was no significant in all sign and symptoms ($P>0.1$).
17.	Randomized controlled trial on the effect of *Vrisha Ghrita* in childhood Asthma management.[46]	1. Kulkarni Reena 2. Ramchandran SK Year of Publication:- 2013	Subjective criteria relief in the signs and symptoms before and after treatment. Objective Parameter: Hematology for Hb%, TLC, RBC Count, DLC, AEC, Serological assessment for - IgA and IgElungfunctiontestsfor PEF, FVC, EFV1andFEV1/FVC.	Drug: Study group-*VrishaGhrita* Control Group-plain ghrita Dose: 0–4 years-5 mL, 4–8 years-10 mL 8–12 years-15 mL tice daily for a period of 3 months	-Vrisha Ghrita showed no significant improvement in objective parameters. -Significant mean changes noted in both control and study group in number of attacks of recurrent respiratory symptoms in 3 month before treatment and after treatment ($p<0.01$), reduction in number of visits to the doctor, school absenteeism, night wakening with cough , day time and night time asthma, loss of sleep and most importantly measures of morbidity
18	A comparative clincal effect of *Shatyadi Churna* with and without *Pranayama* in the management of childhood asthma (tamaka shwasa)[47]	1. Aman Sharma 2. Hashim H 3. Bhattacharya D Year of Publication: 2013	1.Subjective Criteria 2. Objective criteria Blood-Hb, TLC, DLC, and ESR	Drug: Group A-*Shatyadi Churna* Group B-*Shatyadi Churna+*20 rounds of *Pranayama (Nadi Shodhana Pranayam*) in morning and evening. Group C-Placebo (Glucose (in capsule form) with Pranayam Dose: 2 g (in capsule form) TDS Anupana: Warm water	1. ESR - All the three groups showed reduction in mean ESR value with highest significance in group-B. 2. Eosinophills:- All the three groups showed reduction in mean Eosinophil count with highest significance for group B. 3. PEFR - PEFR of the patients of Group-B with maximum number of patients achieving a PEFR value between 90 and 100% of their normal predicted value according to height and age.

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Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
19.	A comparative study on efficacy of *Bharangyadi Avaleha* and *Vasa Avaleha* in the management of *Tamaka Shwasa* with reference to childhood asthma[48]	1. Salim D. Gohel 2. I. P. Anand 3. K. S. Patel Year of Publication :- 2011	1. Clinical features as *Tamaka Shwasa* will objectively assess periodically. 2. Improvement in frequency, intensity, and duration of symptoms had been considered. 3. Hematological investigations. 4. Absolute eosinophil count.	Drug: Group A-*Bharangyadi Avaleha* Group B-*Vasa Aveleha*	In both the groups, symptoms related to *Shwasakashtata, Kasa* and wheezing were reduced but was statistically more highly significant in VA than BA, although trial drug decreases the *Vega Tivrata* and *Vega Avadhi* -In Peak expiratory flow rate BA showed better result. Hematocrit values: In both the groups, there were no statistically significant changes in hematocrit values in comparison with VA (27.27%); BA showed better results to decrease absolute eosinophil count (AEC) (39.69%).
20.	A lifestyle disorder-*Tamakashwasa* (Bronchial Asthma) and its management by different formulations of *Tulsi*	1. Dr Vimal R. Joshi 2. Dr Charmi S. Mehta- 3. Dr B.J. Pattagiri, 4. Dr P.K. Prajapati Publication-2011	Subjective parameter-Efficacy of trail drugs were analyzed in terms of relief produced in cardinal signs and symptoms before after treatment.	Drug: Group I-*Tulsi* Tablet-- (500 mg) 1 Tablets TDS Group II-*Tulsi Arka*-20 ml bid. Dose: *Tulsi* Tablet--(500 mg) 1 Tablets TDS *Tulsi Arka*-20 mL bid	In Arka group–In *Shwasa Vega* frequency, *Ghurghurakama, Urahshula* and Peenasa - highly significant (*P*<0.001) result was found. In intensity, Kasa, Kaphaneeshtevan statistically significant result was found Tulsi tablet - Shwasa vega frequency - Statistically highly significant (*P*<0.0l) result was found. Intensity, Urahashula and Kantha Ghurghurakarma was relieved by 100% which was statistically significant (*P*<0.01). In Peenasa, Kasa, Kapha Nishtivanam statistically significant (*P*<0.10). result was found. Tulsi tablet higher percentage (67.07%) of relief than tulsi arka.
21.	Clinical study on the role of Vasakantakaryadi Yog and Snehana-Swedana in the management of bronchial asthma in children[49]	1. Dr Pawan Kumar Vishuiakarma, 2. Prof Abhimanuu Kumar Year of Publication:-2009	Subjective parameters-for the assessment of response to the treatment on signs and symptoms of Tamaka Swasa,	Drug: Group-A (given *vosakontokaruadi Yoq* VKSl Group-B *(Vasakantakaryczcli Yog* VKSl and *Snehono-Siocdana)*	Dyspnoea and cough - After trial therapy statistically highly significant (*P*<0.00l) improvement was seen in all groups. The higher improvement in group B occurred. Rhinorrhea-After therapy the reduction in morbidity score was found statistically highly

(Contd...)

Table 2: *(Continued)*

S. No	Title	Author	Selected parameters	Grouping and intervention	Result
			Objective Criteria of assessment Blood (Hb%, TLC, DLC, ESR, TEC) and Spirometry (FEVI, FVC, and PEFR)	Group-C (Placebo VKS2 and *Snehana-Sioedcma Y.* Dose: 1 mL/kg/day day dose	significant in group A and B. Eosinophil count-Eosinophil count after therapy was highly significant level in group A and significant level in group B.
22.	A comparative study of the effect of Vasa avaleha prepared with Vasa Swarasa and Vasa Kwatha in Tamaka Shwasa[50]	1. Dr. Ankit Gupta 2. Dr. P.K Prajapati 3. Dr. A.K. Choudhary Year of Publication: 2009	Routine hematological, especially WBC, ESR, AEC and routine urine examination was carried out in all the patient.	Drug: Group A-Vasa Avaleha (Swarasa) Group B-Vasa Avaleha (Kwatha) Dose-For both groups 10 g bid Anupana: Luke warm water	-The data shows that highly significant (p<0.001) results were found in both the groups with respect to the effects of drugs on frequency, intensity and duration of dyspnea. However, the percentage change was more in Group-A than group B. -In hematocrit values both group showed insignificant changes. However, in case of neutrophil value Group B drug showed significant (P<0.05) decrease.
23.	Effect of Simhanada Guggul and punarnavrista in Tamaka Svasa[51]	1. Parameshwarappa 2. S. Byadgi 3. Akash Chandra Tripathi Publication 2008	Subjective parameters- Change in Grading symptom in cardinal feature of Tamak Shwasa Before and after treatment Objective parameter -AEC -Auscultatory finding -Respiratory rate -Improvement in well being -Spirometry finding	Drug:- Group-A- Simhanadagugglu and Punarnavarista Group-B Simhanadagugglu and Punarnavarista along with Kunjal Karma and Pranayama. Dose: Simhanadagugglu - 800 mg Punarnavarista - 20 mL	-Clinically, Patient got remarkable improvement in subjective parameters. -Highly significant result was found in Reduction in pulse and respiratory rates, forced expiratory volume (FEV1) in first seconds, forced vital capacity (FVC) and peak expiratory flow rate (PEFR), AEC.
24.	Treatment of Asthma in Children with Shvas-Kas-Chintamani Ras (SKCR)[52]	1. Dr Shikha Gupta, 2. Prof H.D. Khanna, 3. Dr B.M. Singh Year of Publication: 2007	Objective criteria:- investigations (Hb, TLC, DLC, ESR, AEC, LFT, Urine-R and M, X-ray chest) serum MDA, SOD & GSH-Px;	Drug - SKCR (Shwasa Kasa chintamani rasa) Dose-3–5 mg/kg/ dose×12 hourly Anupan- (Ginger- Garlic-Honey) GGH in a ratio of 1:2:4 respectively	Result of the study was found very encouraging in terms of improvement in clinical features (95%), reduction in serum MDA level, without any significant derangement in LFT and trifle adverse reactions after 3rd follow up (45 days). After 6-month of given treatment, only five cases were relapsed. However, the relapsed rate in these cases was found significantly lower (1.2±0.54 6 month) than the past history (5–4±2–41)

taking the medication. The patient underwent evaluations for both objective and subjective standards. The drug's impact on hematological alterations in neutrophils, lymphocytes, eosinophils, ESR, and AEC was better than expected. AEC and eosinophil count both significantly declined in comparison to other parameters. No incidents of the aforementioned complaints had been reported after 8 weeks of follow-up. Peak expiratory flow rate had gone up from 210 to 320 L/min, AEC level had gone down from 1210 to 210 cells/mL, and ESR had gone down from 10 to 04 mm/h.

Shelotkar and Borage (2018) and colleagues conducted a study in which they found that a 12-year-old female youngster underwent an evaluation based on subjective standards. Based on the clinical presentation and medical history, the ailment was identified as (Bronchial Asthma). Then, treatment is started with *Shaman Aushadhi* for 7 days. *Aamapachaka Vati* 500 mg *Vyanodankale* (BD) with Luke warm, *Shwasakuthara Rasa* 250 mg *Vyanodankale* (BD) with Honey, *Avipattikar Churna* 1gm *Nishakale* (Bed time) with Luke warm water were given. In 1 follow-up after *Shaman Chikitsa,* there was mild relief in *Kasa* only. After that, *Snehapurvaka Virechana* was given on 8th day. *Snehapana* with *Panchatikta Ghrita* 30 ml on 1st day increased with 10 mL each day for next 4 days (Total 5 days). *Virechana Yoga was given with Aaragvadha Manukaphant* 100 mL and *Icchabhedi Rasa* 250 mg. The patient was discharged with discharge medication *Shwasakuthara Rasa* 250 mg with honey SOS, *Pippalyasava* 10 mL *Vyanodankale* (BD) with 10 mL of water *Vyayama-Suryanamaskar 5 time*s Daily, and *Pranayama-Anulom-vilom, Bhramari* Daily (10 min.) Again patient was admitted. After Virechana, there was moderate relief in Kapha Nistivanaman and wheezing as patient came after *Shamana* followed by *Virechana* that there was marked relief in all symptoms. In next follow – up, *Snehapurvaka Vamana* was dpne. Before Vamana, patient had mild breathlessness, mild cough, and no sneezing. *Shehapana with Panchatikta ghrita* 30 mL on 1st day, increased with 10 mL each day for next 4 days (Total 5 days). *Vamana Yoga* was given with *Vacha Siddha Dugdha 100 mL*, *Madanphala Phanta*-100 mL, *Vamanartha Dravya-Yashtikwatha*-4 lit, and *SaindhavaJala*-4 lit After*vamana* that there was complete relief in all the sign and symptoms. On 295 day, the patient had history of severe breathlessness due to excessive playing before 8 days. For this *Swamala* 1tsf empty stomach, *Pippalyasava* 10 mL + 10 mL water after meal was given and also advised to follow-up in July for *Shodhana (Matrabasti).* After completing treatment, patient got good relief. All allopathic medicines were stopped especially rota cap (Bronchodilator). *Shamana Chikitsa* was continued where patient did not need any bronchodilator for 3 months. However, as *Nidanasevana* occurred, again patient came with same complaints. Then, *Shamana Chikitsa* was continued and planned for *Matra Basti* in *Varsha ritu*.

A total of 35 *Shwasa Roga* patients were registered for a study by Jarsania *et al*., out of which 30 patients finished the course of treatment with follow-up and five patients discontinued treatment in the middle. Selected patients were divided at random into two groups, namely, *Bharangiguda Avaleha* was used to treat Group-A. *Bharangyadi Arishta* was used to treat Group-B. It was recommended to take 12 g of *Bharangiguda Avaleha* twice a day with tepid water and 20 mL of *Bharangyadi Arishta* once a day with the same amount of water for a total of 30 days. The outcomes were analyzed based on improvement in the clinical aspects. Total treatments were given to 14 patients in Group-B and 16 patients in Group-A. The outcomes were analyzed based on improvement in the clinical aspects. Investigative characteristics were also taken into account as supporting factors for evaluation. According to all the clinical data observed, *Bharangiguda Avaleha* has a more significant impact on the treatment of the disease *Shwasa* than *Bharangyadi Arishta.*

A brief pilot study on *Kapha Ketu Rasa* was conducted by Anuroopa *et al*. Consequently, a pilot clinical study was conducted before the actual clinical investigation, and the clinical study was then carried out based on the results of the pilot study. 125 mg of *Kapha Ketu Rasa* capsules were given twice daily with *Ardraka Swarasa* before meals to 30 *Tamaka Shwasa* patients, regardless of their age, sex, or religion, for 21 days, and then, they were observed for another 21 days. Objective parameters included Hb%, TLC, DLC, ESR, RBS, urine sugar, albumin, microscopy, and PEF. The positive results of the pilot observational clinical study of *Kapha Ketu Rasa* on *Tamaka Shwasa* included alleviation in *Kasa* (95.2%), *Ghurghurata* (86.9%), and *Swasakruchrata* (86.2%), with no signs of medication intolerance, gastrointestinal irritation, or other side effects. The clinical study proper itself revealed statistically highly significant results in both subjective and objective indicators, including decreases in AEC, ESR, differential eosinophil count, and PEF. *Kasa* (91%) was reduced, as were *Ghurghurata* (83%), and *Swasakruchrata* (82%).

According to research by Deepa *et al*., 26 individuals with bronchial asthma were chosen. The 20 patients in Group I with bronchial asthma received bronchodilators when necessary in addition to *Shirishadi kashaya*, while the six patients in Group II received only *Shirishadi kashaya. Shirishadi Kashaya's* recommended dosage is 25 mL twice daily for 12 weeks. For a total of 12 weeks, each patient received a weekly check-up. Only group 2 is assessed using PEFR and subjective criteria, every week. Highly significant results were obtained in the reduction of days, frequency of asthma attacks in both groups, and the severity of asthma attacks per week in Group I. In group 2, there was a considerable change in PEFR.

Children exhibiting clinical characteristics of *Tamaka Shwasa* between the ages of 2 and 16 of either sex served as the research population in a study by Kumar *et al*. The research was a therapeutic intervention randomized clinical trial. A total of 100 patients with *Tamaka Shwasa* were chosen, and 74 of them finished the prescribed treatment. There were two groups of patients. Depending *Ashtangavaleha* was

given to group *AG* and *Vyaghreehareetakee Avaleha* was given to group VG (5–15 g in divided doses) depending on the age for 8 weeks duration. The medication was prescribed to be taken orally in two divided doses, *Pragbhakta* (before eating), in the morning and evening. The effectiveness of both medications was compared based on metrics measuring QOL, lung function testing, and signs and symptoms of the disease. Despite being statistically insignificant (>0.05), the trial found that *Ashtangavaleha* (66.66%) had a slightly better effect on the patients' overall condition than *Vyaghreehareetakee Avaleha* (63.15%).

13. Pujari *et al*. (2014) conducted a study in which 10 subjects who met the study's criteria were separated into two groups, each with five participants: Group A (the study group) and Group B (control group). Patients in Group B received one *Pala* (48 mL) of *Ardraka Arka* internally in a single dose, while patients in Group A received 5ml of the medication via nebulization. With the aid of a suitable scoring technique that ranged from 0 to 3, the assessment was performed on the improvement in signs and symptoms before treatment, 20 min after treatment in Group A, and 40 min after treatment in Group B. After treatment, according to the references, *Ardraka* has a favorable bronchodilator effect because it reduces symptoms and increases PEFR in <20 min after inhalation; however when *Arka* is taken internally, the improvement takes 40 min to manifest.

In a study by Kumar *et al*., 23 consented that children between the ages of 2 and 12 were included. They were divided into three groups based on their symptoms of cough, fever, breathlessness, running nose, restlessness, wheezing, etc. Further divided into Subgroups "A", "B", and "C" were selected, subgroup "A" had a positive history of having both bronchodilators and corticosteroids, and subgroup "B" having a positive history of taking bronchodilator only whereas subgroup "C" patients having no history of taking steroid or bronchodilator before the registration.

Blood samples for the metabolic indicators such as Hb g%, TLC, AEC, S. protein, S. albumin, SGOT, SGPT, alkaline phosphatase, and S. bilirubin, chest X-ray, PA view, Monteux test, and urine (Routine and microscopic) were taken both before and after the end of trial. SKCR was administered for a total of 45 days at a dose of 4 mg/kg/dose, 12 h, along with garlic, ginger, and honey in ratio of 1:2:4. After registering, the patient underwent three follow-up visits on day 7, 15, and 45. In this study, SKCR was given with (GGH) for effective response of the therapy and its indication in *Tamaka Shwasa* as in ayurvedic text. Modified asthma scale was chosen for assessing the improvement in signs and symptom. The findings suggest that the drug is more effective in those cases who are not receiving corticosteroid with bronchodilator in comparison to children receiving corticosteroids with/without bronchodilator. SKCR is also effective in childhood bronchial asthma that has the history of steroid and bronchodilators. No specific adverse effect of drug SKCR was observed.

There were a total of 47 *Tamaka Shwasa* patients enrolled in the study by Buddhadev *et al*. Twelve of those individuals stopped receiving treatment before the whole course of therapy was completed. The study presents the clinical observations of 47 patients, and the treatment's impact on 35 patients who finished the course of therapy was assessed in three groups: 16 patients in the D.G.1 Group, 11 patients in the D.G.2 Group, and eight patients in the placebo group. Drug group No. 1 It is broken further into two groups. Group A: *Nicotiana tabacum* water-soluble extract-containing rota capsules (D.G.1) The capsule is self-made. Dose: 1 capsule, 3 times a day; 28-day duration. Group B: *N. tabacum* water-soluble extract-based Nicoasthama oral spray (D.G.2) One puff, 2 times per day, including 0.14 cc of the liquid medication. Time frame: 28 days. Group 2: Rostedsuji' placebo group (P.G.) Dose: 200 mg of medication per capsule, taken 3 times daily. a 28-day period. The evaluation criteria were maintained based on the reduction of *Tamaka Shwasa's* symptoms. The research demonstrates that the effects of *N. tabacum* Linn. rota caps and Nicoasthma oral spray exhibited highly significant results, that is, ($P < 0.001$), in all symptom except *Grivagraha* in which significant result was found ($P < 0.01$). The study reveals that the effect of the placebo medicine was not significant for any of the signs or symptoms ($P > 0.1$).

In a study by Reena *et al*., an interventional randomized controlled trial using *Vrisha Ghrita* as an interventional drug on *Tamaka Shwasa* and *Ghrita* as a control plan in children up to the age of 12 was undertaken. For a period of 3 months during attack-free intervals, *Vrisha Ghrita* was administered internally in a split dose of 5–15 mL twice daily with honey. The study included a total of 26 children who were Outpatient Department patients at the hospital. Clinical parameters were: routine hematology with AEC, chosen immunoglobulin assay, lung function tests, indices of asthma and morbidity, and a quality-of-life questionnaire used to analyze the results. The findings revealed that the trial drug is highly effective in controlling recurrent asthma attacks and respiratory tract infections. In contrast, the results of the pulmonary function tests, immunoglobulin assay, and hematology were not statistically significant.

In research by Sharma *et al*., 53 patients (aged between 8 and 16 years) were chosen after the diagnosis had been confirmed. Three groups of chosen individuals were randomly assigned, and 48 patients-16 in each-completed the trial's duration of 8 weeks, while five other patients discontinued their medication during the study. *Shatyadi Churna* 2 g (in capsule form) of T.D.S. was administered to Group A along with warm water. The same *Shatyadi churna* was administered to patients in Group B, who were required to complete 20 rounds of *Nadi Shodhana Pranayama* in the morning and 20 rounds in the evening. Placebo (glucose at a dose of 2 g) in capsule form along with 20 rounds of *Pranayam*a in the morning and evening was advised in Group C. Assessments were based on both subjective and objective parameters (Hb, TLC, DLC, and ESR) before and after treatment. On the basis of the statistical

test, it can be said that *Pranayama* has significantly improved the PEFR of the patients in Group-B, with the majority of patients reaching a PEFR value of between 90 and 100% of what is expected for their height and age.

In a study by Gohel *et al*., a total of 11 subjects received intervention in Group A, or *Bharangyadi Avaleha*, out of the registered participants. *Vasa Ghrita* was given to 11 subjects in Group B. The dose was established using Young's Formula while bearing in mind the adult dose of *Avaleha*, which is 1 pala (48 g). Subjects were evaluated for subjective parameters since frequency, intensity, and duration of symptoms had been taken into consideration as measures of improvement, while the objective parameters were hematological tests and AEC. In the BA group, the majority of patients (63.64%) experienced marked improvement, followed by 18.18% who showed moderate improvement and 18.18% who experienced a full remission. In the VA group, the greatest percentage of patients (71.43%) had marked improvements, and 28.57% had full remission.

19. In a study by Joshi *et al*., in the present study, 15 patients were registered for the tablet group, of which ten patients finished the study and five dropped out. In total, ten patients in group II were registered and finished. All trial medications were administered for 28 days. Group I received treatment with *Tulsi tablets* (500 mg) 1 Tablets TDS and Group II was treated with *Tulsi Arka* 20 ml bid. All trial medications were administered for 28 days. The efficacy of trial medications was evaluated in terms of the degree of alleviation of key symptoms and indicators before and after treatment. By comparing the effects of the formulations on the primary symptoms, it was discovered that the *Tulsi* tablet group provided 67.07% alleviation and 60.17% relief experienced in the *Tulsi Arka* group, suggesting that the Tulsi tablet had a higher effectiveness rate than the arka.

An experiment that was double-blind randomized and placebo-controlled was carried out by Vishuiakarma *et al*. In 46 cases, the study was completed. Three groups of cases who had signed up for the study were selected at random. Group A, which included 15 cases, received the trial drug *Vasakantakaryadi Yog* (VKSl); Group B, which included 17 cases, received the trial drug *Vasakantakaryadi Yog* (VKS1) and *Snehana-Swedana*; and Group C, which included 14 cases, received placebo (VKS2) and *Snehana-Swedana*. A hypothetical formulation called "*Vasakantakaryadi Yog*" (Syrup VKS,) which contained 14 medications, was chosen for the current trial in a dose of 1 mL/kg/day. In the trial, a syrup made of sugar and water served as the placebo (Syrup VKS). *Snehana-Swedana* (Massage) by *Til taila* mixed with *Saindhava lavana* over the thoracic region and then application of *Mridu Sweda* with cloth. This was done daily for 15–20 min. Clinical symptoms such as coughing, wheezing, dyspnea, rhinorrhea, use of accessory muscles, activity, sleep disturbance, and restlessness were assessed on a four-point scale. Spirometry (FEVl, FVC, and PEFR) and blood tests (Hb%, TLC, DLC, ESR, and total eosinophil count) were performed to determine the effectiveness of the trial therapy and to rule out any underlying illnesses. Overall, clinical improvement was found to be moderate in Group A (57.92%) and maximum in Group B patients (70.21%). Group C made a slight improvement (20.14%). All three groups statistically showed highly significant results ($P < 0.01$).

A total of 35 patients were enlisted for the study by Gupta *et al*. Using a straightforward random sample procedure, they were chosen and split into two groups without regard to age, sex, or religion. Using a random table, the chosen patients were separated into two groups, namely, Group A was administered *Vasa Avaleha (Swarasa)* 10 gm and was given with lukewarm water. A 10 g dose of *Vasa Avaleha (Kwatha)* was administered to Group B, and lukewarm water was used as an *Anupana.* Routine hematological tests, including WBC, ESR, and AEC, as well as routine urine examinations were performed on all patients to evaluate the state of the disease and rule out any additional pathology during the 28-day trial period. With the highest percentage in *Vasa Avaleha,* both groups demonstrated highly significant outcomes for the cardinal symptoms of *Tamaka Shwasa*. In addition, the formulations exhibit an insignificant decrease in hematocrit parameters, which comprise neutrophil, eosinophil, lymphocyte count, and E.S.R.

In a study by Parameshwarappa *et al*., 36 patients participated in the study. The study was divided into two groups: Group A included *Punarnavarista* and *Simhanadaguglu* alone, whereas Group B included *Simhanadaguglu* and *Punarnavarista* as well as *Kunjal-Karma* and *Pranayama*. In Groups A and B, S*imhanadagugglu* (800 mg) and *Punarnavarista* (20 mL) were given orally twice daily, orally in the morning and in the evening. The group B patients were also recommended to practice *kunjalkarma* and *Pranayama* in the morning. The evaluation of the patient included both subjective and objective factors. According to a comparison of the two groups, group "B" responded slightly more favorably than group "A."

Gupta *et al*. conducted a study in which a total of 37 kids were involved, including 29 kids with asthma in the clinical study part-I and 8 kids without asthma in the study part-II. Regardless of gender, a total of 29 children between the ages of 2 and 12 were selected for the study. For a duration of 45 days, the medication SKCR was administered in doses of 3–5 mg/kg/dose × 12 hourly along with a particular Anupan-GGH at a ratio of 1:2:4. The whole hemogram, AEC, and LFT, as well as routine and microscopic inspection of urine, were performed to investigate the drug's impact on the disease and any potential harmful effects. The estimation of serum MDA, SOD, and GSH-Px was done at the time of registration, on the 15th (1st-Follow-up), and on the 45th (2nd-Follow-up), days of treatment, along with other investigations. The modified scoring system was used to determine the clinical response on

the first, second, and third follow-ups after registration. The study's findings were very positive in terms of improvement in clinical characteristics (95%), a decrease in serum MDA levels, and the absence of any major LFT derangements or adverse events after the third follow-up (45 days). There are only five cases who showed relapse after therapy was administered for 6 months.

In the study by Panellya *et al*., patients of both sexes with mild chronic instances of bronchial asthma between the ages of 12 and 70 were enrolled that computer-generated randomization was used to divide the 66 patients into two groups, A and B. For the course of 28 days, Group A (n = 32) got VA, whereas Group B (n = 34) received GVA at a dose of 6 g twice daily with tepid water in the morning and evening. In both groups, the follow-up duration was 14 days. A specialized grading scheme, including the ACQ and asthma control test, was used to assess the effectiveness of the trial medicines (ACT)[54] in terms of relief observed in cardinal signs and symptoms before and after treatment. When comparing the trial medications' efficacy, changes in PEFR, BHT, and AEC were also taken into account. At the conclusion of the course of treatment, 25.93% of patients in Group A and 32.26% of patients in Group B showed moderate improvement, while 66.67% of Group A patients and 64.52% of Group B patients showed mild improvement [Table 2].

EFFECT ON SUBJECTIVE PARAMETERS SUCH AS COUGH, WHEEZING, AND FREQUENCY OF ASTHMATIC PARAMETERS

Total of 11 studies out of 24 (Rosylin *et al*., Yadav *et al*., Anju and Kumar, Deepa *et al*., Paneliya *et al*., Buddhadev *et al*., Parmeshwarappa *et al*., Gupta *et al*., Joshi *et al*., Kumar *et al*., and Gupta *et al*., showed highly significant result in dyspnea, cough, rhinorrhea, wheezing, frequency of asthmatic attack, and night-time awakening.

When considering the *Vata-Kapha Shamaka* and the *Tridoshahara* actions of *Pippali, Sunthi,* and *Amlaki* in *Krisnadi Churna*, it exhibits antagonistic *Gunas* of *Kapha Dosha*, resulting in the reduction of *Kapha*. When *Kapha* is reduced, *Vayu's Avarana* is relocated, allowing *Vata* to flow along its own course without being hindered, Which, in turn, makes symptoms such as *Shwasa Krucchata*, *Kasa*, and *Ghurghuraka*go down.

Parnaspanchkam (Yadav *et al*.,) reduced the symptom by mucolytic action of *Bharangi*, immunomodulatory action of *Guduchi Ghan*, antioxidant, and anti-inflammatory property of *kantakari* and tulsi. In a study by Anju and Kumar, Deepa *et al*., the key drug was *Shirish* which lessens bronchial spasm due to its *Kapha Nissaraka* and *Srotoshodhaka* qualities, which are a result of its *Laghu* and *Tikshana guna*. It has the ability to suppress histamine release, preventing both acetylcholine-and histamine-induced bronchospasm[55] *Vasa Avaleha* (Paneliya *et al*., Gupta *et al*., Reena *et al*., and Gohel *et al*.) *Vasa,* a major component of VA, is indicated in diseases such as *Shwasa, Rajayakshma* (tuberculosis), *Raktapitta, Shotha* (edema), and *Jwara* (fever).[56] Vasicine and vasicinone, the bitter alkaloids available in the plant, has bronco-dilatory effect. Few studies have proven 6–10 times greater efficacy of vasicinone against aminophylline in cases of bronchial asthma. *N. tabacum* was the subject of a study by Budhhadev *et al*.; in the study, nicotine is *N. tabacum*'s primary alkaloid. The *Vyavai, Vikasi*, and *Tikshna Guna* of *N. tabacum* allow for quick action, direct delivery of the medication to the respiratory tract in a little dose, and maintenance of the negative effect. In a study by Parameshwarappa *et al*., *Simhanadagugglu* (*guggul, triphala, Trikatu, Sarsapa,* and *Eranda*) and *Punarnavarista* (*Punarnava, Bala, Patha, Vasa, Guduchi, Chitraka, Guda, and Chaturjata*) are much more effective at eradicating and expelling *Mala,* that is, *Rasadhatu-Malarupi-Kapha*, from the *Pranavaha Srotas*, resulting in symptomatic relief from deleterious consequences of *Rasadhatu-Malarupi-Kapha's*. It also contains ingredients that promote healthy bowel motions, which avoids *Ama* stagnation and corrects *Pitta* functions so that *Udbhavasthana*, that is, *Pittasthana* of *Tamakashvasa*, is corrected. SKCR with garlic, ginger, and honey (GGH) as *Anupana* (adjuvant) was chosen for the 2 study, (Kumar *et al*., Gupta *et al*.,) SKCR[57] contains the following components: Purified *Kantakari swaras* (Solanum xanthocarpum), *Yastimadhu* (*Glycyrrhiza glabra*), *Parna patra* (*Piper betle*), and goat milk are used to triturate purified *Parada* (mercury), purified *Gandhaka* (sulfur), purified *Swarna Makshika Bhasma*, and purified *Swarna Bhasma*. The medicine SKCR reduces oxidative stress by reducing the production of free radicals, as shown by the change in antioxidant activity levels seen in the examined instances. *Tulsi Arka* (Joshi *et al*.,), the properties of tulsi arka are *Kaphavatanashaka, Siroverechana,Pachana, Anulomana, Kasahara,* and *Swasahara.* Because *Tulsi Arka* is vyavayi and *Vikashi*, it swiftly assimilates in the body and aids in the emergency condition of the illness *Shwasa.* In a study by Kumar *et al*., *Vasakantakaryadi Yog*, numerous of its components, including *Vasa, Shirish*, and *Kantakari,* have bronchodilator effect and reduces histamine from bronchial and lung tissue.[58] *Guduchi* (immunomodulatory,[59] and antihistaminic[60]) and Inula racemosa (*Parshv shula nasahak*[61]) has these feature that eases coughing-related chest pain. *Snehana-Swedana* over *Urah* (the thoracic region) provides a *Vata-Kapha Shamak* effect, which is the most likely mode of action for these two poses.

Significant Result was Found

Kapha Ketu rasa (Anuroopa *et al*.,) is a quick acting and more potent drug used in asthma due to *Vatsanabha*

and thus can be used in emergency condition. Inhaling *Ardraka* extract (Pujari *et al*.,) through a nebulizer the essential oil of *Ardraka,* Gingerol is transformed into Shogaol and Zingerone when dried or boiled. It directly stimulates the respiratory system to enhance respiratory secretions. By boosting secretions, they liquefy, evacuate, and relax the mucosa that has been inflamed. *Shwasahara Dashemani Churna* and *Jivantyadi churna*[62] (Bhaskar *et al*.,) possess the *Shamana* quality against the *Gunas* of *Vata* and *Kapha* along with anti-allergic, anti-histaminic, anti-inflammatory, anti-septic, analgesic, mast cell stabilizing, anti-microbial, anti-oxidant, bronchodilator, and immune-modulatory[63] property. *Shatyadi Churna* with *Pranayama* (Sharma *et al*.,) showed better result. With a predisposition toward parasympathetic dominance rather than sympathetic dominance brought on by stress, *Pranayama* stabilizes autonomic balance. In a study of Jarsania *et al*., antihistamine and antibiotic action of the *Bharangi* might be responsible for reducing the local congestion and checking the infectious microorganisms. This action of *Bharangi* might be complemented and synergized by the compound *Dashamula.* CHA (Gaur *et al*.,) has *Ushnavirya* and *Vatanulomana* qualities, as well as a *Kapha-Vata* reducing effect and *Rasayana* property.

A study conducted by Dubey *et al*., both drug showed significant result in reducing symptom of *Tamaka Shwasa*. Hence, the comparative is statistically insignificant. The components in both *Ashtangavaleha* and *Vyaghreehareetakee Avaleha* have immunomodulatory activity, which aids in controlling allergic reactions.[64] The parts of *Vyaghreehareetakee Avaleha* work as local counterirritants and block the vagus efferent fibers that send cough signals to the cough center.[65]

SAMSHODHANA

In a study conducted by Priyanka Shelotkar *et al*. and Kannan Sagar *et al.,* the treatment began with Deepana-Pachana to establish Niramavastha, followed by Snehapurvaka Virechana. Given that Sharada Ritu is a period prone to Pitta Dosha aggravation, thus Rakta Prasadana and Pitta Shamana Chikitsa, similar to Virechana, are essential in managing Tamaka Shwasa.

First, *Deepana-Pachana* was done to get *Niramavastha,* followed by *Snehapurvaka Virechana*. Since *Sharada Ritu* is a period prone to *Pitta Dosha* aggravation, thus *Rakta Prasadana* and *Pitta Shamana Chikitsa*, along with *Virechana*, are essential in managing *Tamaka Shwasa.* This is followed by *Vamana* (Shelotkar *et al*.,). This is followed by *Shamana* medication which has *Deepana-Pachana*, *Srotoshodhak, Rasayana*, *Kasa*, and *Shwashara* property along with *Vata-Kapha Hara* action.

EFFECT ON OBJECTIVE PARAMETERS

On Hematological Parameters

Total 15 out of 24 studies assessed on hematological parameters. Among 15 studies, 08 studies showed significant result ($P < 0.001$) in hematological parameters especially AEC and ESR. Four studies showed highly significant result ($P < 0.0001$). In a study conducted by Gohel *et al*., Bharangi avaleha showed significant result in AEC and ESR, though less so in subjective measures. Conversely, *Vasa avaleha* yielded better outcomes compared to *Bharangi Avaleha* in subjective parameters. Three studies (Dubey *et al*., Reena *et al*., and Gupta *et al*.,) showed insignificant result in hematological parameters. The general findings in the current review of these studies suggest that the trial drug significantly decreases the AEC and ESR value.

EFFECT ON S.IGE LEVEL

Only two studies, Rosylin *et al*., Dubey *et al*., assessed for S. IgE level. Rosylin *et al*., showed significant decrease in S. IgE level whereas Dubey *et al*., showed insignificant decrease in S.IgE level.

ON PEFR AND FEV1

Total of 14 out of 24 studies assessed for PEFR, FEV1. Two studies (Deepa *et al*., Gohel *et al*.) showed highly significant improvement in PEFR and FEV1. Moreover, rest 12 studies showed significant improvement. Hence, it can be concluded that these drugs have positive result in improving the PEFR and FEV1 values.

EFFECT ON ACQ, ACT, AND QOL

Out of 24 studies, four studies (Bhaskar *et al*., Bhaskar *et al*., Gaur *et al*., and Paneliya *et al*.,) assessed the effect of trial drug on ACQ, ACT, and QOL. All these studies showed significant improvement in these parameters.

REVIEW STRENGTHS

The articles were searched through the most popular databases that comprise articles from Ayurvedic science. Full-text articles published in English language and written in proper scientific manner with possible scientific discussion and justification were included in this study. Overall, quality assessment of evidences through the Jadad criteria is also strength of the study.

REVIEW LIMITATIONS

The method of search and selection employed in this study has the potential to be biased. The Ayurvedic literature contains several mentions of formulations. In this case, an effort was made to search the papers using potential key terms related to the study; nonetheless, some articles with strange title or formulation names may have escaped the search. Other databases may have certain articles as well. Numerous earlier Ayurvedic articles are still not accessible online. Studies from them were, therefore, excluded from the study.

SUGGESTIONS

The quality of the evidence must be improved in the field of Ayurveda. Tools such as blinding and randomization are effective at raising the quality of clinical trials. If at all possible, planning a controlled trial should also be done. Incorporating a larger sample size into the clinical investigation is recommended.

CONCLUSION

This is a systemic review investigating different ayurvedic management in *Tamaka Shwasa* in children under 15 year of age. It is proved to be beneficial the importance of *Virechana* and *Vamana chikitsa* along with Shamana *Chikitsa*. If it is done in *Sharad Ritu,* then it reduces the frequency and recurrence of *Tamaka Shwasa*. This review also enlightens the importance of *Kunjal Karma* and *Pranayama* along with *Shamana Chikitsa* resulting in better improvement in child's health. The use of different plants as nebulization gives instant relief in acute exacerbation of asthma. Finally, the use of ayurvedic formulation as a adjuvants along with allopathic treatment enhances the resultant effect.

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