Advances in Bioresearch
Adv. Biores., Vol 16 (6) November 2025: 507-514
©2025 Society of Education, India
Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.16.6.507514

Advances in Bioresearch

ORIGINAL ARTICLE

Effectiveness of *Kantakaryadi Arka* in The Management of *Vataja Kasa* (Allergic Bronchitis) in Children: A Pilot Study

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ABSTRACT
Chronic bronchitis, often associated with allergic reactions, has an estimated prevalence of 5% in India. In Ayurveda, Vataja Kasa—characterized by dry cough, hoarseness of voice, chest pain, and throat irritation—is considered analogous to allergic bronchitis in modern medicine. Kantakaryadi arka, a classical Ayurvedic formulation, is traditionally used to treat various types of Kasa. This study aims to evaluate its efficacy as an anti-tussive treatment for Vataja Kasa in children. To assess the anti-tussive effect of Kantakaryadi arka in children presenting with symptoms of Vataja Kasa and to understand its probable mode of action. A pilot clinical trial was conducted on 20 children aged 5 to 12 years diagnosed with Vataja Kasa. Participants received Kantakaryadi arka (6 ml for ages 5–8, and 12 ml for ages 9–12) twice daily for one week. Symptoms were assessed at baseline, day 7, and day 14. Subjective parameters included cough frequency, hoarseness of voice, headache, chest and flank pain, dryness of mouth and throat, and time to relief. Objective parameters included Absolute Eosinophil Count (AEC) in recurrent cases. Significant improvement was observed in all cardinal symptoms of Vataja Kasa, particularly dry cough (Shushka Kasa), Swarabheda, and Shirashool. Notable reductions were recorded in both day and night cough scores. The formulation was well-tolerated and showed rapid symptom relief in the majority of cases. The ingredients—Pippali, Kantakari, and Vasa—demonstrated synergistic effects with known anti-inflammatory, bronchodilatory, immunomodulatory, and antitussive properties. Kantakaryadi arka proved to be an effective, palatable, and child-friendly formulation for managing Vataja Kasa (Allergic Bronchitis). The study highlights its potential as a cost-effective and holistic alternative in pediatric respiratory care, bridging classical Ayurvedic principles with modern clinical relevance.
Keywords: *Vataja Kasa, Allergic Bronchitis, Kantakaryadi arka, Ayurveda, Anti-tussive, Pediatric, Herbal medicine.*

Received 22.08.2025 Revised 21.10.2025 Accepted 30.11.2025

How to cite this article:
Digvijay S, Kavya M, Swapnil R, Ishita S. Effectiveness of *Kantakaryadi Arka* in The Management of *Vataja Kasa* (Allergic Bronchitis) in Children: A Pilot Study. Adv. Biores., Vol 16 (6) November 2025: 503-506

INTRODUCTION

The estimated overall prevalence of chronic bronchitis—a condition frequently linked to allergies—in India is approximately 5.0% [1]. Bronchitis refers to the inflammation of the major airways in the lungs [2]. Acute bronchitis occurs due to sudden inflammation of the bronchi, typically triggered by factors such as viral infections, allergens, or pollutants. In the modern medical system, *Vataja Kasa* is considered comparable to allergic bronchitis [3]. In *Ayurveda*, there are many compound drugs explained to *treat Vataja Kasa.* Contents of *Kantakaryadi arka* [4] can be very effective for the management of *Kasa* as compared to the contemporary medicines. This study represents a sincere effort to explore an alternative and cost-effective treatment for *Vataja Kasa* using *Kantakaryadi arka*. The *Ayurvedic* herbal formulation, *Kantakaryadi arka*, has been specifically prepared to evaluate its anti-tussive (cough-suppressing) properties.

Kantakaryadi arka demonstrated notable effectiveness in managing *Vataja Kasa* (Allergic Bronchitis). According to various *Ayurvedic Acharyas*, *Kasa* (cough) is classified into five types: *Vataja Kasa*, *Pittaja Kasa*, *Kaphaja Kasa*, *Ksataja Kasa*, and *Kshayaja Kasa*. The current study focuses specifically on *Vataja*

Kasa, which correlates with Allergic Bronchitis in modern medicine. *Vataja Kasa* can arise due to several Nidanas (causative factors), including the consumption of *Vata*-aggravating foods (such as dry, cold, and astringent items), suppression of natural bodily urges (*Vegadharana*), and exposure to irritants like dust, smoke, or pollen. Due to vitiated *Vata dosha*, *Swarbheda* (hoarseness of voice), *Urahshool* (pain in chest), *Parshvashool* (pain in flanks), *Shirahshool* (headache), *Shushka Kasa* (dry cough), etc. are produced [5]. Therefore, a medication that helps to pacify *Vata dosha* should be chosen for effective treatment. In this study, *Kantakaryadi arka* has been selected for managing the symptoms of *Vataja Kasa*. To assess the Anti-Tussive effect of the *Kantakaryadi arka* as symptomatic treatment and in management of *Vataja Kasa*.

MATERIAL AND METHODS:

STUDY DESIGN AND PARTICIPANTS

This pilot study included 20 children aged 5 to 12 years with symptoms such as *Kasa vega, Swarabheda, Shirashool*, *Parshvashool*, *Uroshool*, *Shushka mukha* and *shushka gala*. Participants were recruited irrespective of gender, religion, and socio-economic status. Exclusion criteria included age outside the 5-12year range, chronic illnesses (All types of *Kasa* except *Vataja Kasa lakshana,* asthma, tuberculosis, pneumonia Cough with expectoration along with fever), and current use of antihistamines.

DRUG SOURCE

Raw material used for *Kantakaryadi arka* was procured from the local market of the Vadodara city, Gujarat, India and authentified by Pharmacognosy Department of Parul Ayurved institute. *Kantakaryadi arka* was prepared in GMP certified Parul Ayurveda Pharmacy of Parul University, Vadodara, Gujarat, India with following the SOP for *Kantakaryadi arka* formation.

***Kantakaryadi arka*:**

The *Kantakaryadi arka* is described in *Arka Prakash* which contains *Pippali, Kantakari*, *Vasa* and *jala*.

Table No. 1: Ingredients of *Kantakaryadi arka*

Sr No.	Ingredient	*Latin/ English name*	*Rasa*	*Guna*	*Virya*	*Vipaka*	Useful part
1.	*PIPPALI (1 part)*	*Piper Longum*	*Katu*	*Laghu, snigdha, tikshna*	*Ushna*	*Madhura*	Fruit
2.	*KANTAKARI (1 part)*	*Solanum Xanthocarpus*	*Katu Tikta*	*Laghu, Ruksha, Tikshna*	*Ushna*	*Katu*	Root
3.	*VASA (1 part)*	*Adhatoda Vasica*	*Tikta, Kasaya*	*Laghu, Ruksha*	*Sheeta*	*Katu*	Leaf
4.	*Jala (10 parts)*	*Water*					

Method of preparation [6]:

- All raw materials were thoroughly cleaned and coarsely powdered was made.
- The ingredients were accurately weighed in equal proportions and mixed homogeneously.
- The coarse powder was soaked in sufficient water for overnight (a duration of 12 hours).
- The following day, the soaked material was transferred to the round-bottom flask of the distillation apparatus.
- The remaining water was added, Controlled heating of 80-100^{0}C will be applied.
- The distillate was collected in a sterile glass container.

CLINICAL STUDY:

Study Design: A PILOT CLINICAL TRIAL

Sample size: 20

Inclusion criteria:

- Age group between 5yrs to 12yrs.
- Patients of either gender were included.
- Patients of *Vataja kasa* with symptoms like *Shushka Kasa* (dry cough), *Swarbheda* (hoarseness of voice), *Shirashool* (headache), *Parshvashool* and *Urashool* (pain in flank and chest region), *Shushka mukha* and *gala* (dryness of mouth and throat irritation).

Exclusion Criteria:

- All types of *Kasa* except *Vataja Kasa lakshana* were excluded.
- Pneumonia, Juvenile DM, Tuberculosis, Asthma were excluded.
- Cough with expectoration along with fever.

CRITERIA FOR DIAGNOSIS

The diagnosis was mainly based on *lakshanas* (*Shushka Kasa*, *Shushka gala* and *mukha*, *Sawarbheda*, *Shirashoola*, *Urashoola*, *ParshvaShoola*) of *Vataja Kasa* as described in Ayurvedic classics.

Drug and Posology:

Drug : *Kantakaryadi arka*

Dose : The dose of the drug for convenience in administration, the doses were administered based on their active components and optimal therapeutic levels.

Dose for 5 years to 8 years – 6 ml

Dose for 9 years to 12 years –12 ml

Time : Twice a day after food

Duration : 1 week

Anupana : Lukewarm water

Follow up: 1 week

Assessment: It was done on 0th, 7th and 14th

Assessment of results:

Subjective parameters: Assessment is done on basis of relief in the Symptoms of *Vataja Kasa*:

- *Shushka Kasa* (dry cough).
- *Swarbheda* (hoarseness of voice)
- *Shirashool* (headache).
- *Parshvashool* and *Urashool* (pain in flank and chest region).
- *Shushka mukha* and *Shushka gala* (dryness of mouth and throat).
- Time to relief from cough and throat irritation.
- Cough Symptoms Score (CSS) in Day and Night [7] .

Objective parameters :

AEC (if episodes at interval of less than month)

Scoring of Subjective Parameters [8]

Sign And Symptoms	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Kasa vega	Absent	1-5 episodes per day	6-10 episodes per day	More than 10 episodes per day	--	--
Swarbheda	Absent	Present	--	--	--	--
Shirashoola Parshvashooal, Urashoola	No pain	Pain during coughing	Pain intermittently, irrespective of cough, not affecting routine	Pain present continuously, irrespective of cough, affect routine work	--	--
Shushka mukha and gala	No shushkata	Feeling of thirst	Thirst can be tolerated	Thirst that cannot be tolerated	--	--
Time to relief from cough and throat irritation	Reduced between 0-15	Reduced between 16-30 minutes	Reduced between 31-60 minutes	Reduced in >61 minutes	No relief	
CSS day time	No coughing during day	Coughing for one short period	Coughing for more than two short periods	Frequent coughing but did not interfere with daily activities	Frequent coughing which interferes with daily activities	Distressing coughs most of the day
CSS Night time	No coughing	Coughing at wake up	Wake up early due to cough	Frequent waking due to coughs	Frequent Coughing most of night	Distressing coughs preventing any sleep

RESULTS

Total 20 patients with age criteria of 5-to-12-year age was taken for study.

Table No. 1 : Distribution of patient according to age

Age group	No. of Patients	Percentage
5-8	16	80
9-12	04	20

Lowest age limit was chosen at 5 years and upper range of age was chosen at 12 years. Majority of patients are belonging to 5-8 year of age.

Cardinal symptoms of *Kasa Vega* was present in 17 patients, *Swarabheda* in 19 patients,*Shirashoo*l in 13 patients, *Parshvashool* in 12 patients, *Uroshool* in 11 patients, *Shushka mukha* in 09 patients, *Shushka gala* in 08 patients were observed.

Table No.2: Distribution of patient according to symptoms

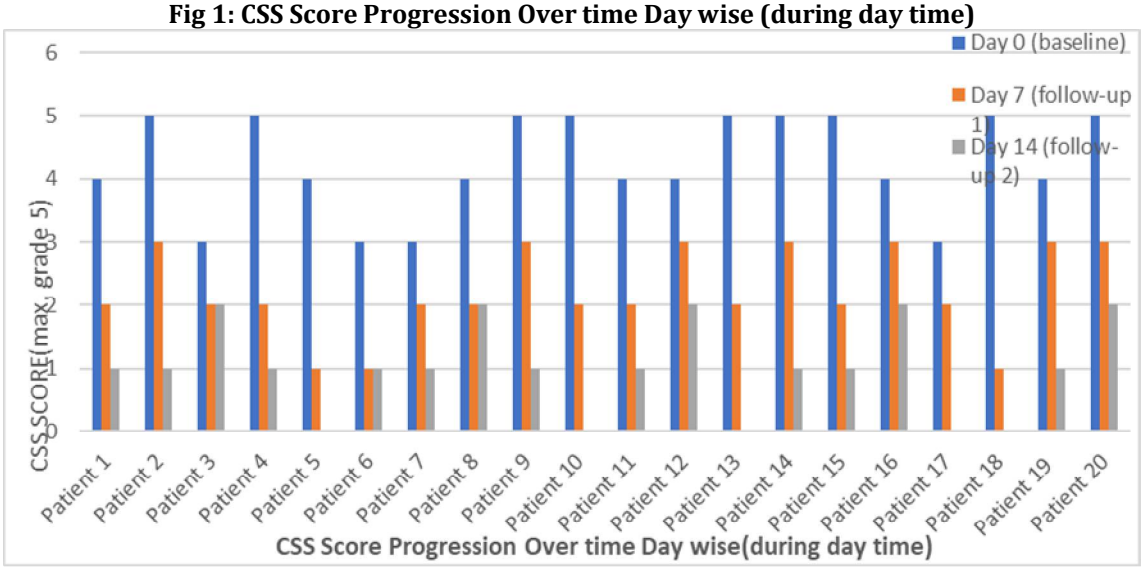
Sr.No.	Name of symptoms	
1.KASA VEGA	YES (17)	NO (03)
2.SWARABHEDA	YES (19)	NO (01)
3.SHIRASHOOl	YES (13)	NO (07)
4.PARSHVASHOOL	YES (12)	NO (08)
5.UROSHOOL	YES (11)	NO (09)
6.SHUSHKA MUKHA	YES (09)	NO (11)
7.SHUSHKA GALA	YES (08)	NO (12)

Table No.3: Distribution of patient according to Gender

Gender	Number of patients	Percentage
Male	13	65
Female	07	35

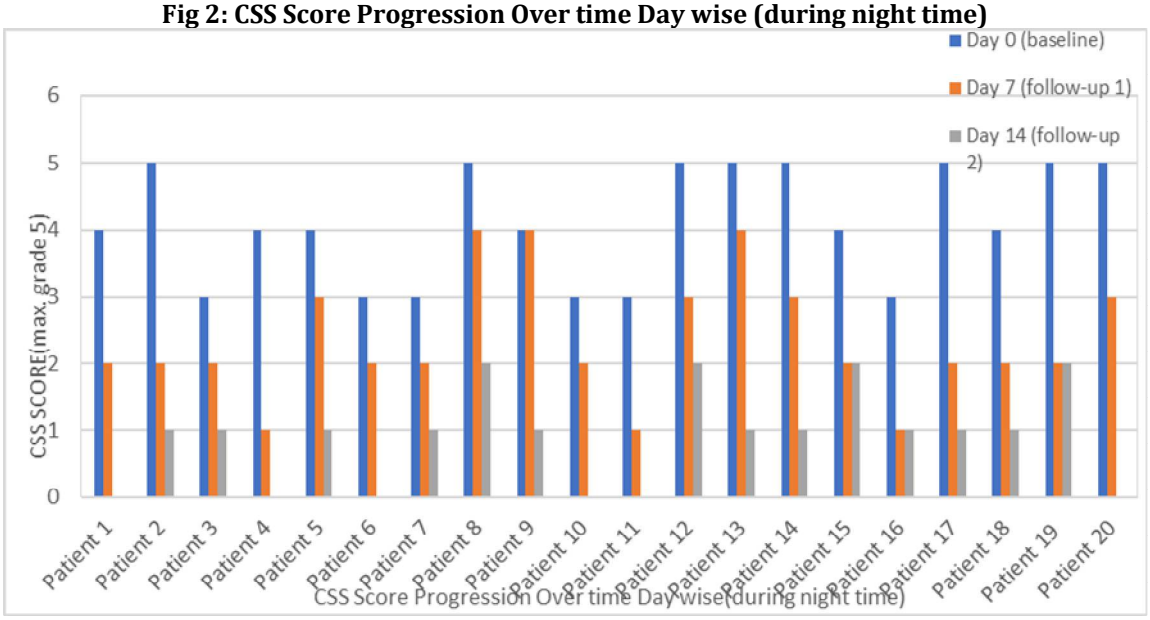
Among the all 20 patients, 65 % of patients were male and remaining 35 % were female patients.

Fig 1: CSS Score Progression Over time Day wise (during day time)



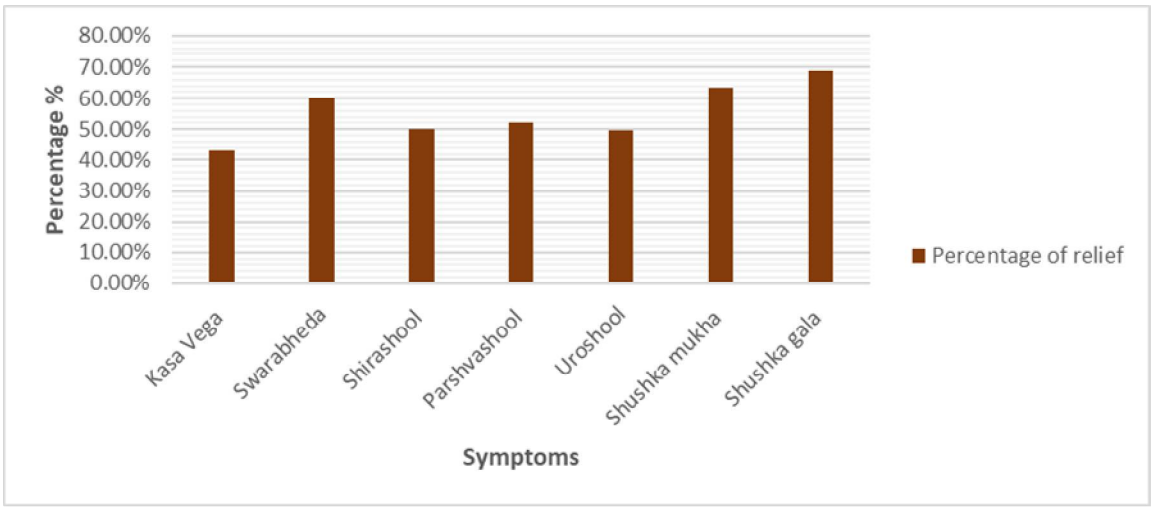
The bar graph illustrates the progression of CSS (Clinical Symptom Score) over time for 20 patients, measured on three different days: Day 0 (baseline), Day 7 (follow-up 1), and Day 14 (follow-up 2). The CSS score has a maximum value of 5. On Day 0, all patients exhibited relatively high CSS scores, ranging between 4 and 5. By Day 7, there was a noticeable reduction in scores for most patients, with the majority showing improvements (scores ranging between 1 and 4). Further improvement is observed on Day 14, where most patients' scores dropped to 1 or 2, indicating continued recovery. Overall, the data suggests a positive trend of decreasing CSS scores over the 14-day period, reflecting clinical improvement in the patient cohort.

Fig 2: CSS Score Progression Over time Day wise (during night time)



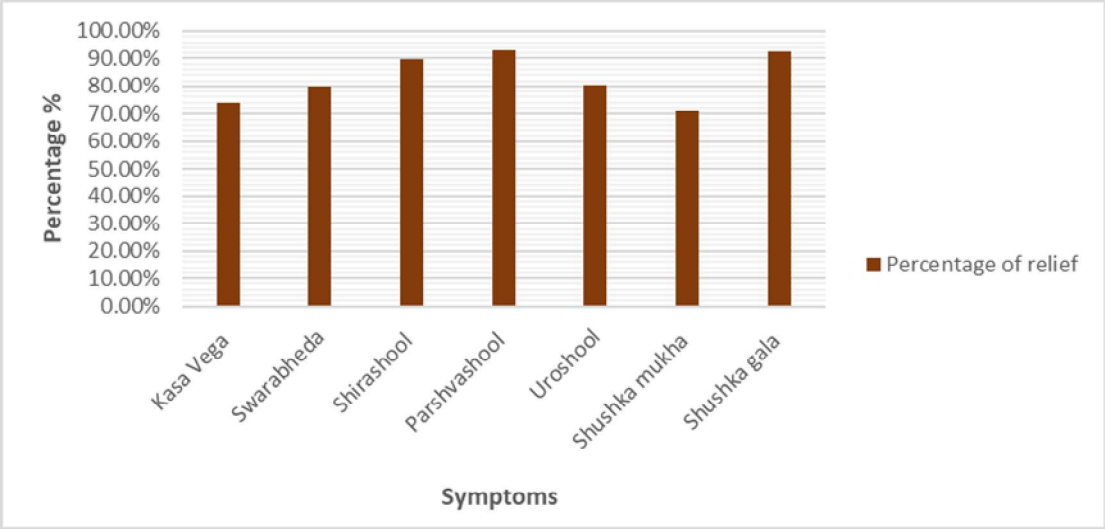
The bar graph presents the progression of CSS (Clinical Symptom Score) during night time across three time points—Day 0 (baseline), Day 7 (follow-up 1), and Day 14 (follow-up 2)—for 20 patients. On Day 0, most patients exhibited higher CSS scores, predominantly ranging from 3 to 5, indicating more severe symptoms. By Day 7, there is a moderate reduction in symptoms for many patients, although some still show high scores (notably Patients 8, 9, and 13 with scores of 4). By Day 14, a marked improvement is observed, with most patients showing CSS scores between 1 and 2, reflecting a significant reduction in symptoms. This trend suggests that patients experienced consistent symptomatic improvement during night time over the 14-day period.

Fig 3: Percentage of relief in Symptoms of *Vataja kasa*(Allergic Bronchitis) immediately after treatment:



The bar chart displays the percentage of relief experienced in various symptoms following treatment. Among the listed symptoms, *Shushka gala* (dry throat) shows the highest percentage of relief at approximately 70%, followed closely by *Shushka mukha* (dry mouth) with around 65% relief. *Swarabheda* (hoarseness of voice) also shows significant improvement, with about 60% relief. Moderate relief, ranging between 48% and 52%, is observed in symptoms like *Parshvashool* (pain in the flanks), *Shirashool* (headache), and *Uroshool* (chest pain). The least percentage of relief is seen in *Kasa Vega* (frequency of cough), with around 43% improvement. Overall, the data indicates that dry symptoms responded more effectively to the treatment compared to others like cough or pain-related symptoms.

Fig 4: Percentage of relief in Symptoms of *Vataja kasa* (Allergic Bronchitis) immediately after follow up



The bar chart illustrates the percentage of symptom relief achieved across various clinical symptoms. The highest relief is observed in *Parshvashool* (pain in the flanks) and *Shushka gala* (dry throat), both exceeding 90%. *Shirashool* (headache) also shows notable improvement, with relief nearing 90%. Symptoms such as *Swarabheda* (hoarseness of voice) and *Uroshool* (chest pain) display slightly lower but still substantial relief percentages, around 80%. *Kasa Vega* (frequency of cough) and *Shushka mukha* (dry mouth) show relatively lower relief, though still significant, at approximately 72% and 70% respectively. Overall, the chart reflects a high degree of effectiveness in symptom relief, particularly for pain and dryness-related conditions.

Statistical Analysis

Due to the pilot nature and small sample size, descriptive statistics were used.

DISCUSSION

The present study demonstrates significant improvement in all six classical cardinal features of *Vataja Kasa*, attributed to *Kantakaryadi arka*—a combination of botanicals with *vatahara* properties (*Kantakari, Pippali, vasa)* that alleviate vitiated *Vata dosha* and *Rasayana* properties (*Pippali*) that enhance immunomodulatory potential in children.

From a modern perspective, *Shushka Kasa* (dry cough) and *Shirahshoola* (headache) can be correlated with allergic conditions, whereas *Swarabheda* (hoarse voice) indicates laryngeal involvement, commonly seen in viral croup (laryngotracheobronchitis). *Daurbalya* (weakness) is more frequently associated with infectious conditions rather than allergies.

In terms of cough scores, a statistically significant improvement was observed in both daytime and night time cough scores. In contemporary medicine, the cough score reflects the frequency and severity of cough in children, which corresponds to *Kasa vega* in *Ayurveda.*

The vitiated which expels out of the body through the with making a loud noisy sound called as *kasai* [9] is a disease in which the attains upward movement and moves above the *Kanta* and *Shira pradesha* [10].

Arka preparation was chosen because it is palatable and requires a low dosage, making it very easy to administer to children. *Arka*, a herb of *Ayurvedic* origin, is classified as a semi-poisonous drug due to its potent properties and requires careful therapeutic use [11]. *Arka* has been advocated in the treatment of various diseases in the Nighantus, which describe it as possessing *Tikta* and *Katu Rasa, Ushna Virya,* and *Sara* and *Tikshna Guna*, while its *Kshira* (latex) is specifically attributed with *Laghu, Snigdha,* and *Ushna* properties. [12]

The drugs selected for the study in the trial group primarily act on the respiratory system and possess antioxidant, antipyretic, anti-inflammatory, and antitussive properties. These compounds exhibit *Ushna virya, Katu vipaka*, and *Vata-Kapha hara* characteristics. *Pippali,* with its *Madhura vipaka* and *Tridoshhara* properties, effectively addresses *Vataja Kasa*, a *Vata*-predominant condition. *Kantakari* and *Pippali,* both having *Ushna virya,* possess *Kasahara*, *Shwasahara*, and *Jwarahara* properties, along with *Vatakaphahara guna*, helping to alleviate cough caused by *Vata* aggravation in *Vataja Kasa*. *Vasa* acts as a *Kasaghna*, reducing the frequency of cough bouts and serving as a bronchodilator. *Kantakari*, with its *Tikta rasa* and *Katu vipaka*, enhances Agni, thereby improving *Jatharagni* and providing relief from *parshwashool.* These

pharmacological actions support the efficacy of the selected drugs in managing respiratory conditions, particularly *Vataja Kasa*. Modern Aspect of Pharmacological Action of Drugs:

Pippali [13], Piperine, the main alkaloid in *Pippali*, significantly enhances drug bioavailability and exhibits anti-inflammatory effects, while pellitorine, a butylamide, shows notable antitubercular activity in vitro, about 20% as potent as streptomycin, and the PE extract stimulates respiration, antagonizing morphine-induced respiratory depression, with both piperine and nalorphine effectively reversing such depression in comparative studies [14]. *Pippali* helps alleviate cough through the cumulative effect of its antimicrobial [14], anti-inflammatory [15] antitussive [16] and immune-stimulatory properties [17], while the predominance of *Ushna veerya* in the formulation corrects *dhatvagnimandya*, improves digestion and metabolism, and facilitates *Srotoshodhana* and *Ama pachana.*

Kantakari is quoted as the best drug of choice for *Kasa* by *Acharya Vagbhatta* [18].

Kantakari powder is anti-tussive and is effective in bronchial asthma and nonspecific cough. Its root is an expectorant. Glycoalkaloid and fatty acid fractions of the *Solanum xanthocarpum* extract cause liberation of histamine from chopped lung tissue. The effect of the drug on bronchial asthma may be attributed to the depletion of histamine from bronchial and lung-tissue. The expectorant action is due to inorganic nitrate content. It is prescribed in cough, asthma, pain in chest, used in the form of electuary. The drug is used as antiasthmatic, hypoglycaemic, anti-inflammatory, antitumor, antitussive, antipyretic, antispasmodic, antihistaminic, hypotensive and cytotoxic activity [19].

Kantakari, the main ingredient of the preferred formulations, is characterized by its *tikta* (bitter) and *katu rasa* (pungent taste), *ruksha* (dry) and *laghu guna* (light) qualities, along with *ushna virya* (hot potency) and *katu vipaka* (pungent after metabolism), making it a potent *deepana* (digestive stimulant) in nature [20]. *Kantakari* plant powder exhibits anti-tussive and anti-allergic properties, with its beneficial effects in bronchial asthma and non-specific cough attributed to histamine depletion from the lungs and its expectorant action due to inorganic nitrate content, which also helps reduce breathlessness and cough in asthmatic patients.

Vasa [21]*: Vasa* is an effective expectorant and potent anti-cough herbal medicine. It is also antispasmodic, antibacterial, etc. and useful in the management of respiratory diseases like cough, bronchitis, asthma; fever, anemia, etc [22]. In Ayurveda, *Vasaka* is renowned for its *Kasahara* property, indicating its effectiveness in alleviating cough, and studies have shown that oral administration of *Adhatoda vasica* extract in guinea pigs exhibits antitussive activity against irritant-induced aerosols, comparable to that of codeine [23].

Vasa contain mainly two alkaloids i.e. Vasicine and Vasicinone along with deoxyvasicine and adhatolic acid [24]. Vasicine demonstrates bronchodilatory activity both in vitro and in vivo, comparable to theophylline, while vasicinone also shows bronchodilation in vitro; their combination exhibits enhanced bronchodilatory effects in both conditions. Additionally, vasicine displays respiratory and uterine stimulant activity along with moderate hypotensive effects. *Adhatoda vasica* is well-documented for its potent anti-inflammatory, antioxidant, antiallergic, antitussive, antiasthmatic, bronchodilatory, and smooth muscle relaxant properties.

Pippali (Piper Longum): Antioxidative and Anti-inflammatory.

Kantakari *(Solanum xanthocarpum)* [25]*:* anti-infammatory, anti- bacterial activity, anti-fungal activity, anti-asthmatic, anti-fertility, hypoglycaemic, anthelmintic, molluscicidal activity.

Vasa (Adhatoda vasica): Antitussive and Expectorant, Anti- Asthmatic, Anti-inflammatory, Bronchodilatory, Anti-microbial, cardioprotective, Analgesic.

CONCLUSION

The findings of this pilot study suggest that *Kantakaryadi arka* is a promising, safe, and effective Ayurvedic formulation for the management of *Vataja Kasa* (Allergic Bronchitis) in children. The formulation, composed of *Pippali, Kantakari, and Vasa,* demonstrated significant anti-tussive, anti-inflammatory, expectorant, and bronchodilatory effects, which are well-aligned with both Ayurvedic principles and modern pharmacological mechanisms.

The study revealed marked symptomatic relief in classical features of *Vataja Kasa*—*Shushka Kasa* (dry cough), *Swarbheda* (hoarseness of voice), *Shirashool* (headache), *Parshvashool*, and *Uroshool*—within a short treatment window of one week, with sustained effects observed during the follow-up. The low-dose, palatable *Arka* form of the medication ensured high compliance among pediatric patients, making it an ideal formulation for children.

From a modern standpoint, the bioactive constituents such as piperine (*Pippali*), vasicine *(Vasa),* and glycoalkaloids (*Kantakari*) contributed significantly to the overall immune modulation, respiratory support, and symptom suppression observed in the trial.

Thus, *Kantakaryadi arka* holds considerable therapeutic potential as a cost-effective, natural alternative to conventional antihistamines and bronchodilators in the treatment of allergic bronchitis. Further large-scale clinical trials are recommended to validate these findings and explore the formulation's broader applications in pediatric respiratory conditions.

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