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Website: www.ayujournal.org
DOI: 10.4103/0974-8520.82032
Quick Response Code:

Review Article

A clinical review of different formulations of *Vasa (Adhatoda vasica)* on *Tamaka Shwasa* (asthma)

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Abstract

Vasa (*Adhatoda vasica* Linn.) is a well known and easily available drug in almost all the seasons. Easy availability of any drug gains popularity among physicians as well as pharmaceuticals and this is the reason why almost every *Kalpana* of *Vasa* is found described in the *Ayurvedika* text. The different dosage forms of *Vasa* like *Kvatha*, *Avaleha*, *Sneha*, and *Sandhana* have been used for the treatment of *Shwasa Roga*. A number of research studies have been performed on different formulations of *Vasa* and its effect on *Shwasa Roga*. Therefore, a review study has been carried out on the *Vasa* extract, *Vasa Avaleha* (prepared from *Svarasa* and *Kvatha*), *Vasa Ghrita*, *Vasarishta,* and *Vasakasava* on *Shwasa Roga,* to know which formulation is better. It was found in the review that *Vasa Ghana*, *Vasa Ghrita* (1), and *Vasa Avaleha* have shown good results on *Tamaka Shwasa*.

Key words: *Ghana* (extract), *Avaleha, Shwasa, Asava, Arishta, Tamaka Shwasa, Adhatoda vasica*

Introduction

Acharya Charaka says that an ideal drug should be available throughout the year, that is, *Bahuta*, and it should be capable of converting into different dosages forms, that is, *Anekavidha Kalpana*,[1] without altering its pharmacological actions. However, it is not feasible as it is often seen that the plants, in the peak of their active principles, are not available at all times and so it is necessary to collect them in a specific season.[2] Therefore, it is also essential to convert these plants into some formulation without them losing their potency, so that they may be available to us in their original potency throughout the year. Extract (*Ghana*),[3] *Avaleha*,[3] *Sneha*,[4] *Sandhana*,[5] and *Kalpana* are the modified forms of *Panchavidha Kashaya Kalpana*, which make the drug material available throughout the year, help in a long shelf-life,[6] help in good taste, an elegant look, pleasant smell, and produce quick action with low doses. Despite this, *Sneha*, *Sandhana*, and *Avaleha Kalpana* have their own specific qualities, namely, *Sneha* pacifies the *Vata Dosha*,[7] has the capacity to reach each and every *Srota* to simulate *Dhatu*, while *Sandhana* produces quick action, palatability, ability to reach each and every *Srota*, and has the capacity to remove the obstruction; this marks their utility in different diseases or different stages of the disease. *Ghrita Kalpana* is one that is predominately used for oral use, while *Asava Arishta* is popular among the *Sandhana* formulations. Therefore, it is mandatory to specify the use of this *Kalpana* in the diseased condition. *Avaleha* is one of the most popular *Kalpanas*, due to its dosage form, which helps in easy administration, palatability, and long shelf-life. It has been widely used as a rejuvenator (*Rasayana*) by Acharya Charaka, Sushruta, and Vagbhatta, except for diseases like *Kasa*, *Shwasa*, *Shotha*, and so on. *Avaleha* is used very often.[8] although *Ghana* is a synonym for *Avaleha*, but mostly it is devoid of sugar, honey, and *Ghrita*. This is also not in routine use in the *Samhita* period unlike *Avaleha*, *Sneha*, and *Sandhana*. Therefore, it is mandatory to specify the use of these *Kalpanas* in the diseased condition, as Acharya Charaka states that every *Kalpana* is not useful for each person having the same disease.

Vasa is a drug that draws attention because of its use in different *Kalpanas* and almost every *Kalpana* [Table 1] of this drug is available in a classic recapitulation of ancient literature that draws attention with regard to the utility of *Vasa* in a different formulation. The same is summed up in the form of *Bhisakamata*,[9] as a synonym of *Vasa*.

The *Shwasa* is a pathological condition in which *Prana Vayu* gets vitiated by itself or others, which leads to the upward movement of the *Prana Vayu*, hampering its normal functioning.[10] Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or early in the morning. These episodes are usually associated with widespread, but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment of the total

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Table 1: Various dosage forms of *Vasa* described in different classics

Dosage form	C S	S S	A S	Bh S	Ka S	Ha S	Sa S	Cd	Y R	Bh R	B P	BNR
Swarasa	-	1	1	1	-	5	2	7	6	8	3	-
Kalka	2	1	1	-	-	-	-	2	1	-	-	-
Kwatha	14	6	5	3	4	17	13	31	53	47	34	4
Hima	1	-	1	-	-	-	1	-	2	2	4	-
Ghrita	14	9	12	3	1	1	1	9	9	7	2	1
Avaleha	3	1	-	-	-	1	-	-	2	-	4	3
Taila	3	2	4	-	1	-	4	1	-	3	4	-
Khanda	-	-	-	-	-	-	-	2	2	1	-	1
Putapaka	-	-	-	-	-	-	1	-	1	1	1	1
Lepa	2	-	1	-	1	-	-	5	2	4	1	1
Sandhan	3	-	-	-	-	-	-	-	1	1	-	-
Vataka	-	-	-	-	-	1	-	2	1	4	2	-
Churna	2	1	3	-	-	4	-	3	2	4	-	-
Patralavan	-	1	-	-	-	-	-	-	-	-	-	-
Guggulu	-	-	-	-	-	-	-	1	-	-	-	-

CS - *Charaka Samhita*, SS - *Sushruta* Samhita, AS - *Ashtang Samgraha*, BhS - *Bhel Samhita*, KaS - *Kashyap Samhita*, HaS - *Harita Samhita*, SaS - *Sharangdhar Samhita*, Cd - *Chakradatta*, YR - Yogratnakar, BhR - *Bhaishajya Ratnavali*, BP - *Bhavaprakash*, BNR - *Brihat Nighantu Ratnakar*

global disease burden. Asthma is a problem worldwide, with an estimated 300 million affected individuals, along with 250 000 deaths estimated worldwide annually.[11]

A great number of research studies on *vasa* have been carried out on different aspects.[12-16] Many studies related to its different *Kalpana*-like extract (*Ghana*), *Avaleha*, *Sneha*, and *Sandhana Kalpana* have also been reported. Although all these formulations have good results on *Shwasa*, there is no report on which of these is better. So, with this objective, a review was carried out to know the better one. The studies that have been taken for review, which were done mainly in the Department of Rasashastra and Bhaishajya Kalpana, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, are as follows:

1. Prasher Ramnivas *et al.*, Standardization of *Vasa Ghrita* and its extract form and their comparative pharmacoclinical study, with special reference to *Shwasa Roga*, Jamnagar, 1997.
2. Kulkarni Shailaja *et al.*, A comparative and pharmacoclinical study of *Vasarishta* and *Vasakasava* in the management of *Shwasa*, Jamnagar, 2001.
3. Gandhi Piyush *et al.*, A comparative study of different formulations of *Vasa* (*Avaleha*, *Sneha*, *Sandhana*) with reference to to its *Shwashara* effect, Jamnagar, 2005.
4. Gupta Ankit *et al.*, A comparative pharmaceuticoclinical study of *Vasa Avaleha* prepared from *Swarasa* and *Kwatha* with reference to its *Shwashara* effect, Jamnagar, 2006.

Materials and Methods

Preparation of test drugs

Dry *Vasa* extract (*Ghana*) was prepared using the principles of *Raskriya*.[3] The double-filtered *Kwatha* of *Vasa* was put on moderate heat, with constant stirring, till the formation of *Ghana*. A fine powder of *Vasa Pushpa* was added at the stage when it gains semi-solid consistency suitable for pill making and mixed properly. *Vasakasava* and *Vasarishta*[17] were prepared using *Vasa Swarasa* as the liquid media, 35% of *Guda* and *Prakshepa* were added initially and the remaining quantity of *Guda* was added after starting the process of fermentation. *Vasa Ghrita* (1)[18] was manufactured from the ingredients *Vasa Kwatha*, *Ghrita*, *Vasa Pushpa Kalka*, and honey, whereas, *Vasa Ghrita* (2) was prepared by *Vasa Kwatha*, *Ghrita*, and *Pippali*, as *Kalka* and the *Paka* were done till the *Sneha Siddhi Lakshana* appeared. *Vasa Avaleha*[19] was prepared by adding *Guda* and *Ghrita* to the *Vasa Swarasa* / *Kwatha* and *Paka* was done till the *Avaleha Siddhi Lakshana* appeared; then *Pippali* powder was added to it and mixed well. Honey was added after cooling.

Selection of patients

Patients attending O.P.D and I.P.D. of the R.S. and B.K. Department of IPGT and RA Hospital, fulfilling the criteria of diagnosis of *Tamak Shwasa* were selected and registered randomly, irrespective of age, sex, or religion.

Criteria for diagnosis

Patients having signs and symptoms of *Tamak Shwasa* as described in Ayurvedic classics, namely, *Shwasakashtata*, *Kasa*, *Pinasa*, *Kanthodhvansa*, *Lalatesweda*, and *Asinolabhetesukham*, were selected for the present study. Detailed history was taken and physical examination was completed on the basis of a special proforma, incorporating the signs and symptoms of the disease.

Investigations

Routine hematological, especially white blood cell (WBC), erythrocyte sedimentation rate (ESR), AEC and urine, and stool examination were carried out in all the patients, to assess the condition of the disease and to exclude any other pathology. Biochemical investigations like BSL (F), Lipid profile, and Sr. Bilirubin were carried out to exclude any other pathology.

Diet and restriction

Patients were advised to avoid the aggravating factors mentioned in ancient literature.

Dose and duration

Two grams of the *Vasa* extract (*Ghana*) was given, while the dose of *Vasa Ghrita* (1), *Vasa Ghrita* (2), *Vasa Avaleha* (s), and

Table 2: Gradation / scoring of the signs and symptoms pattern for *Shwasa*

Symptom / score	0	1	2	3
Shwasa Kashtata	Frequency of attack once in the last 15 days	Frequency of attack, twice or thrice in the last 15 days	Frequency of attack twice in a week	Frequency of attack thrice or more in a week
Kasa	No	Occasional, but not troublesome	Troublesome, but does not disturb the sleep	Troublesome, does not allow to sleep at night
Pinasa	No	Along with *Shwasa*	Even without *Shwasa*	Always persisting
Wheezing	No	During *Shwasa*	Very often	Always
Kanthodhvamsa	No	Occasional	Very often	Always
Lalata Sveda	No	Mild perspiration	Moderate perspiration	Excessive perspiration
Asino Labhate Saukhyam	Relief in lying position	Temporarily, feels better in sitting posture	Relief in sitting position	Spontaneous sitting posture, cannot sleep

Vasa Avaleha (k) was 10 g; however, for the *Vasakasava* and *Vasarishta* it was 20 mL. All the drugs were given b.i.d. with water, for 21 days, except *Vasa Avaleha* (s) and *Vasa Avaleha* (k), which were given for 28 days.

Criteria for assessment

The efficacy of the trial drugs was analyzed in terms of the relief produced in the signs and symptoms before and after treatment. To assess the relief, the scholars had prepared a proforma with a grading system ranging from 0 to 3 [Table 2]. The effect of the trial drugs were also analyzed on certain parameters like WBC count, AEC, and ESR, before and after treatment.

Results

Highly significant ($P < 0.001$) results on *Shwasakashtata* were found in all the test drug groups except in *Vasa Ghrita* (2), which was only significant ($P < 0.05$) [Table 3]. The effect on *Kasa* was also highly significant ($P < 0.001$) in all groups, whereas, it was insignificant (> 0.10) in the *Vasa Ghrita* (2) group [Table 4]. The effect on *Pinasa* was highly significant ($P < 0.001$) only in *Vasa* extract (*Ghana*)-, *Vasa Ghrita* (1), *Vasa Avaleha* (s)-, and *Vasa Avaleha* (k)-treated groups [Table 5].

The *Vasa* extract (*Ghana*), *Vasa Ghrita* (1), *Vasakasava*, *Vasarishta*, and *Vasa Avaleha* (k) have shown highly significant (< 0.01) results on *Kanthodhvansa*, while *Vasa Avaleha* (s) has shown a significant (< 0.05) result [Table 6]. The *Vasa* extract (*Ghana*), *Vasa Ghrita* (1), and *Vasarishta* have shown a highly significant (< 0.001) result on *Lalatesweda*, while *Vasa Avaleha* (s) and *Vasa Avaleha* (k) have shown a significant (< 0.05) result [Table 7]. Highly significant ($P < 0.001$) results on *Asinolabhetesukham* were found in *Vasarishta*-, *Vasa Avaleha* (s)-, and *Vasa Avaleha* (k)-treated groups, while in the *Vasa Ghrita* (2), the result was insignificant ($P < 0.02$) [Table 8]. Highly significant ($P < 0.001$) results on wheezing were found in all the test drug groups except in *Vasa Ghrita* (2), which was insignificant ($P < 0.02$) [Table 9]. No statistically significant result on hematological parameters was observed in any of the treated groups except by the *Vasa* extract (*Ghana*), in which a highly significant ($P < 0.001$) decrease was seen on eosinophil.

Table 3: Effect of drugs on *Shwaskashtata*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	2.909 ± 0.038	96.97↓	< 0.001
Vasa Ghrita (1)	27	2.852 ± 0.070	95.07↓	< 0.001
Vasakasava	10	2.9 ± 0.276	70.73↓	< 0.001
Vasarishta	14	2.6 ± 0.289	68.5↓	< 0.001
Vasa Ghrita (2)	06	1.00 ± 0.36	30.00↓	< 0.05
Vasa Avaleha (S)	11	1.09 0.16	53%↓	< 0.001
Vasa Avaleha (K)	17	0.82 ± 0.13	58.2 ↓	< 0.001

Table 4: Effect of drugs on *Kasa*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	1.913 ± 0.060	97.80↓	< 0.001
Vasa Ghrita(1)	27	2.0 ± 0.117	94.12↓	< 0.001
Vasakasava	04	1.5 ± 0.288	75.00↓	< 0.02
Vasarishta	13	1.4 ± 0.183	70.37↓	< 0.001
Vasa Ghrita (2)	03	1.33 ± 0.88	57.14↓	> 0.10
Vasa Avaleha (S)	10	0.9 0.18	61.50↓	< 0.001
Vasa Avaleha (K)	13	0.62 0.14	54.00↓	< 0.001

Table 5: Effect of drugs on *Pinasa*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	2.036 ± 0.067	89.05↓	< 0.001
Vasa Ghrita (1)	27	1.613 ± 0.114	77.50↓	< 0.001
Vasakasava	06	0.7 ± 0.21	66.66↓	< 0.02
Vasarishta	04	1.05 ± 0.25	60.00↓	> 0.10
Vasa Ghrita (2)	02	1.50 ± 0.49	57.14↓	> 0.10
Vasa Avaleha (S)	05	1.2 ± 0.2	60.00↓	< 0.01
Vasa Avaleha (K)	10	0.78 ± 0.17	60.90↓	< 0.01

Discussion

The development of different dosage forms mainly depends on two factors. The first one belongs to the physician concerned and includes the immune response of the patient and severity of the disease (*Atura* and *Vyadhi Bala*).[20] The second one covers

Table 6: Effect of drugs on *Kanthodwamsa*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	1.716 ± 0.056	91.38↓	< 0.001
Vasa Ghrita (1)	27	1.6 ± 0.129	80.00↓	< 0.001
Vasakasava	09	0.78 ± 0.146	50.00↓	< 0.001
Vasarishta	14	1.08 ± 0.126	71.42↓	< 0.01
Vasa Ghrita (2)	02	0.5 ± 0.49	50.00↓	> 0.10
Vasa Avaleha (S)	05	0.8 ± 0.24	50.00↓	< 0.05
Vasa Avaleha (K)	07	0.57 ± 0.20	41.00↓	< 0.01

Table 7: Effect of drugs on *Lalatesweda*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	1.612 ± 0.063	74.58↓	< 0.001
Vasa Ghrita (1)	27	1.63 ± 0.121	63.78↓	< 0.001
Vasakasava	06	0.5 ± 0.223	50.00↓	> 0.10
Vasarishta	06	0.8 ± 0.166	62.50↓	< 0.01
Vasa Avaleha (S)	05	1.2 0.36	66.70↓	< 0.05
Vasa Avaleha (K)	06	0.83 0.30	62.40↓	< 0.05

Table 8: Effect of drugs on *Aasinolabhetesukham*

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasarishta	04	2.33 ± 0.2	85.00↓	< 0.001
Vasaghrita (2)	06	1.00 ± 0.25	62.50↓	< 0.02
Vasa Avaleha (S)	11	1.1 ± 0.16	69.00↓	< 0.001
Vasa Avaleha (K)	11	0.1 ± 0.13	66.00↓	< 0.001

Table 9: Effect of drugs on wheezing

Groups	n	Improvement		*P* value
		Mean ± S.E.M.	Percentage (%)	
Vasa extract	88	1.011 ± 0.020	50.00↓	< 0.001
Vasa Ghrita (1)	27	1.074 ± 0.091	53.65↓	< 0.001
Vasakasava	09	0.111 ± 0.4	71.42↓	< 0.001
Vasarishta	10	0.152 ± 0.20	81.25↓	< 0.001
Vasa Ghrita (2)	03	2.33 ± 0.32	87.50↓	< 0.02
Vasa Avaleha (S)	11	1.09 ± 0.17	61.00↓	< 0.001
Vasa Avaleha (K)	13	0.84 ± 0.10	59.00 ↓	< 0.001

the pharmaceutical concern like palatability, dose accuracy, long shelf-life, bioavailability, and so on.

Licking of *Avaleha* generally on upper part of tongue enhances salivation due to its sweetness. Excessive salivation causes trigging of the mixture over the naso-oropharynx and larynx, which ultimately produces a soothing effect in the throat, relieving irritation. Secondly, these solutions expose the drug material to the mucosa, which may produce the local effect of the drug.

Sneha preparation is one of the distinctive formulations of Ayurveda. *Sneha Kalpana* (oleaginous medicament) is the hallmark of the pharmaceutics of Ayurveda, which is used in all routes of administration.[21] Contemplation of the ancient literature reveals that the *Ghrita* and *Taila* are predominately used for internal and external application, respectively. Along with the qualities of *Substratum-Kwatha and Swarasa*, it also possesses *Sukshma*, *Ushna*, *Tikta*, *Vikasi*, and *Pramathi* properties.

The ancient scholars were specialists enough to utilize each and every bio-substance [plant–animals], metal, and mineral, and every process in the nature was observed for the benefit of the human beings. The best example of this is *Sandhana Kalpana*. *Madya* — a type of *Sandhana Kalpana*, which generates alcohol, has a good preservative value, and *Vyavayi* and *Asukari* properties. These properties of *Madya* contribute to its quick action and target site delivery of the active principle. Among the *Madya Kalpana*, *Asava* and *Arishta* are extensively used in day-to-day practice, due to their low-alcohol content.

Comparison of all the formulations [Table 10] shows that *Vasa Swarasa / Kwatha* (as it contains alkaloid like *vasicine* and *vasicinone* are proven bronchodilators)[22] is common among all. *Vasa Pushpa* is further added to the *Vasa* extract (*Ghana*), which is a consolidated form of the double-filtered *Kwatha* of *Vasa*, before converting it into the *Vati* form; this is definitely going to enhance the potency of the formulation, which may be the reason for good clinical results. There was a drawback regarding the dose fixation of this formulation, as described by scholar Prasher *et al.*, where initially an equivalent dose, that is, 7.2 g of the *Vasa* extract (*Ghana*) per day was given, but this produced some undesired effect like increase in dyspnea after 4–5 days of treatment. In one or two patients, the dose was reduced to 4 g daily, in two divided dose. *Vasa Ghrita* (1) has shown good results, as *Ghrita* has its own quality to pacify the *Vata* and *Pitta*[23] and exhibits the *Brinhana* property needed for the treatment of *Shwasa*[24] and various types of *Ghrita*. Besides this, the *Vasa Ghrita*[25] is also used to deal with *Shwasa*. The reason for the not-so-good results in the *Vasa Ghrita* (2)-treated patients may be counted, as it has low-sample size as well as some alteration in the original reference. *Vasakasava* and *Vasarishta* have shown highly significant results on symptoms like *Shwasa Kashtata*, *Kanthodhvansa*, and *Asinolabhetesukham*, where as in some of the symptoms like *Peenasa*, *Vasakasava* has shown better results while *Vasarishta* proved better in *Kasa* and *Lalatesweda*. *Vasa Avaleha* either prepared from *Swarasa* or *Kwatha* have shown consistent results for most of the symptoms. The possible reason for this may be because it contains *Guna*, *Ghrita*, and honey along with *Vasa* and *Pippali*. Here, honey gives a soothing effect, whereas, *Ghrita* pacifies the *Vata* and *Pitta*. Another reason for this is also supported by Acharya Charaka where he states that *Brimhana Chikitsa* is excellent for treating the *Shwasa*.[24] This may be fulfilled by *Avaleha* as it contains *Guda*, *Ghrita*, and honey.

In spite of *Rogi* and *Roga Bala* the other factors like *Kala* (season) and palatability of dosage form (because some persons are *Snehadweshi*)[26] must be kept in mind while treating any disease. All these studies are also completed within a certain time limit. Therefore, all these factors may be responsible for the variation in the results.

Table 10: Details of the ingredients in the test drugs

***Vasa* extract (*Ghana*)**	***Vasa Ghrita* (1)**	***Vasakasava*/*Vasarishta***	***Vasa Ghrita* (2)**	***Vasa Avaleha* (S)**	***Vasa Avaleha* (K)**
Vasa Kwatha	*Vasa Kwatha*	*Vasa Kwatha*	*Vasa Kwatha*	*Vasa Swarasa*	*Vasa Kwatha*
Vasa Pushpa	*Ghrita*	Guda	Ghrita	Guda	*Guda*
-	*Vasa Pushpa Kalka*	*Dhataki Pushpa*	Pippali	Ghrita	*Ghrita*
-	Honey	Chaturjata	-	Honey	Honey
-	-	Trikatu	-	Pippali	*Pippali*
-	-	Kankola	-	-	-
-	-	Hwivera	-	-	-

Conclusion

From the study it is concluded that different formulations of *Vasa* have been used for the treatment of *Shwasa*, since the period of Acharya Charaka and Sushruta. Here in this study, all the formulations have shown good results, but the *Vasa* extract (*Ghana*), *Vasa Ghrita* (1), and *Vasa Avaleha* (*Swarasa*/ *Kwatha*) are more consistent.

Acknowledgments

The authors acknowledge the Director I. P. G. T. and R. A. and I/c Vice-Chancellor Gujarat Ayurved University, Jamnagar, Prof. M. S. Baghel, for giving the permission to review these research studies for the benefit of a future planner. The authors also acknowledge all the scholars, supervisors, and co-supervisor of the research study, who have directly or indirectly helped in the publishing of these findings.

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