

EFFECT OF FORMULATIONS OF VASA (AVALEHA, ARISHTA AND GHRITA) IN THE MANAGEMENT OF TAMAKASHWASA (BRONCHIAL ASHTMA)

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Abstract

Different dosage forms (Avaleha, Arishta and Ghrita) of Vasa (*Adhatoda vasica* Ness.) are recommended to treat Tamaka Shwasa (Bronchial Asthma). These formulations were prepared by keeping the ingredients same to evaluate their efficacy in Tamaka Shwasa (Bronchial Asthma). With this aim, a clinical study was undertaken on Vasa Avaleha, Vasa Arishta and Vasa Ghrita. All these drugs were given two times a day orally for 30 days; it is an open trail with 15 days follow-up. The present study reveals that Vasa Avaleha ($p<0.001$) and Vasa Arishta ($p<0.05$) showed highly significant results in frequency and intensity of dyspnoea. While Vasa Ghrita showed statistically insignificant ($p>0.05$) results. Vasa Avaleha and Vasa Arishta showed statistically significant ($p<0.01$ and $p<0.01$ respectively) results in Sakapha Kasa (Productive Cough). On analyzing the overall effect, it was observed that in Avaleha group 77.77 % patient showed moderate improvement while marked improvement is seen in 11% patient followed by Vasa Arishta (33.33%).

Key words: Vasa Avaleha; Vasa Arishta; Vasa Ghrita; Tamaka shwasa; Dyspnoea.

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INTRODUCTION

Bhaishajya Kalpana, most developed branch of Ayurveda, deals with the preparation of different formulations from the raw material available in the nature. This conversion depend upon many factors like availability of the drug throughout the year, shelf life, good taste, pleasant smell, quick in action even in small doses. It also includes Pharmacognosy, Pharmaceutics and Pharmacology of the raw material and its formulations. Bio-pharmaceutics is the part of Bhaishajya Kalpana which deals with change in the pharmacology of drug with change in the pharmaceutical procedure. To evaluate the bio-pharmaceutics, Vasa (*Adhatoda Vasica* Ness.) were selected as drug of choice. In Harita Samhita, while narrating the importance of Vasa, Acharyas mentioned its Kasa hara (Expectorant), Raktapitta hara (Bleeding disorder) and Kshaya hara (Tuberculosis), but did not give much emphasize on its Shwasa hara^[1] (Bronchodilatory) effect. There is no evidence of Avaleha Kalpana of Vasa during the period of Samhita. Later Madanpala Nighantu added the Shwashara^[2] (Bronchodilatory) effect of Vasa. From 11th century, Vasa Avaleha Kalpana has been recommended in Raktapitta^[3] (Bleeding disorder), Rajayakshma^[4] (Tuberculosis) and Kasa^[5] (Cough) rogadhikara. Vasa Ghrita Kalpana is found recommended in Kasa^[6] (Cough), Raktapitta^[7] (Bleeding disorder) and Gulma^[8] rogadhikara. While Vasa Asava or Arishtas recommended in Kasa^[9] (Cough) and Shotha^[10] (Edema) rogadhikara. Avaleha and Ghrita formulations mentioned in Raktapitta^[3] (Bleeding disorder) and Gulma^[8] adhikara (Chapter) are prepared by using Kwatha (Decoction) of Vasa which is prepared by using 8 times water and reducing it to ¼. While Vasa Avaleha mentioned in Rajyakshma Roga adhikara of Bhavapraksha is prepared by using Swarasa^[4] (Juice), which is also useful to treat Shwasa (Asthma).

Acharyas also mentioned to prepare Vasa Kwatha (Decoction) by using 4 times water and reducing it to 1/4 to treat the conditions other than Raktapitta and Gulma.^[8] It denotes alteration in pharmacological action of Vasa Kwatha (Decoction) prepared by two different methods. Despite the textual reference, Vasa Arishta and Vasa Ghrita is used to treat Shwasa (Asthma).

Acharya Vagbhata advised to use Kashaya (Decoction), Sneha (Medicated clarified butter) and Avaleha Kalpana in Anutklishta Kapha Avashtha (Dry Cough).^[11] Acharya Charaka incorporated the use of Avaleha and Sandhana (Sura) Kaplana in Kapha Pradhana Avashtha (Productive Cough).^[12] In the present study it was decided to prepare Vasa Avaleha, Vasa Arishta and Vasa Ghrita by keeping the ingredients same and the formulations were tested clinically for its Shwasa hara (Bronchodilatory) effect.

Aims and objectives

To asses and compare the Shwasa hara (Bronchodilatory) effect of trial drugs, Vasa Avaleha, Vasa Ghrita and Vasa Arishta.

MATERIAL AND METHODS

Preparation of the drug

All the formulations were prepared by following textual references^{[4][8][10]} with some modifications. All formulations mainly contain decoction of Vasa as a main ingredient and Trikatu (Combination of *Piper longum*, *Piper nigrum* and *Zingiber officinale*) as other ingredients. As per requirement of Kalpana (dosage forms), Ghrita, Jaggery and Honey was used to prepare Avaleha. Ghrita Kalpana prepared by using Ghrita and Jaggery, Dhataki Pushpa (Flowers of *Woodfordia fruticosa*) was used to prepare Arishta.

Patients attended O.P.D. and I.P.D. of the Rasa shastra and Bhaishajya Kalpana department of Institute for Post Graduate

Teaching and Research in Ayurveda Hospital, Gujrat Ayurved University, Jamnagar fulfilling the inclusion criteria of diagnosis of Tamaka shwasa (Asthma) were selected and randomly registered irrespective of age, sex and religion for the present study. A specially designed research proforma, incorporating objective parameters of signs and symptoms of Tamaka shwasa (Asthma) was prepared.

Investigations

Haematological investigations like Haemoglobin, Total Leucocyte Count, Differential Leucocyte Count, Erythrocyte Sedimentation Rate, Absolute Eosinophil Count, Platelet count along with urine and stool for routine and microscopic examination were done. Biochemical investigations like BSL(F), Lipid profile, Sr. bilirubin were done to assess the condition of disease and to rule out any other pathological condition.

Study Design

The selected patients were randomly divided into three groups, viz. Group A, Group B and Group C.

Group A

Patients of this group were treated with Vasa Avaleha- 10 g, b.i.d. at 6 AM and 8 PM along with lukewarm water for 30 days. In this group, out of the 10 registered, 9 completed the treatment, and remaining patients left the treatment against medical advice.

Group B

Patients of this group were treated with Vasa Ghrita – 10 g, b.i.d. at 6 AM and 8 PM along with lukewarm water for 30 days. In this group out of the 12 registered, 6 completed the treatment, and 4 patients stopped treatments against medical advice. Two patients were

advised to stop the treatment due to exaggeration of dyspnoea.

Group C

Patients of this group were treated with Vasa Arishta – 20 ml b.i.d. at 6 AM and 8 PM along with equal quantity of water for 30 days. In this group out of the 10 registered, 6 completed the treatment, and remaining patients were left the treatment against medical advice.

Diet

Patients were advised to take routine diet and also advised to avoid Kapha-Vata aggravating factors like ingestion of cold food, milk, milk products and taking dinner at late nights.

Criteria for assessment

A specific scoring pattern was designed for assessment of relief in each cardinal signs and symptoms of patient. Changes in sign and symptoms were assessed at one week interval by using scoring pattern. Total effect of each therapy was evaluated in each patient after completion of treatment schedule. Effect of all medicines on individual signs and symptoms in all patients were evaluated after completion of treatment.

Overall assessment of therapy

The obtained results were measured as per grading system given below,

Complete remission -100%

Markedly Improved -> 75 % and up to 99 % Improvement

Moderately Improved-> 50 % and < 75 % Improvement

Mildly Improved - > 25 % and < 50 % Improvement

Unchanged- < 25 % Improvement

Statistical Analysis

The obtained data were analyzed statistically and presented as Mean \pm SEM. The Student's 't' test was used for observing the difference. The obtained results were interpreted at $P < 0.05$, $P < 0.01$, $P < 0.001$ significant levels.

RESULTS AND DISCUSSION

Among the 32 patients registered, 54% patients were having Kaphapradhana Vataja Tamaka shwasa and 46% patients having Vatapradhana Kaphaja Tamaka shwasa. All these patients have Shwasakashta (Dyspnoea), while Sakapha Kasa (Productive Cough) was found in 54% patients and Parshwa shoola was seen in 70% patients.

Effect of Therapy on Shwasakasta (Dyspnoea)

Vasa Avaleha (76%) showed more relief in frequency of episodes of dyspnoea than Vasa Arishta (42%) and Vasa Ghrita (28%). Decrement in intensity of dyspnoea was observed more in Vasa Avaleha (85%) followed by Vasa Arishta (77%). Duration of dyspnoea was reduced effectively in Vasa Avaleha (84%). Highly significant ($p < 0.001$) results were found in frequency of episodes of dyspnoea in Avaleha group than Arishta ($p < 0.05$) group. Also statistically highly significant ($p < 0.001$) decrement in intensity of dyspnoea was observed in Vasa Avaleha group, whereas moderately significant ($p < 0.05$) results obtained in Vasa Arishta group. Vasa Ghrita showed statistically ($p > 0.05$) insignificant results. Highly significant ($p < 0.001$ and $p < 0.01$ respectively) results were obtained on duration of dyspnoea in Avaleha and Arishta.

Effect of Therapy on other symptoms

Statistically insignificant ($p > 0.1$) relief was found in dry cough in all groups. Avaleha and

Arishta group showed highly significant ($p < 0.01$ and $p < 0.01$ respectively) relief in productive cough. Avaleha group showed statistically significant ($p < 0.02$) results in Peenasa (Running Nose) than Vasa Ghrita ($p > 0.1$). All the groups showed statistically significant ($p < 0.02$, $p < 0.01$, $p < 0.01$) results in Parshwa shoola. Avaleha group showed statistically highly significant ($p < 0.001$) results in darkness in front of eyes than Vasa ghrita ($p > 0.10$). Vasa Avaleha showed statistically highly significant ($p < 0.001$) improvement in Ronchi, while statistically insignificant ($p < 0.10$) results were seen in Vasa Arishta and Vasa Ghrita group.

Overall Effect of Therapy

After analyzing the overall effect, it was observed that Group A (Vasa Avaleha) produced moderate improvement in 77.77 % followed by Vasa Arishta (33.33%). Only Vasa Avaleha showed marked improvement in 11 % patients. (Figure 1)

Probable Mode of Action

Acharya Charaka emphasized to use medicine having Vatakaphaghna, Ushna and Vatanulomaka property as a first line of treatment in Shwasa.^[13] Drugs having either Vatahara or Kaphahara property may not be found much effective than drugs having both Vatakaphahara properties.^[14]

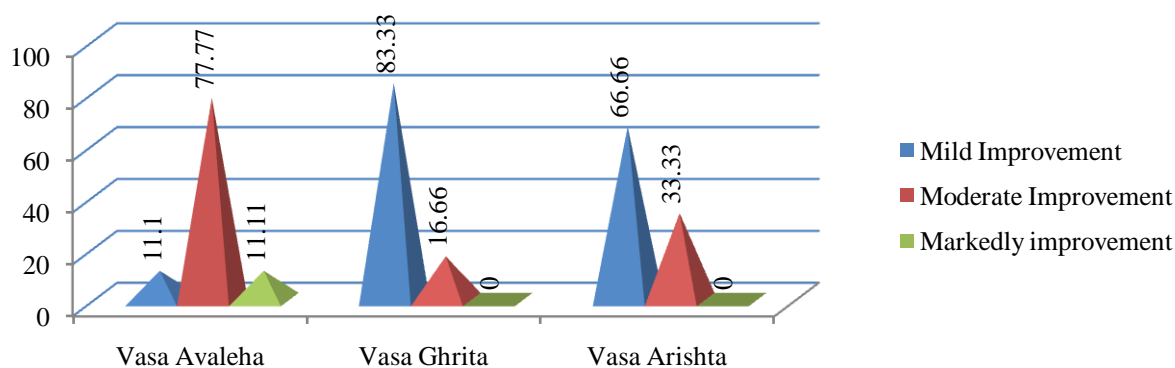
Vasa powder vitiates the Vata dosha and pacifies Kapha dosha due to its Laghu (Light), Ruksha (Dry) qualities, Tikta rasa (Bitter taste) and Katuvipaka (Pungent taste after digestion).^[15] It also pacifies Pitta dosha due to its Tikta rasa (Bitter taste) and Sheeta veerya (Cold in potency). It also causes Kapha Vilayana (Mucolytic) due to Tikta Kashaya rasa (Bitter and Astringent taste), Katu vipaka (Pungent taste after digestion) and Laghu (Light), Ruksha (Dry) properties. It causes constriction of Pranavaha Strotas (Respiratory

Table 1: Effect of therapy on Shwasakashta (Dyspnoea)

Symptom	Group	Mean		B.T.- A.T.	Percentage of Relief
		B.T.	A.T.		
Frequency of dyspnoea	A	4.22 ± 0.46	1.00 ± 0.52	3.22 ± 0.54***	76.31
	B	4.16 ± 0.30	3.00 ± 0.44	1.16 ± 2.47*	28.00
	C	4.66 ± 0.33	2.66 ± 0.75	2.00 ± 0.68**	42.85
Intensity of dyspnoea	A	2.22 ± 0.27	0.33 ± 1.66	1.88 ± 0.2***	85.00
	B	2.33 ± 0.49	1.33 ± 0.61	1.00 ± 0.36****	42.85
	C	1.5 ± 0.33	0.33 ± 0.20	1.16 ± 0.30*	77.77
Duration of dyspnoea	A	3.66 ± 0.47	6.55 ± 0.24	3.215 ± 0.46***	84.84
	B	3.33 ± 0.46	2.33 ± 0.71	1.00 ± 0.36**	30.00
	C	2.33 ± 0.42	0.83 ± 0.47	1.50 ± 0.22*	64.28

Mean ± SEM * >0.10, ** <0.05, *** <0.001, **** <0.001, Group A treated with Vasa Avaleha, Group B treated with Vasa Ghrita and Group C treated with Vasa Arishta

Figure 1: Overall effect of therapy



Vasa Avaleha shows marked improvement in 11.11 %. 77.77 % and 33.33 % patients got moderate improvement in Vasa Avaleha and Vasa Arishta group respectively

tract) by provoking Vata dosha due to Laghu (Light), Ruksha (Dry) properties. Action of Vasa powder may starts from Annavaaha Strotas (Gastrointestinal Tract).

High concentration of sugar and mode of administration i.e. licking facilitate the absorption of Vasa Avaleha from oral cavity. This indirectly produces soothing effect which relieves irritation in throat region. Application of Prakrutisamsamveta principle reveals that Vasa Avaleha is having Tikta Madhura rasa (Bitter and Sweet taste), Sheeta veerya (Cold in potency) and Madhura vipaka (Sweet taste after digestion). Sara (Moving) and Snigdha

(Unctuous) qualities of Vasa Avaleha are due to use of Jaggery and Ghrita, which produces Vatanulomaka effect i.e. normalizing the normal gati of Apana vayu. Trikatu adds Deepana (Appetite stimulant) property to Avaleha, which leads to proper formation of Kapha dosha and normalizing the functions of Samana vayu. The same is exhibited by seeing statistically significant results in productive cough and decrease in frequency of episodes and durations of dyspnoea in Avaleha group. The same results were seen in other work carried out on Vasa Avaleha prepared by using Swarasa (Juice) and Kwatha (Decoction).^[16] Due to Deepana (Appetite stimulant), Sara

Figure 2: Probable mode of action of Vasa Avaleha, Vasa Ghrita and Vasa Arishta

Drug form	→	Vasa Avaleha With tepid water	Vasa Ghrita With tepid water	Vasa Arishta With water
Absorption and digestion	→	Mixed with water in saliva forms solution with water molecule Vasicine, Vasicinone, adhatolic acid, piperine as active principle	Not form the solution with water it present in droplet in water Less vasicine, more vasicinone, piperine and adhatolic acid	Diluted form of hydro alcohol preparation More vasicine, less vasicinone, piperine and adhatolic acid in good
	→	Piperine increases blood circulation of GIT and prevent digestion of vasicine. Quick absorption	1)Micelle present in Ghrita, 2)Piperine in Ghrita increases blood circulation of GIT Quick absorption	1)Alcoholic preparation absorbed quickly more through 2) They increase blood circulation of GIT. Quick absorption
First pass metabolism	→	Through portal vein reaches liver, Piperine prevent biodegradation of vasicine and vasicinone act as substrate for liver enzymes	Through portal vein reaches liver, piperine prevent biodegradation of vasicine and vasicinone act as substrate for liver enzymes	Through portal vein reaches liver. out of more vasicine some degrades to vasicinone. alcohol may check degradation by acting as a substrate.
Distribution and excretion	→	vasicine,vasicinone, piperine, adhatolic acid reaches the lung, kidney, uterus heart and excreted through urine and faces.	Less vasicineand more vasicinone, piperineandadhatolic acid reaches kidney, uterus and heart, excreted through urine and face.	Through alcohol vasicine, adhatolic acid, piperine may reaches lung quickly
Action	→	Vasicine- bronchodilation vasicinone- expectorant piperine- antiallergic jaggery- dislocate the mast cell	Less vassicine -less bronchodilation adhatolic acid- expectorant piperine- antiallergic	vasicine-moderate bronchodilation, adhatolic acid – expectorant

(Moving) and Snigdha (Unctuous) qualities, Avaleha kalpana act as Rasayana for the respiratory tract disease by restricting the production of abnormal kapha and normalizing the normal passage of all Vata

dosha Application of Prakruti samasamveta principle reveals that Vasa Arishta is having Tikta rasa (Bitter taste), Sheeta veerya and Katu vipaka (Pungent taste after digestion). Converting into Arishta form potentiates the Laghu (Light), Ruksha (Dry) property of Vasa. Along with Vyavayi (Get absorbed

without digestion) and Ashukari (Quickly absorbed) qualities, Laghu (Light) property helps in quick absorption and quick action of Arishta form. Laghu (Light), Ruksha (Dry) qualities causes Kapha Vilayana (Mucolytic) effect but does not produce Vatanulomaka. Kapha Vilayana effect leads to expulsion of Kapha which indirectly able to reduce the obstruction of respiratory tract. In present study, Arishta group showed statistically significant results in productive cough. By removing Kapha and thus reducing the obstruction of respiratory tract it shows moderate decrease intensity and significant decrease in duration of dyspnoea. In short Vasa Arishta is useful in acute conditions of asthma which is produced due to accumulations of excessive Kapha.

Action of Vasa Ghrita starts from small intestine due to its fat enriched nature. Vasa Ghrita exhibits all properties of Vasa i.e. Tikta Kashaya rasa (Bitter and astringent taste), Sheeta Veerya (Cold in potency) due to Samskarasyanuvartnam (Quality to assimilate the properties of other without losing its own property) property of Ghrita. Vasa ghrita is having Tikta rasa (Bitter taste) dominancy along with Kashaya (Astringent) and Madhura rasa (Sweet taste), Sheeta veerya (Cold in potency) and Madhura vipaka (Sweet taste after digestion). Atisnigdha (Unctuous), Sheeta (Cold) property and less Deepana (Appetite stimulant) quality due to excessive quantity leads to more production of Kapha dosha which indirectly causes more obstruction of respiratory tract. That's why less significant results were seen in productive cough, duration and intensity of dyspnoea in Vasa Ghrita Group.

Pharmacological action of Drugs

Vasa contain mainly two alkaloids i.e. Vasicine and Vasicinone along with deoxyvasicine and adhatolic acid¹⁷. While Trikatu mainly contains piperine as active

ingredient¹⁸. Vasicine and deoxyvasicinone act as bronchodilator, while Vasicinone prevents capillary bleeding. Adhatolic acid acts as bronchodilator. Vasicinone augments the bronchodilatory effect of Vasicine by acting as a substrate for liver enzyme.¹⁹

Piperine enhances the bio-availability of the drugs by increasing the absorption of drug and preventing enzymatic metabolism of drug in liver²⁰. It act as an anti-allergic, analgesic and relieves the depressant activity on CNS.

Vasa Arishta (1.21%) contain more percentage of Vasicine than Vasa Avaleha (0.55%) and Vasa Ghrita (0.27%). Vasa Ghrita (1.18%) contains more percentage of Vasicinone than Vasa Avaleha (0.32%) and Vasa Arishta (2%). Vasa Ghrita (1.18%) contain more percentage of Piperine than Vasa Avaleha (1.92%).^[21]

Probable mode of action of Vasa Avaleha, Vasa Arishta and Vasa Ghrita can be depicted as in Figure 2. The explanation of probable mode of action is just humble attempt to put forward the pathways through which active principle works. The concentration of Vasicine, Vasicinone, Adhatolic acid and Piperine may vary at blood level, which may alter the effect of drug which is mentioned in Figure 2.

CONCLUSION

Among all the dosage forms, Avaleha form which is mentioned in Rajyakshma Adhikara (tuberculosis) was much useful in treating the Tamaka shwasa (Bronchial Asthma). Vasa Avaleha acts as Rasayana to the respiratory tract by controlling the Kapha production due to deepana property and normalizing the normal passage of all Vayu. Vasa Arishta, which is mentioned in Shotha Adhikara (Edema) acts as expectorant which indirectly helps in clearing the passage of respiratory tract. Vasa Ghrita which is mentioned in Raktapitta (Bleeding disorder) and Gulma adhikara is less effective in Tamaka Shwasa

(Bronchial Asthma). Study also reveals that change in pharmaceutical procedure leads to change in pharmacological action as seen in different forms of Vasa.

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