

Efficacy of Aparajit avaleha in Vataja Kasa in children

Research Article

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Abstract

Background: In Ayurved classics *Kasa* is describes as a disease entity rather than a symptom. Many Respiratory Tract disorders can be incorporated under the broad umbrella of *Kasa*. *Vataja Kasa* which is characterized by *Shuska mukha* and *gala*, *Shuska Kasa* with *Shuska alpa kapha*, *Swarbheda*, *Parshva Shool*, *Shira shool*, *Urashool*, *Daurbalya*. It can be correlated symptomatically with Dry cough having sign and symptoms as Dry Cough, Coughing with small quantity of expectorant, Shortness of breath, Weakness, Soreness and dryness of throat, Heartburn, Pain in flank region, Dryness of mouth, Hoarseness of voice. Though it is not life threatening it impacts daily routine, work capacity as well as growth and development of a child. **Aim and Objectives:** To assess the efficacy of *Aparajit Avaleha* in the management of *Vataja Kasa* in Children and to study the probable mode of action of *Aparajit Avaleha* in management of *Vataja Kasa*. **Materials and Methodology:** In this study, total 30 patients of *Vataja Kasa* were included between 6 years to 12 years. The included patients were treated with *Aparajit Avaleha* described in *Chakradutta* thrice a day for 14 days with lukewarm water. The assessment was done on the basis of subjective as well as objective parameters. **Results:** *Aparajit Avaleha* showed statistically significant improvement in the subjective parameters as well as on objective parameters as most of the drugs possess pharmacological activities as Anti-inflammatory, Anti- asthmatic, Antibacterial, Antispasmodic, Immuno-stimulator, Anti-allergic, Anti- histaminic and Anti-pyretic. **Conclusion:** *Aparajit Avaleha* is effective in the management of *Vataja Kasa* in children.

Keywords: *Vataja Kasa*, Dry Cough, Ayurved, *Aparajit Avaleha*.

Introduction

The etio-pathogenesis of *Kasa* takes place at *Kantha* and *Uras* where *Prana* and *Udana Vata* gets obstructed by vitiated *Kapha* and leads to its forceful expulsion from mouth creating a loud voice like breaking a vessel(1). *Acharya Charaka* has explained five types of *Kasa*. *Vataja Kasa* troubles the most though it does not shows serious health effects it hampers the daily routine and compromise the quality of the work. As per the classics, *Vataja Kasa* lakshanas are *Shushka gala*, *Shuska Kasa* with *Shuska alpa kapha*, *Swarbheda*, *Parshav Shool*, *Shirashool*, *Urashool*, *Daurbalya* etc.(2,3). As per the contemporary science, the symptoms of *Vataja Kasa* can be co-related with simple Pulmonary Eosinophilia and Tropical Pulmonary Eosinophilia with predominant feature of coughing (4). As cough is considered as a reflex only instead of a disease its symptomatic management is indicated. It includes use of Anti-tussive alone or in combination

with Codeine, Anti-histaminics, Decongestants, Expectorants etc.(5) with their own limitations and side effects.

Due to the constant exposure to external environment, Respiratory system is more prone to infections and hyper sensitization in most of the conditions(6). Due to anatomical and physiological characteristics, immunological considerations and social factors, Pediatric age groups are more vulnerable to respiratory tract infections. Dry cough having sign and symptoms as Dry Cough, Coughing with small quantity of expectorant, Shortness of breath, Weakness, Soreness and dryness of throat, Heartburn, Pain in flank region, Dryness of mouth, Hoarseness of voice (7,8).

Acharya Charaka stated *Sneha* as first line of treatment due to increased *rukshata* of *Vata*. *Acharya* also indicated use of *lehana* and *dhoopana* to control the vitiated *Vata*. So, *Aparajit Avaleha* mentioned in *Chakradatta* was taken as trial drug for the present study (9).

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Aims and Objectives

- To assess the efficacy of *Aparajit Avaleha* in the management of *Vataja Kasa* in Children.
- To study the probable mode of action of *Aparajit Avaleha* in management of *Vataja Kasa*.

- To study the etio-pathogenesis of *Vataja Kasa* in children.

Hypothesis

Null Hypothesis (H₀): There is no effect of *Aparajit Avaleha* in the management of *Vataja Kasa* in children.

Alternate hypothesis (H₁): There is effect of *Aparajit Avaleha* in the management of *Vataja Kasa* in the children.

Materials and methods

Selection of patients

Patients were screened and enrolled from Out Patient Department (OPD), Department of *Kaumarbhritya*, Parul Ayurved Hospital, Vadodara, Gujarat as well as from various Camps organized.

Drug Review (11,12,13)

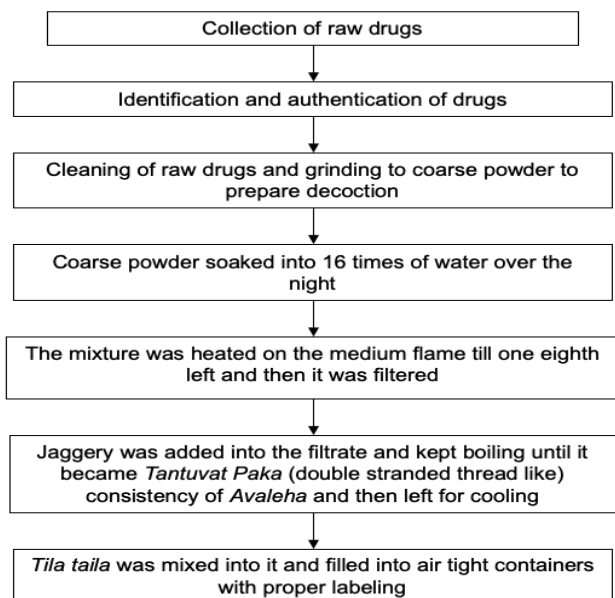
Table 1: Contents of Aparajita avalehya

No.	Drug (Proportion)	Botanical Name	Rasa	Guna	Virya	Vipaka	Useful Part
1	<i>Shati</i> (1 part)	<i>Hedychium spicatum</i> Lin	Katu, Tikta, Kashaya	Laghu, Tikshna	Ushna	Katu	Rhizome
2	<i>Karkatshringi</i> (1 part)	<i>Pistacia integerrima</i> Stewart.	Tikta, Kashaya	Guru	Ushna	Katu	<i>Shringakar Kosha</i>
3	<i>Pippali</i> (1 part)	<i>Piper longum</i> Linn.	Katu	Laghu, snigdha, tikshna	Ushna	Madhura	Fruit
4	<i>Bharangi</i> (1 part)	<i>Clerodendrum Serratum</i> Linn.	Katu, Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu	Root
5	<i>Nagarmotha</i> (1 part)	<i>Cyperus rotundus</i> Linn.	Katu, Tikta, Kashaya	Laghu, Ruksha	Sheeta	Katu	Rhizome
6	<i>Yavasa</i> (1 part)	<i>Alhagi camelorum</i> Fisch.	Madhura, Tikta, Kashaya	Guru, Snigdha	Sheeta	Madhura	<i>Panchang</i>
7	<i>Guda</i> (12 parts)	Jaggery	Madhura	Snigdha	Ushna	Madhura	
8	<i>Tila Taila</i> (1/4 th part.)	<i>Sesamum indicum</i> Linn.	Madhura, Kashaya, Tikta	Guru, Snigdha	Ushna	Madhura	Seed Oil

Aparajit Avaleha

Method of Preparation

Flow chart 1: Showing the method of preparation



Pharmaceutical Analysis of *Aparajit Avaleha* (14) -

Table 2: Organoleptic Characteristics and Qualitative analysis

Parameters	<i>Aparajit Avaleha</i>	Solvent	+/-
Colour	Brown	Alkaloids	+
Odour	Aromatic	Vitamin C	+
Taste	Sweet, slight bitter	Essential Oil, Glycosides	+
Consistency	Semisolid	Flavonoids, Starch	+
Touch	Soft	Saponins, Tannins	+
Present (+); Absent (-)			

Table 3 : Physico - Chemical Parameters

Sr. No.	Parameters	Values
1	Loss on Drying at 110°C (%w/w)	2.98
2	Total Ash Value (%w/w)	3.93
3	Acid Insoluble Ash	1.80
4	Water Soluble Extractive	19.75
5	Alcohol Soluble Extractive	17.00
6	pH value	6.50
7	Total Solid Content	92.60
8	Rancidity	Negative

Qualitative Analysis of *Aparajit Avaleha*

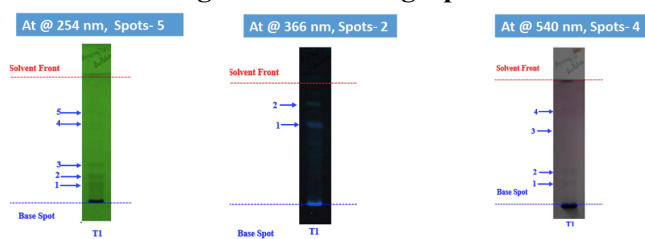
High Performance Thin Layer Chromatography (HPTLC) was carried out at Vasu Research Centre, Vadodara, Gujarat.

Table 4: HPTLC Analysis

Spot	Before Derivatization		After Derivatization	
	Colour of	Rf value	Colour of	Rf value
1	Dark Green	0.04	Black	0.04
2	Orange	0.17	Light Grey	0.17
3	Light Green	0.26	Purple	0.26
4	Yellow	0.4	Light Green	0.4
5			Dark Green	0.64

Long UV	Short UV
No. of Spots : 4	No. of Spots : 3
Rf Value: 0.4, 0.17, 0.26, 0.4	Rf Value: 0.4, 0.26, 0.4

Figure 1: HPTLC graphs



Clinical Study Study Design

Open Label Single Arm clinical study

Sample size: 30

Inclusion criteria

- Patients age between 6 years to 12 years irrespective of gender, socioeconomic status
- Patients with classical sign and symptoms of *Vataja Kasa* like *Parshva shool*, *Shirashool*, *Urashool*, *Sawarbheda*, *Shushka Kasa*, *Shuska Mukha* and *Gala* etc.
- Patients suffering from *Vataja Kasa* for less than 7 days

Exclusion Criteria

- Patients below age 6 years and above 12 years.
- All types of *Kasa* except *Vataja Kasa lakshanas*.
- K/C/O Pneumonia, Juvenile Diabetes Mellitus (JDM), Tuberculosis, Bronchiolitis, Asthma, Chronic

productive cough, Whooping Cough, Sinusitis, Tonsillitis.

Criteria for Diagnosis

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

Approval from Institutional Ethical Committee: It was taken from PIA-IECHR Institutional Ethics Committee for Human Research, Parul Institute of Ayurved with approval number as PU/PIA/IECHR/2019/163 dated 16/10/2019.

CTRI Registration: The present study was registered prospectively to Clinical Trial Registry of India and obtained approval as CTRI/2019/12/022302 (Registered on 11/12/2019)

Drug and Posology:

Drug : *Aparajit Avaleha*

Dose : The dose of the drug was calculated as per the standard guidelines of *Sharangdhar Samhita*. For convenience in administration, the doses were taken as average value.

- Dose for 6 years to 9 years – 7 gm
- Dose for 9 years to 12 years – 10 gm
- Time : Thrice a day after food
- Duration : 14 days
- Anupana : Lukewarm water

Total days of intervention: 14 days

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

Assessment of results

Subjective parameters

Assessment was done on basis of relief in the signs and symptoms of *Vataja Kasa*-

- *Shushka Kasa* (dry cough)
- *Swarbheda*
- *Shirashoola* (headache)
- *Parshva shoola* and *Urashoola* (pain in flank and chest region)
- *Shuska mukha and gala* (dryness of mouth and throat)
- Time to relief from cough and throat irritation (15)
- Cough Symptoms Score (CSS) in Day and Night (15)

Objective parameters

- Hematological investigations like Complete Blood Count and Absolute Eosinophil Count were done before and after the treatment.

Table 5: Scoring of Subjective Parameters

Sign and	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<i>Kasa vega</i>	Absent	1-5 episodes per day	6-10 episodes per day	More than 10 episodes per day	-	-
<i>Swarbheda</i>	Absent	Present	-	-	-	-
<i>Shirashoola</i> <i>Parshvashoola</i> , <i>Urashoola</i>	No pain	Pain during coughing	Pain intermittently, irrespective of cough, not affecting routine	Pain continuously, irrespective of	-	-
<i>Shushka mukha</i>	No shushkata	Feeling of thirst	Thirst can be tolerated	Thirst cannot be		

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Time to relief from cough and	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	Frequent coughing which interferes	coughing most of the day
CSS Night time	No coughing	Coughing at wake up	Wake up early due to cough	Frequent waking due to coughs	coughing most of	cough preventing

Observations and Results

Flow chart 2: Selection of samples

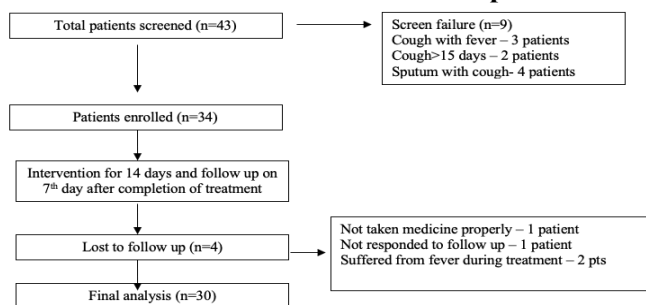
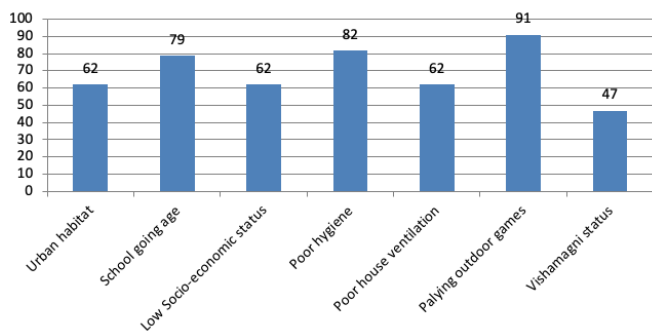


Figure 1: Observations

Observations



Among 30 patients of Vataja Kasa, most of the patients 62% were residing in urban area. Prevalence of Vataja Kasa is increasing in urban due to excessive pollution, poor Air Quality Index (AQI).

Total 79% of patients were from school going age. Due to more chances of cross infections during school hours.

Low socioeconomic status was observed in 62% of patients. More prevalence is observed due to poor hygiene, lack of nutrition, lack of awareness about healthy lifestyle.

Poor hygiene, poor house ventilation and playing outdoor games these are the aggravating factors for respiratory tract disorders.

Analysis of Data

The obtained data was statistically analyzed by SPSS Software Version 26 IBM (16).

- Statistical Analysis of 9 subjective parameters was done by 2 non-parametric tests. First Friedman test was applied followed by with Wilcoxon Signed Rank test with Post hoc analysis and significant level set at 0.016.
- Statistical Analysis of CBC and AEC was done by parametric test i.e. Paired t-test.

Table 6: Statistical analysis of symptoms by Friedman test

Symptoms	Levels	Mean Rank	N	X2	Df	Asymp. Sig.
Shuska Kasa	0th Day (BT)	2.82	30	49.515	2	.000 (S)
	7th Day (DT)	2.02				
	14th Day (AT)	1.17				
Swarbheda	0th Day (BT)	2.48	30	27.125	2	.000 (S)
	7th Day (DT)	1.83				
	14th Day (AT)	1.68				
Shirashoola	0th Day (BT)	2.33	30	15.846	2	.000 (S)
	7th Day (DT)	1.88				
	14th Day (AT)	1.78				
Parshvashoola and Urashoola	0th Day (BT)	2.22	30	9.556	2	.000 (S)
	7th Day (DT)	1.92				
	14th Day (AT)	1.87				
Shushka Mukha and Gala	0th Day (BT)	2.68	30	39.553	2	.000 (S)
	7th Day (DT)	2.00				
	14th Day (AT)	1.32				
Time to relief from cough and throat irritation	0th Day (BT)	2.95	30	56.054	2	.000 (S)
	7th Day (DT)	1.97				
	14th Day (AT)	1.08				
CSS Day time	0th Day (BT)	2.78	30	47.516	2	.000 (S)
	7th Day (DT)	2.02				
	14th Day (AT)	1.20				
CSS night time	0th Day (BT)	2.93	30	53.850	2	.000 (S)
	7th Day (DT)	1.92				
	14th Day (AT)	1.15				

BT – Before Treatment, DT – During Treatment, AT – After Treatment

Table 7: Statistical analysis of symptoms by Wilcoxon signed Rank test

Sign and Symptoms	Ranks	N	MR	SR	Z-Value	P- Value
Shuska Kasa (0 th day-14 th day)	NR	0	0.00	0.00	-4.725	.000 (S)
	PR	28	14.50	406.00		
	Ties	2				
	Total	30				
Swarbheda (0 th day-14 th day)	NR	0	0.00	0.00	-4.000	.000 (S)
	PR	16	8.50	136.00		
	Ties	14				
	Total	30				
Shirashoola (0 th day-14 th day)	NR	1	7.00	7.00	-3.051	.002 (S)
	PR	12	7.00	84.00		
	Ties	17				
	Total	30				
Parshvashoola and Urashoola (0 th day-14 th day)	NR	1	5.00	5.00	-2.333	.020 (S)
	PR	8	5.00	40.00		
	Ties	21				
	Total	30				
Shushka Mukha and Gala (0 th day-14 th day)	NR	0	0.00	0.00	-4.490	.000 (S)
	PR	24	12.50	300.00		
	Ties	6				
	Total	30				
Time to relief from cough and throat irritation (0 th day-14 th day)	NR	0	0.00	0.00	-4.883	.000 (S)
	PR	30	15.50	465.00		
	Ties	0				
	Total	30				
CSS day time (0 th day-14 th day)	NR	0	0.00	0.00	-4.765	.000 (S)
	PR	28	14.50	406.00		
	Ties	2				
	Total	30				
CSS night time (0 th day-14 th day)	NR	0	0.00	0.00	-4.769	.000 (S)
	PR	29	15.00	435.00		
	Ties	1				
	Total	30				

NR – Negative Ranks, PR – Positive Ranks

Table 8: Statistical Analysis of Hematological investigations by Paired t-test

Parameters (BT-AT)	Mean BT	Mean AT	Std. Deviation Mean	Std. Error Mean	df	t	p
Absolute Eosinophil Count (AEC)	543.00	351.16	119.04	21.73	29	8.826	0.000 (S)
Hemoglobin	11.49	11.60	0.12	0.02	29	-4.965	0.000 (S)
Total Leucocyte Count (TLC)	9397.66	7550.00	1325.99	242.09	29	7.632	0.000 (S)
Neutrophil	59.06	49.36	7.46	1.36	29	7.121	0.000 (S)
Eosinophil	33.93	28.73	6.39	1.16	29	4.456	0.000 (S)
Monocytes	4.23	3.26	1.15	0.21	29	4.568	0.000 (S)
Lymphocyte	3.10	2.10	1.36	0.24	29	4.014	0.000 (S)

df – degree of freedom

Discussion

Aparajit Avaleha showed statistically significant effects on the subjective parameters of *Vataja Kasa* like *Shushka Kasa*, *Swarbheda*, *Shirashoola*, *Parshva* and *Urashoola*, *Shushka gala* and *mukha*, Time to relief from cough and throat irritation, Cough Symptom Score day time and Cough Symptom Score night time. It also showed statistically significant effects on objective parameters like CBC and AEC. By virtue of *Ushna virya*, *snigdha guna* and *Deepana*, *Pachana*,

Krimighna, *Vatashamaka*, *Ruchikaraka*, *Kasahara* properties it pacified the sign and symptoms of *Vataja Kasa*. Most of the drugs possess pharmacological activities as Anti-inflammatory, Anti-asthmatic, Antibacterial, Antispasmodic, Immuno-stimulator, Anti-allergic, Anti-histaminic and Anti-pyretic.

Socio-economic status of family has direct relationship with its nutritional status and ultimately immune status. Most of the patients were residing in urban region but in slum area. Factors like pollution,

poor hygiene, ignorance of parents towards child health are responsible for disease condition.

Humidity caused by poor ventilation helps the proliferation of allergens, infections and house dust mites, which aggravate symptoms and other allergic conditions. The observations in the study revealed that most of the patients were playing outdoor games which induce cough. Water loss through excessive sweating leads to respiratory tract mucosal hyperosmolarity, which in turn stimulates mediator release from mast cells & results coughing, tightness in chest, breathlessness etc (17).

- *Yavasa* (18): *Alhagi camelorum* showed biological activities like Anti-oxidant, Anti-inflammatory, Anti-spasmodic, Anti-pyretic, Anti-bacterial. These properties may relieved the symptoms.
- *Bharangi* (19,20): *Clerodendrum Serratum* proved its Anti-asthmatic, Bronchodilator, Hepatoprotective, Anti- allergic, Anti-inflammatory, Vasorelaxant and Anti- thirst properties.
- *Tila Taila* (21,22): By virtue of *snigdha, ushna, madhura, guru* properties leads to *Vata dosha shamana* and reduces frequency of Kasa.
- *Karkatashringi* (23,24): Useful for the treatment of Asthma, Chronic Bronchitis, Fever due to its Anti-spasmodic, carminative properties. *Pistacia integerrima* reveals the Anti-oxidant, Analgesic and Anti-inflammatory effects.
- *Pippali* (25,26): *Piper longum* has Anti-inflammatory, Anti-bacterial, Cough suppressor, Anti-spasmodic, Immunostimulatory and *Deepana, Pachana* properties. These properties may helped in relieving the symptoms of Kasa.
- *Shati* (27):-The phytochemical composition present in the extract of rhizome of *Hedychium spicatum* showed significant Anti-oxidant, Anti-inflammatory, Anti-asthmatic, Anti-allergic properties.
- *Musta* (28): Extract of the rhizomes of *Cyperus rotundus* showed Anti-inflammatory activity, Anti-pyretic and Analgesic effects similar to acetyl salicylic acid and improves appetite and digestion. It also shown antimicrobial action against microbes
- *Guda* (29):- It is *Tridosahara, Agnideepana, Ruchya, Pushtikara and Vibandhaghna*. It is a good source of vitamins and minerals and is beneficial in treating throat and lung infections. It acts as demulcent, cleanses stomach and helps in digestion. *Guda*(Jaggery) contains natural source of Vit.C which is highly effective Anti-oxidant and helps in fighting cold and various inflammatory factors in the body.
- AEC may reduced by Anti-allergic, Anti-histaminic and Anti-oxidant effect of *Shati, Bharangi and Karkatashringi* (30, 31).

Aparajit avaleha showed promising results in Vataja Kasa. So avaleha can be a better choice for administration of drug due to its palatability and better results.

Suhas Chaudhary et al also concluded the statistically significant efficacy of Vasa Avaleha in Doshik Kasa in children.

Conclusion

- *Aparajit Avaleha* showed statistically significant relief in subjective as well as objective parameters of *Vataja Kasa* in children.
- *Aparajit Avaleha* is effective in the management of *Vataja Kasa* in children.
- It accepts alternate hypothesis and rejects null hypothesis.

Future Scope

- Clinical study can be conducted on different age group children.
- Clinical trial can be conducted on comparison with standard control drug.
- Clinical trial can be conducted on large sample size.
- Different forms of medicines can be prepared.

Limitation of the study

- Less sample size
- Lack of comparator group
- Limited to childhood age group only

Adverse drug reactions

No any adverse drug reaction was observed during the study period.

Conflict of interest

All the authors hereby declares there is no conflict of interest.

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