



Research Article

A COMPARATIVE CLINICAL STUDY OF ASWAGANDHA KSHARA IN THE MANAGEMENT OF KAPHAJA KASA

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KEYWORDS: *Kaphaja kasa*, *Aswagandha kshara*, Acute bronchitis.

ABSTRACT

Kaphaja Kasa is most prevalent disorder of *Pranavaha Srotas*, if not treated properly; it can lead to serious diseases like *Swasa*, *Kshaya* etc. The cordial symptoms of *Kaphaja kasa* are *Kasa*, *Pinasa*, *Kaphasteevana*, *Jvara*, *Prabhutaghana*, *Snigdha* and *Bahala kapha*. It is equivalent to acute and chronic bronchitis in modern medicine is an airway inflammatory disorder. *Aswagandha* is a miracle and very common plant drug in our country mainly used in Ayurveda for different disease conditions and also as a preventive medicine. The method adopted in present study is randomized open label clinical trial before and after the treatment. A randomized clinical study was conducted on 30 patients with *Aswagandhakshara* prepared from different plant parts, patients were divided into three groups, each group consisting of 10 patients. In all subjects, history taking, clinical examination and laboratory investigations were done as per the case sheet proforma advocated by CCRAS, *Kshara* prepared from aerial parts shows extremely significant results on *Kaphasteevana*, *Pinasa*, Eosinophils, ESR level, very significant results in *Jvara*, TC, and ESR level, *Kshara* prepared from roots and aerial parts shown extremely significant result on *Pinasa* and ESR level, very significant results on *Kasa*, *Kaphasteevana*, Eosinophils and *Kshara* prepared from roots has shown very significant result on ESR level. The overall result showed that the medicine was effective in patients who were administered *Kshara* prepared from aerial parts.

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INTRODUCTION

Kasa is a symptom in almost all diseases caused by *Pranavahasrotas*. Now a days *Kaphaja kasa* is one of the common prevalent disease. Mainly intake of *Guru*, *Abhishyanda* (Ingredients which cause obstruction to the channels of circulation), *Madhura*, *Snigdhaahara*, excessive sleep, indolence and exposure to *Raja* and *Dhuma*.^[2] These factors result in the vitiation of *Kapha* which creates an obstruction for the movement of *Pranavayu*, moves upwards, afflicts the channels of circulation in the upper part of the body, takes over the functions of *Udanavayu* and settles in throat and the chest, thus producing abnormal sound along with sputum expectoration.^[3] *Acharya Susruta* narrates *Prakopa* of *Prana* and *Udanavayu* causes abnormal, forceful expulsion of *Vayu* from the mouth creating a peculiar sound similar to that of sound produced by broken bronze vessel.^[4]

Symptoms includes coating of oral cavity, loss of appetite, running nose, feeling of fullness in the chest, feeling of heaviness of the body, debility, cough with thick, sticky, white sputum expectoration.^[5,6] Acute bronchitis short term inflammation of bronchus. The most common symptom is cough and other symptoms include coughing up mucus, wheezing, shortness of breath, fever, and chest discomfort.^[7]

Charaka and *Vagbhata*, in their treatises, while prescribing drugs in the treatment of *Kasa*, *Svasa* and *Hikka*, used this drug in the form of *Kshara* (*C.S.Chi.17/117* & *A.H.Chi. 4/38*). But they did not exactly mention from which part of the plant, *Kshara* is to be derived.^[8] *Aswagandha* belongs to the family *Solanaceae* to which, the other

famous plants like *Datura* and *Belladonna* belong to, in relieving the bronchospasm.

AIMS AND OBJECTIVES

To evaluate bronchodilation and expectoration activity of drug *Aswagandha* (*Withania somnifera* Dunal.) *Kshara*, derived from the aerial parts and roots in combination and also separately, while grouping the patients accordingly.

MATERIALS AND METHODS

Collection and preparation of medicine

The *Aswagandha* roots and Aerial parts were collected from cultivated fields of Guntakal, Anantapur district, A.P. These were then thoroughly cleaned. The dust from roots and aerial parts was completely removed.

Name of the Preparation: *Aswagandha Kshara*

Reference: *Sarangadhara Samhitha* (M.K 11/102-104)

Materials: *Aswagandha Roots* – 25kgs

Preparation of Root *kshara*

Aswagandha Aerial parts – 50kgs

Aswagandha whole plant- 30kgs

Water – Q.S

Principle: *Kshara Nirmana*

Apparatus: Gas stove, Iron mesh, Spatula, Iron vessels, *Khalwa yantra*, Measuring jar.

Selection of Patients

- Around 30 patients were selected from both of the sex between age group of 5-60 years.
- Respiratory problems mainly based on the signs and symptoms of *Kaphaja kasa* (Acute bronchitis) described in Ayurvedic as well as Modern texts in addition to the textual description, were selected for the present study
- The drug *Aswagandha kshara* processed for internal administration as per the classical texts at the Department of Rasa Shastra and Bhaisajya kalpana, S.V.Ayurvedic College, Tirupati.



Fig 1: Dried roots of *Aswagandha*



Fig 2: Roots subjected to fire



Fig 3: Collected root ash



Fig 4: Addition of water to root ash



Fig 5: Boiling superannate water of ash Formation of *Kshara Kshara* of roots

Preparation of Aerial Parts *Kshara*



Fig 6: Dried Aerial parts of *Aswagandha*



Fig 7: Aerial parts subjected to fire



Fig 8: Collected Aerial parts ash



Fig 9: Addition of water to Aerial parts ash



Fig 10: *Kshara* of Aerial parts



Preparation of Whole Plant *Kshara*



Fig 11: Whole plant subjected to fire

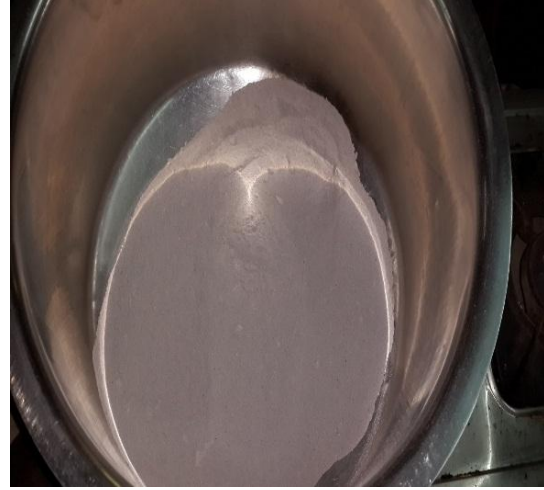


Fig 12: Collected whole plant ash



Fig 13: Supernate portion filtrate



Fig 14: Boiling the filtrate



Fig 15: Whole plant *Kshara*

Inclusion criteria

- Patients suffering from *Kaphaja Kasa* (productive bronchitis) in the age group of 5-60 years.
- Patients willing for the treatment were selected.

Exclusion Criteria

- Patients below 5 years and above 60 years.
- Patients suffering from any cardiac ailments.
- Patients suffering from any other serious diseases like Tuberculosis etc.
- Those who are very weak and disabled.

General investigations

- Routine Hematological

Blood

1. TLC, DLC, ESR (1st hour), Hb%
2. X-ray chest
3. Sputum for AFB

Method of Research

The method adopted in present study is randomized open label clinical trial before and after the treatment. The study had a due clearance from the Institutional Ethics Committee.

Subjective Parameters

Patients were assessed before and after treatment for subjective and objective parameters.

Assessment was totally based on the changes in the clinical features of *Kaphaja kasa* and improvement in scoring index of *Kasa*, *Kaphasteevana*, *Pinasa* and *Jvara* etc.

Kaphaja kasa rating scale

1. Cough/Kasa

Symptom	Grade
No cough	: 0
Cough once or twice	: 1
Severe cough continuous	: 2
Cough disturbing daily activities	: 3

2. Kaphasteevana (sputum colour)

Symptom	Grade
No sputum	: 0
White colour sputum	: 1
Greenish yellow colour	: 2
Yellow	: 3

3. Pinasa

Symptom	Grade
No secretion	: 0
Watery secretion	: 1

Thick secretion	: 2
Very thick secretion	: 3

4. Jvara

Symptom	Grade
Temperature 99 ^o f	: 0
Temperature between 99 ^o f to 100 ^o f	: 1
Temperature between 100 ^o f to 102 ^o f	: 2
Temperature above 102 ^o f	: 3

Grouping and posology

Patients will be divided into three groups, each group consisting of 10 patients.

- Group R: Finely prepared *Aswagandha kshara* from roots is given to the patient
- Group A: Finely prepared *Aswagandha kshara* from aerial parts is given to the patient
- Group R and A: Finely prepared *Aswagandha kshara* from total plant is given to the patient

Dose: 1 gram/ day (O.D)

Anupana: warm water

Follow up

The duration of treatment was 15-20 days and then follow-up at the interval of every 10 day.

Statistical Evaluation of Results

The obtained information was analysed statistically in terms of mean score (x), Standard Deviation (S.D.), Standard Error (S.E.). Paired t-test was carried out at the level of 0.05, 0.001, and 0.0001 of P levels. For the more effectiveness of therapy paired t-test is carried out. The results were interpreted as

- a) P >0.05: Insignificant
- b) P <0.05: Significant
- c) P < 0.001: Very significant
- d) P <0.0001: Extremely significant

OBSERVATION AND RESULTS

Table 1: Shows the Effect of *Aswagandha kshara* prepared from different plant parts in *Kasa*

Group	N	Mean			SD		SEM		SE	t-value	p-value	Significance
		BT	AT	%	BT	AT	BT	AT				
R	10	2.1	1.4	33	0.32	0.97	0.1	0.31	0.26	2.688	0.0248	Significant
A	10	2.3	0.3	86	0.48	0.48	0.15	0.15	0.21	9.4868	0.0001	Extremely significant
R&A	10	2.1	1.2	42	0.32	0.92	0.1	0.29	0.27	3.2504	0.01	Very significant

Table 2: Shows the Effect of *Aswagandhakshara* prepared from different plant parts in *Kaphasteevana*

Group	N	Mean			SD		SEM		SE	t-value	p-value	significance
		BT	AT	%	BT	AT	BT	AT				
R	10	2	1.5	25	0.47	0.85	0.15	0.27	0.167	3	0.015	Significant
A	10	2.3	0.4	83	0.48	0.52	0.15	0.16	0.18	10.5846	0.0001	Extremely significant
R&A	10	2.1	1.1	48	0.57	0.57	0.18	0.18	0.211	4.7434	0.0011	Very significant

Table 3: Shows the Effect of *Aswagandha kshara* prepared from different plant parts in *Pinasa*

Group	N	Mean			SD		SEM		SE	t-value	p-value	Significance
		BT	AT	%	BT	AT	BT	AT				
R	10	2	1.5	25	0	0.53	0	0.17	0.167	3	0.015	Significant
A	10	2.1	0.5	70	0.32	0.53	0.1	0.17	0.163	9.798	0.0001	Extremely significant
R&A	10	2	1.9	50	0	0.32	0	0.1	0.1	11	0.0001	Extremely significant

Table 4: Shows the Effect of *Aswagandha kshara* prepared from different plant parts in *Jvara*

Group	N	Mean			SD		SEM		SE	t-value	p-value	Significance
		BT	AT	%	BT	AT	BT	AT				
R	10	0.4	0.1	75	0.7	0.32	0.22	0.1	0.153	1.964	0.0811	Not significant
A	10	1	0.1	90	0.94	0.32	0.3	0.1	0.277	3.2504	0.01	Very significant
R&A	10	0.6	0	100	0.7	0	0.22	0	0.221	2.7136	0.0239	Significant

Table 5: Showing effect of medicine on TC of all the three groups

Group	Mean			SD		SEM		SE	t-value	p-value	Significance
	BT	AT	%	BT	AT	BT	AT				
R	7300.90	8540	4.15	3.17	1658.11	1001.94	524.34	874.87	1.42	0.1903	Not Significant
A	8050.00	917	14	142.70	1052.04	451.48	332.68	316.16	3.54	0.0063	Very significant
R&A	8100.00	8290	2.35	586.89	850.42	185.59	268.93	138.60	1.37	0.2036	Not significant

Table 6: Showing effect of medicine on Eosinophils of all the three groups

Group	N	Mean			SD		SEM		SE	t-value	p-value	Significance
		BT	AT	%	BT	AT	BT	AT				
R	10	7.30	6.30	12.33	1.89	1.34	0.60	0.42	0.37	2.74	0.0229	Significant
A	10	7.90	5.30	33.00	1.20	1.25	0.38	0.40	0.37	7.00	0.0001	Extremely significant
R&A	10	7.50	5.30	29.33	1.27	1.16	0.40	0.37	0.53	4.13	0.0026	Very significant

Table 7: Showing effect of medicine on ESR of all the three groups

Group	N	Mean			SD		SEM		SE	t-value	p-value	Significance
		BT	AT	%	BT	AT	BT	AT				
R	10	49.90	41.20	17.43	9.85	8.99	3.11	2.84	1.89	4.60	0.0013	Very significant
A	10	47.00	28.00	40.43	13.98	7.53	4.42	2.38	2.96	6.41	0.0001	Extremely significant
R&A	10	46.30	33.10	28.51	10.71	12.64	3.39	4.00	1.46	9.05	0.0001	Extremely significant

Interpretation of Results in Group A, Group R and A, and Group R

Kasa

Aswagandha kshara showed statistically significant effect with 33% of relief in group R, at p value 0.0248. *Aswaganda kshara* prepared from aerial parts has shown extremely significant effect with 86% of relief in group A at p value 0.0001 and it has shown very significant effect with 42% of relief in group A and R at p value 0.01.

Kaphasteevana

Aswagandha kshara prepared from roots showed significant effect with 25% of relief in group R, at p value 0.015. *Aswaganda kshara* prepared from aerial parts has shown extremely significant with 83% of relief in group A at p value 0.0001 and *Aswagandha kshara* prepared roots and aerial parts has shown very significant effect with 48% of relief in group A and R at p value 0.0011.

Pinasa

Aswagandha kshara significant effect with 25% of relief in group R, at p value 0.015. In group A, has shown extremely significant effect with 70% of relief at p value 0.0001 and it has shown extremely significant effect with 50% of relief in group A and R at p value 0.0001.

Jvara

Aswagandha kshara showed significant effect with 75% of relief in group R, at p value 0.0811. In group A *Kshara* has shown very

significant effect with 90% of relief at p value 0.01 and in group A and R it has shown significant effect with 100% of relief at p value 0.0239.

Effect of medicine on TC of all the three groups

On TC it has shown not significant (p value 0.1903) result in group R with 4.5% of increase. In group A it has shown very significant (p value 0.0063) result with 14% of increase, and in group R&A has shown not significant (p value 0.2036) result with 2.35 % of increase in number of cells.

Effect of medicine on Eosinophils of all the three groups

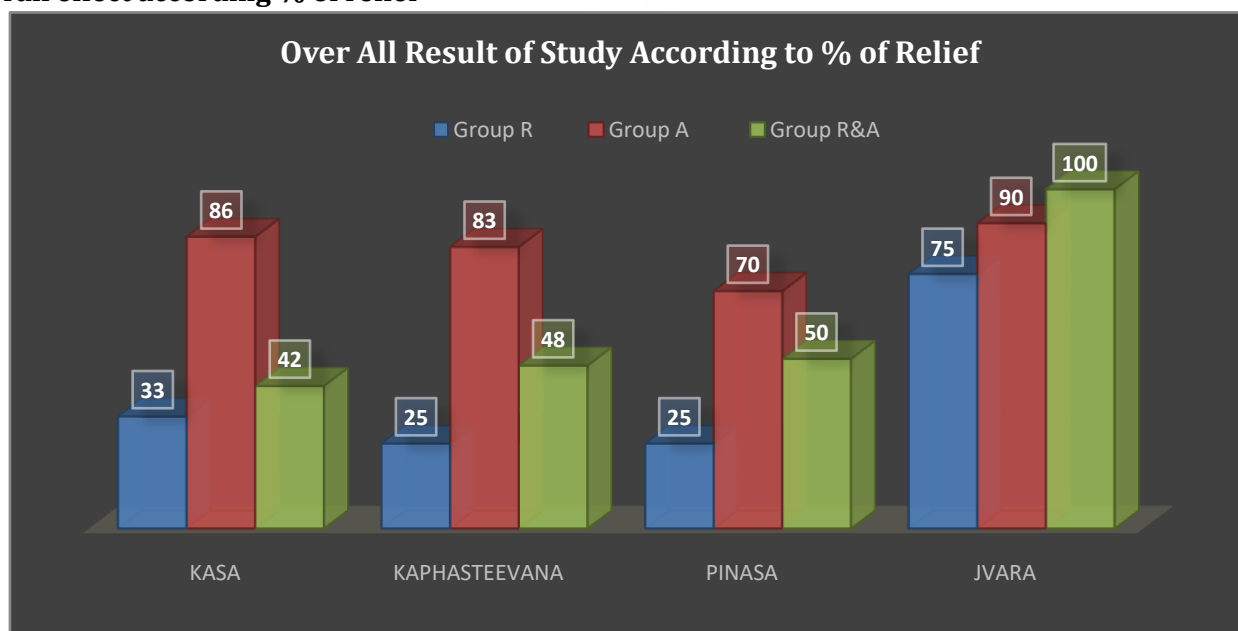
On eosinophils it has shown significant (p value 0.0229) result in group R with 12.3% of reduction. In group A it has shown extremely significant (p value 0.0001) result with 33% of reduction, and in group R and A has shown very significant (p value 0.0026) result with 29.33 % of reduction in cells.

Effect of medicine on ESR of all the three groups

Aswagandha kshara on ESR levels shows very significant (p value 0.0013) result in group R with 17.4% of reduction. It has shown extremely significant (p value 0.0001) result in group A with 40.43% of reduction, and in group R and A has shown extremely significant (p value 0.0001) result with 28.51 % of reduction in ESR levels.

Overall Result of Study

Overall effect according % of relief



The overall result showed that the medicine was effective for Group A patients who were administered *Kshara* prepared from aerial parts. The next place of relief is for Group A and R, who were given the *Kshara* prepared from the roots and aerial parts. The minimum relief was observed in group R, for whom, *Kshara* prepared only from the roots was given.

Table 8: Effect of Medicine on Group ‘R’ Patients

Assessment	No. of Patients	% of patients
Completely Relieved	0	0%
Markedly Relieved	3	30%
Moderately Relieved	3	30%
Unchanged	4	40%

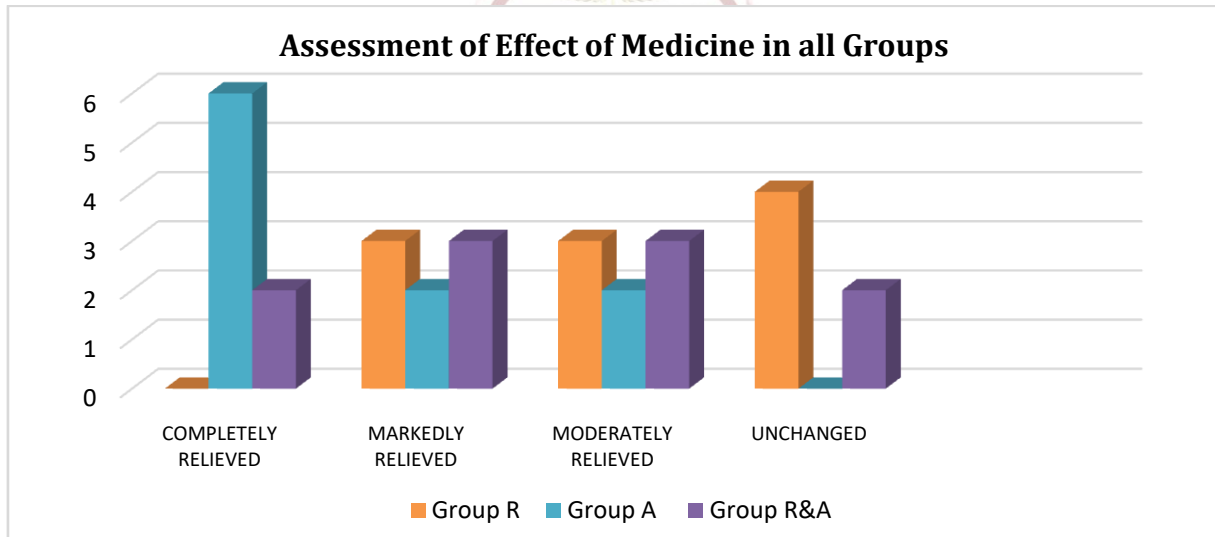
Table 9: Effect of Medicine on Group ‘A’ Patients

Assessment	No. of Patients	% of patients
Completely Relieved	6	60%
Markedly Relieved	2	20%
Moderately Relieved	2	20%
Unchanged	0	0%

Table 10: Effect of Medicine on Group ‘R & A’ Patients

Assessment	No. of Patients	% of patients
Completely Relieved	2	20%
Markedly Relieved	3	30%
Moderately Relieved	3	30%
Unchanged	2	20%

Graph 1: Showing Assessment of effect of Medicine in Group R, Group A and Group A & R



On assessment, completely relieved patients are 6 from Group “A”. And from the same group A, markedly relieved patients are 2 and moderately relieved are 2.

From Group “R” there are no completely relieved patients, markedly relieved are 3 and moderately relieved are 3. Patients with no change are 4 in number.

From Group R and A completely, relieved patients are 2 and markedly relieved are 3. Moderately relieved patients are 3 and those who didn’t show any change are 2 in number.

DISCUSSION

Charaka and Vagbhata, in their treatises, while prescribing drugs in the treatment of *Kasa, Svasa and Hikka*, used this drug in the form of *Kshara* (*Ch.Chi.* 17/117 & *A.H.Chi.* 4/38). But they did not exactly mention from which part of the plant, *Kshara* to be derived. *Aswagandha* belongs to the family Solanaceae to which, the other famous plants like *Datura* and *Belladonna* belong to, in relieving the bronchospasm. Almost all Acharyas have mentioned *Kat u, Tikta, Kashaya Rasa, Laghu, Snigdha Guna, Usna Virya* and *Katu Vipaka*. *Aswagandha* is mainly *Vata Kapha shamaka, Balya* and *Rasayana*.

Katu Rasa has *Kapha Lekhana* and *Kapha Shamaka* property and *Deepana*, similarly *Tikta Rasa* has also *Lekhana* property. *Tikta Rasa* imparts firmness to the mucosa and muscle tissue, depletive and desiccant of moisture *Kapha*, and it is dry and helps in *Pachana* and corrects *Udanavayu*. *Snigdha Guna* imparts energy to the body. *Laghu Guna Dravyas* impart their effect on body as *Lekhana*. It has *Usna Virya* and *Katu Vipaka*, *Laghu guna* helps in *Deepana*, and *Kapha vilayana*, relieves bronchospasm and expels the plugged mucosa from alveoli there by it clearing the airway and helps in proper breathing.

Aswagandha has *Deepana*, *Pachana*, *Vata Kapha hara* properties that control the initial *Ama* formation, which is very important in preventing the disease. The association of *Ama* with *Vata* will be neutralized by these actions. Once this is done, the *Vata kaphahara* action of the drug will pacify both the causative *Dosas* relieving the symptoms. The only *Samanyaguna* in *Vata* and *Kapha* is their *Sheetaguna*. *Aswagandha* is of *Ushnaveerya*, which will correct the *Dosik* pathology of both. This action of the drug pacifies both the causative *Dosas* there by relieving the symptoms.

Kshara possess *Usna*, *Tikshna*, *Laghu*, *Soshana*, *Pachana* and *Bhedana* due to these properties it acts as *Kaphachedana* and broncho-dialator.

Due its *Lekhana*, *Ksharana*, *vilayana*, *Sodhana* and *Soshana* properties it scrapes, melts, softens, liquefies, dissolves and expectorates the plugged mucosa.

Aswagandha is known for its potent anti-inflammatory, immunomodulatory, anti-stress activity, anti-tumor activity and anti-arthritis activity.

The main chemical constituents are alkaloids and steroidal lactones. These include tropine and cuscohygrine. The aerial parts of *Withania somnifera* yielded 5- dihydroxy withanolide-R and withasomniferin-A (Atta-ur-Rahman et al., 1991).

Biochemically roots contain heterogeneous alkaloids like Cuscohygrine (pyridine derivative), anahygrine, tropine, pseudotropine, anaferine, and new alkaloid visamine has been reported, (schwartz et al, Lloydia 1963).

They exhibit relaxant and antispasmodic effects against several spasmogens on intestinal, uterine, bronchial, tracheal and blood-vascular muscles. The pattern of smooth muscle activity of the alkaloids was similar to that of papaverine which suggested a direct mucosotropic action; both

as relaxant and spasmolytic, this pharmacological activity lends credence to the use of *Aswagandha* in respiratory problems in the Ayurvedic system. (Malhotra et al., Indian J. Physiol. Pharmacol., 1965).^[9]

CONCLUSION

- In *Samhitas*, '*Kshara*' is prescribed as a palliative preparation to treat *Kaphaja kasa*.
- Then, *Charaka* and *Vagbhata* have given *Aswagandha kshara* to effectively manage this disease.
- It is widely accepted that any *Kshara* is capable of dissolving plugged *Kapha dosa* to expel it out while creating a disease-free state.
- As *Aswagandha* belongs to the same family botanically as that of *Datura*, i.e., solanaceae the plant parts consist of chemical constituents like atropine, hyoscyamine etc., which act as mucolytic, anti-secretive and broncho-dilatory actions.
- On assessment of the entire study which is aimed primarily at the most efficacious part of the *Aswagandha* plant in the form of *Kshara*, it is observed that the *Kshara* prepared from aerial parts is exerting its action very efficiently in treating *Kaphaja kasa*. The *Kshara* prepared from the roots is not much effective but the *Kshara* prepared from whole plant is moderately effective.
- As the aerial parts after harvesting the roots of *Aswagandha* are discarded, they can be successfully used as a good therapeutic preparation for *Kaphaja kasa*. The preparation of *Kshara* is very easy and highly cost effective.
- Overall, *Aswagandhakshara* as prescribed by *Charaka* is proved to be highly effective in *Kaphaja kasa*.

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