

## ***A CLINICAL STUDY ON DEVADARVYADI YOGA IN THE MANAGEMENT OF KAPHAJA KASA IN CHILDREN***

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### **ABSTRACT**

Respiratory ailments in children are a leading clinical presentation in the coastal area with a high prevalence rate in the Udupi district of Karnataka, which can be attributed to the arid climate and food habits of the children. Children being of *Kapha* predominant, suffer especially from respiratory ailments. *Kaphaja Kasa* is a disease explained in *Ayurvedic* classics, which suggests numerous effective formulations in the therapeutic armamentarium with notable effects. *Ayurveda* explains the use of drugs which acts as *Lekhana* (Scraping), *Hrudya* (Palatable), *Swarya* (Voice promoters), *Tridoshagna* (Equilibrium of *doshas*) and *Rasayana* (Rejuvenative) resulting in long standing effect ensuring non-remission. In the present study, *Devadarvyadi Yoga*, a combination of *Devadaru*, *Abhaya*, *Mustha*, *Pippali* and *Shunti* prepared as a *Choorna* (Powder form), along with *Madhu* as Anupana (Adjuvants) was administered. The effect of *Devadarvyadi Yoga* in the management of *Kaphaja Kasa* was observed by administering the drug in a group of 30 children with the aid of clinical and Hematological parameters over a span of 15 days. The clinical study shows highly significant results in reduction of clinical symptoms of *Kaphaja Kasa* with the administration of *Devadarvyadi Yoga*.

**Keywords:** *KaphajaKasa*, *Devadarvyadi Yoga*, Respiratory disorders.

### **INTRODUCTION**

Children being the building blocks of the nation, are the most vulnerable group in the community, hence requires to be treated with care and concern.<sup>[1]</sup> *Kasa* is a disease which characteristically produces a typical sound of a

broken bronze vessel. In the pathogenesis of the disease, there is obstruction of *Prana* and *UdanaVayu* due to various reasons.<sup>[2]</sup> *Kasa* is one of the commonest symptoms of respiratory diseases noticed during the Pediatric prac-

tice. *KaphajaKasa* is one among the five varieties of *Kasa*. The life span of a human being is divided into three phases namely *Balya Avastha* (Young age), *Madhyama Avastha* (Middle age) and *JeernaAvastha* (Old age).<sup>[3]</sup> Each phase is represented by predominance of specific *Doshas*, among these, *Kapha* is predominant during childhood.<sup>[4]</sup>

Indulgence in *Kaphakaraaahara* and *Vihara* (Food and activities which aggregate *Kapha*) increases the incidence of *KaphajaKasa*. Excessive exposure to dust, pollens, cold environment, sleeping in daytime usually aggravates *KaphajaKasa*. Specific etiologies of *KaphajaKasa* are *Guru*(Heavy), *Abhishyandi* (Ingredients which cause obstruction to the channels of circulation), *Madhura* (Sweet), *Snigdha aahara* (Unctuous), *Swapna* (Excessive sleep) and *Vicheshtana* (Indolence). These factors results in the vitiation of *Kapha* which creates an obstruction for the movement of *Vata* producing *KaphajaKasa*.<sup>[5]</sup>

*KaphajaKasa* is the clinical entity in which there is coating of *Kapha* in mouth, *kapha-sampoornaura* (feeling of phlegm collected in the chest), aversion to food, feeling of heaviness of the body, debility, cough followed by thick *kapha* as sputum.<sup>[6]</sup>

Cough is the fifth common symptom for which patients seek care and its prevalence rate in children worldwide is 25%.The recurrence of the symptom leads to serious respiratory pathology and will gradually lead to complication. Many herbal combinations are described in *Ayurveda* and however their therapeutic effect in *Kasa* is yet to be explored. Hence, it is the need of the hour to bring out a permanent remedy which safe, cheap, effective and palatable in the management of pediatric cough.

Considering the above points, the present work is undertaken by choosing *Devadarvyadi Yoga* in *Choorna* form, which is indicated in *KaphajaKasa*.<sup>[7]</sup>

#### **OBJECTIVES:**

1. To study the concept of *KaphajaKasa* in detail.
2. To evaluate the efficacy of *Devadarvyadi Yoga* in the management of *KaphajaKasa* in children.

#### **MATERIALS AND METHODS**

##### **Study design:**

It is an open label clinical Study with pre-test and post-test design, patients were selected based on the inclusion criteria.

##### **Intervention:**

*Devadarvyadi Yoga* is prepared in *Choorna* form. This was administered to 31 patients including 1 drop out from the study. Drug dosage was fixed with help of Dilling's Formula<sup>[8]</sup>{Dilling's Formula- Age/20\* Adult dose (Adult dose =12 grams)}. The dose of 4 grams for 5 to 10 years and 8 grams for 10 to 15 years, both in divided doses, bid after food, *Madhu* as *Anupana* for 7 days was given.

##### **Follow up study:**

7 days were the follow up period. On the 15<sup>th</sup> day patient was asked to come to OPD for Evaluation.

##### **Pathya and Apathya (Diet and Habits):**

The patients were strictly advised to follow the restrictions regarding food, food habits and life style. They were instructed to avoid possible aggregation of the disease.

### **Inclusion criteria:**

Patients of either sex, with age group of 5 to 15 years and with any of the symptoms (two or more) described in the context of *Kaphaja-Kasa* were selected and taken for study.

### **Exclusion criteria:**

1. *Kasa*, other than *KaphajaKasa* were excluded.
2. *KaphajaKasa* as *Anubandha Lakshana* & *Upadrava* (complication) in other systemic diseases.
3. Patients with history of malignancy, or any other congenital, anatomical abnormalities of chest and respiratory system.
4. Pneumonia, Croup syndrome, Asthma.
5. During the study if symptoms like Vomiting, Itching, Diarrhoea is noticed then the study was discontinued in the selected patient.

### **ASSESSMENTCRITERIA:**

Clinical assessment was done on the basis of gradation of both the subjective and objective parameters. The gradation of the assessment parameters was done B.T (On 1<sup>st</sup> Day), A.T (On 8<sup>th</sup> Day) and at F.U (On 15<sup>th</sup> Day) and were taken for the Statistical Analysis. B.T- Before Treatment, A.T- After Treatment and F.U- Follow up.

#### ➤ **Subjective parameters:**

*Mandagni* (Suppression of the power of digestion), *Aruchi* (Anorexia), *Peenasa* (rhinitis), Disturbance in sleep, *Kasa* severity, *Nishteevana* (Expectoration), *Kaphasampoorna* (Phlegm fullness in the chest), Phonation, Sputum.<sup>[9]</sup>

#### ➤ **Objective parameters:**

Blood examination-HB %, Eosinophil, ESR and AEC.<sup>[10]</sup> X-ray was not necessary as severe conditions were not taken up during the study.

### **Gradation Index**

#### **1. Mandagni**

- 0 – Normal appetite after 3-6 hours of previous food taken
- 1 – Appetite after 6-9hours of previous food taken
- 2 - Appetite after 9-12hours of previous food taken
- 3 – No appetite after 12 hours of previous food taken

#### **2. Aruchi**

- 0 – Willing towards normal food
- 1 – Willing towards only most liked food and not to others
- 2 – Unwilling for food but could take meals only
- 3 – Totally unwilling for meals, does not take meal

#### **3. Peenasa**

- 0 – No nasal discharge
- 1 – Intermittent nasal discharge (watery)
- 2– Persistent nasal discharge (watery /Mucoid)
- 3– Persistent nasal discharge (thick /odoursome)

#### **4. Disturbance in sleep**

- 0- Cough not interfering sleep
- 1- Cough with occasionally disturbed sleep
- 2 -Gets Cough before sleeping and / or awakes him in the morning due to Cough
- 3 – Cough always disturbs sleep

#### **5. Kasa-Severity**

- 0 – No cough

1 – Brief exacerbation for few hours. Intermittent cough in the morning and/or after exercise or in connection with accelerated respiration, which does not inhibit routine activities

2 - Exacerbation for few hours in a day. Continuous cough during day as well as in the morning, which inhibits the routine activities

3 – Exacerbations throughout day and night. Continuous cough during day and night, which disturbs sleep and prohibits the routine activities

#### 6. Nishteavana (Expectoration)

0 – No expectoration

1 – Thick mucoid expectoration which is intermittent during cough

2 - Mucoid and sticky expectoration which is accompanied during cough

3 - Mucopurulent expectoration which is accompanied with each bout of cough

#### 7. Kaphasampoornaura

0 - No heaviness in the chest

1 - Feels heaviness in the chest but does not hamper routine activity

2 - Feels heaviness all over the chest which hampers movements of the body

#### 8. Phonation

0 – Not affected

1 – Change in the voice during morning hours, Pain in throat during speech

2 – Change in the voice throughout day and night, pain in throat able to speak only phrases

3- Unable to speak / speak only phrases with difficulty

#### 9. Sputum

The quality and consistency of sputum was observed and graded as follows

0 – No Sputum

1 – Serous expectoration with traces of thick sputum

2 – Moderately thick solid sputum

3 – Thick large quantity of solid sputum

#### Statistical Evaluation

Statistical analysis was carried out using Statistical package for social science (SPSS) version 20 (SPSS Inc. Chicago, IL, USA) Windows software program. Paired ‘t’ test was utilized. Mean score BT, AT and FU, SD, SEM, d, % of relief and ‘t’ was noted After obtaining ‘t’ value, the corresponding ‘P’ value against particular degree of freedom was noted on the Table of ‘t’. P value < 0.05 was considered as statistically significant, P < 0.01 very significant, P < 0.001 and P < 0.0001 was considered as highly significant. P value > 0.05 was considered as statistically non-significant.

#### Ethical Evaluation

This trial has been cleared by Institutional Ethical Committee Ref. No. SDMCAU/ACA-49/EC46/14-15

## OBSERVATIONS& RESULTS

### OBSERVATIONS

**Table 1:** Showing the Demographic Data

Parameters	Max. Incidence	No: of patients
Age	8 years	6
Sex	Male	20
Religion	Hindu	26
Education	1- 4 <sup>th</sup> Standard	17

Socio economic status	Middle class	13
Mode of onset	Sudden	16
Course of illness	Episodic	19
Maximum time of incidence	Night	19
Aggravating factors	SheethaAahara, Dust	14,11
Type of food	Vegetarian	16
Quantity of food	Madhyamamatra	18
Agni	Mandaagni	19
Koshta	Madhyama	26
Prakruti	Vatakapha	21
Vikruti- desha	Anoopadesha	28
Vikruti- dosha	Vatakaphadosha	29
Vikruti- dushya	Rasa dushya	18
Sara	Madhyamasara	28
Samhanana	Madhyamasamhanana	27
Pramana	Madhyamapramana	15
Satmya	Madhyamasatmya	20
Satwa	Avarasatwa	14
Aharashakti- abhyavaharashakti	Aharashakti – abhyavaharashaktiMadhyama	29
Aharashakti- jaranashakti	Aharashakti – jaranashaktiAvara	31
Vyayamashakti	Madhyamavyayamashakti	27
Vaya	Baalyaavastha	31

## RESULTS:

Following results were obtained within the group and the data observed BT (On 1<sup>st</sup> Day), AT (On 8<sup>th</sup> Day) and FU (On 15<sup>th</sup> Day) were compared by using paired ‘t’ test and the effect

of treatment was analyzed in each subjective and objective parameters. Statistical analysis was done using Statistical package for social science (SPSS) version 20 (SPSS Inc. Chicago, IL, USA) Windows software program.

## Subjective parameters

**Table 2:** Showing the effect on *Mandagni*

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	2.63	AT	1.56	1.067	40.5	0.56	0.10	16.00	<0.0001	Highly significant
		FU	0.50	2.13	80.9	0.68	0.12	16.00	<0.0001	Highly significant

**Table 3:** Showing the effect on *Aruchi*

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	2.50	AT	1.43	1.067	42.6	0.50	0.09	11.21	<0.0001	Highly significant
		FU	0.56	1.933	77.3	0.77	0.14	14.31	<0.0001	Highly significant

**Table 4:** Showing the effect on *Peenasa*

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.26	AT	1.26	1.00	44.2	0.69	0.12	14.74	<0.0001	Highly significant
		FU	0.30	1.96	86.7	0.53	0.09	13.32	<0.0001	Highly significant

**Table 5:** Showing the effect on Disturbance in sleep

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.86	AT	1.66	1.20	41.9	0.54	0.09	13.57	<0.0001	Highly significant
		FU	0.80	2.06	72.0	0.55	0.10	16.37	<0.0001	Highly significant

**Table 6:** Showing the effect on *Kasa - Severity*

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.53	AT	1.43	1.100	43.4	0.62	0.11	12.53	<0.0001	Highly significant
		FU	0.46	2.067	81.6	0.77	0.14	14.42	<0.0001	Highly significant

**Table 7:** Showing the effect on *Nishteevana*

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.70	AT	1.56	1.133	41.9	0.50	0.09	17.95	<0.0001	Highly significant
		FU	0.53	2.167	80.2	0.62	0.11	22.36	<0.0001	Highly significant

**Table 8:** Showing the effect on *Kaphasampoorna*

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	1.93	AT	0.93	1.000	51.8	0.25	0.04	-	-	-
		FU	0.36	1.567	81.1	0.49	0.08	17.02	<0.0001	Highly significant

**Table 9:** Showing the effect on Phonation

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.2	AT	1.13	1.067	48.5	0.50	0.09	23.02	<0.0001	Highly significant
		FU	0.40	1.80	81.8	0.56	0.10	20.36	<0.0001	Highly significant

**Table 10:** Showing the effect on Sputum

N	BT Mean			Diff d	%	Paired t test				significant
						SD	SEM	t	p	
30	2.56	AT	1.40	1.16	45.3	0.49	0.09	13.85	<0.0001	Highly significant
		FU	0.43	2.13	83.2	0.67	0.12	17.14	<0.0001	Highly significant

**Objective parameters****Table 11:** Showing the effect on Hemoglobin %

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	12.39	AT	12.44	- 0.043	0.34	0.78	0.14	0.585	0.5625	Non- Significant

**Table 12:** Showing the effect on Eosinophils

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	5.73	AT	4.46	1.267	22.1	1.30	0.23	3.357	0.0022	Very Significant

**Table 13:** Showing the effect on Erythrocyte sedimentation rate

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	19.16	AT	15.8	3.36	17.5	5.39	0.98	2.156	0.0395	Significant

**Table 14:** Showing the Effect on Absolute eosinophil count

N	BT Mean		Diff d	%	Paired t test				significant	
					SD	SEM	t	p		
30	392.79	AT	297.36	95.43	24.2	87.01	15.88	3.94	0.0005	Highly significant

SD- Standard Deviation, SEM- Standard Error Mean, t – Test of significance, P- Probability, > - More than, < - Less than, N- Sample size, 0,1,2,3 – Grades of severity, %- Percentage, Diff d- Difference, BT – Before Treatment, AT- After Treatment, FU- Follow Up.

In present study, after treating with *Devadarvyadi yoga* it showed 40.5% improvement in *Mandagni* (Suppression of the power of digestion), 42.6% in *Aruchi* (Anorexia), 44.2 % in *Peenasa* (rhinitis), 41.9 % in Disturbance in sleep, 43.4 % in *Kasa-Severity*, 41.9 % in *Nishteavana* (Expectoration), 51.8 % in *Kaphasampoornaura* (Phlegm fullness in the chest), 48.5 % in Phonation, 45.3% in Sputum. The effect of formulation on individual parameter showed better relief in *Mandagni* (Suppression of the power of digestion), *Aruchi* (Anorexia), *Peenasa* (rhinitis), Disturbance in sleep, *Kasa-Severity*, *Nishteavana* (Expectora-

tion), *Kaphasampoornaura* (Phlegm fullness in the chest), Phonation, Sputum, Hemoglobin and Absolute eosinophil count.

**Effect of Trial drug****Subjective parameters****a) Mandagni**

All drugs are known for their *Deepana - Pachana* (Carminative-Digestive) effect individually. Hence, the drug-*Devadarvyadi Yoga* shows *Deepana – Pachana* effect.

**b) Aruchi**

*Shamana Chikitsa* with *Devadarvyadi Yoga* was effective to control *Aruchi* in *Kaphaja Kasa*. All drugs have *Tikta* (Bitter), *Katu* (Acrid/Pungent), *Kashaya* (Astringent) *rasa* and *Katu* (Acrid/Pungent) or *Madhura* (Sweet) *Vipaka* (Metabolic end- effect) which helps to control *Aruchi*.

### c) *Peenasa*

Because of *Ruksha* (Coarse or Dry), *Ushna* (Hot) and *Laghu* (Light) *Guna* (Attributes/ Properties) of all the ingredients in this yoga, reduces congestion of respiratory tract. Hence was found effective to control *Peenasa* in *KaphajaKasa*.

### d) Disturbance in sleep

The drug has effect in decreasing dyspnea and cough during night hours which possibly have given better quality of sleep in the children. It may be due to *Deepana- Pachana* effect individually.

### e) *Kasa* – Severity

Because of *Kaphahara* and *Vatahara* properties of drugs and *Shamana* (Palliative therapy) property of *Devadarvyadi Yoga* was found to be effective to control severity in *KaphajaKasa*.

### f) *Nishteevana*

*Vata-Kaphahara* effect of the drugs in *Devadarvyadi Yoga* was found effective to control *Nishteevana* (Expectoration) in *KaphajaKasa*.

### g) *Kaphasampoornaura*

*Devadarvyadi Yoga* was found effective to control *Kaphasampoornaura* (Fullness in the chest) in *KaphajaKasa*. All drugs have *Tikta, Katu, Kashaya rasa* and *Katu* or *Madhuravipaka*. It helps to control *Kaphasampoornaura*.

### h) Phonation

*Vatahara* property of all the drugs in *Devadarvyadi yoga*, was found to be effective in controlling phonation in *KaphajaKasa*.

### i) Sputum

In this single group clinical study, highly significant improvement was observed in reducing sputum ( $P < 0.0001$ ). This may be because of the *Kapha* and *Vatahara* properties of drugs.

## Objective parameters

### Effect of *Devadarvyadi yoga* on

#### a) Hemoglobin %

After the treatment there is 0.34 % of increase in the level of Hb% (Hemoglobin %). The increased hematocrit levels shows the drug *Devadarvyadi yoga* to be effective in controlling the haemopoetic functions.

#### b) Eosinophils

After treatment, the value of eosinophils was reduced, this suggested that this drug may be helpful to decrease the allergic condition.

#### c) Erythrocyte sedimentation rate

Mean value ESR (Erythrocyte sedimentation rate) before treatment was 19.16 which came down to 15.8 after treatment. Statistically significant results were found in ESR at  $P = 0.0395$  with an improvement of 17.5 %. After treatment the reduced value suggested that this drug may be helpful to decrease the inflammation.

#### d) Absolute eosinophil count

Mean value AEC (Absolute eosinophil count) before treatment was 392.79 which came down to 297.36 after treatment. Statistically highly significant results were found in AEC at  $P = 0.005$  with an improvement of 24.2 %. After treatment, the reduced value suggested that this drug may be helpful to decrease the onset of allergic condition in the body.

## DISCUSSION

30 patients of *KaphajaKasa* in a single group received *Shamana Chikitsa* (palliative treatment) with *Devadarvyadi Yoga* in a dose as per age for a period of seven days. The effects of therapy are being discussed as follows.

The action of the drug might be due to the combined effect of all the drugs. *Kaphachedaka* (scrapping action) and *Kaphanisaraka*

(break down of *kapha*) properties helps in mitigation of the *Vatadosha* and subsequently alleviates the disease *KaphajaKasa*. All the drugs are having *Katu rasa*. *Kledopashoshana* (drying of *kapha*), *Kaphavilayana* (liquification of *kapha*), *Kaphanisarana* (break down of *kapha*) are the main characteristics features of *Katu rasa*. These properties help in the removal of excessive production of mucus secretion from the respiratory passages. Apart from this, being *Katu rasa pradhana yoga*, this also helps in easy absorption and easy assimilation of the drugs and it has *Kantashodana* (purification of throat) and *Aruchinashaka* (appetite enhancer) properties. So this helps in relieving the *kantodwamsa* (obstruction in throat) and loss of appetite associated with *KaphajaKasa* by the action of *Agni Deepana* (ignition of digestive fire) and *Amapachaka-Guna* (Proper digestion).

All the drugs except *Mustha*, have *Ushnaveerya* (hot potency), which helps in alleviating *Kapha* by its *Kaphavilayana* (liquification of *kapha*) property.

All the drugs are having *Vata* and *Kapha Shamaka* properties. This helps in alleviating *Prakupita* (aggravated) *Vata* and *Kapha* and thereby it causes relief of *Srothovarodha* (obstruction of channels) and *Kaphavilayana* (liquification of *kapha*). In this way it helps in *Samprapthi Vighatana* (regaining of physiology) and thus relieving the signs and symptoms associated with *KaphajaKasa*.

## CONCLUSION

*Kasa* is one among *Pranavaha Srothovikara* (respiratory tract infection). *Kapha* and *Vata doshas* have an important role in manifestation of this disease. *Kapha* and *vataprakopakaAhaviharana* (factors for aggravation of *kapha* and

*vata*) acts as the *Utpadakahetu* (productive cause), while exposure to *raja* (dust), *dhooma* (fumes) was observed as *Vyanjakahetu* (distant cause) in causation of *KaphajaKasa*. It can be compared to acute inflammatory condition of respiratory tract along with, cough with expectoration which is secondary to infection. The drugs in this yoga possess *Deepana* (digestive), *Kaphavatahara* property as well as *Hrudya* (palatable) and *Rasayana* (*rejuvenative*) property. The probable mode of effect of *Devadarvyadi Yoga Choorna* may be due to the *Vata* and *Kaphasamaka* alleviating properties of all the drugs. It helps in alleviating *Prakupita* (aggravated) *Vata* and *Kapha* and thereby it causes relief in *Srothovarodha* (obstruction of channels) and *Kaphavilayana* (liquification of *kapha*). In this way, it helps in *Samprapthi Vighatana* (regaining of physiology) of the disease. The drug was well tolerated by children and there were no adverse effects reported. It is cost effective, easily administrable and safe in children. So it can be concluded that the drug *Devadarvyadi yoga* can be a drug of choice in the management of *KaphajaKasa* in children.

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