



Research Article

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**EVALUATION OF ANTITUSSIVE EFFECT OF SHUSHKA KASAHARA ARKA AND TUSQ-DX IN CHILDREN WITH NONPRODUCTIVE COUGH-A RANDOMIZED COMPARATIVE CLINICAL TRAIL**Shankar<sup>1</sup>, Suryanarayana M<sup>2</sup>, Rashmi M. N<sup>3</sup>, Radhika Injamuri<sup>4</sup>PG Scholar<sup>1</sup>, Guide<sup>3</sup>, Asso.Prof<sup>2</sup>, Co-guide<sup>4</sup>, Dept of Kaumarabhritya, SJG Ayurvedic medical college, Koppal, KarnatakaCorresponding Author: [saradagishankarss@gmail.com](mailto:saradagishankarss@gmail.com)<https://doi.org/10.46607/iamj06p7012022>

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**ABSTRACT**

*Kasa* is one of the most frequent symptoms in children, which disturbs the child's day-to-day activities, also disturbs sleep, and makes them visit the hospital. Children are most susceptible to *kasa* due to their *alpa balatwa* (low Immunity), *Mrudu prakruti*. Among them, *Vataja kasa* has more incidence level. So, an effort was made to know the efficacy of *Shushka Kasahara arka* and Tus Q-dx syrup in *Vataja kasa* i.e., non-productive cough management. **Objectives:** To evaluate the effect of *Shushka Kasahara Arka* in *Vataja Kasa* in children and the treatment effect of *Shushka Kasahara Arka* and Tus Q-DX in the remission of the symptoms. **Method:** A total of 40 patients were selected and assigned into two equal groups, Group-A and Group-B with inclusion and exclusion criteria designed for the study. **Intervention: Group A-***Shushka Kasahara Arka* was given 12-24ml in divided doses according to age with *anupana madhu*. **Group B-**TusQ-DX syrup was given after calculating the dosage based on the body weight of the child. **Conclusion:** Based on the results obtained, it is observed that Group-A which was the trail group has shown better results in treating the *vataja kasa* compared to Group-B without any complications.

**Key words:** *Vataja kasa*, *Non-productive cough*, *Shushka Kasahara Arka*, *Vataja kasa*

## INTRODUCTION

The respiratory system is most vulnerable to infections and is considered the prime victim of hyper sensitization in most circumstances. In that non-productive cough is a common URTI now a days. Certain diseases may not be life-threatening but increasingly annoying and irritating to the individual in routine activity. Among them, Cough (*Kasa*) is one of the most common complaints, prompting patients visit to health care professionals especially pediatricians, physicians, etc.

Even though the cough is a protective reflex, it is one of the most frequent symptoms in children, which disturbs the child's day-to-day activities, also disturbs sleep, and makes them visit the hospital. Cough resulting from URTI is a distressing symptom hence empiric treatment with antitussive agents is often used. Cough can be correlated to the description of *Kasa* in Ayurveda. So, in this regard, there is a need to understand the *Kasa* in detail, especially *Vataja Kasa*, which is very common in children.

Hence, there is a need to search for a drug that is cost-effective, palatable, and easy to administer in the

pediatric age group of *Vataja Kasa* i.e., *Shushka kasa* (non-productive cough). Ark preparation is the method of extracting the essence from the medicinal plants extensively adopted in the Ayurveda system of medicine. It is one of the unique preparations which is mentioned in *Arka Kalpana* of *Arka Prakasha* since 18<sup>th</sup> C.A.D. *Shushka kasahara arka* is one among the *arkakalpana* which is explained for *shushka kasa* (*vataja kasa*). *Shushka kasahara arka* is the combination of *brihatkantakari*, *laghukantakari*, *draksha*, *vasa*, *Kacchura*, *nagara*, *pippali* and *khakhas* having *Vatakaphaghna Guna*, *ushna veerya* and *katu vipaka*. Hence effort has been made to study the effect of *Shushka kasahara arka* in *vataja kasa* (nonproductive cough).

### AIM AND OBJECTIVES:

- To evaluate the effect of *Shushka kasahara Arka* in *Vataja Kasa* in children.
- To compare the treatment effect of *Shushka Kasahara Arka* and *TusQ-DX* in the remission of the symptoms of nonproductive cough.

## METHADODOLOGY:

**Table no:1- Composition of Shushka Kasahara Arka<sup>1</sup>**

Sr.no	DRUG	BOTANICAL NAME	QUANTITY
1	Brihatkantakari	Solanum indicum	one part
2	Laghukantakari	Solanum surattense	one part
3	Draksha	Vitisvinifera	one part
4	Vasa	Adhatoda vasica	one part
5	Karchura	Curcuma zedoria	one part
6	Nagara	Zingiber officinale	one part
7	Pippali	Piper longum	one part
8	Khakhasa	Papaver somniferum	one part

### **Method of Arka preparation:**

#### **Drug materials: -**

1. Essential drugs from which *Arka* obtained- 1 part (each 5gm).
2. Water- 10 parts.

#### **Method of preparation of *Shushka kasahara Arka*:**

All the raw drugs were made into a coarse powder form and later, 400 ml of cold water was poured and mixed up well. It was stored in an airtight container for 12 hrs (the previous day night of medicine preparation). The next day stored medicines were put into *arka yantra* (distillation apparatus), the distillation process started with 800C heat, and finally, 50% (200

ml) of arka was collected, after cooling arka was stored in an airtight container. **Preparation of the medicine:** The selected drugs will be identified as per guidelines given in Indian pharmacopeia described

and collected from the local region and prepared with prerequisite standard procedure in the department of Rasa Shastra and Bhaisajya kalpana of S.J.G. Ayurvedic medical college.

**Table no:2- Composition of TusQ-dx syrup:**

Sr no	Ingredients	Dosage
1	Dextromethorphan	1-2mg/kg/day/8 hourly
2	Chlorpheniramine maleate	0.35mg/kg/day every 4-6 hourly
3	Phenylephrine	4-6yrs: 2.5mg/4 <sup>th</sup> hr 6-11yrs; 5mg/4 <sup>th</sup> hr

**METHOD OF COLLECTION OF DATA:**

**Study design:**

In a clinical study with a total number of 40 children with a nonproductive cough who comes to OPD,

swarna prashana camps of Kaumarabhritya department of SJGAMC, fulfilling the inclusion criteria were selected and randomly allocated into two equal groups A and B of 20 children each.

**Table no:3- PLAN FOR STUDY:**

GROUPS	GROUP A	GROUP B
SAMPLE SIZE	20	20
MEDICINE	Shushka Kasahara Arka	TusQ-DX syrup
DOSAGE	12-24ml in divided dose according to age group	Given after calculating the dosage based on the body weight of the child
DURATION	7 days	7 days
ADMINISTRATION TIME	After food	After food

**STUDY DURATION:**

Treatment duration- 7 days.

Follow-up duration- 14 days.

Total duration- 21 days.

**ASSESSMENT CRITERIA:**

Assessment will be based on the following parameters-The subjective and objective parameters will be assessed on day 1(baseline-before treatment) and day 7(end of treatment) and at follow-up (after 14 days). Clinical outcome assessment parameters were included in the study.

**SUBJECTIVE PARAMETERS-**

1. The severity of the cough scores<sup>5</sup>
2. Leicester cough questionnaires<sup>6</sup>

**RESULTS:**

Statistical analysis was done by using the Mann-Whitney U test and Wilcoxon signed ranks test.

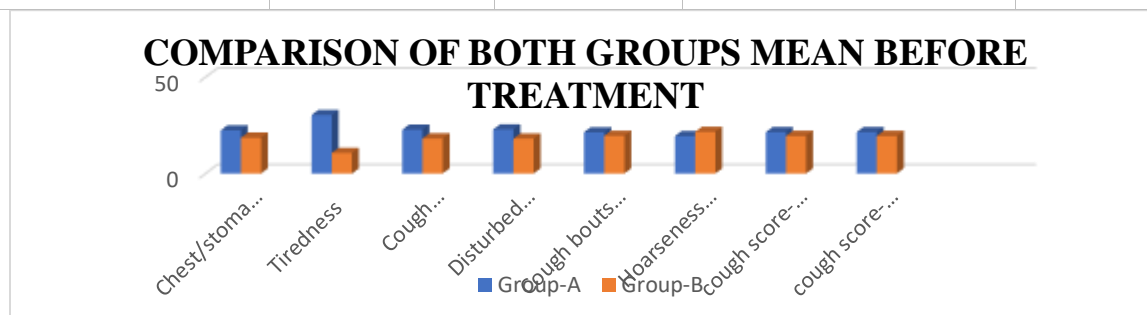
**MANN-WHITNEY U TEST:**

TO COMPARE THE RESULTS BETWEEN THE TWO GROUPS i.e., GROUP-A AND GROUP-B.

**Table 04: Comparison of Both the Groups- Before Treatment**

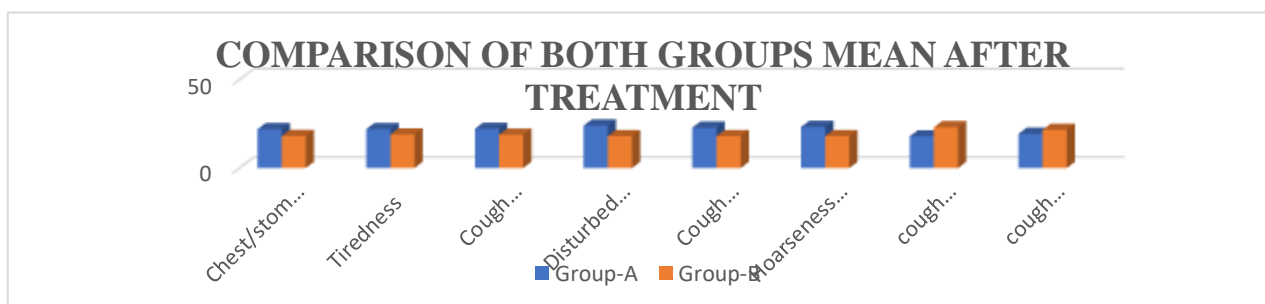
PARAMETRE	GROUPS	N	MEAN RANK	SUM OF RANKS
Chest/stomach pain	GROUP-A	20	22.40	448.00
	GROUP-B	20	18.60	372.00
Tiredness due to cough	GROUP-A	20	30.35	607.00
	GROUP-B	20	10.65	213.00

<b>Cough interfered with daily task</b>	GROUP-A	20	22.80	456.00
	GROUP-B	20	18.20	364.00
<b>Disturbed sleep</b>	GROUP-A	20	22.90	458.00
	GROUP-B	20	18.10	362.00
<b>No. of cough bouts</b>	GROUP-A	20	21.40	428.00
	GROUP-B	20	19.60	392.00
<b>Hoarseness of voice</b>	GROUP-A	20	19.40	388.00
	GROUP-B	20	21.60	432.00
<b>Cough symptom score- day</b>	GROUP-A	20	21.50	430.00
	GROUP-B	20	19.50	390.00
<b>Cough symptom score- night</b>	GROUP-A	20	21.50	430.00
	GROUP-B	20	19.50	390.00



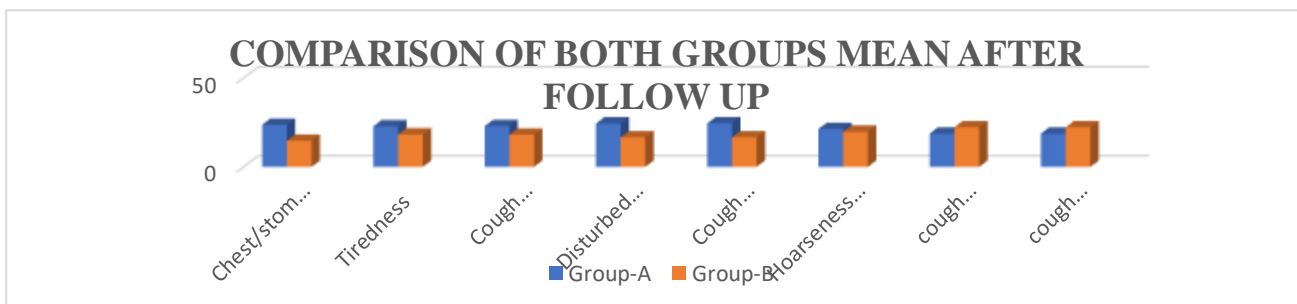
**Table no:5- COMPARISON OF BOTH THE GROUPS- AFTER TREATMENT**

PARAMETRE	GROUPS	N	MEAN RANK	SUM OF RANKS
<b>Chest/stomach pain</b>	GROUP-A	20	23.60	472.00
	GROUP-B	20	17.40	348.00
<b>Tiredness due to cough</b>	GROUP-A	20	22.78	455.50
	GROUP-B	20	18.23	364.50
<b>Cough interfered with daily task</b>	GROUP-A	20	22.95	459.00
	GROUP-B	20	18.05	361.00
<b>Disturbed sleep</b>	GROUP-A	20	24.38	487.50
	GROUP-B	20	16.63	332.50
<b>No. of cough bouts</b>	GROUP-A	20	24.45	489.00
	GROUP-B	20	16.55	331.00
<b>Hoarseness of voice</b>	GROUP-A	20	21.30	426.00
	GROUP-B	20	19.70	394.00
<b>Cough symptom score- day</b>	GROUP-A	20	17.90	358.00
	GROUP-B	20	23.10	462.00
<b>Cough symptom score- night</b>	GROUP-A	20	19.40	388.00
	GROUP-B	20	21.60	432.00



**Table 06: Comparison of Both the Groups- After Follow Up**

PARAMETRE	GROUPS	N	MEAN RANK	SUM OF RANKS
Chest/stomach pain	GROUP-A	20	21.93	438.50
	GROUP-B	20	19.08	381.50
Tiredness due to cough	GROUP-A	20	22.05	441.00
	GROUP-B	20	18.95	379.00
Cough interfered with daily task	GROUP-A	20	22.20	444.00
	GROUP-B	20	18.80	376.00
Disturbed sleep	GROUP-A	20	24.05	481.00
	GROUP-B	20	16.95	339.00
No. of cough bouts	GROUP-A	20	22.85	457.00
	GROUP-B	20	18.15	363.00
Hoarseness of voice	GROUP-A	20	23.23	464.50
	GROUP-B	20	17.78	355.50
Cough symptom score- day	GROUP-A	20	18.70	374.00
	GROUP-B	20	22.30	446.00
Cough symptom score- night	GROUP-A	20	18.70	374.00
	GROUP-B	20	22.30	446.00



**Table 07: Test Statistics: Before & After treatment and after following up**

Parameter		Mann-Whitney U test	Wilcoxon w	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
Chest/stomach pain	B. T	162.000	372.000	-1.095	.273	.314 <sup>b</sup>
	A. T	138.000	348.000	-1.928	.054	.096 <sup>b</sup>
	A. F	171.5	381.500	-1.165	.244	.445 <sup>b</sup>
Tiredness due to cough	B. T	3.000	213.000	-5.731	.000	.000 <sup>b</sup>
	A. T	154.5	364.000	-1.343	.179	.221 <sup>b</sup>
	A. F	169.000	379.000	-1.019	.308	.414 <sup>b</sup>
Cough interfered with daily task	B. T	154.000	364.000	-1.352	.126	.221 <sup>b</sup>
	A. T	151.000	361.000	-1.452	.146	.192 <sup>b</sup>
	A. F	166.000	376.000	-1.092	.275	.369 <sup>b</sup>
Disturbed sleep due to cough	B. T	152.000	362.000	-1.535	.125	.201 <sup>b</sup>
	A. T	122.000	332.000	-2.222	.026	.035 <sup>b</sup>
	A. F	129.000	339.000	-2.207	.027	.056 <sup>b</sup>
Number of cough bouts	B. T	182.000	392.000	-.698	.485	.640 <sup>b</sup>
	A. T	121.000	331.000	-2.372	.018	.033 <sup>b</sup>
	A. F	153.000	363.000	-1.436	.151	.211 <sup>b</sup>
Hoarseness of voice	B. T	178.000	388.000	-.644	.520	.565 <sup>b</sup>
	A. T	184.000	394.000	-.469	.639	.678 <sup>b</sup>
	A. F	145.000	355.500	-1.886	.059	.142 <sup>b</sup>
Cough symptom score- day	B. T	180.000	390.000	-0.681	0.496	0.602
	A. T	148.000	358.000	-1.571	0.116	0.222
	A. F	164.000	374.000	-1.221	0.222	0.341
Cough symptom score-night	B. T	180.000	390.000	-0.637	0.524	0.602
	A. T	178.000	388.000	-0.669	0.503	0.565
	A. F	164.000	374.000	-1.221	0.222	0.341
a. Grouping Variable: groups						
b. Not corrected for ties.						

## DISCUSSION

Arka preparation was selected because this preparation is palatable and has a low dosage, it will be very easy to administer in children.

### Probable Mode of Action:

#### Ayurvedic Aspect of Pharmacological Action of Drugs:

Most of the drugs selected for the study in the trail group are having action on the Respiratory system and also have antioxidant, anti-pyretic, anti-inflammatory, and anti-tussive actions. The drugs used in this compound are having *Ushna virya*, *katu vipaka*, and *Vata Kapha hara* properties and some

are *Madhura vipaka* and *Tridosha hara* on the basis of these properties, they act on *Vataja Kasa* which is a *Vata* predominant. *Kantakari*, *brihati*, *karchura*, *nagara*, and *khakhasa* are *Ushna virya* & they are having *Kasahara*, *Shwasahara*, and *Jwarahara* properties and almost all have *Vatakaphahara guna* which help to mitigate the cough originated by the aggravation of *Vata* in *Vataja Kasa*. *Vasa* act as *Kasaghna* and it reduces the number of cough bouts and also acts as a bronchodilator. Except for *draksha*, the remaining drugs of the trail group are *Tikta rasa*, *Ushna veerya*, and *Katu vipaka*, these drugs help to increase the *agni*, through which it helps to increase *jatharagni*. *Draksha* is having *sheeta veerya*,

*madhura rasa, madhura vipaka, and Vata-pitta hara* properties which help in soothing the throat<sup>7</sup> and thus help in reducing *shushkata* of *kantha* and also act as *vrushya* and *brumhana*. The increased symptoms of Cough bouts, *Swarabhedha, Shookapurna galasyata* are due to *Rooksha guna* in *Vataja kasa*. These symptoms were pacified by trial group drugs like *Brihati, Vasa, pippali, nagara, and draksha* due to their *vatakaphara* effect which provides better relief for these symptoms, and some of these acts like *Hrdya, and Rasayana* also. The drugs like *kantakari, nagara, karchura, khakhasa* having *Ushna virya & Vatashamaka guna*, provides relief in *Parshwash-ula*.

#### **Modern Aspect of Pharmacological Action of Drugs:**

**Kantakari:** *Kantakari* plant powder is anti-tussive, anti-allergic and its beneficial effect in bronchial asthma and non-specific cough has been explained as due to depletion of histamine from the lung and its expectorant action due to inorganic nitrate content<sup>8</sup> and beneficial in reducing breathlessness and cough in asthmatic patients owing to the depletion of histamine from lungs and expectorant action due to inorganic nitrate content<sup>9</sup>. **Bruhati:** Anti-inflammatory action of *Brihati* may help in reducing the chest congestion caused by cough<sup>10</sup>. **Draksha:** Glucose and other sugars present in *draksha* help in toning the lungs and act as expectorants<sup>11</sup>. **Vasa:** Vasicine showed bronchodilatory activity both in vitro and in vivo comparable with that of theophylline. Vasicine showed bronchodilation in vitro. Both in combination had more bronchodilatory activity in vitro and in vivo. Vasicine also exhibited respiratory and uterine stimulant activity and moderate hypotensive activity<sup>12</sup>. The *Adhatoda vasica* is documented for its potent anti-inflammatory, antioxidant, antiallergic, antitussive, antiasthmatic, bronchodilatory, and smooth muscle relaxant activity<sup>13</sup>. **Nagara:** Gingerol, Zingerberenes, Zingerberol, Shogaol, isoproterenol, and Essential oils are those which act on the respiratory system. The anti-inflammatory action of *Shunthi* may help in reducing the chest congestion caused by cough<sup>14</sup>. **Karchura:** The alcoholic extract showed a

spasmolytic effect on the smooth muscles and tracheal chain. Antihistamine and anti-allergic properties of *Kharchura* may help to reduce the cough which is caused by allergens. The anti-inflammatory action of *Kharchura* may help in reducing the chest congestion caused by cough<sup>15</sup>. **Pippali:** Piperine, which is the main alkaloid present in pippali, has a substantially good effect in increasing the bioavailability of the drug, along with its anti-inflammatory action<sup>16</sup>. The pellitorine type of isobutylamide was reported to exhibit significant antitubercular activity in vitro and the effect is about 20% of the potency of streptomycin. The PE extract produced respiratory stimulation in smaller doses. Morphine-induced respiratory depression was antagonized by the extract. In a comparative study, both piperine and nalorphine reversed respiratory depression (singh et al., 1973b)<sup>17</sup>. **Khakhas:** Poppy seeds are used as syrup for cough and asthma. Its seed extraction is found useful in the pharmacy and many traditional medicines in the preparation of cough mixtures, expectorants etc<sup>18</sup>. Codeine and papaverine present in *khakhas* act as an antitussive agents and muscle relaxant<sup>19</sup>.

#### **Overall Interpretation of Results:**

Interpretation Of Mann-Whitney U Test on Obtained Results:

When we compare the mean ranks of Group-A and Group-B it has shown that the mean rank before the treatment is less than after treatment and also, we have got higher mean ranks after following up compared to after treatment. This is because in the Leicester cough questionnaire higher mean rank means a better the result. After observing these values, we can interpret that though there is an improvement in the condition clinically between the groups in before and after treatment values and also after following up, that change is not significant statistically due to the unique scoring system.

#### **CONCLUSION**

*Vataja kasa* is a *vata dosha pradhana kasa*, characterized by the *Shushka kasa, Kruchhrena alpa kapha shtivana, Ura, kantha, vaktra- shushkata*. Based on signs and symptoms it may correlate to a non-

productive cough. The study was a controlled clinical study carried out in 2 groups consisting of 20 patients each. Group A treated with *Shushka kasahara arka*, Group B was treated with TusQ-dx syrup. *Shushka kasahara arka* (distillate) and TusQ-dx syrup have been mentioned for *Vataja kasa chikitsa*, in which *Shushka kasahara arka* contains *kantakari*, *bruhati*, *vasa*, *draksha*, *nagara*, *karchura*, *pippali* and *khakhas*. TusQ-dx is having a composition of Dextromethorphan, Chlorpheniramine maleate, and Phenylephrine. The drugs used in *Shushka kasahara arka* are having *vata-kapha* hara property and *ushna veerya* which are very necessary for treating the *vataja kasa*. *Arka* is the essence of the drug; and possesses *laghu*, *ushna*, and *kaphavatahara* properties, increased potency, more shelf life, easy absorption and act firstly because of its qualities it was more effective and easier to administration in children. To conclude *shushka kasahara arka*, is more effective in non-productive cough management. TusQ-dx has also given good results in treating the non-productive cough. Analyzing the observations and result obtained from Group A and Group B, it can be concluded that the patients of this study, who were treated with *Shushka kasahara arka* (distillate) and TusQ-dx syrup, showed better result. Our trail drug is also equally significant like TusQ-dx syrup. Hence to conclude the study, group A (*Shushka kasahara arka*) showed clinically better results compared to group B (TusQ-dx syrup).

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