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# A Randomized Comparative Clinical Study to Evaluate the Effect of *Vidangakrishnadi* Syrup and *Mustadi* Syrup in *Pureeshaja Krimi* w.s.r to Pin Worm

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## ABSTRACT

**Introduction:** *Pureeshaja Krimi* is one among the intestinal infestation, which is very common in children which contributes significantly to disease burden and cause malnourishment & stunting. Despite the implementation of deworming in the country, recurrence rate is significant. **Methodology:** An open labelled comparative clinical study was conducted with 30 children in the age group between 5 – 10 years were selected from Kaumarabhritya OPD of S D M Ayurveda Hospital, Udipi, fulfilling the inclusion and exclusion criteria and allocated to two groups using permuted block randomization method. Duration of study was 7 days with a dose of 5 ml TID for 5-7 years and 7.5 ml TID for 7-10 years. Follow up was done after 7 days. Assessment was done before & after the treatment and after the follow up. The data collected were statistically analysed within the group and between the groups using Wilcoxon signed rank test and Mann Whitney U test respectively. **Result & Conclusion:** The result obtained were statistically analyzed and found that, both the groups showed highly significant results in relieving *Gudakandu* & *Guda Nishkramana* of *Krimi*. Group B showed more effect in parameters like *Agnimandya* & *Udarashoola* than Group A. Both *Vidangakrishnadi* Syrup & *Mustadi* Syrup can be considered as safe and effective in managing *Pureeshaja Krimi* in children.

**Key Words** *Pureeshaja Krimi*, *Pin worm*, *Mustadi syrup*, *Children*

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## INTRODUCTION

The term *Krimi* is used to denote tiny organisms which reside in human body<sup>1</sup>. *Krimi* is an important disease, which has been described in detail with respect to its etiology, clinical features and treatment in Ayurvedic science. They are

classified into *Bahya* and *Abhyantara*. *Abhyantara Krimi* include *Sleshmaja*, *Pureeshaja* and *Rakthaja Krimi*<sup>2</sup>. *Krimiroga* involve both *Aharaja* & *Viharaja Nidana* such as consumption of food like jaggery, sesamum, meat, unctuous, sweet and cold articles, sleep during day time, lack of exercise etc which cause *Kapha*

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*Utklesana* and formation of *Krimi*<sup>3</sup>. According to Ayurveda the principle of treatment of *Krimi* includes *Apakarshana* (removal/ extraction), *Prakruthi Vighata* (creating unfavourable environment) and *Nidana parivarjana* (avoiding etiology)<sup>4</sup>.

About 1/4th of the world's total population is infested with one or more of most common types of parasites. Greater incidence is seen in preschool & early school going children<sup>5</sup>. Children with worms are often underweight and have stunted growth. The incidence of worm infestation is seen about 1 billion people worldwide and 200 million people in India<sup>6</sup>. Children aged 3-15 years make up the group with highest worm burden, caused greatly due to

environmental pollution, poor sanitation and hygiene

## OBJECTIVES

The study was carried out with the following objectives

- To evaluate the effect of *Mustadi* syrup in the management of *Pureeshaja krimi*
- To evaluate the comparative effect of *Vidangakrishnadi* syrup and *Mustadi* syrup in the management of *Pureeshaja krimi*

## MATERIALS & METHODS

**Table no. 1: Ingredients, part used and proportion of *Vidangakrishnadi* syrup<sup>7</sup>**

**Table no. 2: Ingredients, part used and proportion of *Mustadi* syrup<sup>8</sup>**

**Table 1** Ingredients, part used and proportion of *Vidangakrishnadi* syrup

Sl. No.	Name of drug	Botanical Name	Family	Part used	Quantity
1	<i>Vidanga</i>	<i>Embelia ribes</i>	Myrsinaceae	Seed	320g
2	<i>Krishna</i>	<i>Piper longum</i>	Piperaceae	Fruit	320g
3	<i>Maricha</i>	<i>Piper nigrum</i>	Piperaceae	Fruit	320g
4.	<i>Nirgundi</i>	<i>Vitex negundo</i>	Verbinaceae	Root	320g
5.	<i>Shigru</i>	<i>Moringa pterygosperma</i>	Moringaceae	Root bark	320g
6.	<i>Bharangi</i>	<i>Clerodendrum indicum</i>	Verbinaceae	Root	320g
7.	<i>Viswa</i>	<i>Zingiber officinale</i>	Zingiberaceae	Rhizome	320g
8.	<i>Akhuparni</i>	<i>Merremia emarginata</i>	Convolvulaceae	Root	320g
9.	<i>Musta</i>	<i>Cyperus rotundus</i>	Cyperaceae	Rhizome	320g

**Table 2** Ingredients, part used and proportion of *Mustadi* syrup

Sl. No	Name of drug	Botanical Name	Family	Part used	Quantity
1.	<i>Mustha</i>	<i>Cyperus rotundus</i>	Cyperaceae	Rhizome	280g
2.	<i>Akhuparni</i>	<i>Merremia emarginata</i>	Convolvulaceae	Root	280g
3.	<i>Haritaki</i>	<i>Terminalia chebula</i>	Combretaceae	Fruit	280g
4.	<i>Vibhitaki</i>	<i>Terminalia belerica</i>	Combretaceae	Fruit	280g
5.	<i>Amalaki</i>	<i>Emblca officinalis</i>	Euphorbiaceae	Fruit	280g
6.	<i>Devadaru</i>	<i>Cedrus deodara</i>	Pinaceae	Bark, resin	280g
7.	<i>Shigru</i>	<i>Moringa pterygosperma</i>	Moringaceae	Root bark	280g
8.	<i>Krishna</i>	<i>Piper longum</i>	Piperaceae	Fruit	280g
9.	<i>Krimishatru</i>	<i>Embelia ribes</i>	Myrsinaceae	Seed	280g

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### Method of preparation of *Vidangakrishnadi* syrup & *Mustadi* syrup:

The formulations were prepared based on *Sharkara Kalpana*<sup>9</sup>. Coarse powder of drugs was taken in equal quantity, 16 times of fresh water was added to these drugs and heated on *Mandagni* till it reduced to 1/8th quantity to prepare decoction. The decoction was filtered & 66.6 % sugar (1,680 g) was added and again heated on *Mandagni* with constant stirring. When the mixture was attained one thread consistency then the steel container was removed from the heat & the mixture (Syrup) was allowed to cool. Finally, the syrup was packed in airtight bottles of 200 ml each. Then bottles are labelled & made ready for distribution.

### Study design:

The study was approved by Institutional Ethics Committee (Ref: No. SDMCAU/ACA-49/ECH 12/2020-21). The subjects were screened and selected from the outpatient and inpatient department of Sri Dharmasthala Manjunatheshwara College of Ayurveda, Kuthpady. Udipi. 30 patients suffering from *Pureeshaja Krimi* who fulfil the inclusion criteria, within the age group of 5-10 years of either sex was selected and subjects were randomly allocated into 2 groups of 15 patients each

### Diagnostic criteria

*Pureeshaja Krimiroga* was diagnosed based on

- *Guda Kandu* (Perianal itching)
- *Guda Nishkramana* of *Krimi* (Macroscopic appearance of *Krimi* at perianal region)

### Inclusion criteria

- Subjects fulfilling diagnostic criteria with or without any *Lakshanas* such as *Vivarnatha*, *Udarashoola*, *Aruchi*, *Agnimandya*, *Atisaara*, & *Sadana*
- Children between the age group of 5 to 10 years

### Exclusion criteria

- Anal itching associated with Hemorrhoids, Anal fissure, Candidiasis and Contact dermatitis
- Children with the history of deworming medications within last 30 days

### INTERVENTION:

#### Dosage form: Syrup

#### Dose:

Dose was calculated according to Young's formula

- 5-to-7-year age group – 5 ml TID
- 8 to 10-year age group – 7.5 ml TID

#### Duration: 7 days

**Route:** Oral administration in two divided doses  
Group A – Administered with *Vidangakrishnadi* syrup

Group B – Administered with *Mustadi* syrup

**Time of administration:** *Adhobhaktha* (after food)

#### Duration of study

- 7 days of treatment
- Clinical assessment was done before treatment (0<sup>th</sup> day) and after treatment (7<sup>th</sup> day)
- Follow up - on 14<sup>th</sup> day
- Total duration of study: 15 days

The written informed consent of the parent/guardian is invariably taken prior to his/her

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child's inclusion in the study.

#### Subjective criteria

- ✓ *Guda Kandu* (Anal itching)
- ✓ *Guda Nishkramana of Krimi* (Presence of worms around anal region)
- ✓ *Aruchi* (Anorexia)

- ✓ *Atisaara* (Loose stools)
- ✓ *Vivarnatha* (Discoloration of face)
- ✓ *Udarashoola* (Pain in abdomen)
- ✓ *Agnimandya* (Loss of appetite)

**Table no. 3: showing assessment parameters**

**Table 3** Assessment parameters

Sl. no	Parameters	Grade	Before treatment	After treatment
1.	<i>Gudakandu</i>	0	No anal itching	No anal itching
		1	Occasional	Occasional
		2	Frequent	Frequent
		3	Constant	Constant
2.	<i>Guda Nishkramana of Krimi</i>	0	Absent	Absent
		1	Present	Present
3.	<i>Aruchi</i>	0	Normal	Normal
		1	Reduced	Reduced
		2	Aversion towards food	Aversion towards food
4.	<i>Atisaara</i>	0	No loose stools	No loose stools
		1	1-2 times /day	1-2 times /day
		2	3-5 Times /day	3-6 Times /day
		3	>6 times/day	>6 times /day
5.	<i>Vivarnatha</i>	0	Normal	Normal
		1	Only on face	Only on face
		2	Any half of body & evident patches	Any half of body & evident patches
		3	All over body with distinct patches	All over body with distinct patches
6.	<i>Udarashoola</i>	0	Absent	Absent
		1	Occasional	Occasional
		2	Constant pain	Constant pain
		3	Cries due to pain	Cries due to pain
7.	<i>Agnimandya</i>	0	Likes to take food	Likes to take food
		1	Disliked but takes food	Disliked but takes food
		2	Forcefully fed	Forcefully fed
		3	Refuses food	Refuses food

### OBSERVATION

Among 30 subjects, 21 (70%) belonged to age group 5-7 years and 9 (30%), belonged to 7-10 years age group. 18 (60%) were females and 12 (40%) were males. Out of 30 children, 15(50%) had underwent deworming and remaining 15(50%) with no recent history of deworming. Distribution of subjects according to diet showed,

23 subjects (76.66%) following mixed diet and 7 subjects (23.33%) following vegetarian diet.

Main complaints such as *Gudakandu* & *Gudanishkramana of Krimi* is observed in all 30 (100%) subjects. *Atisaara* in 1 subject (3.33%), *Vivarnatha* in 4 subjects (13.3%), *Udarashoola* in 10 subjects (33.33%) and *Agnimandya* in 19 subjects (63.33%).

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Dietary habits observed among subjects were 15 (50%) had *Alpashana*, 13(43.33) had *Samashana* and 2 (6.66%) had *Vishamashana*. On assessing *Kosta*, 10 subjects (33.33%) were having *Krura Kosta*, 10 subjects (33.33%) were having *Mridu Koshta* and 10 subjects (33.33%) were having *Madhyama Koshta*

While observing *Aharasambandhi Nidana*, 27 subjects (90%) were having habit of intake of *Dugdha*, 24 subjects (80%) had habit of intake of *Matsya*, 18 subjects (60%) had habit of intake of *Mamsa*, 8 subjects (26.66%) had habit of intake of *Virudhahara*, 26 subjects (86.66%) had habit of intake of *Madhuraahara*, 13 subjects (43.33%) had habit of intake of *Dadhi*, 10 subjects (33.33%) had habit of intake of *Masha*, 6 subjects (20%) had habit of intake of *Parnashaaka*, 13 subjects (43.33%) had the habit of *Amlasevana*, 23 subjects (83.33%) had the habit of intake of *Sheetahaara*, 17 subjects (56.66%) had habit of intake of

chocolates. Among *Viharasambandhi Nidana*, 29 (96.66%) were observed to be playing in mud, 17 subjects (56.66%) had the habit of walking or playing without footwear, 5 subjects (16.66%) had *Divaswapna* and only 1 subject (3.33%) had *Avyayama*

On assessing *Prakruti*, 14 subjects (46.66%) were having *Vatapitta Prakriti*, 10 subjects (33.33%) were having *Vatakapha Prakriti* and 6 subjects (20%) were having *Pittakapha Prakriti*. Also 16 subjects (53.33%) had *Madhyama Rasa* and 14 subjects (46.66%) had *Sarva Rasa Satmya*

## RESULTS

**Statistical methods** - Statistical analysis was carried out using the statistical package for social science (SPSS) VER.20.

**Table no. 4: Effect of *Vidangakrishnadi* syrup in Group A**

**Table no. 5: Effect of *Mustadi* syrup in Group B**

**Table 4** Effect of *Vidangakrishnadi* syrup in Group A

Parametres	BT Mean	AT Mean	FU Mean	Z value	P value	Inference
<i>Gudakandu</i>	1.400	0.066	0.000	-3.542	0.000	HS
<i>Gudanishkramana of Krimi</i>	0.933	0.000	0.000	-3.742	0.000	HS
<i>Atisara</i>	2.000	0.000	0.000	-	-	-
<i>Vivarnatha</i>	1.000	0.666	0.666	-1.000	0.317	NS
<i>Udarashoola</i>	1.000	0.000	0.000	-2.000	0.046	NS
<i>Agnimandya</i>	1.000	0.000	0.000	-3.162	0.002	S

**Table 5** Effect of *Mustadi* syrup in Group B

Parametres	BT Mean	AT Mean	FU Mean	Z value	P value	Inference
<i>Gudakandu</i>	1.333	0.667	0.000	-3.542	0.000	HS
<i>Gudanishkramana of Krimi</i>	1.000	0.000	0.000	-3.873	0.000	HS
<i>Atisara</i>	0	0	0	-	-	-
<i>Vivarnatha</i>	1.000	0.000	0.000	-	-	-
<i>Udarashoola</i>	1.000	1.000	0.000	-2.449	0.014	S
<i>Agnimandya</i>	1.000	0.000	0.000	-3.602	0.000	HS

**DISCUSSION** Malnourishment & growth stunting being the most important causes of

disease burden in India, can end up in permanent physical & mental derangements in children.

Being multifactorial, the basic causes for these

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diseases have to be identified and timely management has to be planned. Intestinal worm infestation in young children being the most common cause for these complications, had been selected as the study topic. Greater incidence of worm infestation is seen in preschool & early school going children. Hence the children of age group between 5-10 years were selected. Present study reveals that those underwent deworming got recurrence either with the same symptoms or with increased severity of previous symptoms. The increase in recurrence rates necessitates an effective pharmacological drug which is safe, cost effective, and palatable too. This recurrence may also be due to improper dietary habits & unhygienic sanitary practices.

*Pureeshaja Krimiroga* is *Kapha Pradhana Tridoshaja Vyadhi* with the involvement of *Rasa* and *Pureesha* & *Srotodushti* in the form of *Sanga*. Both the formulations were prepared from the drugs possessing *Katu*, *Tiktha* and *Kashaya Rasa* and *Ushna Veerya* help in counteracting *Kapha* and *Ama*, correcting the *Agni* by its *Pachana* property and cure the symptoms of *Krimi Roga* as per the concept of *Prakriti Vighata*. The taste of *Kashaya* prepared being less palatable to children, the formulations were thought to be prepared from the concepts of *Sharkara Kalpana* and the palatable end product emerging as *Syrup*. it is difficult to use in clinical practice especially in children. This conversion was also intended to increase the shelf life and to reduce dosage.

Majority of subjects of study were non vegetarians. Excessive use of *Matsya* & *Mamsa* in diet were seen among those, which act as major *Nidana* for *Pureeshaja Krimi*.

Improper dietary habits like intake of junk foods (*Kapha Prakopa* & *Abhishyadi Ahara*) & untimely eating enhances growth of *Krimi* leads to *Agnimandya* and *Amotpatti*, which are involved in pathogenesis of *Pureeshaja Krimiroga* and hence triggers the disease manifestation.

*Vihara* such as not wearing footwear & playing in mud were the major unhygienic practices seen in children in present study. This may lead to ingestion of eggs of pin worm which were collected in the nails and their development to an adult worm once they reach small intestine

In *Gudakandu* & *Gudanishkramana* of *Krimi*, Group A & Group B showed highly significant result due to the *Krimighna* & *Kaphahara* property of formulations. Also, *Mustadi* syrup showed significant result in *Guda Kandu* AT- FU than *Vidangakrishnadi* syrup. This is probably due to effect of medicine during follow up period which shows greater effect of drug as *Kaphahara* & *Krimighna*.

Drugs such as *Vidanga*, *Krishna*, *Sigru*, *Maricha* & *Shunti* possess *Shoolahara* property which help in relieving *Udarashoola*. Phytochemical constituents like piperine<sup>10</sup>, embelin<sup>11</sup> etc exhibits analgesic property which relieves pain abdomen. In *Udarashoola*, Group A showed non-significant result which may be because of small number of subjects had *Udararashoola*.

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Clinically, patients showed positive result on *Udarashoola*. Group B showed significant result in *Udarashoola*.

*Vivarnatha* was present only in 4 subjects. In Group A only 3 subjects showed *Vivarnatha*, of which 1 subject got complete recovery and other 2 subject showed fading of discolouration. Due to very small group having symptoms statistically less significant results were obtained. In group B only 1 subject showed *Vivarnatha* which clinically got relieved but statistical analysis proved to be non-significant.

In *Agnimandya*, Group A showed significant results whereas Group B showed highly significant results. Drugs like *Vidanga*, *Sigru*, *Musta*, *Krishna*, *Maricha* etc are having *Deepana Pachana* property & are having phytochemical constituents such as piperine<sup>12</sup>etc, helps to remove *Ama*, enhances *Agni* which in turn increase appetite.

## CONCLUSION

*Pureeshaja Krimiroga* is the major cause of ill health in pediatric age group; hence this field needs more attention. The nearest correlation of the *Pureeshaja Krimi* can be done with the Pin worms due to the similarities in the habitat, morphology, color, clinical manifestation and treatment. *Mithya Ahara* and *Vihara* are the major etiological factors which contribute for the manifestation of the disease in children of different body constitution with varying severity.

Most of the factors explained in *Nidana* cause *Kapha Pradhana Tridosha Prakopa* which in turn leads to *Agnimandya* and *Amotpatti*. *Gudakandu*, *Gudanishkramana* of *Krimi*, *Aruchi*, *Vivarnata*, *Udarashoola* and *Agnimandya* are the symptoms seen in the majority of the children in the clinical study.

*Vidangakrishnadi Yoga* mentioned in *Sahasrayoga* & *Mustadi Yoga* mentioned in *Yogaratnakara* are potent *Krimighna Yoga*'s which act as *Prakriti Vighata* line of management for *Krimi*. Most of the drugs in both formulations possess *Katu Tikta Kashaya Rasa*, *Ushna Veerya*, *Krimighna* & *Deepana Pachana* Guna which helps in counteracting against *Krimiroga* and gives symptomatic relief within a period of 7 days with a non-recurrence period of one more week which was been documented during the follow up period. Clinically and statistically both the drugs showed significant relief in symptoms of *Pureeshaja Krimi* viz pin worm. Both formulations showed positive result in *Guda Kandu* & *Guda Nishkramana* of *Krimi*. *Mustadi* group showed more effect in parameters like *Agnimandya* & *Udarashoola* than *Vidangakrishnadi* group.

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