



A REVIEW ARTICLE ON KRIMI ROGA (WORM INFESTATIONS) IN CHILDREN

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ABSTRACT

The worm infection or helminthiasis is one among the foremost common problems in pediatric practices especially in developing countries because of the poor hygiene. The parasitic infection seen in children are *Ascaris lumbricoides* (Round worm), *Enterobiasis vermicularis* (Pin worm), *Ancylostoma duodenale* (Hook worm), *Echinococcus granulosus* (Hydatid diseases) and *Cystercosis*. Among which the most common worm infection in children is *Ascaris lumbricoides*. Helminthiasis has been found to lead to poor cognitive development, poor school and work performance, poor socioeconomic development, and poverty. Chronic illness, malnutrition, and anemia are further manifestations of secondary effects of helminthiasis. In ayurveda worm infection is described as *Krimi Roga*. In modern sciences the term *Krimi* is often correlated with helminthiasis. Excessive intake of madhura & amla rasa, eating during indigestion, lack of exercise and resorting to day sleep are the main etiological factors mentioned in Ayurveda. Main symptom of *Krimiroga* is *Jwara* (fever), *Vivarnata* (discoloration of skin), *Shula* (Pain), *Hridaroga* (Heart diseases), *Sadanam* (lassitude), *Bhaktadvesha* (Anorexia), *Atisara* (Diarrhea), *Vamana* (Vomiting). Ayurveda puts three basic approaches for the treatment of Helminthiasis disease like *Apakarsana* (Removal of visible worm from the body), *Prakriti Vighata* (to create unfavorable environment by means of diet and medicine) and *Nidana Parivarjana* (Avoid etiological factor).

KEYWORDS: Krimi Roga, Intestinal worms, Helminthiasis, Worm Infestations.

INTRODUCTION

Intestinal parasitic infestation is the most common pediatric complaint worldwide in tropical and subtropical geographical areas. Recent global estimate indicates that more than a quarter of the world population is infected with one or more of most common type of parasites like Round worms (*Ascaris lumbricoids*), Hook worms and Whip worms. According to WHO estimate, globally there are 800- 1,000 million cases of *ascariasis*. *Ascaris lumbricoids* infestation has greater incidence in pediatric practices. Poverty, ignorance, lack of hygiene, bad sanitation and use of uncooked food or improper washing of food materials etc. are the important factors for spreading worm infestation in developing countries like India.

Helminthiasis in children is ignored by both parents and physicians because of less severity of symptoms until the infection becomes more severe. Once the disease advances the matured eggs may enter or dwell in gastrointestinal tract and in any system, even may enter in the brain, heart, lungs and show serious complications like intestinal obstruction. It has been observed that Helminthiasis lowers the school performance of the child. In short when Helminthic infestation is mild it's

difficult to identify and when it becomes severe it is difficult to control. There is a wide range of references for Helminthiasis in Ayurvedic classics under the name of *Krimi Roga*.

Detail descriptions of different varieties of *Krimis* are available in *Brihatrayi* and *Laghutrayi* of Ayurveda. *Charaka* has explained three ways of the treatment for eradication, relief and prevention of *Krimi Roga*. *Apakarshana* is the first line of treatment for the expulsion of *Krimi* is concerned, which should be followed by *Prakriti Vighata* and *Nidana Parivarjana* which helps to prevent the further aggravation or recurrence of the condition. Along with that special group of *Krimihara* drugs are mentioned, which can be used both internally and externally. *Charaka*, *Sushruta*, *Vagbhata*, *Madhavakara*, *Bhavaprakasha*, *Bhela* have given vivid description about *Krimi*. In *Kashyapa Samhita* only Chikitsa of *Krimi* is mentioned. Overall view of all the *Acharyas* are having similar opinion regarding *Krimi* and therefore the description is quite comparable with the science of parasitology. So the attempt is made to found some correlation of *krimi* with modern parasites and to review its treatment by ayurvedic point of view.

AIM: To review *krimi roga* described in Ayurvedic literature with respect to modern pathogenesis

OBJECTIVES

1. To study *krimi roga* and its management described in Ayurvedic texts.
2. To correlate *krimi* with pathogens explained in modern science.

MATERIAL AND METHODS

This is conceptual type of study. All sorts of references related to worm infection (*krimi roga*) has been collected and compiled from various available classics text of Ayurveda like *bhruhattrayi*, *laghutrayi* and *kashyap samhita* with available commentaries. Literature available regarding worm infection collected from various available journals and books. All matter is analyzed and attempt has been made to draw some fruitful conclusions regarding the correlation of *krimi* with modern parasites and to review its treatment by ayurvedic point of view.

REVIEW OF LITERATURE

Classification of *Krimis*

The *Krimi* can be differentiated mainly in two categories on broad spectrum according to their pathogenic nature as

1. *Sahaja Krimi*
2. *Vaikarika Krimi*

Sub classifications

Bahya Krimi:

Abhyantara Krimi:

Number of *Krimis* in Ayurveda texts

Different authors do not agree on same number of *Krimi*. They have considered different numbers, work of few of them is summarized.

DISCUSSION

Malaja krimi - The *Bahya Krimi* described in Ayurveda, can be very well correlated with the parasitic lices, ticks, *Sarcoptes Scabiei* and *Pediculus pubis* of man mentioned in modern medical literature as per the similarities of their site, morphology and pathogenicity.

Shleshmaja (Kaphaja) krimi - Even the vivid etiological meaning of these *Krimis* made by different scholars have some disparities, but after concluding it reveals it's spread by ingestion of unwholesome food material i.e. *Mithya Ahara* especially *Anupa Mamsa*, fish and *Parnashaka*. So, under this heading only those microorganisms which spread by mediatory habits should be included. This can be effective in two ways such that one is ova, cyst and bacteria can reach inside the body with food and second by providing favorable media for the microbes to flourish. *Amashaya* has been mentioned as the site of these *Krimi* by all the *Acharyas*, which denotes upper gastrointestinal tract. The site of *Kaphaja Krimi* seems to be head, neck, and thorax along

with upper gastrointestinal tract. None of the *Acharyas* after *Sushruta* had supported his view even the description given by *Sushruta* seems to be practical, and coincides with the pathogenicity described in all the Ayurvedic texts. So according to *Sushruta* upper gastro intestinal tract up to the upper part of small intestinal and thoracic cavity seems to be the site of the *Kaphaja Krimi* and microorganisms. The morphology of *Krimi* described by *Sushruta* is found entirely different, when *Agnivesh* and other later *Acharyas* compared it. It seems that *Sushruta* has included in this group all the microbes. *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Sangraha*, *Ashtanga Hridaya*, *Madhava Nidana* and *Yoga Ratnakara* have also mentioned the morphological characters of these *Krimi* with such similarities. *Prithu*, *Braghna*, *Gandupada*, *Tantwakriti* are of white color means these morphological characters are only found in *Kaphaja Krimi* and not in any other group of *Krimi* described by them. This aspect must be kept in consideration at the time of the correlation and finding of body equivalence. Naming of those *Krimis* seem to tend consistent with their effect on the body, the signs and symptoms (fever, vomiting, excessive salivation, and other symptoms of upper gastrointestinal tract) produced by *Kaphaja Krimi* which may be related to microbes. Similarly the parasite and bacteria caused by faulty feeding techniques and living in small intestine having a white colour and round flat thread like shape can also be considered.

Purishaja krimi - The mode of entry and etiology of this group of *Krimi* is almost similar in all the Ayurvedic texts. *Charaka* and other *Acharyas* have given special morphological characters of these *Krimis* such as their wool like appearance, thick and round shape, white-yellow and blackish colour. *Sushruta* has described them having a red colour with long shape and stated their site completely in large intestine and lower part of small intestine. Main symptoms mentioned by all *Samhitas* of these *Krimis* are itching in anal region and halitosis. *Sushruta* has made a special reference of *Gandupada Krimi*, which indicates towards the nematodes. *Ancylostoma duodenalis* cannot be included in both *Purishaja* and *Kaphaja Krimi* as it is not caused by faulty feeding techniques. Hence, no equivalence can be made as per their morphological character and pathogenicity. The details of the equivalence can probably be understood from the given Table no 2.

Table No 1.

Sl. No.	Name of the Text	Bahya or Malaja Krimi (External)	Abhyantara krimi (Internal)				Total No. of Krimi
			Kaphaja	Raktaja	Purishaja	Shlesmaraktaja	
1.	<i>Charaka Samhita</i>	2	7	6	5	-	20
2.	<i>Sushruta Samhita</i>	-	6	7	7	-	20
3.	<i>Vagabhata</i>	2	7	6	5	-	20
4.	<i>Bhela Samhita</i>	-	-	-	-	-	20
5.	<i>Harita Samhita</i>	7	6	-	-	-	13
6.	<i>Madhava</i>	2	7	6	5	-	20
7.	<i>Sarangdhara</i>	2	7	6	5	1	21
8.	<i>Bhava Prakasha</i>	2	7	6	5	-	20
9.	<i>Yoga Ratnakara</i>	2	7	6	5	-	20

Table No 2.

1.	<i>Leliha, (Charaka). Gandupada (Shu.)</i>	Nematodes a) Thread worm b) <i>Trichuris trichuria</i> c) <i>Ascaris lumbricoides</i> (Shu.)
2.	<i>Sashula</i> (Ch. & others)	Sarcodina (a) <i>E. histolytica</i> (b) <i>E.nana</i>
3.	<i>Sousharada</i> (Ch. & others)	Ciliata (a) <i>Balantidium coli</i>
4.	<i>Kakeruka</i> (Ch. & others)	Trematodes (a) <i>Gastro-discoids hominis</i>
5.	<i>Churu</i> (Sushruta)	Entero-bacteriaceae (a) <i>Shiegella</i>

Raktaja krimi- The etiological meaning of this group of *Krimi* is considered similar to *Kustha*. *Sushruta* says that they all are invisible according to morphology. It seems that they include all micro-organism living in the blood and lymphatic e.g. bacteria, fungus, virus, actinomyces, rickettsia, and other blood parasites.

TREATMENT/ MANAGEMENT OF KRIMI IN AYURVEDA

Ayurveda puts three basic approaches for the treatment of Helminthiasis disease like

1. *Apakarsana* (Removal of visible worm from the body)
2. *Prakriti Vighata* (to create unfavorable environment by means of diet and medicine)
3. *Nidana Parivarjana* (Avoid etiological factor)

Ayurvedic Preparations by different Acharyas for Krimi In Children

Asava/Arishta: Khadiradi Arishta, Vidanga Arishta, DevaDarya Arishta, Vidangaasav, Kutjarista.

Bhasma/Kashaya: Loha Bhasma, Vanga Bhasma

Choorna: Vidanagadi Choorna

Ghrita: Bimbi Ghritam, Vidanagadi Ghritam

Rasa: Krimikaalanala Rasa, Krimi Mudgarasa, Krimikuthara Rasa

Taila: Bhallatak Taila

Pathyapathya In Krimi Infested Children

Pathya

Rasa: Tikta & Kashaaya.

Dugdha: Cow & Goat Dugdha.

Drava: Tila Taila, Kaanjika, Tushodaka, Gomootra, Suraa & Sauveeraka.

Phala: Apakva Kadalee, Pakva Taalaphala & Nimbuka Rasa.

Others: *Aasthaapana Basti, Dhoopa, Abhyanaga & Kaphaghna vihara*

Apathya

Rasa: Amla & Madhura

Maamsa: Pork

Dugdha: Mahisha Dugdha

Phala: Badara

TREATMENT/ MANAGEMENT IN MODERN MEDICINE

Proper hygiene maintenance is one of the most important measures to prevent helminth infection. For the treatment of *A. lumbricoides*, several drugs may be used, including albendazole, mebendazole, pyrantel pamoate, levamisole, and ivermectin. If patients develop intestinal obstruction, it requires proper treatment with intravenous support, anthelmintics, and antibiotic treatment. Laparotomy might be necessary in case of small bowel obstruction, intussusception, and volvulus. Hepatobiliary

ascariasis can be treated with drug therapy. If conservative therapy fails, then endoscopic and surgical therapy may be required.

CONCLUSION

Concept of *Krimi* and *Krimi Roga* are accessible since Vedic period, but comprehensive descriptions has been originated in *samhita* period along with three-fold treatment of *krimiroga*. According to time era profundity of literature varies which had more aspect of description regarding *Krimiroga*. The word *krimi* illustrates all the microorganisms, helminthes, protozoa, bacteria and viruses within the Ayurvedic literature. So, it seems too worth to know the correlation between the term *krimi* and modern science due to lack of detail explanation of individual *krimi* in ayurveda. Although management of *krimi roga* given in Ayurvedic texts is step by step in a proper way but it's not well established practically because it's grim to follow all the steps of management especially in children.

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