



Integrative Management of Worm Infestation in Children: A Modern and Ayurvedic Perspective- A Literature Review

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Abstract

Introduction:

Worm infestations, especially soil-transmitted helminths such as *Ascaris lumbricoides*, hookworms, and *Enterobius vermicularis*, are common in Indian children, causing malnutrition, anemia, and cognitive delays. Modern anthelmintics are effective but face challenges of reinfection and resistance. Ayurveda, through *Krimi Chikitsa*, offers a holistic approach integrating detoxification, digestive correction, and herbal therapy.

Methods:

An integrative review was conducted using Ayurvedic classics (*Charaka Samhita*³, *Sushruta Samhita*⁴, *Kashyapa Samhita*⁶), WHO data, and contemporary literature, correlating traditional *Krimi Roga* concepts with modern clinical classifications.

Results:

Modern drugs such as albendazole, mebendazole, and pyrantel pamoate are standard, but Ayurveda prescribes a threefold strategy—*Apakarshana* (expulsion), *Prakriti Vighata* (terrain correction), and *Nidana Parivarjana* (cause elimination). Classical formulations like *Vidangadi Kashayam*, *Krimi Sudarshana Churna*, *Vidangarishtam*, *Panchatikta Ghrita*, and *Krimighna Vati* possess *krimighna*, *deepana*, and *rasayana* properties, aiding parasite clearance and recurrence prevention.

Discussion:

Ayurvedic measures complement pharmacotherapy by restoring gut health, enhancing immunity, and promoting preventive practices. Clinical validation through controlled trials is essential.

Conclusion:

Integrating modern anthelmintics with *Krimi Chikitsa* offers a comprehensive, sustainable strategy for managing pediatric worm infestations in endemic regions.

Keywords: Worm infestation, Helminthiasis, *Krimi Roga*, Ayurveda, Anthelmintic, Pediatrics, India.

I. INTRODUCTION

Helminthiasis, or worm infestation, affects nearly 68% of Indian children under 14 years¹ of age, primarily due to inadequate sanitation, poor hygiene, and contaminated food and water intake¹. The World Health Organization estimates² that over 220 million children globally are at risk of soil-transmitted helminth infections, which have long-term effects on nutrition, immunity, and cognitive growth. In addition to conventional allopathic treatment, Ayurveda's concept of *Krimi Roga* offers a broader disease model that recognizes both parasitic worms and microbes. Ayurvedic treatment includes *Deepana*, *Pachana*, *Shodhana*, and lifestyle and dietary modifications, offering a systemic and sustainable solution.

Clinical Types and Modern Understanding

1. Ascariasis

Caused by *Ascaris lumbricoides*, this helminth enters via the feco-oral route. Its life cycle includes a pulmonary migration phase, resulting in cough and eosinophilia. Intestinal blockage, cholecystitis, and malnutrition are common complications.

2. Hookworm Infections

Primarily due to *Ancylostoma duodenale* and *Necator americanus*, hookworms enter through skin or ingestion. Chronic cases result in iron-deficiency anemia, protein loss, and growth retardation.

3. Enterobiasis

Enterobius vermicularis presents with perianal pruritus and disturbed sleep. Though often benign, complications may include appendicitis and pelvic infections.

4. Tapeworm Infections

Taenia saginata and *Taenia solium* are transmitted via undercooked meat. Clinical signs are mild but observing motile segments can cause significant psychological discomfort.

Ayurveda Perspective of *Krimi Roga*

In Ayurveda, *Krimi* is classified based on origin and symptomatology. Texts such as the *Charaka Samhita*³, *Sushruta Samhita*⁴, and *Kashyapa Samhita*⁸ outline classifications including *Malaja*, *Raktaja*, *Purishaja*, and *Shleshmaja Krimi*. These correspond with modern GI and hematological parasitic infections.

Pathogenesis (Samprapti)

Krimi Roga originates from *Agnimandhya* (weak digestive fire), resulting in *Ama* (toxins), vitiation of *Kapha* and *Pitta*, and favourable conditions for parasitic proliferation. Lifestyle and dietary indiscretions such as excessive intake of sweet, heavy, and incompatible foods are contributing factors.

Principles of *Krimi Chikitsa*

Ayurveda offers a comprehensive threefold therapeutic strategy:

1. *Apakarshana* (Expulsion)

This includes internal cleansing through *Panchakarma*:

- *Vamana* (emesis)
- *Virechana* (purgation)
- *Vasti* (medicated enema)
- *Nasya* (nasal administration)

Herbal agents such as *Madanaphala*, *Trivrit*, and *Vidanga* are used for their strong anthelmintic and purificatory actions.

2. *Prakriti Vighata* (Host Terrain Correction)

Use of *Katu* (pungent), *Tikta* (bitter), *Kashaya* (astringent), and *Ushna* (hot) substances like *Pippali*, *Vacha*, and *Kshara* restore the gut environment and digestion.

3. *Nidana Parivarjana* (Elimination of Causes)

Advising against etiological factors such as poor hygiene, contaminated food, and sedentary lifestyle ensures prevention of recurrence.

Therapeutic Formulations

Ayurveda has documented a rich pharmacopeia of herbal formulations for the effective management of *Krimi Roga*, drawing from classical compendiums such as *Charaka Samhita*³, *Sushruta Samhita*⁴, *Arogyakalpadruma*⁵, *Sahasrayoga*⁷, and others. These formulations address both the expulsion of parasites and the restoration of gut ecology, offering both curative and preventive benefits. They are classified broadly into decoctions (*Kashayams*), powders (*Churnas*), medicated ghee/oils (*Ghritas/Tailas*), fermented preparations (*Arishtas/Asavas*), and pills (*Gutikas*).

1. *Kashayams*

Kashayams are concentrated herbal decoctions prepared by boiling medicinal herbs in water. Key *Krimighna* *kashayams* include:

- *Vidangadi Kashayam*: A powerful anthelmintic that contains *Vidanga*, *Krishna*, and *Maricha*, primarily used for *Purishaja Krimi*.
- *Nimbashataka Kashayam*: Comprising bitter herbs such as *Neem* and *Patola*, it cleanses the blood and helps eliminate *Raktaja Krimi*.
- *Khadiradi Kashayam*: Known for treating chronic skin ailments arising from parasitic infestations.

2. Churnas

Churnas are herbal powders administered with adjuvants like honey or buttermilk. Common examples are:

- Krimi Sudarshana Churna: Contains Kiratatikta, Haridra, and Vidanga; effective against general parasitic infections and fevers.
- Palasabijadi Churna: Made from Palasha seeds, Indrayava, and Kutaja; used in chronic Krimi.
- Vidangadi Churna: A mix of Vidanga, Haritaki, and Kampillaka; administered with buttermilk for intestinal cleansing.

3. Arishtas and Asavas

- Vidangarishtam: Prepared with Vidanga and Trijata; useful in bloating, indigestion, and muscular stiffness due to Krimi.
- Kumaryasavam: Aloe-based formulation beneficial in chronic Krimi with associated anemia or liver dysfunction.
- Abhayarishtam: Mild purgative used to clear bowel toxins, thus reducing Krimi recurrence.

4. Ghritas and Tailas

- Panchatikta Ghrita: Combines five bitter herbs to purify blood and treat dermal Krimi manifestations.
- Arushkara Taila: Applied externally or through nasya; effective in head and neck region Krimi.
- Kriminashini Taila: Topical application for lice, scabies, and other ectoparasitic infections.

5. Gutikas

- Krimighna Vati: A pediatric-friendly tablet formulation with Vidanga and Ajamoda.
- Kankayana Gulika: Indicated for chronic Grahani and Krimi with digestive disorders.
- Yogaraja Guggulu: Primarily for systemic detoxification, also beneficial in Krimi-related flatulence and pain.

6. Lehyas and Avalehas

- Manibhadra Gudam: Polyherbal formulation with Haritaki, Amalaki, and Vidanga; helpful in skin, respiratory, and digestive issues.

- Dantyadi Avaleha: Supports digestion and prevents recurrence of Krimi post-detox.

These formulations must be chosen considering the type of Krimi, strength of digestion, and age of the patient. Adjuvants like Madhu, Ushnodaka, or Takra enhance their efficacy.

In Ayurvedic medicine, the treatment of Krimi Roga is not limited to the mechanical expulsion of parasites but includes normalization of digestive functions, correction of doshic imbalance, and improvement in immunity. This is achieved through a large number of classical formulations with specific pharmacodynamic actions. These formulations target different types of Krimi (Malaja, Purishaja, Raktaja, and Kaphaja) and cater to both pediatric and adult populations.

Kashayams – Mode of Action and Indications

Kashayams are decoctions where the extraction of phytochemicals from selected herbs provides quick absorption and rapid action. The bitter and pungent drugs in these formulations possess krimighna, dipana, pachana, and stambhana properties.

- Vidangadi Kashayam is one of the most prescribed formulations in Krimi Roga. It reduces worm load and relieves associated symptoms like bloating and colic. Its deepana and pachana action makes it especially suitable post-virechana.
- Nimbastaka Kashayam is indicated in parasitic infections associated with itching, urticaria, or pustular skin lesions, often seen in Raktaja Krimi. The bitter herbs have blood-purifying and immunomodulatory effects.
- Khadiradi Kashayam is used when the worm infestation is complicated by secondary skin diseases such as eczema or psoriasis.

Powders (Churnas) – Dosage and Pediatric Use

Churnas are dry powdered herbal blends, commonly administered with honey or Takra. They are highly effective in treating GI-based infestations and offer flexible dosing for children.

- Krimi Sudarshana Churna is a broad-spectrum formulation that not only acts on parasites but also addresses fever and indigestion caused by Krimi. Safe for children when adjusted by weight.
- Vidangadi Churna has both curative and prophylactic applications. When taken monthly during Amavasya with Takra, it helps in preventing reinfestation.
- Kampillyadi Churna is specific for treating chronic cases of helminthiasis and also supports liver function, often compromised in recurrent infections.

Fermented Formulations – Arishtas and Asavas

These preparations undergo natural fermentation, making them self-preserving and easy to digest. They are particularly suitable for children and the elderly.

- Vidangarishtam, with Vidanga as its base, is used in all forms of internal Krimi. It relieves colic, restores appetite, and improves gut motility.
- Kumaryasavam not only treats Krimi but also addresses accompanying complaints such as anemia, liver dysfunction, and hormonal imbalance.
- Abhayarishtam acts on the colon, helps relieve constipation, and facilitates natural expulsion of worms and toxins.

Ghritas and Tailas – Internal and External Benefits

Medicated ghee (ghrita) and oil (taila) are lipid-based formulations that carry active principles to deeper tissues.

- Panchatikta Ghrita balances Pitta and supports detoxification. It is especially effective in worm-induced dermatoses.
- Arushkara Taila is used for nasal therapy in cases of Krimi affecting the ENT region and for topical application in lice and scabies.
- Kriminashini Taila is massaged over the abdomen or used in vasti for treating internal Krimi with symptoms of bloating and abdominal pain.

Lehyas and Avalehas – Palatable Formulations for Children

These are semisolid herbal jams used widely in pediatric cases due to their taste and tonic effects.

- Manibhadra Gudam is a rejuvenative formula effective in chronic parasitic infections with coexisting skin and respiratory symptoms.
- Dantyadi Avaleha is a potent laxative formulation with Krimighna herbs; it cleanses the bowels and enhances liver function.

Gutikas – Tablet Formulations with Strong Action

- Krimighna Vati is effective in all types of intestinal worms, especially useful in institutional deworming programs.
- Kankayana Gulika is often used in post-detox regimens to prevent reinfection and enhance digestive fire.
- Yogaraja Guggulu plays a supportive role in chronic Krimi associated with joint and muscle stiffness.

These formulations, when administered with proper adjuvants, offer a multifaceted action – from direct worm elimination to restoration of gut flora and systemic immunity. Clinical selection depends on dosha predominance, strength of Agni (digestive fire), chronicity of infestation, and presence of complications like anemia or malnutrition.

Pediatric Indications:

- *Poopalika* (herbal cakes) with *Vidanga* for oral intake
- *Yavagu* with *Kshara* and *Takra* for digestive restoration
- *Krimighna Vati* and *Kankayana Gulika* for child-safe administration

Discussion

While albendazole, mebendazole, and pyrantel pamoate are widely used in modern medicine, concerns about reinfection, resistance, and adverse effects necessitate adjunctive strategies. Ayurvedic therapy emphasizes the restoration of gastrointestinal ecology and immunity. Its preventive approach, including dietary restrictions, hygiene, and seasonal detoxification, is particularly valuable in endemic populations.

Conclusion

Worm infestation continues to challenge pediatric health in India. Modern and Ayurvedic systems, when integrated, offer a robust and holistic framework for effective management. *Krimi Chikitsa*, with its focus on detoxification, diet, and rejuvenation, may serve as a valuable complement to pharmacotherapy. Collaborative research and clinical validation of these practices can significantly enhance child health outcomes in endemic regions.

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