



Krimi Roga in Children: Changing Epidemiology and the Ayurvedic

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Abstract

Background: *Krimi Roga* (parasitic and worm infestations) is one of the most commonly described pediatric disorders in classical Ayurvedic literature, particularly under *Kaumarbhritya*. While modern public health interventions have reduced the burden of severe helminthic infestations, changing environmental conditions, urbanization, altered dietary habits, antibiotic exposure, and hygiene practices have significantly modified the epidemiology and clinical presentation of pediatric parasitic diseases.

Objective: To provide a comprehensive narrative review of *Krimi Roga* in children by integrating classical Ayurvedic concepts with contemporary epidemiological trends and pediatric health perspectives.

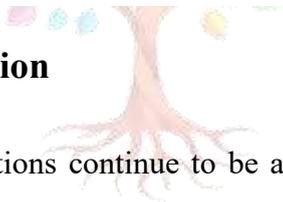
Methods: A narrative review was conducted using authoritative Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Kashyapa Samhita*) and modern biomedical literature related to pediatric parasitic infections, gut health, nutrition, and immunity. Relevant review articles, epidemiological reports, and clinical studies were thematically synthesized.

Results: Ayurveda describes *Krimi Roga* as a multifactorial disease arising from *Agnimandya*, *Ama* formation, *Kapha* predominance, and unhygienic practices, particularly in children with immature digestion. Modern epidemiology shows a shift from overt heavy infestations to chronic, low-grade, recurrent infections with significant nutritional and immunological consequences. Ayurvedic management emphasizes *Apakarshana*, *Prakriti Vighata*, *Nidana Parivarjana*, and long-term preventive care.

Conclusion: The Ayurvedic framework of *Krimi Roga* remains highly relevant in the context of changing pediatric epidemiology. Its holistic, digestion-centered, and preventive approach complements modern deworming strategies and may reduce recurrence and long-term morbidity.

Keywords: *Krimi Roga*; Pediatric Parasitic Infections; *Kaumarbhritya*; Ayurveda; Intestinal Worms; Child Nutrition

1. Introduction



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Parasitic infections continue to be a major contributor to childhood morbidity, particularly in low- and middle-income countries. They are associated with anaemia, undernutrition, impaired growth, recurrent gastrointestinal symptoms, and reduced cognitive performance [1]. Despite large-scale deworming programs, reinfection rates remain high, suggesting that parasite eradication alone is insufficient for sustained child health improvement [2].

In recent years, epidemiological patterns of pediatric parasitic infections have changed substantially. Improved sanitation has reduced heavy worm burdens, but children increasingly present with chronic, subclinical, or mixed infections associated with poor gut health, dysbiosis, and nutritional deficiencies [3].

Ayurveda provides a unique perspective on these conditions through the concept of *Krimi Roga*. Unlike modern parasitology, Ayurveda views *Krimi* not only as external organisms but also as pathological entities sustained by internal host factors such as impaired digestion, faulty diet, and weakened resistance (*Bala*) [4]. This host-centered approach is particularly emphasized in *Kaumarbhritya*, the Ayurvedic

branch dedicated to child health.

2. Concept of *Krimi Roga* in Ayurveda

2.1 Definition and Scope

Charaka Samhita defines *Krimi* as organisms that originate internally or externally and cause disease when favorable conditions exist within the body:

“*Malaja raktaja bahyashcha krimayo dehasambhavah*”

(*Charaka Samhita*, Sutra Sthana 20/7)

This definition highlights the endogenous role of internal milieu in sustaining *Krimi*, a concept that resonates with modern understanding of host susceptibility.

2.2 Classification of *Krimi*

Ayurveda broadly classifies *Krimi* into:

- ***Bahya Krimi*** – external parasites (e.g., lice, mites)
- ***Abhyantara Krimi*** – internal parasites

Internal *Krimi* are further classified as:

- *Purishaja Krimi* (intestinal worms)
- *Raktaja Krimi* (blood-borne organisms)
- *Kaphaja Krimi* (organisms thriving in mucus-rich environments)

3. *Krimi Roga* in Children (*Bala*)

3.1 Pediatric Susceptibility

Kashyapa Samhita emphasizes that children are particularly prone to *Krimi Roga* due to:

- Immature *Jatharagni*
- Frequent intake of *Madhura* and *Snigdha Ahara*

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- Developing immune mechanisms
- Incomplete hygiene practices

This observation aligns with modern pediatric immunology, which recognizes immature gut immunity in early childhood [5].

4. Etiopathogenesis (*Nidana* and *Samprapti*)

4.1 Etiological Factors (*Nidana*)

Commonly described etiological factors include:

- Excessive intake of sweets, milk products, and refined foods
- Consumption of contaminated food and water
- Poor personal hygiene
- Chronic indigestion and irregular feeding habits

4.2 *Samprapti* (Pathogenesis)

The Ayurvedic pathogenesis of *Krimi Roga* can be summarized as:

Ayurvedic Event	Functional Interpretation
<i>Agnimandya</i>	Impaired digestion
<i>Ama</i> formation	Toxic, undigested metabolites
<i>Kapha Vriddhi</i>	Mucus-rich environment
<i>Krimi Utpatti</i>	Parasite proliferation
<i>Srotodushti</i>	Malabsorption, anemia

This sequence mirrors modern concepts of gut dysbiosis, impaired mucosal immunity, and nutrient depletion [6].

5. Changing Epidemiology of *Krimi Roga* in Children

5.1 Epidemiological Transition

Classical Scenario	Present-Day Scenario
Heavy worm infestation	Low-grade recurrent infection

Rural predominance	Urban and peri-urban spread
Single parasite	Polyparasitism
Acute symptoms	Chronic nutritional impact

Environmental pollution, antibiotic overuse, and dietary shifts toward processed foods have altered gut microbial ecology, increasing susceptibility to recurrent parasitic and functional gastrointestinal disorders [7].

6. Clinical Features (*Lakshana*)

Ayurveda describes both local and systemic manifestations:

- Abdominal pain
- Loss of appetite
- Excessive salivation
- Perianal itching
- Pallor and fatigue
- Growth retardation

Many of these symptoms correspond with modern clinical presentations of chronic helminthic infection and micronutrient deficiency [8].



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7. Ayurvedic Management of *Krimi Roga*

7.1 Fundamental Principles of Treatment

Charaka Samhita outlines three core principles:

1. *Apakarshana* – elimination of *Krimi*
2. *Prakriti Vighata* – destruction of the internal environment favorable to *Krimi*
3. *Nidana Parivarjana* – avoidance of causative factors

7.2 *Krimighna Dravyas*

Commonly used *Krimighna* drugs include:

- *Vidanga (Embelia ribes)*
- *Palasha*

- *Kutaja*
- *Nimba*

Experimental studies have demonstrated anthelmintic, antimicrobial, and immunomodulatory effects of these drugs [9].

7.3 Preventive and Supportive Care

Ayurveda emphasizes:

- Strengthening *Agni*
- Dietary moderation
- Hygiene education
- Periodic *Deepana–Pachana*

This approach aims to prevent recurrence rather than merely eradicate parasites.

8. Discussion

The Ayurvedic understanding of *Krimi Roga* extends beyond parasite elimination to include host factors such as digestion, immunity, nutrition, and behavior. Modern deworming programs are effective but often insufficient to prevent reinfection or address long-term nutritional deficits.

Ayurveda's focus on *Agni*, *Kapha* regulation, and child-specific care provides a broader framework consistent with emerging insights into gut–immune interactions and microbiome health.

9. Future Perspectives

- Integrative pediatric protocols combining deworming with Ayurvedic digestion-focused interventions
- Clinical trials assessing recurrence and nutritional outcomes
- Microbiome-based research correlating *Ama* and gut dysbiosis
- Development of child-friendly *Krimighna* formulations

10. Conclusion

Krimi Roga in children, as conceptualized in Ayurveda, represents a holistic disease model encompassing infection, digestion, immunity, and nutrition. In the context of changing epidemiology, Ayurvedic

principles offer valuable preventive and supportive strategies that can complement modern pediatric healthcare.

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