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A CRITICAL REVIEW OF *KRIMI ROGA* IN *KAUMARBHRITYA* WITH SPECIAL REFERENCE TO WORM INFESTATION IN CHILDREN

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ABSTRACT

Background *Krimi Roga* is an important disease entity described in *Ayurveda*, especially relevant in *Kaumarbhritya*, because children are more prone to intestinal infections due to immature digestion, poor hygiene habits, frequent soil contact, and developing immunity. In classical texts, *Krimi* are described as living organisms developing in the body due to improper diet, poor digestive fire, accumulation of *Ama*, vitiation of *Dosha*, and contamination of internal channels. In modern science, worm infestation in children is commonly understood under helminthic infections such as ascariasis, hookworm infestation, trichuriasis, and enterobiasis. Both systems accept that poor sanitation, improper food habits, contaminated surroundings, and weak host resistance play a major role in disease development. **Aim** To critically review *Krimi Roga* in *Kaumarbhritya* with special reference to worm infestation in children. **Objectives** To study the classical concept of *Krimi Roga* in *Ayurveda*. To understand the importance of *Krimi Roga* in *Kaumarbhritya*. To correlate *Ayurvedic* descriptions with modern worm infestation in children. To review the etiological factors, clinical features, *Samprapti*, pathogenesis, prevention, and management principles. To highlight the relevance of diet, hygiene, *Agni*, and immunity in prevention of recurrence.

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DR. NIDHI AND DR. ANKUSH KUMAR

A CRITICAL REVIEW OF *KRIMI ROGA*

IN *KAUMARBHRITYA* WITH SPECIAL REFERENCE TO WORM INFESTATION IN CHILDREN

Materials and Methods Classical *Ayurvedic* texts related to *Krimi Roga*, *Kaumarbhritya*, *Agni*, *Ama*, and *Ahara-Vihara* were reviewed. Modern literature on worm infestation, soil-transmitted helminths, pediatric parasitic infections, pathogenesis, clinical features, diagnosis, prevention, and treatment was studied. A conceptual and comparative analysis was done to understand the relevance of *Krimi Roga* in present pediatric practice. **Discussion** The clinical presentation of *Krimi Roga* shows strong similarity with worm infestation, including abdominal pain, anorexia, nausea, itching, loose stool, anemia, malnutrition, irritability, and disturbed sleep. The *Ayurvedic* approach focuses on correction of *Nidana*, improvement of *Agni*, removal of *Krimi*, and prevention of recurrence. **Conclusion** *Krimi Roga* in *Kaumarbhritya* can be understood as a broad clinical entity comparable with worm infestation and other parasitic conditions in children. A combined approach of hygiene, diet correction, deworming, strengthening of digestion, and health education is useful for prevention and control.

Keywords *Krimi Roga*, *Kaumarbhritya*, Worm Infestation, Children, *Agni*, *Ama*

Introduction

Krimi Roga is one of the well-described disease conditions in *Ayurvedic* classics. The word *Krimi* generally denotes small living organisms that may exist inside or outside the body and produce disease when they multiply in a favorable environment. In the context of children, *Krimi Roga* is very important because childhood is a sensitive period where digestion, immunity, nutrition, and hygiene habits are still developing. Children commonly consume sweet, heavy, oily, and irregular food, and they often play in soil or contaminated surroundings, which increases the chances of worm infestation.¹

In *Ayurveda*, the origin of *Krimi* is explained through the role of *Nidana*, *Mandagni*, *Ama*, and vitiation of *Dosha*. Improper food habits such as excessive intake of *Madhura Rasa*, *Guru Ahara*, *Abhishyandi Ahara*, day sleep, lack of cleanliness, and poor bowel habits create a suitable environment for *Krimi* formation. The disease is not only considered a local intestinal disorder but also a systemic condition because it affects nutrition, strength, complexion, growth, mental activity, and general health of the child.² In modern medicine, worm infestation in children is mainly caused by intestinal helminths. Common worms include roundworm, hookworm, whipworm, and pinworm. These infections are more common in areas where sanitation, safe drinking water, proper toilet use, handwashing, and food

hygiene are inadequate. Worm infestation may remain asymptomatic in mild cases, but moderate to severe infestation can cause abdominal symptoms, anemia, growth delay, malnutrition, poor school performance, and repeated illness.³

The concept of *Krimi Roga* in *Kaumarbhritya* is highly relevant today because worm infestation is still an important public health problem among children. A critical review helps in understanding how classical principles like *Nidana Parivarjana*, *Agni Deepana*, *Ama Pachana*, *Krimighna Chikitsa*, hygiene, and dietary regulation can be integrated with modern preventive measures such as sanitation, deworming, safe drinking water, and health education.⁴

Aim and Objectives

Aim

To critically review *Krimi Roga* in *Kaumarbhritya* with special reference to worm infestation in children.

Objectives

1. To study the classical concept of *Krimi Roga* in *Ayurveda*.
2. To understand the importance of *Krimi Roga* in *Kaumarbhritya*.
3. To correlate *Ayurvedic* descriptions with modern worm infestation in children.
4. To review the etiological factors, clinical features, *Samprapti*, pathogenesis, prevention, and management principles.
5. To highlight the relevance of diet, hygiene, *Agni*, and immunity in prevention of recurrence.

Materials and Methods

This is a conceptual review study based on classical *Ayurvedic* literature and modern medical literature. The *Ayurvedic* review was carried out through references related to *Krimi Roga*, *Kaumarbhritya*, *Agni*, *Ama*, *Nidana*, *Samprapti*, *Lakshana*, and *Chikitsa* from major classical texts and their commentaries. The modern review was based on available literature regarding worm infestation in children, soil-transmitted helminths, epidemiology, transmission, clinical presentation, complications, diagnosis, prevention, and treatment. The collected information was analyzed critically and presented in a structured manner for conceptual understanding and clinical relevance.

AYURVEDIC REVIEW**KRIMI**

In *Ayurveda*, *Krimi* are described as living organisms that may be visible or invisible and may develop in different parts of the body. The concept is broad and includes intestinal worms, parasites, microorganisms, and disease-producing organisms. Classical texts explain that *Krimi* may originate from *Kapha*, *Rakta*, *Purisha*, and other body materials when they become vitiated due to improper diet and lifestyle. The idea of *Krimi* is not limited only to large worms visible in stool. It also includes subtle organisms that cannot be easily seen but can produce disease. This shows that ancient scholars had a broad understanding of infective and parasitic conditions. In children, intestinal *Krimi* are especially important because they directly disturb digestion, nutrition, growth, and immunity.⁵

Classification of *Krimi*

Classically, *Krimi* are described under different categories based on origin, location, and nature. They may be classified as external and internal. External *Krimi* may affect skin, hair, and external body parts, while internal *Krimi* may develop in the gastrointestinal tract, blood, or other internal tissues. Internal *Krimi* are more relevant in children with worm infestation. These are commonly associated with the intestine and stool. *Purishaja Krimi* are especially comparable with intestinal worms because they are related to the colon, fecal matter, poor digestion, contaminated food, and abnormal bowel condition.

Krimi Roga* in *Kaumarbhritya

Kaumarbhritya deals with child health, growth, nutrition, immunity, and diseases of children. In this branch, *Krimi Roga* has special importance because children are naturally more vulnerable. Their *Agni* is not fully stable, their *Dhatu* are under development, and their habits often expose them to infection. Children may eat soil, consume unwashed food, avoid handwashing, play barefoot, and share contaminated objects. These behaviors create a direct connection with worm infestation. From an *Ayurvedic* view, such exposure works along with *Mandagni* and *Ama* to produce *Krimi Roga*.⁶

Nidana* of *Krimi Roga

The main causative factors of *Krimi Roga* include improper diet, poor hygiene, weak digestion, and contaminated surroundings. Excessive intake of sweet, heavy, unctuous, stale, incompatible, and improperly cooked food promotes *Kapha* and *Ama*. These factors make the

gastrointestinal tract favorable for the growth of *Krimi*. Important *Nidana* include excessive *Madhura Rasa*, *Guru Ahara*, *Snigdha Ahara*, *Dadhi*, milk preparations, jaggery, newly harvested grains, day sleep, poor cleanliness, contaminated food, and irregular bowel habits. In children, excessive chocolates, sweets, bakery foods, junk food, unhygienic snacks, and street food can be considered modern equivalents of such causative factors.

Role of Agni and Ama

Agni is the main factor responsible for digestion, metabolism, tissue nourishment, and immunity. When *Agni* becomes weak, food is not properly digested and forms *Ama*. This *Ama* blocks the channels, disturbs normal gut environment, and supports disease formation.

In *Krimi Roga*, *Mandagni* and *Ama* play a central role. Worms grow more easily when digestion is weak and undigested material accumulates in the intestine. This explains why children with poor appetite, bloating, irregular stool, and recurrent abdominal complaints are more prone to worm-related symptoms.⁷

Role of Dosha

Kapha Dosha plays a major role in the formation of *Krimi* because it is heavy, slimy, moist, and nourishing in nature. Excess *Kapha* creates a favorable medium for *Krimi* growth. *Pitta Dosha* may be involved in inflammation, burning, loose stool, and irritability. *Vata Dosha* becomes aggravated later due to intestinal irritation, colic pain, dryness, obstruction, and disturbed bowel movement. Thus, *Krimi Roga* may start with *Kapha* and *Ama* dominance, but later it can involve *Vata* and *Pitta* according to severity and chronicity.

Role of Dushya

The main *Dushya* involved in *Krimi Roga* are *Rasa Dhatu*, *Rakta Dhatu*, *Mamsa Dhatu*, and *Purisha*. In children, *Rasa Dhatu* involvement leads to poor nourishment, weakness, and growth problems. *Rakta Dhatu* involvement may produce pallor, anemia-like features, itching, and skin changes. *Purisha* involvement directly produces abnormal stool, worms in stool, foul smell, mucus, diarrhea, constipation, and abdominal discomfort.

Srotas Involvement

The main *Srotas* involved are *Annavaha Srotas*, *Purishavaha Srotas*, and *Rasavaha Srotas*. *Annavaha Srotas* involvement produces loss of appetite, nausea, vomiting, abdominal

heaviness, and indigestion. *Purishavaha Srotas* involvement produces bowel irregularity, worms in stool, abdominal pain, and anal itching. *Rasavaha Srotas* involvement affects nutrition, energy, complexion, and growth.⁸

Clinical Features of *Krimi Roga*

Common symptoms of *Krimi Roga* in children include abdominal pain, loss of appetite, nausea, vomiting, excessive salivation, distension of abdomen, itching around anus, abnormal stool, worms in stool, foul smell, weakness, pallor, irritability, disturbed sleep, grinding of teeth, poor weight gain, and recurrent digestive complaints.

Some children may show behavioral changes such as restlessness, lack of concentration, crying without clear cause, and poor school performance. Chronic cases may show nutritional deficiency, delayed growth, and reduced immunity.

***Krimi Roga* and Child Nutrition**

Worm infestation affects child nutrition by reducing appetite, disturbing digestion, consuming nutrients, and damaging intestinal mucosa. In *Ayurvedic* understanding, this is explained through disturbance of *Agni*, improper formation of *Rasa Dhatu*, and weakness of subsequent *Dhatu*. As a result, the child may become weak, undernourished, pale, and less active.⁹

***Ayurvedic* Preventive View**

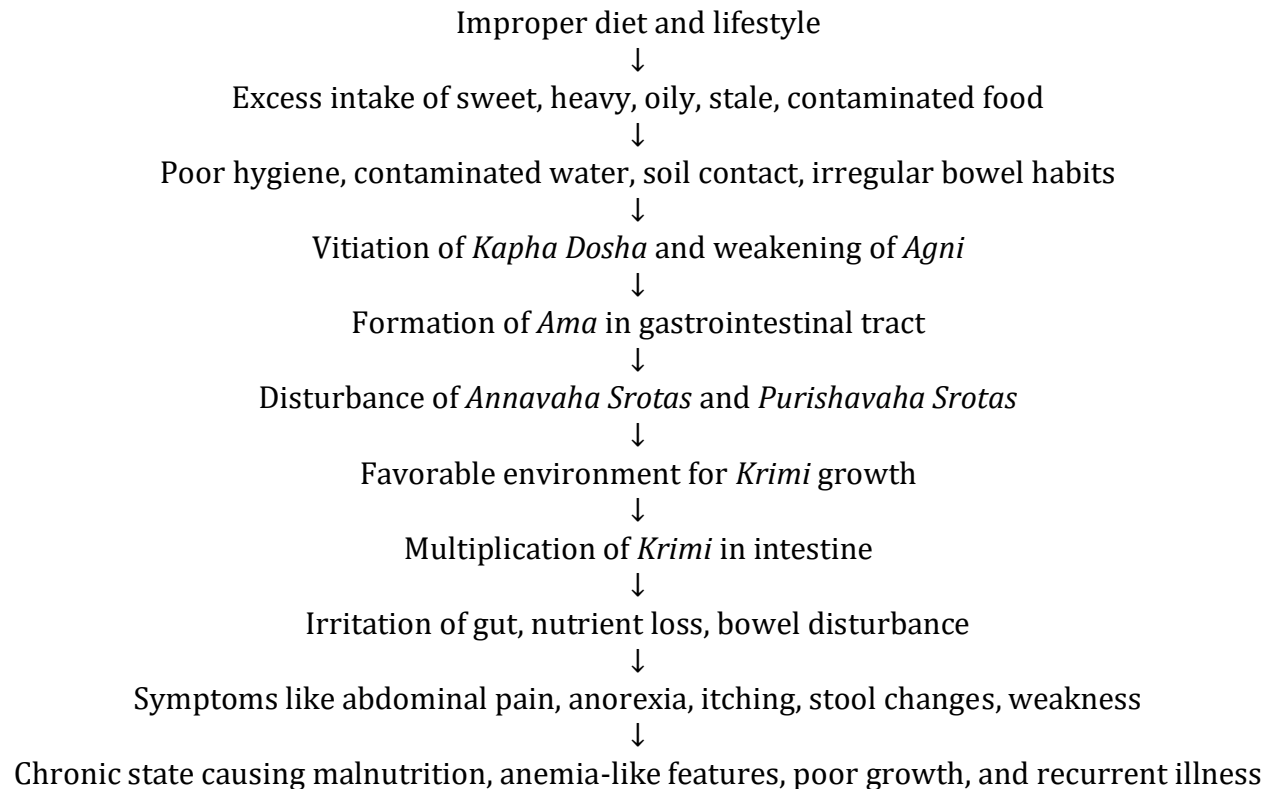
Prevention of *Krimi Roga* is mainly based on *Nidana Parivarjana*. Children should avoid unhygienic food, excessive sweets, stale food, contaminated water, and improper eating habits. Cleanliness of hands, nails, clothes, bedding, utensils, and surroundings is very important. Diet should be light, freshly prepared, warm, digestible, and suitable for the child's digestive capacity. Foods and herbs having *Deepana*, *Pachana*, and *Krimighna* properties are useful under proper medical guidance.

***Ayurvedic* Management Principles**

The management of *Krimi Roga* includes three main principles: removal of causative factors, destruction or expulsion of *Krimi*, and restoration of digestion. *Deepana* improves digestive fire, *Pachana* digests *Ama*, *Krimighna Dravya* acts against worms, and proper diet prevents recurrence. Classical management may include *Apakarshana*, *Prakriti Vighata*, and *Nidana*

Parivarjana. *Apakarshana* means removal of *Krimi*. *Prakriti Vighata* means creating an unfavorable environment for *Krimi*. *Nidana Parivarjana* means avoiding the causes responsible for the disease. Commonly described *Krimighna* substances include *Vidanga*, *Palasha*, *Nimba*, *Haridra*, *Pippali*, *Maricha*, *Hingu*, *Ajamoda*, and *Katu-Tikta Rasa* dominant drugs. These should be used only according to age, strength, disease severity, and physician's advice.¹⁰

Samprapti of Krimi Roga in Flow Chart



MODERN REVIEW

Worm Infestation in Children

Worm infestation refers to infection of the human body by parasitic worms, mainly helminths. In children, these worms commonly live in the intestine and interfere with digestion, nutrition, growth, and general health. Common worm infestations include ascariasis, hookworm infection, trichuriasis, and enterobiasis.

Common Worms in Children

The important worms affecting children are *Ascaris Lumbricoides*, *Trichuris Trichiura*, hookworms such as *Ancylostoma Duodenale* and *Necator Americanus*, and pinworm known

as *Enterobius Vermicularis*. *Ascaris* is commonly known as roundworm and may cause abdominal symptoms and nutritional problems. Hookworms may cause blood loss and anemia. Whipworm may cause diarrhea and rectal symptoms. Pinworm commonly causes perianal itching, especially at night.¹¹

Epidemiology

Worm infestation is common in tropical and subtropical countries, especially in places with poor sanitation, unsafe drinking water, open defecation, poor waste disposal, overcrowding, and lack of hygiene awareness. Children are more affected because they frequently play in soil, put fingers in the mouth, eat without washing hands, and may walk barefoot.

School-age children are an important risk group because of repeated exposure and group contact. Worm infestation is also associated with poverty, malnutrition, lack of clean toilets, and poor health education.

Mode of Transmission

Transmission depends on the type of worm. Soil-transmitted helminths spread mainly through eggs passed in human feces. These eggs contaminate soil, water, vegetables, and hands. Children become infected when they ingest infective eggs through contaminated food, water, fingers, or soil. Hookworm larvae may enter through the skin, especially when children walk barefoot on contaminated soil. Pinworm spreads through the fecal-oral route and also through contaminated bedding, clothes, nails, and household surfaces.

Risk Factors in Children

Major risk factors include poor handwashing, long and dirty nails, eating unwashed fruits and vegetables, drinking unsafe water, open defecation, walking barefoot, poor toilet hygiene, overcrowding, malnutrition, low immunity, and lack of regular deworming. Dietary factors also contribute indirectly. Children with poor nutrition and weak immunity suffer more severe effects of worm infestation. Repeated infections worsen nutritional deficiency and create a cycle of infection and weakness.¹²

Clinical Features

Many children with mild infestation may not show obvious symptoms. Symptomatic children may present with abdominal pain, loss of appetite, nausea, vomiting, bloating, diarrhea,

constipation, mucus in stool, worms in stool, perianal itching, irritability, disturbed sleep, teeth grinding, pallor, weakness, and poor weight gain. In chronic infestation, children may develop anemia, protein-energy malnutrition, growth retardation, reduced physical activity, poor concentration, and decreased school performance. Heavy worm load may rarely cause intestinal obstruction, biliary obstruction, or severe abdominal complications.¹³

Diagnosis

Diagnosis is usually based on history, clinical examination, and stool examination. Stool microscopy helps identify ova, cysts, larvae, or adult worms depending on the parasite. In pinworm infestation, the tape test may be useful. Complete blood count may show anemia or eosinophilia in some cases. Nutritional assessment is also important in children with chronic or recurrent infestation.

Complications

Worm infestation can lead to anemia, malnutrition, vitamin and mineral deficiency, poor growth, impaired learning, recurrent abdominal complaints, intestinal obstruction, rectal prolapse, and reduced immunity. Hookworm infection is strongly associated with iron-deficiency anemia due to chronic blood loss. Severe *Ascaris* infestation may cause intestinal obstruction, especially in young children.¹⁴

Prevention

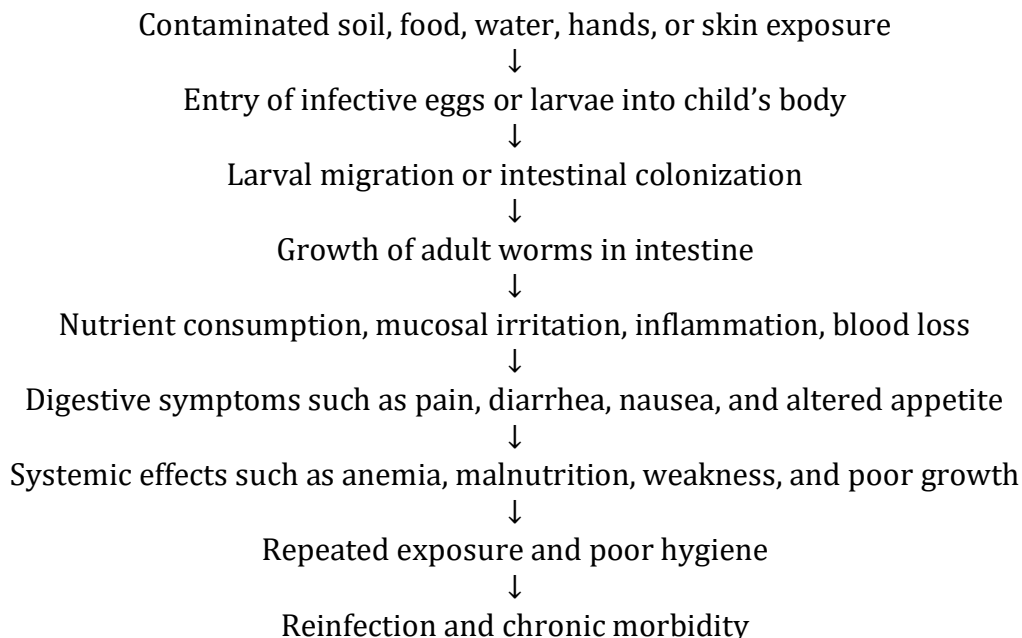
Prevention depends on breaking the transmission cycle. Important measures include regular handwashing with soap, cutting nails, washing fruits and vegetables, drinking safe water, using sanitary toilets, avoiding open defecation, wearing footwear, proper disposal of feces, keeping food covered, and maintaining personal and environmental cleanliness. Health education for parents, school teachers, and children is essential. Regular deworming programs are useful in endemic areas. Nutritional improvement also helps reduce the harmful impact of worm infestation.

Treatment

Modern treatment includes antihelminthic drugs such as albendazole or mebendazole, depending on the type of worm, age of the child, and local guidelines. Reinfection is common,

so treatment should be combined with hygiene correction, sanitation, family screening where needed, and repeated deworming as per public health recommendations.¹⁵

Pathogenesis of Worm Infestation in Flow Chart



Result and Findings

1. *Krimi Roga* is a broad *Ayurvedic* concept that can be correlated with worm infestation and parasitic disease in children.
2. Children are more vulnerable due to immature *Agni*, developing immunity, poor hygiene practices, and frequent exposure to contaminated soil and food.
3. *Mandagni*, *Ama*, *Kapha Prakopa*, and involvement of *Annavaha Srotas* and *Purishavaha Srotas* are central in the *Ayurvedic* understanding of *Krimi Roga*.
4. Modern science explains worm infestation mainly through fecal-oral transmission, contaminated soil, unsafe water, poor sanitation, and skin penetration in hookworm infection.
5. Common symptoms in both views include abdominal pain, anorexia, nausea, vomiting, itching, abnormal stool, weakness, pallor, disturbed sleep, and poor growth.
6. Chronic worm infestation can affect nutrition, hemoglobin level, physical growth, cognition, and school performance.
7. *Ayurvedic* management focuses on *Nidana Parivarjana*, *Deepana*, *Pachana*, *Krimighna Chikitsa*, and restoration of normal digestion.

8. Modern management focuses on deworming, stool examination, nutritional correction, hygiene improvement, and sanitation.
9. Prevention is more important than treatment because reinfection is common in children.
10. An integrated approach combining hygiene, diet regulation, digestive correction, deworming, and health education is most useful in pediatric practice.

Discussion

Krimi Roga in *Kaumarbhritya* reflects a deep understanding of parasitic disease in children. Classical texts explain that improper diet, poor digestion, and unhygienic conditions create a favorable environment for *Krimi*. This view is highly relevant today because modern worm infestation also depends on contaminated soil, unsafe water, fecal contamination, and poor personal hygiene. The *Ayurvedic* concept of *Mandagni* and *Ama* can be understood as a disturbed internal environment where digestion, gut function, and host resistance become weak.¹⁶

The clinical features described under *Krimi Roga* show close similarity with pediatric worm infestation. Abdominal pain, loss of appetite, itching, abnormal stool, salivation, pallor, weakness, irritability, and poor growth are commonly observed in both systems. Worm infestation is not only an intestinal problem; it affects nutrition, immunity, physical growth, mental alertness, and overall development of the child. This makes it an important concern in child health and school health programs.¹⁷

The management of *Krimi Roga* should not be limited to killing worms alone. If poor hygiene, contaminated food, weak digestion, and faulty diet continue, reinfection is likely. Therefore, *Nidana Parivarjana* has great practical value. Proper handwashing, nail cutting, safe water, toilet hygiene, footwear use, fresh food, regular deworming, and improvement of *Agni* are necessary. In clinical practice, a combined approach of modern deworming and *Ayurvedic* principles of digestion correction, diet planning, and prevention can give better long-term benefit.¹⁸

Conclusion

Krimi Roga in *Kaumarbhritya* is an important pediatric condition that can be closely correlated with worm infestation in children. The disease develops due to poor hygiene, contaminated food and water, weak *Agni*, *Ama* formation, and favorable intestinal conditions for worm growth. Children are highly susceptible because of immature immunity, developing

digestive strength, and frequent exposure to contaminated surroundings. The review shows that both *Ayurveda* and modern medicine emphasize prevention, cleanliness, dietary regulation, and removal of causative factors. A practical approach combining deworming, hygiene education, safe sanitation, nutritional support, and *Ayurvedic* digestive correction may help in reducing recurrence and improving child health.

Conflict of Interest -Nil.

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