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EFFECTS OF ASCARIASIS ON THE MUCOSAL LAYER OF THE SMALL INTESTINE

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Abstract: Ascariasis, a parasitic infection caused by Ascaris lumbricoides, significantly impacts the small intestine's mucosal layer. This study explores the pathological changes induced by the parasite, including inflammation, villous atrophy, and disruption of nutrient absorption. Understanding these effects is crucial for developing effective treatments and preventive measures.

Keywords: Ascariasis, small intestine, mucosal layer, villous atrophy, inflammation, malabsorption, Ascaris lumbricoides, helminth infection, intestinal pathology, parasitic disease

Introduction. Ascariasis is a widespread parasitic infection caused by Ascaris lumbricoides, a large intestinal roundworm that primarily affects the human gastrointestinal system. According to the World Health Organization (WHO), over 800 million people worldwide are infected with Ascaris, particularly in regions with poor sanitation and inadequate hygiene. The transmission occurs through the ingestion of eggs from contaminated soil, food, or water.

The small intestine serves as the primary site for adult Ascaris colonization. While mild infections may be asymptomatic, moderate to severe infections can lead to significant damage to the intestinal mucosa, resulting in inflammation, nutrient malabsorption, and in extreme cases, intestinal obstruction. The parasite disrupts the delicate balance of the mucosal layer by causing villous atrophy, increasing mucus secretion, and altering the immune response. These effects contribute to chronic malnutrition, stunted growth in children, and impaired cognitive development.

This paper aims to explore the pathological effects of Ascaris lumbricoides on the mucosal layer of the small intestine, including mechanical damage, immune response, and villous atrophy. Furthermore, it discusses the clinical implications, treatment strategies, and preventive measures to control ascariasis-related complications. Understanding these mechanisms is crucial for developing effective public health interventions to combat this neglected tropical disease.

The small intestine’s mucosal layer consists of three main components:

- Epithelium: Absorbs nutrients and serves as a barrier against pathogens.
- Lamina propria: Contains immune cells that defend against infections.

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- Muscularis mucosae: Facilitates the movement of intestinal contents. Disruptions in these structures due to Ascaris infection can severely affect digestion and overall health.

Mechanical damage. The movement and adhesion of adult Ascaris worms to the intestinal wall cause direct physical damage, leading to: erosion of the epithelial lining, ulcer formation, increased permeability, allowing toxins and pathogens to enter the bloodstream

Infection triggers an immune response, resulting in: Increased production of cytokines (IL-4, IL-5, IL-13), leading to chronic inflammation, eosinophilic infiltration, which contributes to tissue damage, edema formation, impairing nutrient absorption

Chronic inflammation leads to the destruction of villi, reducing the absorptive surface area. Goblet cell hyperplasia increases mucus production, altering digestion.

Malabsorption of fats, proteins, and vitamins causes weight loss and nutritional deficiencies.

Mild infections: Asymptomatic or mild digestive disturbances

Moderate infections: Abdominal pain, bloating, diarrhea. Severe infections: Malnutrition, growth retardation in children, bowel obstruction. Early diagnosis and treatment are essential to prevent long-term complications.

Conclusion. Ascariasis remains a major global health concern, particularly in low-income countries where sanitation infrastructure is inadequate. The presence of Ascaris lumbricoides in the small intestine disrupts the integrity of the mucosal layer, leading to a range of gastrointestinal and systemic complications. Mechanical damage, chronic inflammation, and villous atrophy contribute to impaired digestion, malabsorption, and nutritional deficiencies, which are particularly harmful to growing children.

Despite the availability of effective anthelmintic treatments, reinfection rates remain high due to persistent environmental contamination and poor hygiene practices. Therefore, long-term strategies such as improved sanitation, public health education, and mass deworming programs are essential in reducing the burden of ascariasis.

Further research is needed to understand the long-term consequences of chronic Ascaris infection on the gut microbiome, immune system, and overall health. By addressing these issues, healthcare professionals and policymakers can develop sustainable solutions to prevent and manage ascariasis, ultimately improving the quality of life for millions of affected individuals worldwide.

References:

1. Bethony, J., et al. (2006). Soil-Transmitted Helminth Infections: Ascariasis, Trichuriasis, and Hookworm. The Lancet, 367(9521), 1521-1532.
2. Holland, C. V., & Smith, H. V. (2006). Ascaris: The Neglected Parasite. Taylor & Francis.
3. Stephenson, L. S., et al. (2000). Malnutrition and Parasitic Helminth Infections. Parasitology, 121(S1), S23-S38.
4. WHO. (2023). Helminth Control in School-Age Children: A Guide for Managers of Control Programmes. World Health Organization.