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GLOBAL TRENDS IN ASCARIASIS PREVALENCE: A REVIEW OF PUBLIC HEALTH DATA OVER THE LAST DECADE

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ABSTRACT

Ascariasis, caused by the intestinal nematode *Ascaris lumbricoides*, remains one of the most prevalent parasitic infections globally, particularly in tropical and subtropical regions. This article aims to provide a comprehensive overview of ascariasis, including its epidemiology, pathophysiology, clinical presentation, diagnosis, treatment, and preventive strategies. With a focus on tropical medicine, we discuss the burden of the disease in low-resource settings and explore the role of integrated control programs in reducing its prevalence.

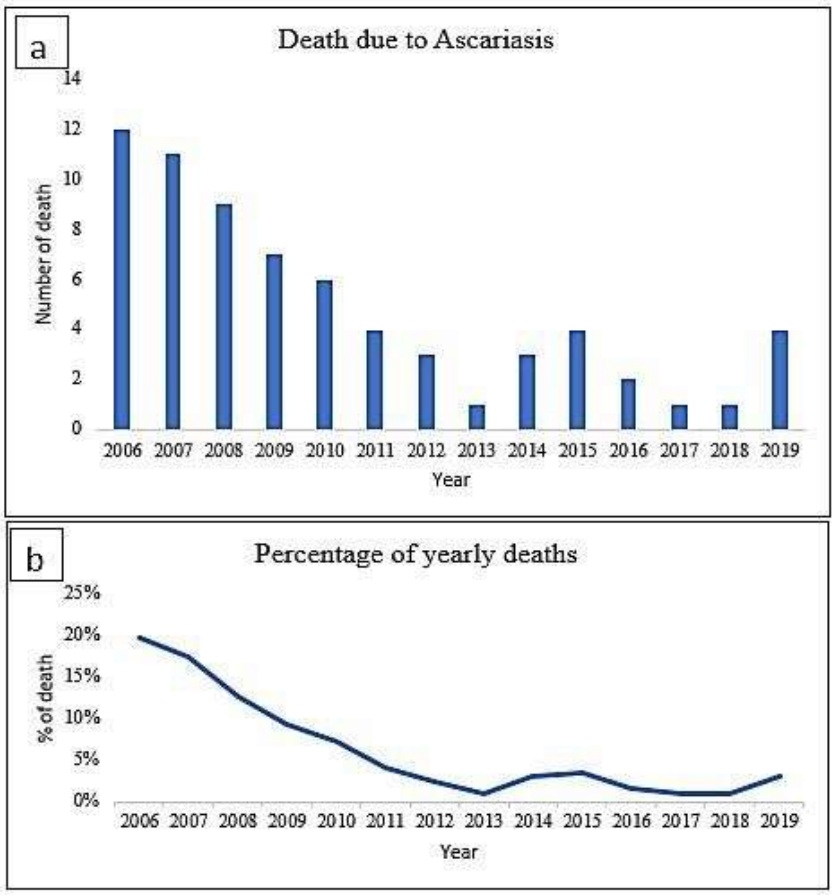
1. INTRODUCTION

Ascariasis is a neglected tropical disease (NTD) that continues to affect millions worldwide, with the highest burden observed in tropical and subtropical regions. Despite advances in public health and sanitation, the persistence of ascariasis reflects significant gaps in healthcare infrastructure, hygiene practices, and sanitation systems in many affected areas. This review examines the epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment, and prevention of ascariasis, with a particular emphasis on its significance in tropical medicine.

Epidemiology:

Ascaris lumbricoides* is one of the largest and most common roundworms infecting humans. It is estimated that over 1.5 billion people are infected globally, with the majority residing in regions of Southeast Asia, sub-Saharan Africa, Central and South America, and parts of the Middle East. Ascariasis is most common in areas with poor sanitation, where eggs of the parasite contaminate soil and water sources.

Infections peak among children aged 5–14 years, who are more likely to ingest contaminated food, water, or soil. Other risk factors include inadequate sanitation, lack of access to clean water, poor hygiene practices, and overcrowded living conditions. Epidemiological surveys have shown that ascariasis is prevalent in rural agricultural communities, where manual laborers are more exposed to contaminated environments.



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Life Cycle and Pathophysiology:

The life cycle of *Ascaris lumbricoides* begins when the fertilized eggs are ingested through contaminated food, water, or soil. Once inside the gastrointestinal tract, the larvae hatch in the small intestine, penetrate the intestinal wall, and enter the bloodstream. They travel through the liver, heart, and lungs, where they mature into larvae that ascend the bronchial tree, causing respiratory symptoms.

The larvae are eventually coughed up, swallowed, and return to the intestines, where they develop into adult worms. Adult worms, which can grow up to 35 cm in length, reside in the small intestine and lay millions of eggs, which are passed in the feces, completing the cycle.

The clinical symptoms of ascariasis depend on the stage of infection and the number of worms present. In the early stages, the migratory phase through the lungs can cause symptoms such as cough, wheezing, fever, and shortness of breath, resembling a respiratory infection. As the worms mature in the intestines, gastrointestinal symptoms such as abdominal pain, nausea, vomiting, malnutrition, and diarrhea may occur. Large worm burdens can lead to intestinal obstruction, volvulus, or perforation, requiring surgical intervention.

Clinical Presentation:

Ascariasis can present in a variety of ways, depending on the stage of infection and the number of worms involved. The clinical manifestations can be categorized into the following stages:

1. Larval Migration Stage (Pulmonary Phase):

- Symptoms of this phase are primarily respiratory, including cough, wheezing, dyspnea, and fever. In some cases, *Löffler's syndrome*, a transient eosinophilic lung infiltrate, may be observed on chest radiographs.

2. Intestinal Phase:

- Once the larvae reach the small intestine and mature into adult worms, patients may experience symptoms such as abdominal pain, nausea, vomiting, and diarrhea. Large worm burdens can lead to more severe complications such as intestinal obstruction, pancreatitis, or bile duct obstruction.

3. Complications:

- Severe cases of ascariasis may lead to life-threatening conditions such as peritonitis due to intestinal perforation, bowel obstruction, and malnutrition. Rarely, the worms may migrate to other organs, including the biliary tract, appendix, and lungs, leading to additional complications.

Diagnosis:

The diagnosis of ascariasis is primarily based on clinical suspicion and laboratory investigations. Common diagnostic methods include:

1. Stool Examination:

- The most reliable method for diagnosing ascariasis is the identification of *Ascaris* eggs in stool samples. However, because of the irregular egg-laying pattern, multiple stool samples may be needed for definitive diagnosis.

2. Serology and Imaging:

- In cases of suspected migration through the lungs, serologic tests for antibodies and eosinophil counts may be helpful. Chest X-rays may show signs of *Löffler's syndrome* in the migratory phase.

3. Endoscopy:

- In complicated cases, endoscopic evaluation may be performed to identify adult worms in the gastrointestinal tract.

Treatment:

The treatment of ascariasis involves the use of anthelmintic drugs that effectively target the adult worms in the intestines. The most commonly used medications include:

1. Albendazole:

- A broad-spectrum anthelmintic that disrupts the metabolic processes of the parasite. A single oral dose of 400 mg is often sufficient to treat the infection.

2. Mebendazole:

- Similar to albendazole, mebendazole works by inhibiting worm glucose metabolism. A single dose of 100 mg for three days is usually effective in clearing the infection.

3. Pyrantel Pamoate:

- A safer option for pregnant women, pyrantel pamoate paralyzes the worms, facilitating their expulsion from the body.

In severe cases, particularly those with complications such as intestinal obstruction or perforation, surgical intervention may be required.

Prevention and Control:

Preventing ascariasis involves improving sanitation, promoting hygiene, and reducing soil contamination with parasite eggs. Key preventive measures include:

1. Improved Sanitation:

- Access to clean water and proper waste disposal systems is essential to prevent contamination with *Ascaris* eggs.

2. Health Education:

- Public health campaigns that promote proper handwashing, the use of latrines, and food hygiene are crucial in reducing the transmission of the parasite.

3. Mass Drug Administration (MDA):

- In endemic areas, periodic mass deworming programs targeting school-age children have proven effective in reducing the prevalence of ascariasis and other soil-transmitted helminths (STH).

4. Soil Fertility Management:

- In agricultural communities, the use of human feces as fertilizer increases the risk of *Ascaris* transmission. Education on safe agricultural practices and composting human waste can significantly reduce transmission.

2. CONCLUSION

Ascariasis remains a major public health problem in tropical and subtropical regions, particularly in areas with inadequate sanitation and hygiene. While effective treatment options exist, the challenge lies in addressing the root causes of transmission through improved sanitation, hygiene, and mass deworming initiatives. With global health organizations focusing on the elimination of neglected tropical diseases, ascariasis presents an opportunity for integrated control programs that can reduce the burden of this parasitic infection, particularly in resource-poor settings. Continued research into novel diagnostic tools, treatments, and prevention strategies is critical in reducing the prevalence of ascariasis and its associated complications.

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