

## **Features of the Clinical Course of Enterobiasis in Children**

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**Abstract:** Parasitic diseases constitute a significant part of infectious pathology, including in children. However, the massive spread of parasitic diseases is recorded in all regions of the world. The WHO expert assessment indicates that in terms of the number of patients, helminthiases are in 3rd place in the world, and malaria is in 4th place among all the most significant infectious and parasitic diseases.

**Keywords:** parasitic diseases, enterobiasis, pathogens, clinical manifestations, prevention.

In terms of the amount of damage caused to human health, intestinal helminthiases are among the 4 leading causes of all diseases and injuries. More than 70% of infestation cases occur in children. In recent years, there has been a tendency to increase the incidence of certain helminthiases, primarily nematodes (enterobiasis and ascariasis). In addition, according to the famous scientist and clinician Hulda R. Clark, the increase in the prevalence of parasitosis and the emergence of hidden parasitic invasion is due to the use of a large number of pollutants in industry and their entry into the human body. Dyes, preservatives (benzene, isopropyl alcohol, methyl alcohol, acetone, etc.) trigger the process of microinvasion. For many parasites, pollutants are catalysts included in the metabolic cycle; they can accelerate the reproduction of certain types of parasites due to the mutual cumulative action of parasites and pollutants.

Having adapted over millions of years to a long, often many-year, residence in the human body, which is due to the fairly long lifespan of many pathogens, helminths have learned not to manifest themselves with pronounced clinical symptoms. At the same time, despite their long-term asymptomatic persistence, serious changes occur in the child's body that adversely affect his entire subsequent life. During their life, helminths not only rob the body, but also cause enormous harm to health, releasing toxic substances, causing serious changes in the immune system and mutations in the genomic apparatus.

The diversity of pathogens and their development cycles determines their different localization in the body and determines the nature of the influence both on the affected organ and on the entire organism as a whole.

At the same time, the clinical manifestations of parasitic diseases are not nonspecific; they are similar to those of many infectious and non-infectious diseases, which has served as the topic of a number of scientific works devoted to the study of clinical masks of helminth infections. The symptoms of helminth infections are similar to the clinical manifestations of all kinds of organ pathologies of other origins, they are weakly expressed (or completely absent) regardless of the severity of the pathological process; helminthiasis often overlaps with diseases of non-parasitic origin. Thus, the diagnosis and treatment of parasitic infestations remains a pressing problem in pediatrics.

Enterobiasis is the most common helminthiasis among children. Every year, about 400 million cases of infection are registered worldwide, in most cases in children under 14 years of age.

Enterobiasis is a contact helminthiasis, manifested by perianal itching, dyspeptic symptoms and neurotic reactions (especially in children). Enterobiasis has been known since ancient times; its descriptions are found in the works of Hippocrates. The causative agent of enterobiasis is the pinworm, *Enterobius vermicularis*. Hugot and Hugot and TourteSchaefer reported that nematodes of the genus *Enterobius*, which cause enterobiasis in humans, can be classified into 2 different species depending on the size and shape of the spicules in the male worms - *E. vermicularis* and *E. gregori*. However, according to other authors, *E. gregori* is an early (young) form of *E. vermicularis*.

The source of infection is a patient or a parasite carrier. The epidemic danger of the source persists throughout the entire period of presence of sexually mature parasites. This period, due to possible reinfestations, can last for many months. The mechanism of transmission of infection is fecal-oral. Infection of a person occurs orally when ingesting mature (containing an invasive larva) helminth eggs: when pinworm eggs enter the mouth from the fingers, from household items, with food, or when breathing in dust. Factors in the transmission of infection are hands, household items, and food contaminated with helminth eggs. The causative agent of enterobiasis is very resistant to disinfectants. On toys, bedding, carpets and other household items, the enterobiasis pathogen remains viable for up to 21 days, on environmental objects in the upper layers of the soil of playgrounds, sand from sandboxes - up to 14 days, in tap and waste water - up to 7 days. The stability of pinworm eggs in the external environment increases as they mature. At a temperature of 22–28°C and a decrease in humidity to 60%, pinworm eggs remain viable for up to 8 days.

Their lifespan does not exceed 1 month. Crawling and egg laying begin 10–12 days after infection. Optimal conditions for egg ripening are temperature 35–36°C, humidity 90–100%; Under these conditions, maturation occurs and the eggs become invasive within 4–6 hours.

The severity of clinical manifestations of enterobiasis depends on the intensity of invasion and the individual reactivity of the patient's body. The earliest sign of the disease is perianal itching.

The most common clinical manifestations of enterobiasis in children:

- itching in the perianal area, perineum, genitals;
- asthenoneurotic syndrome with sleep disturbance;
- prolonged enterocolitis;
- acute appendicitis syndrome;
- paraproctitis;
- masturbation;
- enuresis.

Extraintestinal manifestations of parasitism are rare. The most common extraintestinal manifestation is damage to the female genital tract (vagina, uterus, ovaries and fallopian tubes) due to migration of the female pinworm from the anus. The female pinworm can also enter the urinary tract, kidneys, bile ducts and liver. Finally, there are isolated case reports of infection involving the salivary glands, nasal mucosa, skin and lungs (presumably due to autoinoculation of this infestation with eggs or adult worms from the gastrointestinal tract). -intestinal tract).

Enterobiasis quite often accompanies surgical pathology in childhood.

Most often it is detected during surgery for acute appendicitis. The frequency of association of *E. vermicularis* infestation with acute appendicitis varies worldwide from 0.2 to 41.8%. In recent years, the number of cases of the formation of perianal granulomas, pseudotumors or abscesses,

inside which female pinworms or helminth eggs were found, has increased. In this regard, it is advisable to screen all children with these conditions for enterobiasis.

The main method for diagnosing enterobiasis remains perianal scraping. Material for analysis is taken after a night or daytime sleep (the time of egg laying). It is necessary to warn parents that the child does not need to be washed - then an unreliable negative result is possible. However, the reliability of this method does not exceed 15–20%.

The uninformative nature of perianal scraping during 1–2-fold examination is due to the periodicity of oviposition by female pinworms.

Each case of enterobiasis must be registered and recorded at the place of its detection in medical organizations in the infectious diseases register of the established form.

Every identified patient is subject to treatment. Recommended drugs for the treatment of intestinal enterobiasis: mebendazole - adults and children over 2 years old - 100 mg once; pyrantel - adults and children from 6 months - 10 mg/kg once; albendazole - adults and children over 2 years old - 400 mg once; carbendacin - 10 mg/kg once.

In the USA, the journal "The Medical Letter" published recommendations for the treatment of enterobiasis, which included the same pharmacological drugs: pyrantel pamoate - 11 mg/kg once (maximum - 1 g), repeated course of treatment - after 2 weeks; mebendazole - 100 mg once, repeated course of treatment - after 2 weeks; albendazole - 400 mg once, repeated course of treatment - after 2 weeks.

Treatment of extraintestinal enterobiasis is not regulated; longer courses of treatment with antiparasitic drugs are recommended.

Prevention of enterobiasis involves a set of the following measures:

- identification of patients (parasite carriers) with enterobiasis;
- examination of persons belonging to the decreed contingent;
- treatment of identified infected persons and chemoprophylaxis of persons who were in contact with infected persons;
- sanitary and parasitological control of environmental objects, including household items, water in swimming pools, sand in sandboxes, drinking water;
- monitoring the circulation of the enterobiasis pathogen in groups at increased risk of infection;
- implementation of sanitary and hygienic measures in accordance with regulatory documents on compliance with the anti-epidemic regime;
- determination of the risk of infection in accordance with the epidemiological situation, the results of sanitary and parasitological control and (or) the level of infection of persons examined in the outbreak of infection;
- development of comprehensive plans and targeted programs for the prevention of parasitic diseases (including enterobiasis);
- hygienic education of the population.

The following are subject to examination for enterobiasis:

- children attending preschool educational organizations;
- staff of preschool educational organizations;
- primary school students (1–4);
- children, adolescents, persons on voluntary service during medical examinations and preventive examinations;

- children and adolescents for epidemic reasons (often suffering from acute intestinal infections, living in unsanitary conditions and in socially disadvantaged families);
- children enrolled in preschool and other educational organizations, children's homes, orphanages, boarding schools, for sanatorium and resort treatment, and health organizations;
- outpatients and inpatients in children's clinics and hospitals;
- decreed and equated contingents;
- persons who have been in contact with a patient (parasite carrier) with enterobiasis;
- persons receiving access to the swimming pool.

Planned preventive examinations of children and staff in preschool groups and groups of children of primary school age are carried out once a year (after the summer period, when forming a team) and (or) according to epidemic indications.

Anti-epidemic measures in the focus of enterobiasis:

- identification of sources of invasion;
- treatment of patients with enterobiasis, taking into account the types of lesions;
- sanitation of foci of enterobiasis, including disinfestation measures, regardless of the type of foci.

Disinfection measures are carried out during the treatment of children, as well as within 3 days after its completion. Household items are put into storerooms for 3 days until disinfection is completed or subjected to chamber disinfection. Observation of the focus of enterobiasis is carried out for a period of 2–3 months to 1 year, depending on the degree of risk of infection.

Children infected with pinworms, which are sources of the spread of enterobiasis, are not allowed into preschool educational institutions for the period of treatment and control laboratory examination.

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