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Pathogenetic Bases And Prevalence Of Parasitic Infections In Children: Literature Review

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ABSTRACT

The purpose of this study was to analyze the literary sources of recent years dedicated to the degree of occurrence, the structure of morbidity and the pathogenetic basis of parasitic infections occurring in children. In addition, the features of the detection of nematodes, cestodoses and rematodes in different countries of the world are given. The basics of diagnosis and prevention of parasitic infections in children are described.

KEYWORDS

Parasitic infections, helminthiasis, children, the degree of occurrence, pathogenesis and prevention of parasitic infections.

INTRODUCTION

Currently, one of the factors that determine the state of health of the population are socially caused diseases, including protozoonoses and helminthiases, which account for 99% of all parasitic diseases [13, 29].

Parasitic diseases are a group of diseases caused by helminths and arthropods. ... A parasite is an organism that lives at the expense of another, which is called the "host

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of the parasite" and coordinates its vital activity with its physiology.

Despite the existence of parasitic diseases since ancient times, they remain the most common diseases in the world. Currently, there are about 50 thousand species of organisms leading a parasitic lifestyle. Over 342 types of helminths and 18 protozoa cause diseases in humans, as a result of which the invasion of the population has reached 2 billion. This is especially true for children, among the sick they make up more than 80%. Schoolchildren and preschool children account for 90-95% of all patients with enterobiasis, 65.1% of patients with ascariasis. Today, the most widespread parasitic diseases include enterobiasis (725.83 per 100 thousand), ascariasis (158.03 per 100 thousand) and trichocephalosis (35.44 per 100 thousand of the population). 200 million are infected with giardiasis annually. and 500 thousand people suffer from clinically expressed forms [5, 7, 31].

The increase in the incidence of helminthiases in different countries of the world is a consequence of high environmental pollution with helminth eggs as a result of wastewater discharge, increased population migration, increased human contact with animals, low socioeconomic living standards, and weakening of the population's immune system [25].

It has been established that children are the most vulnerable category of the population in relation to parasitic invasions. This is due, on the one hand, to a lower level of compliance with sanitary and hygienic standards, and on the other hand, more intensive growth and development processes, which are reduced in conditions of parasitic infections. In childhood, parasites are often factors contributing to the development of chronic eating disorders, dysfunctions of the gastrointestinal tract (GIT), intoxication, sensitization of the body, and weakening of the immune system. Migrating helminth larvae can damage organs and tissues on their way: visceral membranes, eyes, and the nervous system. 5-7% of larval migrants enter the brain, larvae of more than 30 species of parasites infect lung tissue [7].

According to the international classification of diseases - ICD-10 (WHO, 2007), parasitic diseases belong to class 1. Helminthiases rank 4th in the degree of damage to the health of the world's population, after diarrhea, tuberculosis and coronary heart disease [32].

Depending on the source of invasion, infection routes and transmission factors, all human helminthiases are divided into 3 main groups [14]: geohelminthiasis (ascariasis, trichocephalosis, ankylostomiasis, strongyloidiasis); biohelminthiasis (teniarinhoses, teniasis, opisthorchiasis, diphyllobothriasis, fasasolosorosis trichinosis, echinococcosis); contagious helminthiases (hymenolepiasis, enterobiasis, in some cases strongyloidosis and cysticercosis).

Taking into account the biological characteristics of pathogens, helminthiasis is divided into 3 main classes [14]: nematoses: ascariasis, enterobiasis, trichocephalosis, ankylostomiasis (ankylostomiasis and necatoriasis), trichinosis, etc.; cestodoses: teniarinchiasis, teniasis, dyphyllobothyroidism, echomeninocolemia and hypochondriosis; trematodoses: opisthorchiasis, clonorchiasis, fascioliasis, etc.

By localization in the human body, helminths are classified into intestinal and extraintestinal, including tissue helminthiases.

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MATERIALS AND METHODS

In Russia, the frequency of helminthiases infested on average reaches 140-200 cases per 100 thousand of the population, in the Far Eastern Federal District, 330 cases per 100 thousand, in the Khabarovsk Territory, 130.5-180.3 cases per 100 thousand. population. Parasitological examination of 1265 children aged from 6 months to 15 years, living in different districts of the Khabarovsk Territory, revealed 946 infested children (86.6% of all examined). The presence of 13 monoinvasions by different helminths, 18 mixed invasions was established. The most frequent helminthiases in children were ascariasis, toxocariasis, clonorchiasis, both in the form of monoinvasions and as associates [15].

Starostina O.Yu. et al. [22] presented an analysis of the incidence rates of helminthiases and protozoses in the Omsk region of Russia. There was no tendency to a decrease in the incidence of opisthorchiasis, an increase in serological indicators of the incidence of toxocariasis, and the existence of a high risk of mixed parasitosis formation among the rural population.

The group of rare helminthiases includes helminthiases, endemic in the local area, the pathogens of which circulate in this area, but due to biological barriers, human infection is rare, as well as imported helminthiases, the pathogens of which do not circulate due to the lack of natural and climatic conditions [6].

Materials on the serological diagnosis of trichinosis in the population of the Tyumen region of Russia indicate the high importance of this biohelminthiasis, with a greater danger for the population of the northern territories due to the presence of active natural foci [19].

In Belarus, the complex of natural conditions and the species composition of natural hosts create favorable conditions for the existence of natural foci of trichinosis and determine the endemicity of the country's territory for this invasion. It was found that in the structure of parasitic diseases helminthiases accounted for 90.5-94.0%, protozoses 6.0-8.5%. The total annual incidence of parasitic diseases in Belarus amounted to 210.32 per 100 thousand population [8, 9, 28].

In patients with the syndrome of the right hypochondrium of unspecified etiology, liver flukes are rarely detected. Parasitological examination of 84 patients was carried out, of which 87% were diagnosed with opisthorchiasis, 3.5% with pseudamphistomiasis, 9.5% with a combination of opisthorchiasis and pseudamphistomiasis. Instrumental examination methods help to identify indirect signs of damage to the organs of the hepatobiliary system [27].

Studies in preschool children in East Africa have shown a strong, direct correlation between hookworm disease and anemia. In children in coastal Kenya, anemia has been associated with hookworm infestation (> 200 eggs per gram) in all age groups, in both sexes, regardless of socioeconomic factors. In Zanzibar, Tanzania, low hemoglobin concentrations have been associated with hookworm infections in children aged 30-71 months. Importantly, this study showed an association between the extent of hookworm infestation and rates of iron deficiency (serum ferritin and erythrocyte protoporphyrin). Currently, a significant number of studies have been carried out that demonstrate how geohelminthiases worsen the nutritional status of children [30].

Helminthiasis is one of the most common diseases in Uzbekistan, accounting for more

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than 90% of the total number of parasitic diseases. The level of long-term incidence of the population remains stably high [23].

More than 200 thousand infected people are registered in Uzbekistan every year - out of 7,580,703 people examined for helminthiasis, 263,167 were identified (3.5%). According to a study carried out in the Samarkand region, the invasion of children in individual children's institutions was more than 50%, the frequency of mixed invasions was 39.6% [17].

The prevalence of helminths varies across regions of Uzbekistan. Enterobiasis and hymenolepiasis are ubiquitous, both in urban and rural areas. The foci of ascariasis are recorded in the mountain-foothill zones of the Fergana, Namangan and Surkhandarya regions, the Khorezm region is the focus of the teniarinhoz. Uzbekistan belongs to the regions endemic in relation to echinococcosis. In some preschool institutions and general education schools, the invasion of children with Enterobiusvermicularis, Hymenolepisnana, Lambliaintestinalis was 30-35%. Analyzing the situation in terms of the prevalence and clinical manifestations of parasitoses, we can note a certain role of helminthiases and parasitoses in the formation of background conditions in children [17].

Taking into account the absence of a trend towards a decrease in the incidence of parasitosis, the Cabinet of Ministers of the Republic of Uzbekistan on January 23, 2015 issued a Decree on measures for the prevention and treatment of helminthiasis in children in Uzbekistan for 2015-2018. The document approved a plan of measures for the prevention and treatment of helminthiasis worth 9.348 billion soums and 30 thousand US dollars (UNICEF funds).

For the first time in the Bukhara region of Uzbekistan, the indicators of infestation by helminthiases in children under 14 years old were studied. The prevalence of helminthiasis in children under 14 years of age at the level of primary health care was revealed, and a structural analysis of helminthosis among children in this region was carried out [16].

According to researchers [13, 14, 18], the pathogenic effect of the influence of helminths on the body of children is as follows: mechanical effect on the mucous membranes, which leads to damage to the gastrointestinal tract; toxic-allergic effects of metabolic products and excretion of helminths, which leads to the development of allergic reactions; nutrients of the human body by helminths, which lead to a lag in physical, mental and mental development, the formation of asthenovegetative syndrome; their migration to vital organs and tissues of the body disrupts the normal function of the body; they contribute to chronicity, lengthening the treatment of diseases with which they are combined; reduce the effectiveness vaccinations, a sufficient protective level of the immune response is not achieved during vaccination and revaccination against tetanus, measles, diphtheria, whooping cough; helminthiasis are accompanied by nonspecific clinical manifestations: weakness, fatigue, irritability, sleep disturbance, dyspeptic symptoms decrease in the production of insulin-like growth factor and an increase in tumor necrosis factor-α, as well as a decrease in collagen synthesis, which contributes to a decrease in appetite, a decrease in absorption processes in the intestine; chronic persistent micro blood loss , in particular, from the intestine with hookworm infections and through the bile ducts with trematodes of the liver, in which there is also a loss of amino acids with bile.

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According to Clark H.R. (1995) an increase in the prevalence of parasitosis, the emergence of latent parasitic invasion is to some extent due to the use of pollutants in industry and their ingestion into the human body. Dyes, preservatives start the process of microinvasion. For many parasites, pollutants are catalysts that enter the metabolic cycle; they can accelerate the reproduction of certain parasites due to the mutual combined action of parasites and pollutants [18].

The pathological effect of all parasites is due to the modulating effect on the human immune system. Eosinophilia, overproduction of IgE, release of mediators by mast cells, hypersecretion of mucus, synthesis of interleukins are a protective reaction and a manifestation of the body's mobilization in the fight against parasites. On the one hand, these studies demonstrate an inverse relationship between the presence of parasitic invasion and the activity of the inflammatory process in allergic diseases. On the other hand, parasites and their metabolic products are allergens, cause inflammatory changes, have a sensitizing effect, which initiates the development of chronic allergic diseases [21].

Evolutionarily, the phenomenon of an allergic reaction was formed due to the molecular similarity of parasite antigens and antigens entering the body from the outside (dust, pollen, food), which determines the development of nonspecific sensitization in those infested with parasites [13, 21].

The immune response induced by helminths is determined by their morphological and biological characteristics. The authors believe that the acquired antiparasitic immunity is due to both increased polymorphism of the biological properties and antigenic composition of the pathogen, and complex mechanisms of development of the immune system itself, the constant adaptation of the pathogen to avoid factors of the host's immunological defense [4].

Growth retardation in children with geohelminthiasis is associated with various mechanisms, including decreased nutrient intake due to malabsorption and / or decreased appetite. The study, which was conducted among children in northeastern Brazil, showed that in a cohort of children aged 2-7 years under the condition of helminth infestation in early childhood, there was a growth deficit of 4-6 cm at the age of 7 years. It has been established that low serum vitamin A levels are associated with ascariasis and trichocephalosis. A study conducted in Nepal showed that the prevalence of xerophthalmia is 3 times higher in children with ascariasis at the age of 6–120 months than in children without ascaris [14].

RESULT AND DISCUSSION

Most parasitic diseases have a chronic course associated with the long-term presence of the pathogen in the patient's body due to the lack of specific treatment. Diseases caused by helminth larvae, which are not typical for humans, require great attention in modern megacities. Larval invasions are caused by representatives of all 3 classes of helminths - nematodes, trematodes and cestodes. Definitive hosts are the source of invasion in larval helminthiasis. Man plays the role of an intermediate host, its epidemiological role is comparable to that of animals [4].

Giardiasis is one of the most common parasitic infestations. Parasitizing in the small intestine lead to recurrent or persistent clinical manifestations that combine painful, dyspeptic and asthenoneurotic symptoms. Clinical signs are similar to those in other types of pathology of the gastroduodenal zone, intestines, biliary

tract, which makes clinical diagnosis almost impossible [3, 24].

In persons infested with Strongyloidesstercoralis, with the addition of HIV infection or other conditions associated with immunosuppression, hyperinvasive syndrome develops due to overproduction of larvae in the intestine, followed by severe ulcerative intestinal lesions, perforated peritonitis, central nervous system damage, respiratory organs, the development of hypoproteinemia, mynemia up to 80% [13].

We studied dental morbidity in children with nematodes. Ascariasis was found in 38.3%, enterobiasis in 4.97%, giardiasis in 26.6% of cases. Combined parasitic lesions were diagnosed: ascariasis and giardiasis occurred in 22.1%, enterobiasis and lambliasis 2.7%, ascariasis and enterobiasis in 2.2%, ascariasis, enterobiasis and giardiasis in 2.98% of cases. Among children under 3 years of age with nematodes, the prevalence of dental caries was 27.1%. Desquamative glossitis occurred in 8.5%, atopic cheilitis in 19.2%, acute herpetic stomatitis in 23.4% of cases. 25.5% complained about bad breath from the child, and 40.4% of the parents surveyed indicated nocturnal bruxism [10].

The wide spread of parasitic diseases among humans and animals contributes to the intensive seeding of various environmental objects with helminth eggs. Failure to comply with the rules of personal hygiene, the lack of preventive measures among people and animals, the contamination of environmental objects with eggs and larvae of parasites leads to an increase in the number of cases of parasitic morbidity [1].

In the clinic of helminthiasis, neurological and autonomic symptoms often predominate, which is due to the pathogenetic characteristics of intoxication. The authors describe the effectiveness of a broad-spectrum anthelmintic agent - albendazole (Vormil). It inhibited the polymerization of beta globulin, which led to the disruption of the formation of cytoplasmic microtubules of helminth cells [7].

Halafli H.N. [26] believes that in solving the problem of intestinal parasitosis and the health of children, it is important to rationalize the approaches to comprehensive examination of children for intestinal parasitosis; assessment of the incidence of intestinal parasitosis in children; assessment of the influence of intestinal parasitoses on the physical and mental development of children; identification of epidemiological patterns of the incidence of intestinal parasitosis in children; evaluation of the effectiveness of combinations of basic antiparasitic agents in the treatment of children; development of methods for the rehabilitation of the health of children with intestinal parasitosis; approbation of regional epidemiologically based preventive measures to reduce the risk of infection of children with intestinal parasitosis.

It has been established that the leading sign of a number of parasitic lung lesions according to CT, MRI and ultrasound is the identification of fluid contents, cloisonne structures (echinococcus, cysticercosis, alveococcus), no changes in the bronchi in the affected area, absence or insignificant accumulation of contrast agent in the pathology area with bolus enhancement (paragonimiasis, schistosomiasis, toxoplasmosis, pneumocystosis). The authors came to the conclusion that dynamic CT monitoring is one of the leading methods in the recognition and differential diagnosis of atypical manifestations of parasitic lung lesions [12].

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CONSCLUSIONS

A retrospective study was carried out to assess the influence of parasitic diseases on the peculiarities of the development of tuberculosis in children. A lower risk of developing infectious and parasitic diseases in children with tuberculosis was characteristic of girls. At the same time, preschoolers most often suffered from infectious and parasitic diseases, rarely children 12-14 years old with active tuberculosis. Secondary forms of tuberculosis were more often recorded in children who did not have infectious and / or parasitic diseases [20].

Kozlovsky A.A. [11] highlights specific and non-specific prevention of helminthiasis. Non-specific prevention includes: a healthy lifestyle; observance of sanitary and hygienic skills in the family, children's institutions, medical and preventive institutions; correct culinary processing of food products; using only boiled, bottled, filtered water; prevention of faecal pollution of the environment; proper keeping of pets; early detection of patients, timely treatment. Specific prevention includes: chemoprophylaxis of helminthiasis for children at risk of infection, as well as for children with persistent eosinophilia in a general blood test (1-2 times a year, in spring and / or autumn).

Some authors determined the effectiveness of preventive work to reduce helminthiasis in children in preschool institutions [2].

REFERENCES

1. Alekhina N.A., Sokolova Ya.O., Ismailova Z.M., Martynova O.V., Kenembaeva A.S. Parasitic cleanliness of environmental objects of the Astrakhan region for 2014-2016. Electronic magazine "Concept". 2017; 396: 2711-2715.
2. Akhatova G.Kh., Nazarova U.Kh., Tursunova Kh.N. Improving the effectiveness of the use of preventive measures in children to reduce the incidence of helminthiasis. Young scientist. 2017; 16: 25-27.
3. Bekhtereva M.K., Luppova N.E., Kornienko E.A., Minina S.N. Working protocol for the diagnosis and treatment of giardiasis in children. Questions of pediatric dietetics. 2013; 6: 72-76.
4. Bodnya E.I., Bodnya I.P. Clinical and immunological aspects of parasitic diseases. Clinical immunology. Allergology. Infectology. 2007; 3 (8): 26-29.
5. Bodnya E.I. The problem of parasitic diseases in modern conditions. Suchasniinfektsiï.2009; 1: 41-44.
6. Guzeeva M.V. The role and place of rare helminthiases in parasitic pathology in Russia. Author's abstract. dissertation ... for the degree of candidate of medical sciences. - Moscow, 2009 .-- 21 p.
7. Ershova I.B., Mochalova A.A., Lokhmatova I.A., Monashova M.G., Petrenko O.V. Non-specific manifestations of helminthiasis in children. Child health. 2015; 8 (68): 45-50.
8. Zharnova V.V., Kuzyuta S.L., Nikitin V.F. Measures for the prevention of nematodes. Russian parasitological journal. Moscow, 2016; 36: 2: 217-222.
9. Zharnova V.V., Zhmakin D.A., Nikitin V.F. Clinical and epidemiological picture of trichinosis in the Grodno region.

Russian parasitological journal. Moscow, 2015; 4: 38-42.

10. Isaeva N.S. Dental morbidity in children with helminthiasis (nematodes). Internet Medical Bulletin. 2013; 3: 9: 1080-1081.
11. Kozlovsky A.A. Helminthiasis in children of the Gomel region. Medical news. Minsk, 2015; 6: 19-25.
12. Kotlyarov P.M., Egorova E.V. Differential diagnosis of parasitic diseases of the lungs according to the data of radiation research methods. Pulmonology. 2016; 26 (4): 453-458.
13. Lysenko A.Ya., Vladimova M.G., Kondrashin A.V., Majori J. Clinical parasitology. Leadership. Geneva, WHO, 2002; 752.
14. Marushko Yu.V., Gracheva M.G. The current state of the problem of helminthiasis in children. Diagnostic and treatment issues. Modern pediatrics. Kiev, 2012; 3 (43): 1-5.
15. Miropolskaya N.Yu., Milk V.P. Helminthiasis of the Russian Far East. Far Eastern medical journal. 2014; 2: 116-122.
16. Mukhitdinov Sh.T., Zhuraeva F.R. Problems of helminthiasis among children under 14 years of age and organizational methods of combating them in primary health care. International Science Journal "Internauka". 2017; 6 (28): 30-32.
17. Norkulova G. S. Helminthiasis in children: frequency and causes // Europeanresearch: Innovationinscience, educationandtechnologyXXVIII International scientific and practical conference // London. United Kingdom. 2017; 73-74.
18. Odintseva V.E. Modern features of diagnostics and treatment of parasitic infections in children. Diss ... for the degree of Ph.D. St. Petersburg, 2010; 128.
19. Peklo G.N., Stepanova T.F., Panarina P.V. Serological monitoring of trichinosis in the Tyumen region. Epidemiology and Vaccine Prophylaxis. 2010; 1 (50): 30-33.
20. Romanova M.A., Mordyk A.V. Infectious and parasitic diseases in children with active tuberculosis. Medical Bulletin of the North Caucasus. 2018; 13 (2): 343-347.
21. A. Sannikova. Comorbidity of allergic and parasitic diseases in children: clinical and diagnostic features: Diss ... for the degree of candidate of medical sciences. Ugra, 2016; 129.
22. Starostina O.Yu., Panyushkina I.I., Emtsova T.B., Tishkova E.L. Distribution of endemic helminthiases and protozoa in the south of Western Siberia (Omsk region). Epidemiology and Vaccine Prophylaxis. 2010; 1 (50): 33-36.
23. Ulmasov M.M. Epidemiological features of some helminthiasis and the organization of the fight against them in the Tashkent region. Diss. for the degree of Candidate of Medical Sciences Tashkent, 2007; 116.
24. Usenko D.V., Konanykhina S.Yu. Modern aspects of the diagnosis and treatment of giardiasis. Questions of modern pediatrics. 2015; 14 (1): 108-113.
25. Faizullina R.A. Samorodnova E.A., Dobrokvashina V.M. Helminthiasis in childhood. Practical medicine. 2010; 3: 31-36.

Published: October 31, 2020 | **Pages:** 87-95
Doi: https://doi.org/10.37547/TAJMSPR/Volume02Issue10-14

26. Halafli H.N. Influence of intestinal parasitoses on children's health. Basic research. 2013; 9: 156-162.
27. Khamidullin A.R., Sayfutdinov R.G., Khaertynova I.M. Human helminths: opisthorchiasis and pseudamphistomiasis. Practical medicine. 2011; 3 (50): 35-37.
28. Chistenko G.N., Vedenkov A.L. Parasitic diseases in the Republic of Belarus // "Modern aspects of pathogenesis, clinical picture, treatment and prevention of parasitic diseases." Proceedings of the VIII Republican Scientific and Practical Conference with International Participation. Vitebsk, VSMU, 2012: 197-200.
29. Baldursson S., Karanis P. Waterborne transmission of protozoan parasites: review of worldwide outbreaks - an update 2004-2010. Water Res. 2011; 15: 45 (20): 6603-6614.
30. Bethony J., Brooker S., Albonico M. Soil-transmitted helminth infections: ascariasis, trichuriasis, and hookworm. Lancet. 2006; 367 (9521): 1521-1532.
31. Cervera-Castillo H., Torres-Caballero V., Martinez Garcia E. Human trichinosis. A case simulating polymyostis. Rev. Med. Mex. Seguro Soc. 2009; 47 (3): 323-326.
32. World Health Organization, UNICEF. Prevention and control of schistosomiasis and soil-transmitted helminthiasis. Joint statement. Geneva, 2004.