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FEATURES OF BIOCHEMICAL CHANGES DURING HELMINTHIASES IN CHILDREN OF THE ARAL SEA REGION (LITERATURE REVIEW)

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Summary

With helminthiases, a special feature is the extreme variety of clinical manifestations, even when infected with one type of pathogen, and they cause damage not only to the organs in which they directly parasitize, but also to the entire body. A set of laboratory tests is aimed at detecting eggs, larvae and adults. A positive stool test result allows the diagnosis of intestinal infestations and protozoal infections.

Key words: helminthiases, pathogen, larvae, infections.

Prevalence. Helminthiasis is a large group of parasitic diseases caused by helminths (parasitic worms), which largely determines the health status of the population. According to WHO, almost every person experiences one or another parasitic disease during their lifetime [2]. Children are the category most susceptible to helminth infestations; among the total number of infected people, the proportion of children under 14 years of age is 80-85%. According to the World Health Organization (WHO), helminthiasis ranks 4th in terms of damage to the health of the world's population (after diarrhea, tuberculosis and coronary heart disease) [5].

Thus, every year approximately every second person on the planet becomes infected with one of the 3 main types of helminths, which leads to ascariasis (1.2 billion people), hookworm (900 million) and trichuriasis (up to 700 million) [3.5]. In the industrialized countries of Europe, the situation has also worsened over the past two decades due to the increasing importation of parasitic diseases from endemic countries. Another unfavorable factor is the weakening of the immune status of the population due to the HIV epidemic, drug addiction and environmental pathogens [7]. Currently, about 256 species of helminths that parasitize humans are known, with 98 species distributed in Russia and neighboring countries, of which 18-20 are common, and most often pinworms, roundworms, whipworms and dwarf tapeworms, often in combinations [6].

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The annual incidence of helminthiases in Uzbekistan exceeds thousands of people [8]. In Uzbekistan, the most common helminthiases are: enterobiasis, ascariasis, trematodiasis. The incidence of enterobiasis in the country is 1,100 cases per 100 thousand populations. Among the patients, 90% are children, mainly aged 1 to 3 years. The incidence of ascariasis is 100 cases per 100 thousand populations [9]. Intestinal helminthiases are the most common in the Aral Sea region. Among them, ascariasis takes the leading place in the structure of morbidity, accounting for more than 30% of all identified helminthiases [6]. Currently, there are many works covering the problem of ascariasis, the clinical manifestations of ascariasis have been sufficiently studied, however, global environmental changes in recent decades, the widespread use of antibacterial, immunotropic and other drugs and a number of other factors have changed the clinical picture of nematodes, which requires additional study [5,6].

According to modern classification, all human helminthiases are divided into three main groups depending on the source of invasion (infection), routes of infection and transmission factors. According to their specific localization in the human body, helminths are classified into intestinal and extraintestinal, including tissue helminthiases, when parasites multiply not in the intestines, but in the soft tissues of the microorganism.

Infection of humans with helminths can occur in various ways: food - as a result of ingestion of helminth eggs with unwashed vegetables, fruits, etc., as well as by consuming meat of intermediate hosts containing helminth larvae; aquatic - when drinking water from reservoirs that contain helminth larvae; through the skin - less common. The larvae of some helminths (for example, filaria) enter the body through the bites of blood-sucking insects, while the larvae of others (hookworms, schistosomes) are able to actively penetrate the skin (when walking barefoot, lying on the ground, etc.); through the placenta - also a rare route of infection [4]. According to parasitological monitoring data, almost every person in our country experiences a parasitic disease during their lifetime, and children are most often affected. Schoolchildren and young children account for up to 80% of helminthic infestations.

In addition, most researchers identify among them a group at risk of contracting enterobiasis and other helminthiases: children from large and socially disadvantaged families, long-term and frequently ill children who simultaneously have 7 or more stigmas of dysembryogenesis, children who received artificial feeding, children with mental and mental retardations. Mental development and low level of personal hygiene skills.

The impact of helminths on a child’s body is very diverse. Helminthiasis contributes to the chronicization and prolongation of treatment of those diseases with which they are combined (intestinal infections, disorders of intestinal biocenosis, skin diseases, etc.). Against the background of helminthiasis, the effectiveness of

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vaccinations decreases, the protective level of immunity is not achieved during vaccination and revaccination against tetanus, measles, diphtheria, whooping cough [10]. Special diagnostic laboratory methods are divided into the following groups: helminth-ovoscopic (with and without enrichment); microhelminthoscopic (enterobiasis, taeniasis); helmintholarvoscopic (vomit, bile, urine, sputum, duodenal contents); muscle biopsy (taeniasis); scrapings (enterobiasis); immunological methods, epidemiological methods (collection of epidemiological data). Currently, a new method for identifying helminths has been developed - histological carpology [1,11].

The essence of the method is that stool samples are subjected to special processing, fixed, and followed by the production of paraffin blocks, sections and staining of the resulting preparations with tissue dyes, which are then examined under a microscope. When studying micropreparations, the microbial background of feces is characterized. The undoubted advantage of the method is the ability to diagnose some helminthiasis by detected fragments of worms and larvae parasitizing in the intestines; small nematodes, immature individuals and nematode larvae, which have a similar histological significance, as well as parasite eggs can be found in stool sections stained with tissue dyes. It is especially important to collect an epidemiological history to identify natural focal helminths and to diagnose the early phase of helminthiasis, when the patient has not yet excreted eggs or larvae of parasites.

It is not always possible to detect helminthiasis using stool analysis alone. In addition, many parasitic infestations are asymptomatic, and a person may not be aware that he is a carrier of worms. Symptoms can manifest as weakness, rashes, and abdominal pain. As a result, patients may undergo examinations by an allergist or gastroenterologist for a long time and still not identify the true cause of poor health. The solution is to take a blood test for helminths. It provides the most accurate information about the presence or absence of worms in the body. Moreover, with its help it is possible to establish the type of parasite [12].

During the acute period of helminthiasis, as a rule, the level of leukocytes, including eosinophils, increases, and the erythrocyte sedimentation rate (ESR), one of the markers of inflammation, also increases. Elevated levels of C-reactive protein may also indicate inflammation. Eosinophilia is a condition in which the level of eosinophils in the blood is increased; the results of a clinical blood test in combination with characteristic symptoms of helminthiasis and a “suspicious” history are a sufficient reason for additional examination. And the determination of eosinophilic neurotoxin in feces allows us to clarify the connection between inflammation in the intestine and the activation of eosinophils. The study is used in the complex diagnosis of intestinal parasites.

Biochemistry helps to identify changes in the balance of blood proteins: the titer of gamma globulins, which contain antiparasitic antibodies, increases, and the amount

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of albumin decreases due to impaired liver function. Also, with stagnation of bile, the level of bilirubin (bile pigment), alkaline phosphatase and alanine aminotransferase (liver enzymes) increases [7].

Thus, a set of laboratory tests is aimed at detecting eggs, larvae and adults. A positive stool test result allows the diagnosis of intestinal infestations and protozoal infections. Testing is also carried out to monitor the effectiveness of treatment and ascertain recovery for helminthiases in children of the Aral Sea region.

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