

## EPIDEMIOLOGICAL FEATURES OF PARASITIC DISEASES AND PARASITISM

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**ABSTRACT.** Helminthiasis constitutes the largest group of parasitic diseases. They are caused by parasitic worms or helminths. More than 250 species of helminths have been registered in humans. Of this number, about 30 are common human parasites and form foci with significant infestation, and the rest are animal helminths that infect humans more or less accidentally.

**Keywords:** helminths, epidemiology, parasites, symbiosis, parasitism.

### ЭПИДЕМИОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ПАЗАРИТНЫХ ЗАБОЛЕВАНИЙ И ПАРАЗИТИЗМА

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**АННОТАЦИЯ.** Гельминтозы составляют самую большую группу паразитарных заболеваний. Они вызываются паразитическими червями или гельминтами. У человека зарегистрировано более 250 видов гельминтов. Из этого числа около 30 являются распространенными паразитами человека и формируют очаги со значительной инвазией, а остальные — это гельминты животных, которые более или менее случайно заражают человека.

Ключевые слова: гельминты, эпидемиология паразитов, симбиоз, паразитизм.

**Introduction.** According to the World Health Organization, "...intestinal helminthiasis ranks second after diarrhea among parasitic diseases, with an annual incidence of more than 3.5 billion cases. Children aged 4-14 years are at risk of helminthiasis infection. The incidence of geohelminthiasis in children under 17 years of age in different countries varies from 27% (India), 6-7% (Indonesia, China, Nigeria), and up to 2-3% (Democratic Republic of the Congo, Tanzania, and the Philippines) ..." In clinical practice, determining the impact of hymenolepiasis on the immune system using parasitological, immunological, and molecular genetic research methods is important. This pathology leads to secondary immunodeficiency, which contributes to the development of autoimmune and tumor processes in genetically predisposed individuals.

Early diagnosis and treatment of helminthiasis is a pressing issue in infectious diseases and attracts the attention of researchers and clinicians. Despite

significant advances in global science, treatment of this disease remains one of the unsolved problems in modern medicine.

Various forms of parasitism. Parasitism is not an independent condition, completely separate from some conditions of the animal world. It comes in several forms. The main problems associated with parasitism are symbiosis and synocysion.

During these events we look at the interaction of two different animal species. All living organisms on Earth are divided into two groups based on nutrition: 1. Autotrophic organisms. 2. Heterotrophic organisms

Autotrophic organisms synthesize organic substances from inorganic substances. These include green plants.

Heterotrophic organisms are those that feed on ready-made organic matter. In turn, they can be divided into herbivores, omnivores, etc. Carnivorous animals, in turn, are divided into parasites, predators and saprophytes. Parasites are divided into parasites of humans, animals and plants. All living organisms interact directly and indirectly with each other. In the process of evolutionary development, this connection between organisms becomes more or less complicated and is biologically divided into different categories, that is, animals form different groups and live together in neutral (indifferent), friendly and antagonistic relationships.

Indifferent-neutral relationships. They live in the same conditions, in the same environment (territory), and do not harm or bring any benefit to each other. Examples of this are coral polyps, igneous starfish and crinoids.

II. Antagonistic – opposite relationships. In such a situation, one of the cohabitants causes harm to the other. Examples of this are predation and parasitism.

III. Symbiosis is a mutually beneficial relationship. The meaning of symbiosis is “sim” - together, “bios” - life (living), both living together benefit from each other to one degree or another.

Symbiosis is very complex and takes several forms. Even one cannot live without the other. Initially, such coexistence becomes necessary only for one of the cohabitants, since he cannot independently communicate with the external environment.

Symbiosis is a very complex relationship between two organisms belonging to different species. M: Hypermastigins live in the intestines of termites. When termites were cleared of parasites in the laboratory, the parasites died immediately. When termites with parasites and termites without parasites were observed under the same conditions, termites with parasites lived up to 1.5 years given sufficient food and favorable conditions, while termites without parasites lived only 10-14 days and then began to die.

Another form of symbiosis is synoikia (syn-together, oikos-house, place). This is such a coexistence that both animals living together can be neutral towards each other, or one of them uses the other, but does not harm him in any way. Thus,

one of the cohabitants slowly serves the other and does not see any benefit for himself from such cohabitation.

Sometimes one of the cohabitants, due to his small size or very slow mobility, climbs onto the body of the other cohabitant and lives with him as a companion. Such relationships can be expressed by the general term "lease". There are several types of rental housing.

Simple rent - lives in the body of the owner or within the limits of his influence. When living together in a rented apartment, one organism uses the other as a home. For example, the mustard fish protects its eggs from enemies by placing the eggs in the mantle of toothless bivalves, or the very small Fierasphere fish hides under the umbrellas of jellyfish in case of any danger.

2. Epioikia - a tenant living on rent sits on his body and uses it as a means of transportation. M: Crustaceans belonging to the genus Cirripeda cling to the bodies of whales and sharks and use them as transport, while they themselves feed on plankton, or sticky fish passively cling to the shark with their dorsal fin and feed on food left by the sharks. . In this case, the sticky fish spreads to other places at the expense of sharks, which is called epioikia.

3. Entoikia - along with sitting on the owner, it is used for feeding at his expense. M: Fishes of the ammotid family live in the watery lungs of sea cucumbers, but can sometimes go out into the water and feed on small crustaceans.

One of the main manifestations of synoikia is commensalism. In a commensal relationship, one organism does not harm another organism by eating unwanted food.

Forms of communication between parasites and hosts. Facultative parasitism is a phenomenon in which some free-living organisms enter other organisms and survive. Facultative parasitism is important in studying the origin of parasites.

When free-living organisms become parasitic, their structure and physiology must have specific characteristics and certain conditions. M: Owners must have strong skin, not exposed to digestive juices, and be able to live in anaerobic conditions.

In rare cases, false parasitism also occurs. In this case, some organisms accidentally end up in the body of a second organism that has not adapted during evolutionary development. But this organism cannot live in the body (for example, an earthworm can come out of the intestines of vertebrates). If the larvae or eggs of various flies and mosquitoes enter the human body through food, they cause various symptoms of illness (diarrhea, nausea, vomiting and nausea).

Parasites are divided into temporary and stationary (permanent) depending on the duration of their stay in the host's body. In temporary parasitism, the parasite temporarily lives in the host's body, feeds normally, but does not develop or reproduce. In this case, there are no harmonic connections between the parasite and the host. The parasite enters the host's body only during feeding.

These include many blood-sucking ectoparasites (mosquitoes, flies, ticks, bedbugs, leeches, etc.). Stationary parasitism is studied in two ways. Periodic and

permanent. In periodic parasitism, parasitism occurs during the developmental cycles of organisms. Some organisms parasitize during the larval period (larval parasitism, m: mermitidae). Some of them parasitize in the adult period (imaginally) (m. nematodes - Strongilidae).

Helminths are parasitic multicellular organisms belonging to the lower worms of the Scolecida type.

Epidemiological features of helminth infections are determined by the biological characteristics of helminths.

Non-contagiousness of helminthiasis. An infected person is generally not contagious to others (with the exception of enterobiasis, hymenolipidiasis; sometimes - taeniasis, strongyloidiasis).

The disease is transmitted mainly through contaminated hands, unboiled water, household items, and eating unwashed fruit. You can become infected anywhere if you fail to follow basic rules of personal hygiene or careless attitude to nutrition. Symptoms of helminthic infestation are not always noticeable; for a long time, the disease can masquerade as other problems. Detection of parasites during a medical examination or targeted examination for suspected helminthiasis is a reason for treatment. The disease is more common in children of preschool and school age and is manifested by the following symptoms: in children it begins with a decrease in appetite, nausea, abdominal pain, the child becomes capricious, whiny, due to a disorder of the nervous system, children stop growing mentally and physically; and sometimes convulsions may also occur. In adults, allergic rashes, itchy skin, and allergic diseases are more common.

**Results and discussion.** The human body is an ideal habitat for parasites; they can live for years not only in the intestines, but also in other organs (lung tissue, liver parenchyma, eyeballs, skin, circulatory system, myocardium, brain), causing serious harm to health. The size of these "illegals" varies from microscopic (protozoa) to tens of meters (tapeworms).

Taking into account mutual fitness, helminths and hosts are divided into two groups: obligate and facultative helminths and, accordingly, obligate and facultative hosts. An obligate helminth is one whose evolution is closely related to the evolution of the host. Such a helminth has optimally adapted to the conditions of the biochemical and biophysical environment present in the organs and tissues of a given host. Outside the body of a given host, the parasite would not be able to withstand competition in the struggle for existence. The obligate host of this helminth is characterized by the fact that it is in it that the parasite is ensured the greatest survival rate, the fastest and most complete growth. An example of obligate parasites and hosts is humans and roundworms.

Facultative parasites are those whose evolution occurred independently of the evolution of the given host; therefore, they are poorly adapted to the conditions of the biochemical and biophysical environment present in the organs and tissues of the host. Under these conditions, the facultative parasite has extremely low viability. A facultative parasite is found infrequently in the body of a facultative

host and in most cases in a small number of copies. Examples of facultative hosts and parasites include humans and trichostrongylids.

**Conclusion.** The localization of helminths is very diverse. Helminths can parasitize almost all human organs and tissues. The most common site of localization is the gastrointestinal tract. The lungs are the site of localization of the parasite during paragonimiasis and the site of temporary localization of the larvae of migrating nematodes (ascariasis, toxacariasis, hookworm disease, etc.). Echinococcus can sometimes be localized in the lungs. Helminths can parasitize in the blood (schistosomiasis, filariasis). The larvae of migratory nematodes, as well as a number of helminths that parasitize humans in the larval stage in various tissues (echinococcus, cysticercus, trichinella, etc.), can temporarily be present in the blood and spread hematogenously. Some helminths (echinococcus, cysticercus) can parasitize the central nervous system. When the digestive organs are damaged, helminths are characterized by strictly defined localization. In particular, bovine and pork tapeworms, wide tapeworms and roundworms (in the mature stage) are fixed in the upper part of the small intestine, dwarf tapeworm - in the lower third of it, whipworm - in the large intestine, opisthorchis - in the bile ducts of the liver and pancreatic ducts. Some helminths can be localized in various organs. Thus, cysticercus can parasitize the brain, eyes, intermuscular connective tissue and subcutaneous tissue, heart, and liver. Echinococcus most often affects the liver and lungs, but can also parasitize the central nervous system, genitals, kidneys, muscles, eyes, and sometimes other organs and tissues. There are intensive and multiple invasions. The intensity of invasion is determined by the number of parasitic helminths of one species. It can range from one to several thousand copies (ascariasis, enterobiasis, trichuriasis), even with invasion by large helminths (wide tapeworm, etc.), the number of parasites can reach 10 or more.

Multiple infestations refer to the parasitism of several types of helminths. There may be 2-3 or even 4 types of helminths. Simultaneous parasitism of more than five species of helminths is very rare.

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