



Parasitology and Sleeping Sickness

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Abstract: Parasites are fighters of a person or a living creature from the inside, which has moved into the body reduces vital activity. The most prominent representative of parasitology is considered to be trypanosome, which will have an impact on human life with sleeping sickness.

Keywords: Parasitology, phytoparasitology, arachnoentomology, arthropods, helminthology, drepanidothernia, fasciolae, Chagas disease.

INTRODUCTION

Parasitology is a complex discipline closely related to a number of related sciences: ecology, various sections of zoology, medicine, veterinary medicine and is subdivided into general, medical, veterinary-agronomic, or phytoparasitology. Medical parasitology studies the features of the structure and life cycles of human parasites, relationships in the "parasite-host" system, as well as methods for diagnosing, treating and preventing parasitic diseases. Most human parasites belong to the species of protozoa, flatworms (Plathelminths) and roundworms (Nemathelminths), respectively, in parasitology there are sections: medical protozoology and medical helminthology. Many animals of medical importance also belong to the phylum Arthropoda. Some of them themselves are pathogens, others are either carriers of pathogens of parasitic and infectious diseases, or intermediate hosts of parasites. The biology of arthropods - pathogens, vectors and intermediate hosts of parasites (arachnids, in particular mites and insects) is studied by medical arachnoentomology. Parasites can live in any human organs, so a doctor of any specialty may encounter parasitic diseases and must be able to recognize them, treat patients and prevent infection with parasites. Parasites are divided into groups depending on the time (term) of parasitism, localization and the degree of their specificity in relation to the hosts. By the time of parasitism, parasites are temporary and stationary. Temporary parasites live and multiply in the external environment, and animals are attacked only for the sake of food (gadflies, mosquitoes, etc.). Stationary parasites are inside or outside the host organism for a long time (sometimes all life). These include most helminths, gadflies, lice, scabies mites, etc. In turn, they are divided into two subgroups - permanent and periodic. Permanent parasites go through all stages of life, from the moment of birth to death, without a host (lice, lice, scabies, etc.). Periodic parasites live in the host organism for a long time (in the sexually mature or larval stages). For example, gadflies parasitize in the body of animals in the larval stage, and most helminths - in the mature stage. According to the place of localization of parasites, they are divided into endoparasites and ectoparasites. Endoparasites, or internal parasites, live in the internal organs and tissues of the host (most helminths are endoparasites). Ectoparasites, or external parasites (mosquitoes, horseflies, lice, ixodid ticks) temporarily or permanently live on the outer integument of the host's body. According to the degree of specificity, parasites are divided into strictly specific, developing in a limited range of hosts (bovine tapeworm can only develop in humans), and capable of parasitizing on a wide range of hosts (fasciolae are found in many domestic and wild animals). hosts of parasites. Host - a creature in whose body the parasite temporarily or permanently lives and feeds at its expense. Parasite hosts. Host - a creature in whose body the parasite temporarily or permanently lives and feeds at its expense. Hosts can be definitive, intermediate, accessory, and reservoir (see

Introduction to Helminthology), as well as obligate and facultative. The hosts in whose organism the parasites have the most favorable conditions for their development are called obligate or obligate (sheep for fasciola). Hosts in which parasites develop poorly due to insufficiently favorable conditions are called facultative (duck for drepanidothernia).

Trypanosomes are a genus of parasitic single-celled organisms from the trypanosomatid family that parasitize on various hosts and cause many diseases in both humans (sleeping sickness, Chagas disease) and animals (accidental disease of horses). The natural reservoir of trypanosomes is mainly mammals, the carrier is insects. The tsetse fly is a carrier of *Trypanosoma brucei*, the causative agent of sleeping sickness. Triatomine bugs are carriers of *Trypanosoma cruzi*, the causative agent of Chagas disease.

Sleeping sickness, also called "human African trypanosomiasis", is a widespread tropical disease that can be fatal if left untreated. It is spread through the bite of an infected tsetse fly (genus *Glossina*), which is found on the African continent. More than 60 million people are at risk of contracting sleeping sickness, most of whom live in rural areas of East, West and Central Africa. A red sore develops at the site of the tsetse bite, and after a few weeks the person develops a fever, swollen lymph nodes, muscle and joint pain, headaches, and irritability. In later stages, the disease affects the central nervous system, and sufferers experience personality changes, shifts in the biological clock (circadian rhythm), confusion, slurred speech, seizures, and difficulty with movement and speech. These problems can get worse over many years, and without proper treatment, death occurs. The main methods of combating African trypanosomiasis are the reduction of the number of foci of infection and the destruction of the tsetse fly. Screening people at risk helps to identify patients in the early stages of the disease. It is necessary to diagnose the disease as early as possible, before the onset of advanced stages of the disease, in order to avoid complex, difficult and risky medical procedures. By itself, sleeping sickness does not have any restrictions and does not depend on the external environment, it keeps a person in a sleepy period, he can wake up or go to bed at any time. The type of treatment depends on the form and stage of the disease. Early detection of the disease increases the chances of a successful cure. Since the parasite can persist for a long time and cause relapses many months after the end of therapy, patients should be observed for up to 24 months, during which clinical examination of patients and laboratory studies should be carried out to evaluate the results of treatment. bodily fluids, including in some cases cerebrospinal fluid obtained by lumbar puncture. For successful treatment of the disease at the second stage, it is necessary to use drugs that can overcome the blood-brain barrier and neutralize the parasite in the CNS.

Symptoms. After a tsetse fly bite, there is an incubation period that lasts 1-3 weeks. At the site of the bite, a trypanosomid shankar is sometimes formed, in which the parasites actively multiply, penetrating the tissues, blood, lymph, and which disappears after 5-7 days. The first symptoms are bouts of fever, headaches and joint pain, often greatly enlarged lymph nodes. Some patients develop large tumors of the cervical and occipital lymph nodes. If treatment is not started, the disease continues to progress, causing anemia, disturbances in the functioning of the heart, kidneys, and endocrine system.

Prevention. A set of measures to improve the foci of sleeping sickness includes the detection and treatment of African trypanosomiasis, public and individual prevention of the population, and vector control. Serological testing is important, especially for individuals at risk (hunters, lumberjacks, road builders, etc.). Examination should be carried out at least twice a year (before the season and after the season of greatest risk of infection).

The stage of CNS damage in the Gambian form lasts from several months to several years after the onset of acute illness. In the Rhodesian form, the disease is more rapid, and the nervous system is often affected within a few weeks. CNS involvement causes persistent headache, inability to concentrate, behavioral changes (eg, progressive fatigue and indifference), daytime sleepiness, tremors, ataxia, and eventually coma. Without treatment, death occurs within a few months of the onset of the disease in the case of *T. b. rhodesiense* and within 2-3 years for *T. b. gambiense*. Untreated patients die in a coma from exhaustion or secondary infections. To diagnose trypanosomiasis, light microscopy of blood (thin or thick smear) or punctate of lymph nodes is used.

The concentration of trypanosomes in the blood is often low, so different methods of concentration increase the sensitivity of diagnostic methods. Serological testing is often uninformative.

All patients with African trypanosomiasis should undergo a lumbar puncture and examination of the cerebrospinal fluid to determine the stage of the disease. When CSF is involved in the pathological process, there is an increase in the level of lymphocytes (≥ 6 cells/ μ l), total protein and nonspecific IgM. Treatment of African trypanosomiasis depends on the type of pathogen and the stage of the disease.

To prevent African trypanosomiasis, endemic areas must be avoided and tsetse fly bites protected. Close clothing should be worn, repellents should be used.

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