

MEDICINE AND PHARMACEUTICAL SCIENCES

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Parasitology – As an Important Scientific Field of Medicine

Abstract

Medical parasitology is the science that studies human parasites, diseases caused by them, and measures to combat these diseases. Medical parasitology is an important part of the science of parasitology (which includes zooparasitology and phytoparasitology) and studies the causes, transmission, pathogenesis, clinic, epidemiology, immunology and treatment of parasitic diseases in humans, as well as ways of prevention and control of these diseases. Traditionally, parasitic diseases include diseases caused by protozoa (protozoa), diseases caused by helminths (helminthoses) and diseases caused by arthropods. One of the most important tasks facing parasitology is the development and implementation of scientific-based measures against diseases caused by parasites in order to protect people's health, protect agricultural animals and plants from various diseases.

Keywords: *parasites, medical parasitology, helminthoses, protozoa, prevention*

Introduction

Taking into account the global importance of parasitic pathology in modern times, most countries of the world have set the problem of fighting parasitic diseases as a goal to be solved. According to the World Health Organization, more than 4.5 billion people worldwide suffer from parasitic diseases. About one million parasitic patients are registered in Russia every year. Their actual number exceeds 20 million people. Protozoan diseases and helminthoses, which are the subject of parasitology, are an important part of infectious pathology. WHO indicates that diseases caused by helminths are the third most important infectious and parasitic diseases in the world, and diseases caused by plasmodials are the fourth (1.4 billion and 600 million cases, respectively). The socio-economic importance of parasitic diseases, above all malaria and intestinal helminthosis, is so great that this pathology creates an obstacle for the economic development of many countries of the world. Cases of introduction of tropical parasitic diseases in non-endemic countries seriously harm people's health. All this determines the study medical workers with the modern principles of diagnosis, treatment and prevention of human parasitic diseases and increases its importance.

Research

One of the most important issues facing our healthcare in modern times is the reduction and eventual elimination of infectious and invasive diseases. Among the practical disciplines dealing with this, parasitology occupies one of the leading places (Aghayev, 2022, p. 822). To understand its importance, let's briefly review the content of the subject.

Due to the high level of organization of parasitosis agents compared to microorganisms, their interaction with the host organism is more complex and diverse than that of parasitic prokaryotes (Salehov, 2022, p. 233). The presence of a multicellular organism (often a parasite) in another complex organism is possible only when the natural defense mechanisms are weakened. Therefore, parasitic diseases are always accompanied by allergies and immunosuppression. The susceptibility of the infected organism to infection by other infectious agents increases, and at the same time, the resistance of this organism to the influence of negative environmental factors decreases. In recent years, along with the more severe course of infectious diseases, there has been an increase in cases of infection with a number of parasitosis.

Parasitology (from the Greek *parasitos* – "living thanks to another", *logos* – word, teaching) is a science that studies parasites, their hosts, carriers and their relationship with the environment, as well as the diseases they cause and measures to combat them. Parasitology is one of the main branches of biological science, it studies the phenomenon of parasitism (Briko, 2013, p. 768). The subject of parasitology is to study the complex mutual relations between the parasite and the host and the change of these relations depending on external environmental factors. That is why parasitology belongs to the system of ecological sciences.

The main task of the science of parasitology is to study the structure of the parasite, its life cycle, its adaptation to nutrition in the host organism, as well as its geographical distribution, origin, etc. (Sergiyev, 2006, p. 592). It is for this purpose that parasitology is primarily closely related to zoology, botany, medicine, veterinary medicine, chemistry and other sciences. The study of complex interactions between parasites and the external environment plays a major role both theoretically and in the development of measures to control parasitic diseases. Therefore, the science of parasitology is closely related to epidemiology and epizootology, and studies the general laws of the occurrence of invasion and infectious diseases.

Parasites, that is, organisms that permanently or temporarily use the organisms of other species as a place of residence or a source of food, are all living agents of human, animal and plant diseases without exception. Existence at the expense of the host organism is characteristic of prions, viroids, viruses, rickettsiae, bacteria, parasitic fungi, protozoa, helminths and many species of arthropods (Zuyeva, 2006, p. 752). However, according to current practice, diseases caused by prions, viroids, viruses, rickettsiae and bacteria are called infectious diseases. Mycoses are diseases caused by pathogenic fungi. According to the current terminology, parasitic diseases include only protozoa caused by protozoa, which are pathogenic single-celled organisms, and helminthoses, whose causative agents are parasitic worms. Sometimes diseases caused by arthropods are also included in the group of parasitic diseases. According to the modern classification, out of 1415 known causative agents of human diseases, 353 cause protozoan diseases and helminthoses (Sergiyev, 2006, p. 592).

Parasitology is divided into general, medical, veterinary and phytoparasitology. General parasitology deals with general laws of parasitism, theoretical aspects of parasite-host relationships, issues of taxonomy, classification, etc. reviews. Depending on the systematic position of the studied group of parasites, the following sections of parasitology are distinguished: protozoology (protistology), helminthology and arachnoentomology (Briko, 2013, p. 768). As mentioned, according to the 3 main groups of parasites, this science is divided into 3 sections: protozoology (the science of primitives), helminthology (the science of helminths) and arachnoentomology (the science of arthropods) (Aghayev, 2022, p. 915).

Diseases caused by parasites of animal origin are called parasitic or invasive diseases. In the animal world, there are a large number of microorganisms belonging to the family of primitives (Protozoa), which enter the human body and cause a number of diseases – protozoa (giardiasis, toxoplasmosis, malaria, leishmaniasis, etc.) (Chobanov, 2006, p. 280). Protozoa are very

widespread. For example, malaria, leishmaniasis, diseases caused by intestinal protozoa are recorded in all countries (Aghayev, 2010, p. 117).

The second largest group of parasitic diseases is helminthosis. Helminths also have important medical and social importance (Sergiyev, 2006, p. 592). They (ascariidosis, trichocephalosis, enterobiosis, echinococcosis, teniidosis, etc.) come across very often to both treating doctors and pediatricians. In general, more than 250 species of parasitic worms, thousands of which are common in nature, are encountered in the human body.

The third part studied by medical parasitology is the arthropods. Arthropods play a significant role in the spread of a number of diseases (malaria, leishmaniasis, encephalitis, typhoid fever, plague, yellow fever, etc.) (Briko, 2015, p. 768). Many of their representatives (mites, insects) lead a parasitic life in human organs and tissues and have various harmful effects on it. In addition, arthropods play the role of live carriers (malaria, leishmaniasis) or reservoir (tick-borne encephalitis) of many diseases. It should be noted that rodents can also be reservoirs and sources of infection in parasitic diseases (Chebisheva, 2005, p. 440). Therefore, in the fight against diseases, it is important to implement certain measures in relation to vectors. Thus, often their destruction (disinsection) ensures the effectiveness of anti-epidemic measures (Hajiyev, 2010, p. 238).

Parasitism is one of the main processes studied by parasitology. Parasitism is a form of relationship between two organisms of different species, where one (the parasite) uses the body of the other (the host) as food and habitat, and both organisms are in an antagonistic relationship with each other. Parasitism is one of the forms of biotic communication between living organisms of different species. Before its appearance, various types of interactions between different organisms have arisen. The main types of these interactions are as follows: synoicism, commensalism, mutualism.

From this point of view, the teaching of parasitology is very important, and it consists primarily of familiarization with the carriers and agents of parasitic diseases, the biological and ecological characteristics of medically important protozoa, helminths, arthropods, the role they play in human pathology, laboratory diagnosis and treatment methods, involves carrying out measures to fight against the carriers of invasion and infectious diseases. Medical parasitology is also involved in the implementation of counter-epidemic and preventive measures.

Training of medical personnel in this field is carried out in higher education institutions, primarily in universities and colleges providing medical education. It should be noted that the subject of parasitology is also taught at the Azerbaijan Medical University and specialists in this field are trained. At this time, students master the scientific and organizational bases of epidemiological diagnostics and epidemiological control during separate nosological forms of parasitic diseases. Also, the nature of the interaction of parasites with the host organism, the potential effect of the anti-epidemic measures implemented in preventing their spread, the functional directions of the activities of the institutions and departments of the anti-epidemic system, as well as the measures to combat them, depending on the ecological characteristics and epidemiological role of the vectors, are studied.

The aim of the course is to acquaint students with the basics of parasitology, parasitic diseases occurring among humans, their epidemiological characteristics, laboratory diagnostics of parasitic diseases, as well as the main principles of the fight against parasitic diseases, which play an important role in the pathology of the country of Azerbaijan. Also, the biological-ecological characteristics of parasites and the nature of the interaction between them and their host organisms, the potential effectiveness of anti-epidemic measures, the mastering of the scientific and organizational bases of epidemiological control during separate forms of parasitic diseases in accordance with the functional directions of the activities of anti-epidemic system institutions and departments.

Teaching is conducted according to a newly developed program. The program is primarily designed for students of the Faculty of Public Health and the Faculty of Medicine. But at the same time, it will be useful for epidemiologists, parasitologists, sanitary-epidemiological service workers,

including medical doctors. The program is developed on the basis of examples taught in the field of parasitology in world practice and includes both theoretical and practical issues.

Conclusion

Thanks to the training conducted under the new program, students: Plan and implement preventive and anti-epidemic measures in protozoa and helminthosis foci; Evaluates the results obtained during parasitological examinations; Based on the diagnosis of individuals in different developmental stages of parasites, it differentiates them; Determines the epidemiological nosogeography of the causative agent based on the microscopy of preparations on glass slides with a more suitable diagnostic method of malaria; Based on the microscopy of the preparations obtained from different substrates, it determines the ways and factors of the infection of parasitic diseases; to make a parasitological diagnosis by differentiating helminth eggs; He is able to perform sanitary-helminthological and parasitological examinations. We believe that this subject is an important field of medicine and teaches knowledge and skills about parasitic diseases, so it should be taught not only in the Faculty of Public Health and Medicine, but also in other faculties. Because every doctor definitely encounters the complications of these diseases in his professional activity.

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