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EPIDEMIOLOGICAL AND ETIOLOGICAL ASPECTS OF LEPTOSPIROSIS

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Abstract
Global environmental and climatic changes taking place on our planet, such as increased solar activity, warming of the earth's atmosphere, melting of eternal glaciers, more frequent cases of heavy rains, and other natural disasters cannot but affect the nature of the manifestation of natural focal diseases of humans and animals.

Keywords. Leptospirosis, epidemiology, Spirochaetales, leptospiron, Pathogenic leptospira, a separate nosological.

Introduction

Leptospirosis is a group of natural -focal non-transmissible zoonoses, similar but not identical in pathogenesis, epidemiology and clinical manifestations. Against the background of widespread distribution, on almost all continents of the globe, the highest incidence of people is observed in regions with a humid subtropical and tropical climate

The causative agents of leptospirosis are spirochetes belonging to the species Leptospirainterrogans of the genus Leptospira, which is part of the Leptospiraceae family of the order Spirochaetales. Leptospira (Leptospira) is a genus of gram-negative spiral bacteria of the spirochete class. Bacteria of this genus are mobile - they are characterized by translational, oscillatory and rotational movements. They are not stained with aniline dyes; they are visible only in a dark-field microscope.

Pathogenic leptospira identified to date are assigned to 25 serological groups, 250 serovars and 20 taxonomic species.

Wild and domestic animals of many species can be classified as leptospira carriers. The main hosts (reservoirs) and sources of the infectious agent are rodents (grey voles, mice, rats and others) and insectivores (hedgehogs, shrews), in which the infection is asymptomatic, accompanied by the excretion of leptospira in the urine.

In anthropurgic foci, this role is played by domestic animals - dogs, pigs, cattle, sheep, less often goats, horses and reindeer, as well as caged fur animals - foxes, arctic foxes, coypu. In these mammals, the disease proceeds acutely, subacutely, or in the form of chronic asymptomatic leptospiron carriers; miscarriages (abortions) are possible during "pregnancy".

A person is included in the infectious process by direct contact with the urine of infected animals - leptospira carriers or through contaminated objects of the external environment, mainly through water, soil and plants, sometimes food products. [3,4] The following infection mechanisms have been established: contact and fecal-oral .

Febrile illnesses, occurring with jaundice and not infrequently becoming widespread, have long attracted the attention of physicians. The nature of these diseases, their sources and ways of distribution remained unknown for a long time. [4]

In 1886, Weil described and separated into a separate nosological form, separating from other forms of icteric infections, a febrile illness accompanied by splenomegaly, jaundice and inflammation of the kidneys. In 1888 N.P. Vasiliev, having studied 11 cases of this disease from 1883 to 1888. and after analyzing 37 cases already described by 1888 by foreign authors, he provided convincing data for the recognition of this disease as an independent disease and called it "infectious jaundice". According to N.P. Vasiliev, the main symptoms were acute onset, high body temperature, lesions of the central nervous system, liver and kidneys. Abroad, the name "Weil's disease", or icterohemorrhagic leptospirosis, was adopted.

In different parts of the world, leptospirosis had different names that indicated a connection with the season, symptoms, duration, or occupational affiliation. In Japan, diseases named nanukayami (seven-day fever), akiyami (autumn fever), or hasamiyami (autumn fever in Hasami County) have been linked to leptospirosis. Such diseases were often observed among people employed in rice fields in ancient China. In Europe and Australia, this infection was known as cane-cutters' disease, cattle-herder's disease and Schlammfieber (mud, slush, fever), and only later their leptospiral etiology was established.

In 1914, Japanese scientists Inada and Ido (Inada, Ido) confirmed the assumption of the infectious nature of Vasiliev-Weil's disease by finding the pathogen, which they called Spirochaetaicterohaemorrhagiae [synonyms: Sp. icterogenes, Uhlenhuth and Fromme (Uhlenhuth, Fromme); sp. nodosa, Hübner and Reiter]. Later, according to morphological and biological characters, Noguchi Sp. icterohaemorrhagiae and spirochetes - saprophytes [Sp. biflexa (Wolbach, Binger), 1913] established an independent genus for them - Leptospira (Leptos - thin, Spare - spiral, Noguchi, 1918). According to the WHO definition, leptospirosis is becoming increasingly important, especially in countries with a tropical and subtropical climate, and the territories of the countries of South and Southeast Asia are almost completely endemic. In addition, serious complications of the epidemic situation for leptospirosis are the consequences of natural emergencies. [2] Fatal outcomes of the disease are observed with the

development of severe complications (infectious toxic shock, acute renal failure, acute renal and hepatic failure, DIC, ARDS, pulmonary hemorrhage, etc.).

It is known that the morphology and tinctorial properties of leptospira have already been well studied both in light and electron microscopy and are sufficiently covered in the specialized literature. There are reports that leptospira do not withstand the competition of other microorganisms, and their antigenic and pathogenic properties increase due to a long stay in the soil (Yu.G. Chernukha [1]). It is known that leptospira - Saprophytes grow much faster than pathogenic ones on differential nutrient media, and pathogenic leptospira are low-resistant and quickly die under the influence of heat and chemicals, but survive at low temperatures. So, it was found that the survival of leptospira in the soil depends on the action of sunlight, chemical pollution, bacterial form, pH of the medium and other factors. In dry soil, they die in 2–2.5 hours, and in moist soil (69–70%) they retain pathogenic properties for up to 279 days. Studying the pathogenic properties of leptospira, researchers noted their ability to rapidly penetrate the membranes of the host organism, which is facilitated by their adhesiveness and the production of plasmacoagulase and fibrinolysin. Leptospira in the host organism produce and secrete toxins, and in particular soluble extracellular hemolysin, which is characterized by thermolability and instability to an acidic environment, the enzyme trypsin. In pathogenic leptospira, hemolysin is more thermolabile, lyses erythrocytes with a low content of phospholipids in sheep and cattle. Endotoxin Leptospira has a pyrogenic and skin necrotic effect. The work of many domestic and foreign researchers is devoted to the study of the pathogenic effects of leptospira on the host organism. It has been established that the manifestation of leptospirosis in cattle directly correlates with the immunological consequences of the infectious process. One of the manifest indicators of leptospirosis infection in cattle is a decrease in milk productivity.

It follows from the literature data that leptospira are coactants of the infectious parasitic system, exhibit a certain hostility, and pathogenic effects on the host organism are manifested through adhesive, enzymatic and toxigenic properties, causing significant deviations in the host organism, manifested manifestly or proceeding imperceptibly.

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