GENERAL AND SPECIFIC PREVENTION LISTERIOSIS IN ANIMALS AND HUMANS

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Annotation

Listeriosis refers to diseases characterized by polymorphism of clinical manifestations, a variety of variants of the course and outcomes of the disease. Epidemiological and epizootic surveillance of listeriosis remains an urgent problem. The incidence of listeriosis is low, however, given the severity of clinical manifestations and high mortality in large foci (20-40%), this infection is controlled by the World Health Organization. Listeriosis has been described the peculiarities o f listeriosis, its causes in animals and humans, diagnostic methods, prevention and eradication ways.

Relevance

Listeriosis refers to diseases characterized by polymorphism of clinical manifestations, a variety of variants of the course and outcomes of the disease. Epidemiological and epizootic surveillance of listeriosis remains an urgent problem. The incidence of listeriosis is low, however, taking into account the severity of clinical manifestations and high mortality in large foci (20-40%), this infection is controlled by the World Health Organization. Listeriosis, from diseases that are more often reported mainly among animals and less often among people in rural areas, has become one of the most significant food-borne zooanroponotic diseases in the world. Pathogenic listeria species (Listeria monocytogenes and Listeria ivanovii) have become traditional contaminants of food raw materials and foodstuffs, which, as transmission factors, play a leading role in the occurrence of listeriosis in humans. Ready-to-eat products are particularly dangerous because there is no heat treatment or other antimicrobial effects between their production and consumption. Newborns, pregnant women, the elderly, and people with weakened immune systems are particularly susceptible to listeriosis. The timely detection of L. monocytogenes in food products at the stages of their manufacture and storage is important for both food industry and catering enterprises, as well as for public health.

At the same time, it must be remembered that listeria is widespread and, having wide adaptive capabilities, is able to adapt to existence in various conditions and acquire various properties that are not typical for them. Thus, L. monocytogenes is able to switch between saprophyticism and virulence depending on the conditions. The environment in which the pathogen is located can influence the expression of virulence genes.

The purpose of the research is to analyze the literature data, as well as our own research on the laboratory diagnosis of listeriosis in animals and humans. The article provides data on the features of the disease, the causes of its occurrence in humans and animals, diagnosis, methods of prevention and elimination.

Materials and methods of research. We have studied the scientific and methodological literature on the study of the epidemiological and epizootic features of listeriosis.

The causative agent of listeriosis Listeria monocytogenes (pathogenic to animals and humans) and L. ivanovii-2 (pathogenic to animals and less commonly to humans) belongs to the genus Listeria. This genus includes four more species of bacteria that are not pathogenic to humans and animals (grayi (murrayi), seeligeri, innocua, and welsimeri). Representatives of this genus are short sticks of regular shape with rounded ends, measuring 0.4-0.5 x 0.5 - 2 microns. Listeria are located singly or in pairs at an angle in the shape of the letter V, sometimes they have the shape of cocci, vibrions and filaments. They are gram-positive, do not form spores or capsules, are non-acid-resistant, and have flagella and mobility in young 6-18-hour cultures. In older cultures, they lose their mobility and become gram-negative. Listeria has a complex antigenic structure, they have 15 somatic and 5 flagellar antigens. The pathogen grows well under aerobic conditions on ordinary BCH and MPA. Their growth is accelerated on media cooked in open-hearth broth and on liver media with the addition of 1% glucose and 2-3% glycerin. It is characterized by transformation into L forms and parasitization intracellularly. This causes insufficient effectiveness of antibacterial therapy and explains the latent course of the infectious process and bacterial transmission. On the first day of BCH, the pathogen formed a slight turbidity of the broth. In 3-5 days, a mucous deposit occurs, and the appearance of pigtails when shaken is also characteristic. On dense media (MPA), listeria growth is observed with the formation of delicate transparent colonies with a bluish tinge, 1-1.5 mm in diameter, resembling dew droplets (subsequently, the colonies become cloudy). The causative agent of listeriosis is morphologically and by the nature of growth on nutrient media very similar to the causative agent of porcine erysipelas. L. monocytogenes is capable. The environment in which the pathogen resides can affect the expression of virulence genes. This is probably why listeria is able to switch between saprophytism and virulence depending on environmental conditions. It is known that Listeria species are

able to exchange resistance determinants with other bacterial species, acquiring antibiotic resistance genes from plasmids of other organisms and conjugated transposons. Having wide adaptive capabilities, they are able to adapt to existence in various conditions and acquire various properties that are not typical for them.

An analysis of the literature data and the results of our own research show that listeriosis is registered in more than 50 countries of the world and in all CIS countries. The economic damage can be significant and consists of an animal mortality rate of up to 40%, reduced productivity, abortions, as well as the cost of therapeutic and preventive measures. Due to human susceptibility to listeriosis, the disease has great social significance. Mortality in humans with listeriosis can reach 60%, including among children under 1 month of age from 21.1% to 75.1%. Listeria can transform into L forms and parasitize intracellularly, which sometimes causes insufficient effectiveness of antibacterial therapy and explains the latent course of the infectious process and bacterial carrier. Listeria resistance is significant. They persist for a long time in the external environment: in soil - from 1 to 4 months; in water - up to 20 months; in livestock - about 1 month; in oats - up to 10 months; in silage and meat and bone meal - up to 4 months. At low temperatures, listeria can persist for a long time not only in soil and water, but also in silage, therefore listeriosis is considered as "sapronosis", and the disease is often called "silage disease". In the objects of the external environment, listeria can not only persist for a long time, but also multiply. At the same time, listeria grow in a wide range of temperatures (from +3 to +42 ° C) and the pH of the medium (from 5.5 to 9.5), tolerate cooling well and can multiply at +4 - +6 °C in soil, water, plants, and organs of corpses. In food products (sausages, cheeses, milk, meat, etc.) they multiply at the temperature of a household refrigerator. At +70 ° C they die in 20-30 minutes, at +100 ° C - in 3-5 minutes; they are inactivated with solutions of formalin (0.5 - 1%), phenol (5%), bleach (2% active chlorine), sodium hydroxide (3%). The causative agents of listeriosis belong to the first group of resistance of microorganisms (poorly resistant) to disinfectants. Listeria is sensitive to penicillins, tetracyclines, aminoglycosides, and resistant to cephalosporins. New generation fluoroquinolones have antibacterial activity against L. monocytogenes. Of the laboratory animals, white mice, rabbits and guinea pigs are susceptible. Pregnant women, newborns (in the first three weeks of life), adults over the age of 45-50, as well as people with defects in the immune system and the microbial ecology of the digestive tract are susceptible to listeriosis in humans. Occupational disease is considered for workers of livestock and poultry farms and complexes, workshops of primary processing of livestock products at meat and poultry processing plants, veterinary specialists and slaughterhouse workers. The source of the causative agent of infection is sick animals that secrete the pathogen into the external environment with discharge from the nasal cavity, genitals (during abortions), with feces, urine, milk (with

listeriosis mastitis), as well as listeria-carrying animals. In animals in farms that are not affected by this disease, listeria production can reach 21%, and up to 9% of them may be listeria separators. Listeria-bearing can occur among healthy animals of prosperous farms. Sources of the causative agent of infection for animals can be people with listeriosis, as well as listeri carriers. The frequency of listeriocarditis in humans can be 2-20%, and 5-6% of the examined individuals have listeria from the feces of healthy people. The pathogen is released from the animal body into the external environment with urine, feces, milk and discharge from the nasal cavity, eyes and genitals. Infection occurs in an alimentary manner, as well as through the mucous membranes of the eyes, nasal cavity and damaged skin. Intrauterine, aerogenic, and sexual infection is possible. The mechanisms of human infection are diverse. Most often, infection occurs in an alimentary way when consuming milk and dairy products, animal and poultry meat, vegetables and seafood contaminated with listeria. Currently, listeriosis is considered in medicine as a disease with a predominantly alimentary transmission route. There are known contact mechanisms of infection (from infected animals and rodents), aerogenic (indoors when processing hides, wool, and also in hospitals), transmissible (when bitten by insects, in particular ticks), and sexual. Of particular importance is the transmission of the causative agent of listeriosis from a pregnant woman to the fetus (transplacentally). Listeria can be a cause of nosocomial infection, particularly in maternity hospitals. Transmission factors for animals are soil, water, feed, food waste, care items, etc. contaminated with the pathogen (1,2,4). Of the food products, dairy products, mainly unpasteurized or poorly pasteurized, play an important role as a transmission factor. Listeriosis in animals is recorded in the form of sporadic cases and enzootics, less often in the form of epizootics. The mortality rate reaches 40%- 80%. Mortality in septic listeriosis in newborns, people with severe immunodeficiency and impaired ecology of the digestive tract, patients with cirrhosis of the liver and chronic alcoholism can reach 60%. The pathogen enters the animal body through the mucous membranes of the nasal and oral cavities, conjunctiva, digestive tract, respiratory tract and damaged skin. From the sites of primary penetration, the pathogen spreads lymphogenically and hematogenically throughout the body. Exo- and endotoxins play an important role in the pathogenesis of listeriosis. Under their action, the permeability of blood vessels increases, dystrophy and inflammatory processes occur in tissues and various organs, and the number of monocytes increases. An increase in the number of monocytes in the blood of animals with listeriosis is considered as a result of an active phagocytic reaction of the body or the presence of a substance stimulating monocytosis in the causative agent of listeriosis. According to modern concepts, listeria in the body of animals reproduce mainly inside macrophages. The latter (free and fixed) play an important role in the spread and preservation of listeria in the body. The incompleteness of phagocytosis in listeriosis, the long-term preservation of phagocytes with listeria in

the animal body (up to 2 years) causes prolonged listeriocarriage. A similar mechanism of development of the infectious process occurs in listeriosis in humans. In animals, listeriosis can manifest itself in nervous, genital and septic forms, and in humans - in glandular, nervous and septic forms. Treatment for listeriosis is poorly effective. Animals with listeriosis that show signs of damage to the central nervous system are sent for slaughter. Antibiotic therapy also takes place in the treatment of people with listeriosis. Specific prevention of listeriosis in humans has not been developed. In order to prevent listeriosis, it is necessary to carry out general measures, and it is important to prohibit the consumption of unpasteurized milk and insufficiently heat-treated meat in the prevention of listeriosis in humans. Women working in animal husbandry and planning pregnancy should be temporarily transferred to jobs that do not involve constant contact with animals. Specific prevention of listeriosis in humans has not been developed.

Conclusion. Thus, listeriosis is a natural focal zooanthroponotic infectious disease of animals and humans, occurring with signs of damage to the central nervous system, sepsis, abortions and mastitis.The disease is manifested by polymorphism of clinical signs, damage to almost all organs, systems and tissues of the body, a significant effect on the neuroimmunoendocrine system and high mortality in newborns, people with immunodeficiency, impaired ecology of the digestive tract, patients with cirrhosis of the liver and alcoholism. In animals and humans, the disease can occur in the form of asymptomatic carriage. Mortality in animals with listeriosis reaches 40%, and in humans - 60%, including among children under 1 month of age - from 21.1 to 75.1%. An important role in the prevention of listeriosis in humans is assigned to the prevention of this disease in animals.

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