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PROBLEMS OF PREVENTION OF RABIES VIRUS**ПРОБЛЕМА ПРОФИЛАКТИКИ ВИРУСА БЕШЕНСТВА**

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Abstract. Every year 70000 people in the world die of rabies in spite of the fact, that effective rabies vaccines and the ways of the prevention of this disease for humans and animals exist. Taking into account the positive situation in the countries of Western Europe it is especially alarming that rabies still exists in Russia and is shown generally in the central, the Volga and southern federal districts. What is the reason? I'll try to find it out in this paper.

Аннотация. Несмотря на то, что уже достаточно давно существуют действенные вакцины против бешенства, а также способы профилактики этого заболевания, как среди людей, так и среди животных, в мире за год погибает около 70000 человек. И хотя некоторые страны фактически победили бешенство (преимущественно страны Западной Европы), в России оно проявляется в основном в Центральном, Приволжском и Южном федеральных округах. Так в чем же проблема? Данная работа — попытка ответить на этот вопрос.

Keywords: rabies virus, vaccine, prevention, epizooty, antibodies.

Ключевые слова: вирус бешенства, вакцина, профилактика, эпизоотия, антитела.

Rabies, the neuroviral illness of animals and humans, is characterized by symptoms of polyencephalitis which practically always leads to death. According to the WHO it is one of the five zoonoses causing extensive economic damage and it is a constant threat to humans and animals.

The infection agent, a rabies virus, belongs to the RNA-containing viruses, Rhabdoviridae family, a sort—Lissavirus. Representatives of the sort Lissavirus are subdivided into 2 phylogenetic groups: genotypes 1,4,5,7 (first phylogroup) and genotypes 2 and 3 (second phylogroup). It is important to consider as the vaccine based on strains of a rabies virus of the first genotype are protective for all representatives of the first phylogroup and aren't effective for viruses of the second phylogroup. Virion contains a single-stranded RNA surrounded by capsid, which outside is covered with a shell, which part, the glycoprotein, plays an important role in pathogenesis of the illness. Rabies is characterized by the greatest number of lethal outcomes for warm-blooded animals and humans from all known infectious diseases. Infection happens in case of a bite or in cases when infected saliva gets on damaged covers of a body, in cases of organ and fabric transplantation, also takes place an aerogenic infection in cases of high concentration of a virus in air indoors.

Rabies is a natural focal infection. The main source and the tank of rabies in Europe including Russia is the red fox, but in epizootic process also other types of wild and domestic carnivorous can participate [1, p. 63]. In general the world rabies of dogs makes 66% of total number of sick animals, wild carnivorous — 28%, wing-handed animals — 6%. According to statistical data of 2014 in Russia the greatest number of cases of infection with rabies has been registered among foxes (44%), dogs (16,6%), cats (14,8%>), cattle (10,4%), raccoon dogs (5,3%). The listed animals are the main participants of epizootic process on the territory of the Russian Federation and it is

94% of the cases of rabies registered in 2014. A source of a disease for humans in 95% of lethal cases is dogs [2, p. 4].

For prevention of spread of rabies measures of the general and specific prevention are required. It is actual also for domestic carnivorous. The main way of prevention of rabies among foxes is the oral vaccination which has proved the efficiency in countries of Western Europe and Baltic. Oral vaccination of foxes in nature is recognized by OIE — World Organization for Animal Health. For this purpose in some countries of the world including Russia special virusvaccines from the attenuated strain of the rabies virus are produced [3].

1. Wide spreading: the minimum area of vaccination is 5000 sq. km; air or combined method of spreading; at an air vaccination method the distance between lines of flying has to be 500–1000 meters, dumping baits each 100 meters.

2. Long-lasting: the minimum duration of vaccination on a site — 6 years + 2 years after registration of the last case of rabies; vaccination — 2 times a year (in autumn and spring) and it is desirable the third time late spring.

3. Scientific planning: carrying out vaccination by veterinary services with research establishments, and analyze the efficiency of vaccination.

It is also necessary to carry out continuous monitoring of the suspicious and died animals [4].

1. Ring vaccination around residual or reemergent centers of rabies in the area from 2000 to 8000 sq. km.

2. Control of the consumption of baits by a tetracycline biomarker and the immune status from credits of neutralized antibodies with level inspections not less than 8 foxes each 100 km.

3. Consumption not less than 75% of baits (tetracycline marker).

4. Immunization not less than 70% of foxes (antibodies in protective credits).

5. Obligatory systematic epizootological monitoring of rabies by means of laboratory diagnostics of the maximum number of the surveyed animals of different types in a zone of oral vaccination of foxes.

6. Differentiation of a vaccinal virus from epizootic by means of monoclonal antibodies [5, p. 106–107].

Besides vaccination of domestic carnivorous — dogs and cats, including homeless, is necessary. It is reached by application of parenteral vaccines which quality and efficiency are high. Planned rabies inoculations are carried out by the public and private veterinary service. For vaccination they use the inactivated vaccines from different manufacturers.

The main reasons of prosperity of rabies in the territory of the Russian Federation can be considered non-compliance or incomplete compliance of the ordered norms of vaccination and control of wild animals evenly in all territory of the country, growth of the number of homeless dogs and cats, and the main reason is the lack of the funds allocated for the solution of this problem and lack of state programs for large-scale oral vaccination, monitoring of wild and control of homeless animals within settlements .

Consider that in the next 10–15 years rabies will keep its spot among general diseases of animals and humans. The opinion is formed on (except mentioned above) the emergence of new phenomena as a result of sometimes not thought-out interventions in the Biosystems that simplify distribution of the causative agent of rabies and wide ecological exchange of it in a circle “countryside–city”. [5, p. 24]

Fight against rabies in city conditions has to be carried out according to some principles:

–vaccination of domestic animals;

–monitoring of homeless animals (reduction of their number, vaccination);

–also it is expedient to enact the law obliging careless owners to be responsible for the “thrown out” animals (because it is a source of so high growth of their number).

–also important factor is systematic “educational program” about rabies and ways of its prevention [6].

Conclusion. The existing epizootic rabies situation in the Russian Federation demands acceptance of urgent complex measures on the basis of developing and deploying of the Federal

program providing systematizing of a natural foci of a disease, broad-scale monitoring, development and deployment of modern diagnostic aids, specific prevention and broad educational work with peoples.

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