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About Epizootic And Epidemic Manifestations Of Tularemia In Central Ciscaucasia And Measures To Ensure Biosecurity.

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ABSTRACT

According to long-term observations of enzootic tularemia, 56.2% of the administrative territories of the Stavropol Territory, which belongs to the Central Ciscaucasia, are confined to the steppe landscape-geographical zone. In the Stavropol Territory, there are areas of two natural foci of tularemia. The first is the Terek-Kum floodplain, which is located in the mouths of the Terek and Kuma rivers, as well as in the swampy coastal strip of the Caspian Sea. The second is the Ciscaucasian plain-foothill steppe type, which includes the territory from the western part of the Ciscaucasia and the Azov Sea in the northwest to the Sunzhensky Range in the southeast. In the last twenty-six years from 1990 to 2016, in the province, 61 cases of tularemia were recorded in 11 enzootic regions, as well as two cities of regional subordination, whose infection occurred when they left the enzootic territories. In the main, there was a sporadic morbidity with the contact mechanism of transmission in hunters and their families when cutting the hares and preparing them, as well as the waterway of infection. The situation with the activation of the natural focus of tularemia once again showed the risks in the region for the population and the need to strengthen the epidemiological surveillance of this especially dangerous infection, as well as the implementation of sanitary and preventive measures, including immunization of the population, information and explanatory work, checking the anti-epidemic readiness of therapeutic and preventive institutions and employment with medical staff.

eywords: biological food safety, tularemia, epizootic situation, epidemic manifestations.

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INTRODUCTION

Tularemia refers to diseases transmitted to humans when caring for animals, processing and consuming meat and dairy products [1]. That is why the study of modern aspects of surveillance for natural focal infections makes it possible to ensure the biological safety of products of animal origin [2, 4], as well as effective disinfection of objects contaminated with this pathogen [3, 5].

The purpose of our study was a long-term study and obtaining reliable data necessary for predicting the epizootic situation in the natural focal area of tularemia to ensure the biological safety of products of animal origin.

MATERIAL AND METHODS

The data were obtained on the basis of epizootological examination of the territory of the Stavropol Territory and epidemic manifestations in the natural focal area of tularemia, as well as on the results of laboratory studies confirming the presence of the causative agent (or antigen) in various sites on the basis of the Stavropol Scientific Research Anti-Plague Institute of Rospotrebnadzor, Stavropol in 1990-2017. On the basis of these data, a reasoned conclusion is given about the presence in this area of an epizootic of tularemia.

RESULTS AND DISCUSSION

According to long-term observations, enzootic tularemia is the 18 administrative territories of the region from 32 (56.2%), confined to the steppe landscape and geographical area of the Stavropol Territory, which belongs to the Central Ciscaucasia. When differentiating enzootic territories in terms of risk for tularemia infection in 10 (80%) enzootic territories, there is a high risk of infection of the population: these are the areas of the central, northern and western parts of the region (Krasnogvardeysky, Ipatovsky, Apanasenkovsky, Izobilnensky, Petrovsky, Grachevsky, Andropovsky, Mineralovodsky, Trunovsky and Turkmen districts). In 8 enzootic regions located in the southern and eastern parts of the region (Arzgirsky, Aleksandrovsky, Georgievsky, Levokumsky, Kirovsky, Kochubeevsky, Predgorny and Shpakovsky), the manifestations of tularemia are episodic.

In the Stavropol Territory, there are areas of 2 natural foci of tularemia: the Tersko-Kuma floodplain and the Ciscaucasian plain-foothill steppe type. The Terek-Kum Tularemia focus is located in the mouths of the Terek and Kuma rivers, as well as in the swampy coastal strip of the Caspian Sea, penetrating its western extremity along the Kuma floodplain to the Levokumsky and Neftekumsky districts of the Stavropol Territory. The area of the Ciscaucasian plain-foothill focal point of tularemia includes a vast territory from the western part of the Ciscaucasia and the Azov Sea in the northwest to the Sunzhensky Range in the southeast. The above-mentioned western, central and southern areas of the Stavropol Territory fall into the zone of action of this focus.

The first reliable information about tularemia in the Stavropol Territory dates back to 1938, when diseases were first diagnosed among people and the culture of tularemia microbe from ground squirrels was singled out. Since then, tularemia in the province has periodically manifested itself in the form of widely diffused epizootics, complicated by epidemic outbreaks, and in the form of local epizootics, which were accompanied by the sporadic incidence of people. In the last twenty-six years from 1990 to 2016, in the province, 61 cases of tularemia were recorded in 11 enzootic regions, as well as two cities of regional subordination, whose infection occurred when they left the enzootic territories. In the main, there was a sporadic morbidity with the contact mechanism of transmission in hunters and their families when cutting the hares and preparing them, as well as the water way of infection.

In the territory of the Stavropol Territory since 2003, there has been an increase in the incidence of tularemia among the population. 3 people were sick in the village. Konstantinovskiy Petrovskiy district for the period from 3 to 8 March. Given the clinical picture (eye-bubonic and anginous-bubonic forms) and factors of transmission of infection, a water epidemiological type of human disease was established. The *Francisella tularensis* culture is isolated from the water in this area. In 2004, 12 cases of tularemia among the population were registered, including 9 in Grachevskiy district, and one case in Stavropol, Mineralovodskiy, and Georgievskiy districts. Group disease tularemia is registered among residents of. Novospitsevka Grachevskiy

district. The water type of the disease occurred with the use of tap water from the captivity, the operation of which did not meet the sanitary and hygienic requirements. This was confirmed by the isolation of four cultures of the pathogen of tularemia. In 2005, 11 cases of tularemia were registered, including 6 in Stavropol, 2 in Shpakovo, 2 in Ipatovsky, Petrovsky, and Grachevsky districts on 1 case. In 2006 epidemiological situation on tularemia in the territory of the region was marked as safe. However, in 2007, 7 sporadic cases of diseases among people were recorded in 6 settlements in 4 districts: Krasnogvardeyskoye - 4, in Shpakovskiy, Novoaleksandrovsky, and Trunovsky - on 1 case.

Following the epidemic calm observed in 2008, 2 cases of the disease were registered in the territory of the region in 2009 in different places in the Ipatovsky District. During 2010, the epidemiological situation for tularemia in the territory of the region was noted as successful. In December 2011, 1 case of a resident of Petrovsky district was registered. In 2012, 9 cases of diseases among people in 5 administrative districts were registered: Krasnogvardeysky (4), Predgorny (2), Petrovsky, Trunovskiy and Shpakovsky (1 case). In 2013, a disease with tularemia was detected in a resident of Stavropol, but it was found that the disease is associated with a stay in the Apsheronysky district of the Krasnodar Territory, where the patient was bitten by a field mole (contact). Three patients were registered in 2014 at three different locations: Krasnogvardeysky and Petrovsky districts, and also in Kislovodsk - in contact with rodents in the enzootic Mineralovodsky district. In 2015, there were no epidemiological complications of tularemia in the territory of the region. The activity of the natural foci of tularemia on the territory of the Stavropol Territory was confirmed by the isolation of cultures of the causative agent of tularemia from ixodid ticks, small mammals and the water of open water bodies.

Epidemiological prognosis according to FBUZ data "Center for Hygiene and Epidemiology in the Stavropol Territory for tularemia for the autumn-winter period of 2016/2017 was unfavorable.

This forecast was justified by the registration of the incidence of the population in January-March 2017. Already in the first three months of 2017, 39 cases of tularemia were registered in the region among residents of seven administrative districts of the region and the city of Stavropol, which were infected as a result of contacts with hares harvested in enzootic areas. (Table 1).

Table 1: Dynamics of the incidence of tularemia in the Stavropol Territory in 2017

Administrative District	Month of the year										Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	
Ipatovsky	3	5	2	5					1	1	17
Krasnogvardeysky	2	2	1					1			6
Mineralovodsky		1									1
Petrovsky	1	14						1			16
Trunovsky		1		1							2
Turkmen		1									1
Shpakovsky		1									1
Stavropol	2	3									5
Total	8	28	3	6				2	1	1	49

In the Stavropol Territory in 2017g. registered 5 clinical forms of tularemia, among which the glandular (bubonic) form prevailed, accounting for 46.2% (18 patients) of all cases; followed by anginal-glandular - 28.2% (11 patients) and pulmonary 12.8% (5); 10.2% (4) occurred in the ulcerative bubonic form and 1 case (2.5%) in the eye-bubonic. According to the severity of the course, 87.2% of the diseases were of medium severity, the condition of one patient in the pulmonary form was assessed as severe, in 4 patients - a mild course.

In 22 patients (56% of cases), the contact route of infection was realized, including 17 people (43.5%) in contact with carcass of hares hunted in hunting, 5 in contact with rodents and their secretions, in 12 people (30,7%) there was an alimentary route of infection, including 9 people in two villages (Donskaya Balka and Konstantinovskoye of the Petrovsky District) with drinking tap water supplied from spring captures in 3 people with the use of infected foods, in 5 affected aspirated pathway of infection.

The role of the water factor in the transmission of the pathogen of tularemia was confirmed by laboratory studies of drinking water samples from water sources and the water supply network, including samples of tularemia patients' homes taken from the cranes, conducted at the Stavropol Anti-Plague Institute of the Federal Service for Supervision of Health Protection of the Russian Federation. Based on the results of laboratory studies of water samples collected from 26.01. On 22.02.2017, 32 positive results were obtained with molecular genetic studies with the detection of the genetic material of the tularemia microbe, in 14 samples the culture of the pathogen of tularemia was isolated. The occurrence of a tularemia pathogen in spring water was promoted by a thaw in early January 2017, as well as violations in the disinfection regime of drinking water before feeding into the breeding network.

An analysis of the dynamics of the development of epidemic manifestations showed that the first cases of tularemia, according to the dates of the appearance of clinical signs of the disease, occurred in the autumn of 2016. However, three patients were not diagnosed with tularemia when seeking medical help. In December 2016g. 12 more people fell ill, however, they either did not seek medical help or, upon treatment, the diagnosis of tularemia was not made. The current situation led in the subsequent to the massive receipt of emergency notices from medical organizations in the second decade of January 2017g. As a result, the total number of patients with tularemia in the Stavropol Territory in 2017. reached 49 people.

In connection with the escalating epidemiological situation of tularemia infection in the Stavropol Territory in February 2017, an additional epizootological examination of the Kursk region was carried out. Laboratory studies of field material showed that a culture of the causative agent of tularemia (*Francisella tularensis*) was isolated in one sample from house mice caught 7 km east of the village of Dydymkin, Kursk region. To improve the acute epidemiological situation in tularemia that was established in 2017 on the territory supervised by the department of the Stavropol Territory, the following sanitary and preventive measures were carried out: immunization against the causative agent of tularemia, information and explanatory work with the population, checking the anti-epidemic readiness of medical and preventive institutions for especially dangerous infections, classes with medical staff: seminars, briefings, and training sessions.

CONCLUSION

The situation with the activation of the natural focal point of tularemia once again showed the risks existing in the region for the population and the need to strengthen the epidemiological surveillance of this, especially dangerous infection. In this connection, work will continue on monitoring the circulation of the pathogen of tularemia in carrier populations in the territory under supervision, as well as conducting explanatory work in the enzootic territories.

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