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Epidemiological and Epizootic Problems of Agricultural Animalsand Birds Tuberculosis

Fayziev U.M., Mamadullaev G. Kh.
Scientific-research institute of veterinary, R. of Uzbekistan

ABSTRACT

The article presents theEpidemiological, epizootic and socio-economic problems of animal and birds tuberculosis, the infectivity of human and bovine tuberculosis to different types of animals and birds, for humans, as well as measures to prevent the disease.

KEYWORDS: *agricultural, birds, tuberculosis.*

One of the most essential necessities of today is the development of animal husbandry, which is an important part of agriculture in the country. Animal infectious diseases are well-known as the greatest threat to livestock, and the industry's expansion obstructs the accomplishment of high profitability.Infectious bacterial infections spread across a large area due to their high frequency and mortality, and a lot of money is spent on measures like prevention and treatment [13]. As a result, research into the etiology, diagnosis, and prevention of tuberculosis in farm animals on livestock farms is critical.Tuberculosis spreads due to unfavorable natural conditions and violations of veterinary-sanitary norms. The problem is exacerbated by the lack of efficient biological and biochemical medications in the veterinary care system, which leads to disease spread [7; 14].

Although tuberculosis' causal agent has evolved into a specific form of animal organism over time, it can now be found in agricultural, domestic, and wild animals, as well as poultry and even the human body [1]. As a result of tuberculosis being added to the list of anthropozoonotic diseases, medical and veterinary specialists must work together to diagnose, treat, and control the disease [4; 14].

In addition to the traits shared by all infectious diseases, tuberculosis has a number of distinguishing characteristics. The disease's prevalence, the variables that cause infection, the disease's chronic course, and the organism's existence in a wide range of quantitative and qualitative variations from the disease [2; 7].The infection's most prominent aspect is its intertwined relationship with society's social structure, as well as the population's economic, living, and cultural conditions. As a result, tuberculosis has long been regarded as an infectious as well as a socioeconomic issue [4; 17].

The degree of pathogen isolation in cattle (M. bovis) is mostly determined by the epidemiological and epizootic condition of tuberculosis in cattle and other farm animals [13; 15].

In this regard, in the Russian Federation in 2002, 93,500 head, in 2003, 93,700 head, in 2004, 75,254 head of cattle tested positive for tuberculin, and 21,600, 19,900 and 18,000 samples were tested for tuberculosis, respectively. In the study, 63.6% of cattle were found to be pathogenic and 36.4% of cattle were found to have different atypical mycobacteria. Of the isolated pathogenic strains, 96.5% were M. bovis and 2.7% were M. tuberculosis and 0.8% of M.avium species [12].

Tuberculosis is far more common in the CIS, the Baltic States, and other Eastern European countries, according to some scientists. The incidence rate in Russia peaked at 90.7 per 100,000 people in 2000.

(90.7 per 100,000 people). This number began to fall in 2001-2002. Ukraine (68.6/100000), Transcaucasia, and Central Asia all had comparable situations. [15].

In our country, 11.6% of M.bovis pathogens are isolated from humans. The etiological determinants of the creation of pathological processes of the pathogen in human pulmonary tuberculosis or other organs of the lungs are influenced by the degree of epizootic malignancy in bovine tuberculosis. Long-term contact with diseased cattle has been found to cause up to 2.4 percent of urogenital tuberculosis in cattle [13].

Carnivorous animals infected with the M. bovis type can also serve as a source of infection for humans. The incidence of tuberculosis in stray dogs is 3.8%. In healthy families, 3.7% of dogs were diagnosed with tuberculosis and 5.2% of cats. In families with tuberculosis, this figure may be 3 times higher [4].

In the process of applying measures to combat tuberculosis the recovery period of the farm depends on the complexity of the epizootic process, how long the area has been unhealthy, the time of the disease and the age of the animal, the mechanism of infection, the qualifications of the farm veterinarian, the level of implementation of veterinary and sanitary measures and regulations. [8].

As a result of comprehensive veterinary-sanitary and preventive measures for the recovery of cattle from tuberculosis in the community sector has led to an increase in livestock production and livestock numbers.In 1999, an average of 2,800 liters of milk was milked per cow in unhealthy farms on tuberculosis, but after the farm was rehabilitated, the amount of milk produced increased by 4,200 kg.Grade I milk production increased from 79.7% to 98.7%.During the first 5 months of 2000, the average milk yield of dairy farms at “Ivanovskoe”, “Novoselskoe”, JSC “Petronovskoe”, “Novaya Sheshma” and SEA “Krasnyy Oktyabr” increased by 120 kg per cow in 5 months. [6].

Studies have shown that mycobacterial species were the only species at the beginning of evolutionary development and that they adapted to different animals, birds and humans throughout their lifestyles. Therefore, M. bovis and M. avium species play an important etiological role in the development of tuberculosis in humans. Animal milk and poultry eggs pose a serious risk to human health, especially children [1].

Migration of the tubercle mycobacterium bird (M.avium) to cattle, pigs, and other types of farm animals creates foci of infection that are dangerous to humans. It is also possible that avian tuberculosis can be transmitted to humans.This type of tuberculosis can enter cattle or other types of farm animals through wild birds. Many wild synanthropic birds are infected with tuberculosis mycobacteria. According to research, 8% of mycobacteria were isolated from crows, 4.8% from ravens, 9.3% from fishing birds, 3.8% from pigeons, 23% from pheasants and 34.4% from black crows [1].

In dairy, pig farms and poultry factories, people are also more likely to be infected with the bird type of mycobacteria [1].

An allergic test of poultry factory workers revealed a positive reaction to avium sensitivitis in 11.2-17.3% of people. At the tuberculosis dispensary, the avium pathogen was isolated from 3 patients with fibrinous-cavernous, hematogenous-disseminated and knee tuberculosis.It turns out that these people worked in a poultry factory for a certain period of time. There is also a lot of information that the bird-type pathogen can be transmitted to humans through infected chicken eggs. According to observations, chickens began to die in a family engaged in raising chickens. Investigations revealed an acute septic form of avian species. Homeowners and other people who consumed this chicken egg were infected with the pathogen [10].

In Kazakhstan, when typing mycobacteria isolated from patients with bone and joint tuberculosis,

cattle (M. bovis) type of tuberculosis was detected in 19.7% of cases, and poultry type (M. avium) in 3.2% and M. tuberculosis (a disease-causing species in humans) in 77.1%.In tuberculosis of the bones caused by pathogens of cattle and poultry type, combined lesions are delivered, diffuse destructive changes in the skeletal system occur in a chronic process, and intoxications occur during the course of the disease.Bone tuberculosis caused by avian type persists in the form of a long-term septic process, the clinical manifestations of the disease are different, the radiograph shows spotty osteoporosis in the bones, foci of necrosis, acute lysis of bone trabeculae [3].

In pathomorphological changes in bone tuberculosis caused by M. bovis type pathogen, polymorphism and the prevalence of the process in the tissue structure, foci of caseous necrosis of different sizes and developmental stages are observed. There is a hyperergic type of inflammation and petrification of the caseous-necrotic mass.Granulation tissue is enriched with epithelial-lymphoid, plasma and giant cells. The process of tissue regeneration consists of coarse fibers and connective connective tissue. At the site of inflammation, the bone tissue thickens and sclerosis, and the bone marrow undergoes fibrosis. Tissues are observed on the inside of the walls of blood vessels. As a result, the process of tuberculosis in the inflammatory focus intensifies and becomes a form of generalization [11].

Treatment of bone tuberculosis caused by the causative agent of cattle and poultry is not effective enough. Treatment of bone tuberculosis caused by M.tuberculosis type is up to 76.6%, and treatment of M.bovis type is effective by 25%. Treatment of bone tuberculosis caused by M. avium type is ineffective [11].

M.tuberculosis and M.bovis pathogens adapted to the organism of chickens can be released into the external environment through eggs in 28.5 and 13% of cases. Although the biological activity of pathogens in this area is slightly reduced, their pathogenicity is preserved, posing a threat to human and animal health [1].

Cattle (M.bovis) and poultry (M.avium) species of tuberculosis, as well as M. intracelulare, M.scrofulaceum and M.fortuitum non-typical mycobacterial species have been found to live up to 160 days in milk, yogurt and cream [11].

In Kazakhstan, scientists have shown that “Peschanka” and “Saigak” serve as additional sources and carriers of pathogenic and atypical mycobacteria, ensuring their circulation in natural habitats [4].

Studies have shown that the possibility of migrating the pathogen from animals to people with the cattle type of tuberculosis to animals has been proven. Especially if people infected with this species are serving on livestock farms, such a person can serve as a source of disease on the farm and cause it to spread. For example, on a farm with 127 head of cattle, tuberculosis infection is on the rise. 45 head of infected cattle are identified. The source of the disease is identified as a servant on the farm with a fibrous-cavernous form of tuberculosis [3].

In humans, tuberculosis is mainly caused by the M.tuberculosis type. However, this species has been found to infect many other animal species, including cattle, cats, dogs, pigs, horses, goats, lions, bears, monkeys, donkeys, elephantsand antelope.

Therefore, the migration of the human tuberculosis pathogen to agricultural, fur, and wild animals poses a serious epidemiological and epizootiological risk.

In the process of tuberculosis control, the recovery period of the farm depends on the level of complexity of the epizootic process, how long the area is unhealthy, the time of the disease and the age of the animal, the mechanism of infection, as well as the qualifications of veterinary specialists, veterinary and sanitary measures. depends on the implementation of rehabilitation plans in accordance with regulations [6].

In accordance with the current guidelines for tuberculosis control and prevention measures, the final disinfection of the farm before quarantine should be carried out in a complex, step-by-step manner, first by wet method and then by aerosol disinfection [14].

Mycobacteria are spread on the territory of dairy farms and they enter the body of cattle mainly through food. As a result of increased contamination in the environment and in food, the susceptibility of cattle to tuberculin is increased.In the process of carrying out veterinary and sanitary measures, the areas of ponds, drinking vessels, corridors, indoors and outdoors, distribution areas must be mechanically cleaned and disinfected. Regular disinfection of premises, improvement of sanitary condition of food-reduces paraallergic reaction on the farm and prevents unjustified slaughter of productive cattle [17].

It is advisable to monitor the health of the farm for tuberculosis using simultaneous allergy testing. Simultaneous allergy testing provides an exception to tuberculosis in 97.1% of reactive cattle without slaughter for diagnostic purposes [11].

Establishment of a computer bank of tuberculosis mycobacteria in accordance with the recommendations of the World Health Organization (WHO) will allow to control the spread of infection, to control the movement from region to region, from country to country. It is advisable to apply this method to all countries. So far, banking on the M. bovis strain is slow, and control of the M. tuberculosis strain is well established. [10].

The division of large livestock farms into small farms in Kazakhstan has complicated the epizootic situation with bovine tuberculosis. In particular, the lack of mechanical cleaning, disinfection and sanitation of livestock buildings, prolonged storage of the pathogen in the environment and incomplete coverage of diagnostic tests have led to an intensification of the epizootic process. The epizootic process has a periodic character, sometimes showing an increase or decrease in infection. While the epizootic process is intensively developed, especially in dairy cattle farms, it is slow in meat farms [8].

It can be concluded that the cause of recurrence of the disease in newly rehabilitated farms is cattle that did not react to tuberculin during the allergic test. Tuberculosis in cattle is sometimes latent-latent microbism. In this case, cattle react poorly to tuberculin.Although the tubercle-specific changes do not occur in the internal organs during latent microbism in the animal, the pathogen is located in the lymph nodes. This form of infection poses a great epizootiological risk. Under the influence of an unfavorable external environment, this form of infection contributes to the development and active tuberculosis develops. This is especially the case during the spring, when many calves are born and the food base is reduced.

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