Epidemiological surveillance of brucellosis in humans and animals in the Republic of Uzbekistan

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Background

In the Republic of Uzbekistan, brucellosis as a zoonotic disease included in the official state list of diseases the preventive care against which is fully financed from the public budget. There is a set of planned epidemiological measures in the country aimed at non-proliferation and prevention of brucellosis among humans and animals.

However, this system in our view is a passive surveillance instrument. Particular difficulties in this respect are created by the newly emerging economic conditions common for the FSU countries, where often the majority of livestock is being kept by the private sector and surveillance measures are not as strict and efficient as in the public livestock production industry of the past decades. Also, larger numbers of people can be in contact with the infected animals.

The existing official measures are mainly aimed at the prevention of brucellosis among large cattle. Sanitary methods are applied in the areas with low incidence (including annual serological surveillance, laboratory testing and confirmatory testing of samples (double-checking the negative results) and full sanitization of identified farms. Whereas in the risk-prone and high-risk areas the set of measures include both veterinary-sanitary and preventive care measures, such as annual serological surveillance and preventive immunization among healthy animals with *Brucella Abortus* strain 19, in accordance with the existing vaccination protocols.

At present, brucellosis is an endemic disease in the Republic of Uzbekistan (0,02-0,03%).

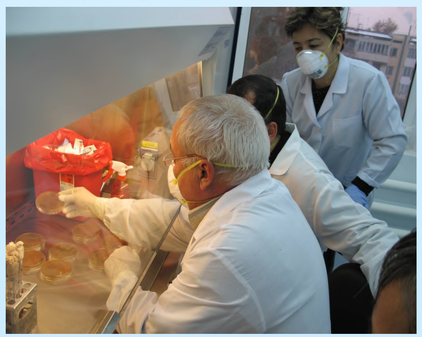
Introduction

Development and implementation of the comprehensive active surveillance system focusing on brucellosis in humans and animals in the Republic of Uzbekistan, including serological tests and determination of microbiological characteristics of the isolates obtained. The improved system allows detailed epidemiological mapping of three target provinces of the country for follow-up analysis. Systemized information will be provided to the appropriate health authorities of Uzbekistan for further application in prevention and elimination of brucellosis in the country. Overall, the joint Uzbek-American scientific work will be used in both countries to provide the governments with assistance in non-proliferation of biological weapons. The project addressed four main objectives therefore:

- Development and implementation of active surveillance system for brucellosis of humans and animals;
- Laboratory analysis of animal samples collected in households where owners proved to be positively reacting to Rose-Bengal test;
- Molecular-biological research of those blood cultures that positively reacted to Rose-Bengal tests;
- Development of recommendations for further improvement of counter-brucellosis instruments and measures in the country.

Materials and Methods

In the course of the epidemiological survey a specially developed questionnaire was used to collect data from the livestock owners. Particular attention was paid to such issues as cases of aborted fetuses among animals, any visually observed clinical signs, such as lameness and others. Local residents in the survey areas were randomly selected and questioned whether they and their family members regularly consume meat and dairy products and in what form (raw, cooked etc.). Serological tests included Rose-Bengal test. The pathogen was isolated on 5% sheep blood brucella agar. Microbiological identification involved such tests as dye sensitivity , hydrogen sulphide, oxidase, catalase, urease, acriflavin. Isolated cultures were later confirmed by Real Time PCR with Idaho Technology kits and reagents. The obtained data is currently being analyzed.



Results

Standard operating procedures for the project field work were initiated in the Parkent district of the Tashkent province of Uzbekistan in May 2006. The main sero-epidemiological and epizootic surveillance activities were conducted in Bukhara, Samarkand and Ferghana provinces in 2007.

The samples collected across three provinces, positively and negatively reacting.

	Animal species	Total sampled	Positive	Negative
1	**Large cattle**	499	6	493
2	**Sheep**	542	29	513
3	**Goats**	204	11	193
4	**Donkeys**	4	-	4
	Total	1249	46	1203

In the human study, 1673 samples were collected, of which 156 were serologically positive for brucellosis. The corresponding bacteriological samples were cultured resulting in 21 positives which were confirmed by PCR. On the veterinary side, from three provinces, 1249 animals were sampled of which 46 have reacted positively to Rose-Bengal agglutination tests, including 6 bovine, 29 ovine and 11 caprine species. All of the positively reacting samples were plated for blood culture for isolation and identification of pathogens. Six samples showed good growth of Brucella.

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