

Current assessment of risks of anthrax outbreaks in Ukraine

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Introduction

Anthrax is an acute especially dangerous infectious disease of animals and humans. *Bacillus anthracis* is a potential bioterrorism tool. In Ukraine, there are favorable natural conditions for the spread of anthrax. There are 13.5 thousand of constantly anthrax-troubled points. Anthrax epidemic situation in Ukraine could be characterized as unstable. Because of the continuing reform of Ukrainian human health entities, the State Sanitary Epidemiological Service (SSES) has lost its control functions and is remaining in an uncertain state, which increases possible risks.

Methods

Epidemiological analysis of official data has been performed using information from the following sources: State Sanitary Epidemiological Service of Ukraine (SSES), State Veterinary and Phytosanitary Service of Ukraine, and analytical materials from SI UCDCM. Collected papers Distribution and Epidemiological Characteristics of Major Human Infectious Diseases in Ukraine (Kyiv Research Institute of Epidemiology, Microbiology and Parasitology, 1976) were also used during the study. Materials were compiled for the period from 1945 to 2015.

Results

In the early XX century, more than 10,000 cases of anthrax in humans were annually registered in tsarist Russia. In 1913, 1,473 cases of anthrax in animals were recorded only in Kherson province (currently, Kherson oblast of Ukraine). The morbidity among humans increased again during the WWII. In the late 40s, massive epizootic anthrax among animals was eliminated and morbidity among people significantly reduced because of planned government measures, strengthened veterinary, sanitary, and epidemiological surveillance. Since 1950, significant reduction of incidence of human anthrax has been being recorded in Ukraine.

Since 1964, certification and mapping of persistent anthrax-troubled points in Ukraine have been being performed.

Compulsory vaccination of people against anthrax was cancelled and compulsory vaccination of all livestock was introduced in 1990.

The period from 1976 to 1993 is characterized as epidemically safe. Single cases of the disease in human were registered with intensity rates of 0.01 – 0.002 per 100,000 population (excluding 1985). No human cases were registered during the certain years: 1978, 1982, 1987, 1988.

The epidemic situation complicated during the period 1994-2001. The following outbreaks were registered:

Table 1. Total number of disease cases/ including the number of cases during outbreaks within regions

The main reason for the complication of the epidemiological situation was weakening of epidemiological and veterinary surveillance during the economic crisis characterizing this period. Epizootiological outbreaks arose from incomplete anti-anthrax vaccination of agricultural animals and from violation of veterinary-sanitary rules for their keeping as well. More than 80% of human infection cases happened resulting compelled cattle slaughtering, while the rest 20% resulted from meat product distribution and consumption without corresponding sanitary-veterinary expertise.

Six human cases of anthrax were registered during 2002-2015.

Fig. 1. Dynamics of anthrax cases in humans in Ukraine during 1945 – 2015 (absolute numbers)

Table 2. Chronology of anthrax epidemiological surveillance milestones in Ukraine

Conclusions

Relative wellbeing regarding anthrax in Ukraine persists owing to the implementation of ruled veterinary-sanitary activities and state sanitary epidemiological surveillance in meat- and leather-processing industries as well as because of active food control.

The main risks, which could trigger complication in the current epidemiological situation with anthrax, are the following:

- 1) Uncertainty in the system of sanitary-epidemiological and veterinary surveillance, which resulted from the reformation of the State Sanitary-Epidemiological and State Veterinary services.
- 2) Existence of favorable conditions for anthrax agent circulation (considerable number of persistent anthrax-troubled points in all regions).
- 3) Economic instability in the country.
- 4) Uncontrolled epidemic situation in the zone of the Anti-terrorist operation (Donetsk and Luhansk oblasts).

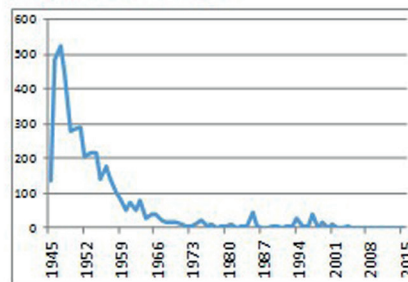
Table 1.

Years	Total number of disease cases/ including the number of cases during outbreaks within regions
1994	28 /17 (Autonomous Republic of Crimea)
1997	38/35 (Donetsk oblast)
1999	14/8 (Kherson oblast)
2001	9/7 (Kyiv oblast)

Table 2.

Years	Facts
2012	The last anthrax case in humans
2001	The last outbreak; the last case of profession-connected illness
1997	The last lethal cases (three cases during an outbreak in Donetsk oblast)
1967	The last case of anthrax in children

Dynamics of anthrax cases in humans in Ukraine during 1945 – 2015 (absolute numbers)



Keywords

Anthrax; Outbreaks; Risk assessment; Epidemiological surveillance

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