

Two cases of infection with *Bacillus anthracis*, Romania, October 2011

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A cluster of two confirmed cases of anthrax were reported in October 2011 from a small village with a population of 3,400 people, in south-eastern Romania. One was a fatal case of cutaneous and anthrax meningoencephalitis, while the other had cutaneous anthrax. Both cases had been exposed to one *Bacillus anthracis*-infected cow via consumption of its meat or being involved in its slaughter.

Two cases of anthrax were reported to the National Centre for Communicable Diseases Surveillance and Control on 7 and 8 October 2011 respectively by a local public health authority in south-eastern Romania.

Case description

Case 1

On 7 October 2011, a person in their 20s was admitted to a local hospital with fever (40 °C), chills, malaise, pustular lesions on both forearms (symptom onset on 6 October), blood pressure 65/40 mmHg and respiratory arrest (symptom onset on 7 October); After that, the patient developed meningitis symptoms and died on 9 October. During the hospital stay, the patient was mechanically ventilated and received dopamine, penicillin and ciprofloxacin intravenously. The cause of death was reported as cardiovascular and respiratory failure and septic shock due to disseminated infection with *B. anthracis*, confirmed by presence of the bacterium on the skin and in the bloody cerebrospinal fluid (CSF).

Case 2

Following the identification of Case 1, during the epidemiological investigations conducted by the local public health department, a second person in their 20s was identified from the same village and subsequently confirmed as a case of cutaneous anthrax. The onset of symptoms in this case was 3 October and they included pustules on the left-hand index finger. The case was hospitalised on 7 October and received penicillin and ciprofloxacin intravenously. The patient responded

well to the treatment: the general condition is now good and the patient was discharged from hospital.

Background information

Anthrax is included in the early warning and rapid response system in Romania [1]. It is a notifiable disease, based on the European Union (EU) case definition [2]. The alert threshold is one clinically suspected case of anthrax. Any such case detected by a health-care provider must be immediately reported by telephone to the local public health authorities. Within five days of the initial report, the healthcare provider has to complete and send a standardised reporting form to the local public health authority. All data are centralised in one electronic register for communicable diseases by the National Centre for Communicable Diseases Surveillance and Control [3,4].

Laboratory-confirmed anthrax cases are notified through the European Union Early Warning and Response System and to the World Health Organization in compliance with the International Health Regulations (2005) [5].

According to data published by the European Centre for Disease Prevention and Control, the number of notified cases of anthrax continue to be sporadic in Romania, as well as in other EU countries and are mainly related to occupational exposure. Between 2006 and 2008, 13 confirmed cases of anthrax were reported from five EU countries: Romania (n=3), Spain (n=3), Bulgaria (n=3), Greece (n=2), United Kingdom (n=2). Between 2008 and 2010, no confirmed cases of anthrax were reported in Romania [6-8]. None of the three cases identified in Romania between 2006 and 2008 were in the district where the cases described in this report occurred. In some cases, the source of infection was sick animals and in others, the disease was contracted due to possible contamination of pre-existing skin lesions with *B. anthracis* spores from the ground [9].

In the past five years, there were two cases of infection with *B. anthracis* in animals (pigs) in this district in 2009, 62 miles from the district where the cases described here were located (data not shown).

Laboratory investigation

On 10 October, biological samples (smears from pustules from both patients and CSF from Case 1 who presented with meningitis symptoms) were sent for diagnostic tests to the National Reference Laboratory for Zoonotic Infections 'Cantacuzino'. Microscopic examination of the smears from both cases and the CSF from Case 1 showed the presence of Gram-positive rods, typical of *B. anthracis*.

Bacterial cultures from the pustules, grown for 24 hrs on 5% blood agar, produced grey-white colonies (diameter 2–4 mm) that were non-haemolytic. When examined microscopically, smears of these colonies showed large Gram-positive rods, in short and long chains, seldom sporulated, with ellipsoidal spores but without a swollen sporangium, suggestive of *B. anthracis*.

The sample from CSF from Case 1 did not grow in culture.

To further confirm these findings, a pathogenicity test was performed on two mice, by subcutaneous inoculation of 0.2–0.3 ml opalescent suspension of the bacterial strain isolated from the pustules (suspension prepared in saline isotonic solution and corresponding to McFarland standard number 0.5). It was positive after 20–24 hrs, Gram-positive encapsulated bacilli, arranged in short paired chains, were observed on the liver, spleen and heart imprints. The presence of the bacterial capsule was demonstrated in vitro, after cultivating the isolated strains for six hours in defibrinated sheep blood.

The laboratory results were received on 13 October and confirmed the presence of *B. anthracis* in both cases.

Epidemiological investigation

In the epidemiological investigation, a *B. anthracis*-infected cow from the village where the cases lived, slaughtered on 28 September in a private backyard, was identified as the source of infection. According to the local veterinarian, the cow had been vaccinated against anthrax in April 2011, but on 11 October the district Veterinary Department confirmed *B. anthracis* in the meat of the slaughtered cow. No other suspected human anthrax cases or anthrax-suspected deaths in animals were reported in the village previously or since this cluster.

Nine people were exposed to the infected animal through consumption of its meat that was not thoroughly cooked and four of them took part in the slaughtering of the cow, including Case 1 described above. Even though the second case declared only having consumed the meat and not having participated

in the slaughtering, he was diagnosed with cutaneous anthrax. He probably contracted the infection while handling the raw or insufficiently cooked meat.

Control measures

All persons at risk and all household contacts of the cases are being carefully monitored during the maximum incubation period (until 12 November) by the local general practitioner. So far none of them have presented symptoms of anthrax. The residents of the village were informed about the health measures to be followed in order to avoid infection. These include washing hands, wearing gloves when in contact with infected animals or avoiding contact with infected animals. If a person has contact with an infected animal, they should disinfect or dispose of any objects used or clothes worn. The residents were also advised to seek medical attention if they develop any symptoms compatible with anthrax (for cutaneous anthrax: macula, pustule development, necrosis and oedema; for inhalational anthrax: fever, dyspnoea and hypotension; and for gastrointestinal anthrax: vomiting, abdominal pain and severe diarrhoea).

Veterinary control measures included disinfection and decontamination of the household where the cow had been slaughtered. All the remaining meat of the slaughtered cow and its organs were collected and incinerated.

The Veterinary Department vaccinated all animals (cattle, sheep, goats and horses) in the village against anthrax and banned the movement of animals in or out of the village, until immunity is installed.

Conclusions

In this cluster, due to the rapid implementation of measures by the local health authorities, after the suspected diagnosis in the index case, the second case was detected in a timely manner and treated appropriately, thus preventing further spread of the disease. At present it is thought that the public health impact of this outbreak is only local. The infected cow was raised in the village and there was no notification of the animal's movement to other localities. The meat had not been sold commercially and the village is not usually visited by tourists.

The two anthrax cases described could have been prevented if the national legislation that requires examining the animal carcasses in authorised slaughtering units by the official veterinarian or by a person nominated by the authority had been taken into account [10].

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