

## OCCURRENCE OF ANTHRAX IN KARS DISTRICT, TURKEY

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The aims of the study were to determine the prevalence of anthrax by bacteriologic methods in cattle and sheep between January 2000 and September 2001 and to determine the distribution of this zoonotic disease in humans in Kars district, Turkey. *Bacillus anthracis* was isolated and identified in 34 out of 38 (91%) cattle and 11 out of 17 (64%) sheep samples obtained from organs suspected of anthrax. The records of the Governmental Health Branch showed that 89 cases of cutaneous anthrax were diagnosed in humans during the study periods in the same district.

**Key words:** Anthrax, epizootiology, epidemiology, Turkey

Anthrax is a fatal disease of warm-blooded animals caused by *Bacillus anthracis* which can also be a threat to human health. The more acute infections are common in cattle and sheep.

Anthrax is global in its geographical distribution and is endemic to many parts of southern Europe, Asia, Africa, North and South America, and Australia (Dragon and Rennie, 1995; Anon., 1998). Due to widespread vaccination of animals and the disinfection of animal products such as hides and wool in the developed countries the prevalence of anthrax has decreased significantly. Transmission of the bacterium to humans occurs through contact with infected animals and their products, but infection can also occur through inhalation of air laden with the spores of the bacilli. Pulmonary, intestinal and cutaneous forms of anthrax (the last accounting for > 90% of the cases) are seen in humans (Carter and Chengappa, 1991).

The aims of the study were to investigate the prevalence of anthrax in the cattle and sheep population and also to determine the distribution of this zoonotic disease in humans in Kars district, Turkey.

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## Materials and methods

### *Samples*

Samples (spleen, liver, lung, etc.) were collected from 38 cattle and 17 sheep brought to the Department of Pathology with suspected anthrax between January 2000 and September 2001. During the study period the records of the Governmental Health Branch (GHB) were also investigated.

### *Isolation and identification of the bacterium*

Organs suspected of anthrax were macroscopically examined for anthrax in a biohazard safety cabinet. The smears were prepared from localised sites and stained with Giemsa and Gram staining methods. To isolate *B. anthracis*, swab samples were inoculated onto sheep blood agar, nutrient agar and nutrient broth. Media were incubated under aerobic conditions at 37 °C for 24–48 h. The colonies growing out on sheep blood agar that were 5 mm in diameter, flat, dry and greyish with a granular 'ground-glass' appearance, were selected for further examination on the basis of morphology, microscopic appearance, growth features in broth, haemolysis, penicillin susceptibility, gamma phage susceptibility, catalase production, and motility (Carter and Cole, 1990; Carter and Chengappa, 1991).

## Results

Macroscopically, most of the organs of animals suspected of anthrax showed signs of softening, no blood coagulation, splenomegaly and darkening of the spleen, and haemorrhages on the serous membranes. In a few cases no gross changes were observed. Gram staining showed large Gram-positive bacilli and in Giemsa-stained preparations single or couples of blue rod chains surrounded with a pink, square-ended capsule suggested the possibility of *B. anthracis*. In addition to the staining results, the isolation and identification methods used for *B. anthracis* were also successful in 34 out of 38 (91%) cattle and 11 out of 17 (64%) sheep samples. The records of the GHB showed that 89 cases of cutaneous anthrax were diagnosed in humans belonging to various age groups and representing both sexes during the study period.

## Discussion

Anthrax is primarily a disease of domesticated and wild animals, particularly herbivores, and occurs all over the world, including Turkey. Outbreaks of anthrax have been reported in many countries such as Nigeria (Okolo, 1985),

Zambia (Tuchili et al., 1993), France (Patra et al., 1998), and Australia (Turner et al., 1999). Evidence of the presence of anthrax among cattle and sheep in Turkey has been described by many investigators, such as Şahin and Aydın (1999), who bacteriologically examined 164 samples from animals suspected of anthrax between 1993 and 1998 and reported 132 anthrax-positive animals (80% positivity rate) in Kars district. Moreover, Aydın et al. (1996) have also successfully isolated and identified *B. anthracis* in 27 samples from 30 cattle (90%) and 10 samples from 13 sheep (76%) between 1994 and 1995 in the same region. In this study, we isolated and identified *B. anthracis* in 34 out of 38 cattle (91%) and 11 out of 17 sheep (64%), and obtained information on 89 cases of human cutaneous anthrax from the GHB. Diagnosis of anthrax in both animals and humans in the same period clearly shows that the zoonotic characteristics of the disease. Contact with infected animals and consumption of infected animal products are the likely sources of anthrax in humans.

The presence of seasonal outbreaks show that anthrax remains a problem in cattle and sheep, and that it is a zoonotic disease in Kars district. Anthrax is enzootic and commonly occurs in the grazing season in consecutive years in both animals and humans. Due to its economic impact and zoonotic characteristics, anthrax is a major threat both to animal husbandry and human health in this geographic area. Administrative precautions including regular vaccination programmes in animals, strict border control, restriction of animal movements and stopping of illegal slaughtering of animals should be tightened when fighting against anthrax in this region. These measures are important for the eradication of the disease or at least for restricting its spread.

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