An outbreak of anthrax meningocerephalitis

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Abstract

We report a common-source outbreak of anthrax meningocerephalitis in Chittoor district in Andhra Pradesh, southern India, in October 1990. The source of infection was the carcass of a sheep. Of 5 persons who had skin wounds and cut up the meat for human consumption, 4 developed anthrax meningocerephalitis and one developed a malignant pustule. Another person who wrapped the meat in a cloth and carried it home on his head developed a malignant pustule on his forehead and also meningocerephalitis. All subjects with anthrax meningocerephalitis died, but the one with only a malignant pustule recovered. A large number of people who cooked or ate the cooked meat of the dead sheep remained well. The medical, public health and veterinary authorities were alerted and sheep, goats and cattle in the locality were immunized with anthrax vaccine. Although rules against consumption of meat of dead animals exist, their violation shows a lack of public awareness. Health education should be undertaken to correct this situation.

Introduction

Animal and human anthrax have been repeatedly reported in the 3 contiguous states of Andhra Pradesh, Karnataka and Tamil Nadu in the Deccan peninsula of India (Koshti et al., 1981; Bhat et al., 1983, 1985, 1990; Chandramukhi et al., 1983; Lalitha et al., 1988, 1990; Khanna et al., 1989; Bhat & Mohan, 1990). Anthrax meningoencephalitis (AME) has been reported relatively frequently in southern India; among 8 reported cases of human anthrax, 5 had meningoencephalitis (Koshti et al., 1981; Bhat et al., 1983, 1985, 1990; Chandramukhi et al., 1983; Lalitha et al., 1988, 1990; Khanna et al., 1989; Bhat & Mohan, 1990). We have recently investigated an outbreak of anthrax meningoencephalitis, reported here, illustrating that central nervous system disease is common and also that zoonotic anthrax continues to be a public health problem.

Subjects and Methods

In Saliseelampalli village in the district of Chittoor in Andhra Pradesh, one among about 20 sheep in a farmer’s pen died on 12 October 1990. Assuming that it would be safe to eat the meat, the farmer and 4 friends skinned the carcass and cut up and distributed the meat among neighbours. Two of these 5 subjects became very ill (cases no. 1 and 2) and were admitted to Chittoor district hospital on 14 October 1990. Two more persons fell ill (cases no. 3 and 4) and were admitted to this hospital on 15 October. The fifth subject was examined and found to have an ulcerated lesion on his right thumb, headache and vomiting. Case no. 5 had a malignant pustule on his right index finger, headache and vomiting, but no seizure; he progressed to coma. Case no. 5 had a malignant pustule on the right thumb but no other systemic symptom or sign. Case no. 6 had a malignant pustule on his forehead; he developed right-sided seizures and progressed to coma.

The stained smears of CSF from patients no. 3, 4 and 6 showed large Gram-positive rods in short chains; with methylene blue, the organisms were seen to be encapsulated. The CSF was grossly turbid in all cases. The patients’ laboratory findings are presented in the Table.

All specimens yielded organisms in culture, which were morphologically typical of B. anthracis. The swab from the skin lesion of the fifth patient showed Gram-positive rods and also grew B. anthracis in culture.

Results

Cases no. 1 and 7 were men aged 50-60 years who had developed fever and generalized seizures. Both had neck rigidity and were in coma. Since the history of contact with the dead sheep had not been mentioned by the relatives, anthrax was not suspected and they were treated by injections of penicillin. Both patients died 6-8 h after admission.

Case no. 3 was 30 years old and nos 4, 5 and 6 were also men aged 50-60 years. They developed fever one day after skinning the sheep carcass. Case 3 had headache, vomiting and repeated generalized seizures progressing to coma and decerebrate rigidity. Case no. 4 had a malignant pustule on his right index finger, headache and vomiting, but no seizure; he progressed to coma. Case no. 5 had a malignant pustule on the right thumb but no other systemic symptom or sign. Case no. 6 had a malignant pustule on his forehead; he developed right-sided seizures and progressed to coma.

The stained smears of CSF from patients no. 3, 4 and 6 showed large Gram-positive rods in short chains; with methylene blue, the organisms were seen to be capsulated. The CSF was grossly turbid in all cases. The patients’ laboratory findings are presented in the Table.

Discussion

Although no laboratory confirmation was made on cases no. 1 and 2, the epidemiological and clinical data suggest anthrax meningoencephalitis as the diagnosis. In the 4 subsequent cases, anthrax was confirmed bacteriologically; 3 of them had meningoencephalitis. After the diagnosis of anthrax was made, the government veteri-

Table. Laboratory findings in cerebrospinal fluid samples of 3 patients with anthrax meningoencephalitis

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>3</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cells/mm³</td>
<td>20000</td>
<td>23000</td>
<td>48000</td>
</tr>
<tr>
<td>White blood cells/mm³</td>
<td>2400</td>
<td>4800</td>
<td>2800</td>
</tr>
<tr>
<td>Polymorphonuclear cells</td>
<td>99%</td>
<td>99%</td>
<td>99%</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>10%</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Glucose (mg%)</td>
<td>31</td>
<td>114</td>
<td>46</td>
</tr>
<tr>
<td>Protein (g%)</td>
<td>1.2</td>
<td>2.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>

The CSF samples from the 8 villagers who were investigated for suspected anthrax were completely normal. They and all other members of the community were reassured but cautioned against handling dead animals.

The 3 patients with anthrax meningoencephalitis (nos 3, 4, 6) were treated with large doses (2 million units every 2 h) of intravenous penicillin G, dexamethasone and mannitol, but all died within 96 h. The patient with only a skin lesion (no. 5) was also treated with penicillin G (2 million units every 6 h) and recovered completely.
nary officer and we visited the village on 16 October. The same day another sheep had died and a blood smear from it showed large Gram-positive rods typical of B. anthracis.

The high frequency of meningocoecephalitis in human anthrax (5 of 6 cases) and its occurrence in an outbreak are features not previously reported. In 2 individuals the encephalitis may have been secondary to cutaneous infection, and the route of infection may have been by conveyance to the nasal mucosa from the fingers. Acquisition through the respiratory tract by inhalation would have resulted in acute pulmonary anthrax.

Sporadic cases of anthrax meningocoecephalitis have been reported in different parts of the world (HOUSE, 1920; HAIGHT, 1952; RANGEL & GONZALEZ, 1975). In India, between 1977 and 1990, 8 cases have been documented, all in persons living in rural areas in the states of Tamil Nadu or Karnataka. Among them, 7 had close association with cattle, sheep or goats. Agrawal, U. Z., 1983; LALITHA et al., 1985, 1990; CHANDRAMUKHI et al., 1983; LALITHA et al., 1987, 1990; KHANNA et al., 1989; BHAT & MOHAN, 1990. The patients were all men aged 17 to 63 years from rural areas, predominantly farmers with close contact with animals. Animal anthrax clearly contaminates to be enzootic in this region.

We have anecdotal evidence to indicate repeated occurrences of cutaneous lesions which may have been due to anthrax in Saliseelampalli village and its surroundings over many months preceding the reported epidemic. The local primary health centre doctor reported having treated with penicillin injections many cases of what appeared to be malignant pustules in the preceding 3 months.

Systems regulating meat hygiene in the region had broken down. Unauthorized slaughter of sheep, goats and cattle was common and the meat of other dead animals had been consumed. Well cooked meat poses no risk of transmission of B. anthracis; none of the villagers who ate the cooked meat of the infected animal developed any clinical illness. Urgent attention needs to be paid to health education and stricter enforcement of rules regarding meat hygiene; immunization of animals must be practised more systematically.

References


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Announcements

Second Tropical Neurology Congress
Limoges, France 21–23 September 1994

The official languages of this congress will be French and English. Registration fee: FF 1500 (US $ 250) before 1 March 1994; FF 2000 (US $ 325) after that date.

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