

# Treatment of Anthrax in Children

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Anthrax has been described since biblical times. It was the first disease proved to be caused by an identified bacterial agent, the *Bacillus anthracis*. In man, the disease occurs in a cutaneous form as a malignant pustule, in a pulmonary form as wool sorters' disease, and very rarely in an intestinal form. Although the incidence of anthrax is rare in many parts of the world, it still remains enzootic and epizootic in many countries from which hairs and hides are exported. In southern Iran, the incidence of anthrax is probably much higher than recorded, for several reasons. Physicians are usually reluctant to report cases unless identification has been made by bacterial examination. Frequently, identification is not possible because of previously administered antibiotics. Some severe cases expire in the villages because they cannot reach professional help in the city. Some simple cutaneous lesions are treated in the village, without admittance to hospital.

It is the purpose of this communication to report 6 cases of cutaneous anthrax in young children, with particular emphasis on the treatment of this infection.

## Case Reports

Six cases (3 boys and 3 girls) of cutaneous anthrax were admitted to the Paediatric Department at Nemazee Hospital during a period of 2 years. Their ages ranged from 9 months to 10 years. In each case, the family history revealed close contacts with animals, for the fathers were usually farmers or shepherds. The youngest patient had been in contact with clothes made from contaminated sheep wool. Of these cases, 4 were admitted during July, the period of drought.

The location of the black eschars was the face in 4: a lower eyelid in 2, an upper eyelid in 1, and the corner of the lip in 1 (Fig. 1-3). One child had the lesion over the scapular region, and one on the chest wall. All palpebral eschars were associated with malignant oedema of the face and neck, and the other children also had massive oedema around the lesions. On admission, the temperature ranged from 39 to 40° C. All patients looked toxic

and were in a septicaemia-like state. The duration of the disease on admission ranged from 2 to 5 days. The total duration of disease from onset of manifestations to hospital discharge was from 8 to 17 days.

**Laboratory data.** Haemoglobin ranged between 8.6 and 15.8 g./100 ml. White blood cell counts ranged from 13,200 to 36,500/mm.<sup>3</sup> with a shift to the left, 4 out of 6 having counts over 22,000. Smears and cultures were positive for *Bacillus anthracis* in all but one case: in the latter, smear and culture were taken from under the eschar 18 hours after she had received an unknown amount of intramuscular penicillin from her local physician. All cases were treated with massive doses of penicillin and steroids.

## Treatment

Because of severe toxicity and extensive facial oedema, 4 of the patients received intravenous hydrocortisone and penicillin for the first three to four days. The dose of hydrocortisone was 50-150 mg. and of crystalline penicillin 4-6 mega units per day. Thereafter, oral prednisone and intramuscular penicillin were given. The dosage of prednisone ranged from 10-20 mg. per day according to the patient's age and response, and was continued for from 2 to 5 days.

As the 2 other patients were less toxic and as oral feeding had not been hindered, they were treated with oral prednisone and intramuscular penicillin. The prednisone dose ranged from 15-20 mg. per day for the first 2 days, and was then tapered off over the subsequent 3 days.

The temperature returned to normal within 48 hours from the beginning of treatment. The oedema and respiratory distress decreased conspicuously in 2 days and completely subsided within 5 days. The general condition of the patients was dramatically improved within 3 days, so that those with extensive facial oedema could be fed.

## Comment

There have been many reports of anthrax in adults, but to our knowledge, this is the first report of the infection in such young children. It is clear that a child of any age who is in close contact with infected materials of animals may develop the disease. The localization of the eschars in our



FIG. 1.—Eschar of upper eyelid with oedema of the face and neck in a 2-year-old girl who was in contact with a goat.



FIG. 2.—Same patient as in Fig. 1. Eschar of the upper eyelid 5 days after penicillin and steroid therapy. Note complete disappearance of facial oedema.



FIG. 3.—Eschar of lower eye-lid with oedema of the face and neck in a 10-year-old girl who was in contact with a sheep.

patients was mainly over exposed parts of the body.

Five of the patients who had high temperatures were also in a septicaemia-like clinical state: they all had extensive oedema and high leucocytosis. In advanced cases, the malignant oedema had affected the mouth, larynx, and eyes.

Because of the difficulty the villagers have in travelling to the city, the patients we have seen are mainly those who, because of severe symptoms or grotesque oedema, were compelled to seek medical help in the city. Children with severe facial or palpebral oedema sought medical help 2-5 days after the first symptom was noticed. The lesions generally showed marked improvement by the 5th-10th day of treatment, but one patient will probably need plastic surgery of the upper eyelid.

Anthrax is susceptible to all known antibiotics except polymyxin B. Because of the severity of the infection, the extensive oedema, and the inability to take oral feedings, our young patients were treated with intravenous fluid, penicillin, and hydrocortisone for the first 3 days. When a response to this initial therapy was apparent, oral steroids and intramuscular penicillin were administered. It was not necessary to continue treatment beyond 5-10 days. This regimen resulted in a rapid reduction of the facial and laryngeal oedema, disappearance of respiratory distress, and a satisfactory cosmetic appearance of the face and eyelids.

In brief, we recommend immediate high dosage intravenous penicillin and corticosteroid therapy in young children, who are in poor general condition and have rapidly spreading oedema. In comparison with past experience, this combined treatment has afforded much improved results.

In southern Iran, there exists widespread anthrax infection in both man and animals. We believe that the cases reported here represent only a fraction of the children developing anthrax, but we are still uninformed about the size of this problem, even in the more easily accessible areas of the vicinity of the city.

### Conclusion

Six cases of cutaneous anthrax in children, seen during a period of 2 years from the southern part of Iran, are reported. These cases probably represent only a small fraction of the cases occurring in the area. Most of the patients were in poor general condition, with high fever, leucocytosis, and massive oedema. They were successfully treated with high doses of parenteral penicillin and corticosteroids. These satisfactory results contrast with our previous experience, when children with severe anthrax infections, who were treated only with conventional doses of penicillin without steroids, frequently succumbed.