

# Anthrax information for general practitioners

Anthrax is caused by a spore forming bacterium, *Bacillus anthracis*. It is primarily a disease of grazing herbivores such as sheep and cattle, which are infected through ingestion of vegetation contaminated by anthrax spores. Once ingested, the spores germinate and the vegetative forms multiply eventually killing the host. Bacilli are shed in massive numbers as the animal dies; they sporulate rapidly on exposure to air. Anthrax spores are profoundly resistant to desiccation, heat, irradiation etc and can remain dormant in some types of soil for decades.

## Anthrax cycle of infection

### Human anthrax

Man is an incidental host, usually acquiring anthrax from contact with infected animals or animal products. There are three forms of human anthrax:

#### Cutaneous anthrax

- is the most common form of naturally occurring human anthrax
- is acquired by inoculation of spores into skin abrasions eg. when handling untreated animal hides
- usually occurs on exposed sites such as hands, forearms, face and neck
- has an incubation period of 1-7 days during which the spores germinate
- initial lesion is a pruritic macule or papule surrounded by local oedema, which soon evolves into an ulcer surrounded by vesicles, followed by the development of a depressed black eschar, often associated with extensive local oedema
- neither the ulcer nor the eschar are painful (distinguishes from cellulitis)
- responds promptly to antibiotics, prognosis usually excellent. The eschar sloughs off after 1-2 weeks, usually with no permanent scar
- direct exposure to secretions from cutaneous anthrax lesions may very rarely result in secondary cutaneous anthrax.

#### Gastrointestinal anthrax

- a rare form of human anthrax, acquired by the ingestion of inadequately cooked contaminated meat
- during an incubation of 1-7 days, the spores germinate in the GI tract leading to either oropharyngeal (oral or oesophageal ulcers with regional lymphadenopathy, oedema and sepsis) or abdominal (nausea, vomiting and bloody diarrhoea progressing to an acute abdomen with septicaemia) syndromes
- GI anthrax complicated by septicaemia has a poor prognosis regardless of antibiotic therapy.

#### Inhalation anthrax

- a rare cause of naturally occurring human anthrax. However, could result from a deliberate release of large quantities of spores in an aerosol
- occurs when very fine spore-bearing particles reach the alveoli
- alveolar macrophages destroy some spores; the remainder reach, via lymphatics, the mediastinal lymph nodes
- spores germinate in the mediastinal nodes after an incubation period usually of 1-7 days, but on occasion up to 60 days following the exposure
- initial symptoms following inhalation of spores are non-specific and flu-like; followed 2-4 days later by sudden deterioration with high fever, acute respiratory failure and shock
- bronchopneumonia does not occur in inhalation anthrax, and therefore sputum samples are of little use in making the diagnosis
- antibiotics may be effective if administered early in the prodrome; once respiratory or septicaemic symptoms develop the disease is often fatal, sometimes within hours

