EPI-NEWS **NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES**
Editor: Susanne Samuelsson
Statens Serum Institut - 5 Artillerivej - 2300 Copenhagen S - Denmark
Tel: +45 3268 3268 - Fax: +45 3268 3874
www.ssi.dk - serum@ssi.dk - ISSN: 1396-4798

ANTHRAX

No. 42, 2001

As anthrax is very much in the news, Statens Serum Institut has decided to publish this special issue of EPI-NEWS.
Anthrax is an acute infectious disease caused by the spore-forming bacterium Bacillus anthracis. The bacterium occurs in the soil and in herbivores, whether wild or domesticated (cattle, sheep, goats and camels). Anthrax can also occur in humans exposed to infection from animals, e.g. by handling meat, wool or hides.

Occurrence
Anthrax occurs most frequently in agricultural regions of developing countries and is found in animals in Central and South America, southern and eastern Europe, Asia, Africa, the Caribbean and the Middle East. Human infections are usually due to occupational contact with infected animals and/or animal products. In Denmark, anthrax has not been detected in animals since 1988 and there have been no human cases for many years. In Norway, a case occurred in 2000, in a drug user who had injected contaminated heroin. Anthrax is also very rare in the USA, where there have been about 250 cases of cutaneous anthrax over the last 50 years, and 18 cases of inhalational anthrax over the past century. This low incidence means that cases of anthrax in humans without known natural exposure will give rise to suspicions of deliberate actions or biological terrorism.

Symptoms
The symptoms depend on how the infection was acquired, but usually appear within seven days of exposure. On inhalation, symptoms may appear up to 60 days after infection.

Modes of transmission
Infection can occur in three ways: through the skin, by inhalation or by the ingestion of food. The bacterium can form resistant spores that survive both boiling and most methods of disinfection. The spores may be found in soil, animal skins and wool, and can infect humans through skin abrasions or wounds and by inhalation or ingestion. Anthrax is not usually transmitted from person to person.
Cutaneous anthrax
Most human cases of anthrax (95%) occur when the bacteria infect damaged skin, e.g. on handling wool, hides or infected animals. The cutaneous infection typically appears as a non-tender carbuncle with a black base. The mortality is about 20% without treatment but very low with antibiotic treatment.
Inhalational anthrax
Inhalational anthrax is caused by the inhalation of dust containing anthrax spores, 1-5 µm in diameter. Initial symptoms are influenza-like. Over a few days the patient develops increasing breathlessness and a rising fever. Chest x-ray shows a widened mediastinum, and the patient goes into shock. Symptomatic, untreated inhalational anthrax is nearly always fatal. Antibiotic treatment must be started early if it is to be effective.
Foodborne infection
Rare cases of anthrax may be seen after the ingestion of infected meat. This leads to acute enteritis with bloody diarrhoea. The infection carries a high mortality.

Treatment and prevention
The treatment of anthrax requires hospital admission and the use of antibiotics guided by resistance determination. After exposure to anthrax, the infection can be effectively prevented by antibiotics (penicillin V, doxycycline or ciprofloxacin). Antibiotic prophylaxis in exposed persons should be continued for 60 days. Vaccines against anthrax are available for human use. Depending on the type of vaccine, 4 or 6 doses must be given to obtain full protection. Vaccination is currently only used for persons who are especially exposed to infection, e.g. through laboratory work with anthrax bacilli. In addition, the vaccine is routinely used in American soldiers. Prevention of anthrax by vaccinating the civilian population is not regarded as relevant and is not performed anywhere in the world. The vaccine is not available in Denmark.

Preparedness
Statens Serum Institut and the larger clinical microbiology departments in Denmark are equipped to demonstrate anthrax bacilli in patient specimens. Current diagnostic methods are time-consuming, but Statens Serum Institut has now set up a molecular biology technique enabling identification to be completed in 36 hours. If a local microbiology department suspects anthrax, it should contact Statens Serum Institut and send in the specimen for identification. The Institute has a 24-hour on-call service.

Handling of suspicious mail
Government authorities assess the risk of Danish residents or businesses receiving mail with anthrax bacteria as minimal. If a suspicious letter or package should arrive it is therefore important to keep calm and avoid panic. Even if a letter does contain anthrax bacteria, the risk of infection is slight. A distinction should be made between suspicious unopened letters and opened letters that have been found to contain a suspicious powder. Unopened letters are not regarded as being directly infectious. To avoid creating unnecessary upheaval and overloading the preparedness facilities, everyone is requested to evaluate the situation carefully and investigate, e.g. within the business, whether there could be a natural explanation for the mail received.
Opened mail
1. Carefully place the letter or package on a table without shaking it.
2. Get everyone present to leave the room and lock it or seal it off.
3. Call the local police or, if necessary, the emergency services (dial 112), and state who is calling, from what address, what the problem is and how many people are affected.
4. Await arrival of the police or rescue services.

Unopened mail
Contact the local police and ask for instructions on handling the letter. The local preparedness services will then evaluate the actual risk and start taking the necessary measures, including the management of exposed persons, collection of samples, any preventive treatment, etc. One should not go to hospital casualty departments if exposure is suspected, but contact the local police, who will advise on what action should be taken. Additional information can be obtained from the Institute's home page: <www.ssi.dk>.
(Nils Strandberg Pedersen, Niels Frimodt-Møller)

17 October 2001