

Bacterial Diseases

Anthrax

Anthrax is a life-threatening infectious disease that normally affects animals, especially ruminants (such as goats, cattle, sheep, and horses). Anthrax can be transmitted to humans by contact with infected animals or their products. In recent years, anthrax has received a great deal of attention as it has become clear that the infection can also be spread by a bioterrorist attack or by biological warfare. Anthrax does not spread from person to person.

anthrax causes

The agent of anthrax is a bacterium called *Bacillus anthracis*. Anthrax organisms exist in a dormant form called spores. These spores are very hardy and difficult to destroy. The spores have been known to survive in the soil for as long as 48 years.

anthrax transmission

Anthrax can infect humans in three ways. The most common is infection through the skin. Occupational exposure to infected animals or their products (such as skin, wool, and meat) is the usual pathway of exposure for humans, which causes an ugly sore. Humans and animals can ingest anthrax from carcasses of dead animals that have been contaminated with anthrax. Ingestion of anthrax can cause serious, sometimes fatal disease. The most deadly form is inhalation anthrax. If the spores of anthrax are inhaled.

kinds of anthrax

There are three forms of disease caused by anthrax: cutaneous (skin) anthrax, inhalation anthrax, and gastrointestinal (bowel) anthrax.

Cutaneous anthrax

starts as a red-brown raised spot that enlarges with considerable redness around it, blistering, and hardening. The center of the spot then shows an ulcer crater with blood-tinged drainage and the formation of a black crust called an eschar. Symptoms include muscle aches and pain. The illness usually resolves in about six weeks, but deaths may occur if patients do not receive appropriate antibiotics.

Inhalation anthrax

The first symptoms flu-like (influenza). In a few days, the illness worsens and there may be severe respiratory distress. Shock, coma, and death follow. The spores that invade and survive multiply produce deadly toxins, and spread throughout the body. Severe hemorrhage and tissue death (necrosis) occurs in these lymph nodes in the chest. From there, the disease spreads to the adjacent lungs and the rest of the body, and most affected individuals will die even if they get appropriate antibiotics.

Gastrointestinal anthrax

gastrointestinal anthrax is the result of eating undercooked, contaminated meat. The symptoms of this form of anthrax include nausea, loss of appetite, bloody diarrhea and fever followed by abdominal pain. The bacteria invade through the bowel wall. Then the infection spreads throughout the body through the bloodstream (septicemia) with deadly toxicity.

diagnosis of anthrax

The history, including the occupation of the person, is important.

The bacteria may be found in cultures or smears in cutaneous (skin) anthrax and in throat swabs and sputum in pulmonary anthrax.

Chest X-rays

Anthrax treatment

In most cases, early treatment can cure anthrax. be treated with common antibiotics such as penicillin, tetracycline, erythromycin, and ciprofloxacin. Inhalation anthrax necessitates treatment with IV therapy with antibiotics

A vaccine exists but is not yet available to the general public

prevention

There is a vaccine available for people at high risk. the Centers for Disease Control and Prevention are working very hard to prevent a bioterrorist attack and to be prepared to deal with the consequences if one occurs.

DISEASE: Anthrax

AGENT

Bacillus anthracis

RECOGNITION

Syndrome: Human: Cutaneous: most common, cutaneous pruritic made, becomes edematous, vesiculates, then necrotic with black central scar; Pulmonary: febrile respiratory tract disease, mild onset, then sudden onset of second stage with dyspnea, sweating, cyanosis, and death with **24** hours; Intestinal: febrile gastrointestinal disease.

Animal. Affects domestic and wild ruminants (cattle, goats, sheep), horses, and swine.

Incubation period Cutaneous, **1-7** days; pulmonary, **1-5** days; intestinal, **12** hours-5 days.

Case fatality rate: If untreated, cutaneous **5%-20%**, pulmonary **100%**, and intestinal **50%**.

Confirmatory tests: Gram or Giemsa stain, Ascoli precipitin test, culture blood or tissue. Radiographic evidence of mediastinal widening in pulmonary cases.

Occurrence: Worldwide, particularly in areas of alkaline soil subject to flooding. Occurs in dry, warm periods after heavy rains, frequently

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recurring on same pasture. Seen in occupations handling livestock or wool.

Transmission: Usually, by direct contact with infected animal. *Also*, by ingestion of undercooked meat or, occasionally, by inhalation of spores in wool from infected ruminants. Spores are found in bone meal, soil, water, and on vegetation. Some arthropods, such as horseflies, may be involved in animal-to-animal spread. Spores form readily when vegetative form is exposed to air, are long-lived, and are very resistant to environmental extremes and disinfectants.

CONTROL AND PREVENTION

Individual herd Treat with penicillin; tetracyclines or erythromycin

effective if treated early. Vaccinate livestock in endemic areas.

Vaccination may be considered for high-risk occupations. Avoid necropsy of (suspected) infected carcasses beyond collection of blood specimen. Dispose of carcass by deep burial or burning.

Local community: Control dust in industries handling wool or hides.

Wash and disinfect wool hair from endemic areas (10% formalin, 5% Iye). Prevent livestock movement from affected premises during outbreak.

National/international: Require sterilization of imported bone meal.