

Anthrax (*Bacillus anthracis*)
(Splenic Fever, Charbon, Milzbrand, Woolorter's Disease, Cumberland Disease, Malignant Carbuncle)

Agent: Anthrax is caused by the spore-forming, gram-positive, aerobic bacterium *Bacillus anthracis* which induces disease in virtually all warm-blooded animals. There are recognized areas of natural infection in South Dakota, Nebraska, Arkansas, Mississippi, Louisiana, Texas, and California. Small areas of natural exposure exist in a number of other states. Anthrax is an OIE reportable disease.

Brief Description: The clinical signs of anthrax vary with species affected and form of exposure. In animals, clinical signs range from peracute to chronic. The peracute form is characterized by sudden death which may or may not be accompanied by the failure of blood to clot, bloody discharges from body orifices, rapid bloating, and incomplete rigor mortis following death. The acute form is characterized by fever, excitement followed by depression, convulsions, abortion, staggering, death, lack of rigor mortis, and a bloody discharge from body orifices. The chronic form is characterized by localized, subcutaneous edema of the ventral parts of the body.

Humans may exhibit three types of anthrax: cutaneous anthrax, acquired when a spore enters the skin through a cut or an abrasion; gastrointestinal anthrax, contracted from eating contaminated food, primarily meat from an animal that died of the disease; and pulmonary (inhalation) anthrax from breathing in airborne anthrax spores. Clinical signs of cutaneous anthrax include blisters or ulcers, usually with extensive swelling, that later form a black scab. Gastrointestinal anthrax is characterized by nausea and vomiting (which may include blood), anorexia, and bloody diarrhea. Inhalation anthrax is characterized by fever, malaise, headache, cough, shortness of breath, and chest pains, which may be followed by shock.

Differential Diagnosis:

In cattle and sheep:

- Clostridial Infections
- Bloat
- Lightning Strike
- Acute Leptospirosis
- Bacillary Hemoglobinuria
- Anaplasmosis
- Acute Poisonings by Bracken Fern or Sweet Clover

In horses:

- Acute Equine Infectious Anemia
- Purpura Hemorrhagica
- Colic
- Lead Poisoning
- Lightning Strike
- Sunstroke

In swine:

- Acute Hog Cholera
- African Swine Fever
- Pharyngeal Malignant Edema

Reservoir/Host Species:

- Domestic animals including cattle, sheep, goats, horses, donkeys, swine, and dogs
- Wild herbivores
- Wild carnivores

Mode of Transmission: Anthrax can be transmitted via insect vectors (flies, etc.), ingestion of or contact with contaminated vegetation or soil, contaminated meat, bone meal, blood, or tissues. Transmission can also occur through inhalation or direct contact with anthrax spores via contaminated wool, hides, fur, and/or carcasses.

Incubation Period: The incubation period can range from 1-20 days. However, most infections are noticeable within 3-7 days.

Diagnosis: Diagnostic techniques include bacterial culture, Polymerase Chain Reaction (PCR) testing for the bacterium, a chromatographic assay for protective antigen in blood, and fluorescent Antibody (FA) stains to demonstrate the agent in blood films or tissues. Western blot and Enzyme-linked Immunosorbent Assay (ELISA) tests can be used to detect antibodies against the bacterium. Since anthrax is not endemic in Georgia, a Foreign Animal Disease Diagnostician (FADD) will be dispatched when anthrax is suspected to obtain appropriate samples for testing at the National Veterinary Diagnostic Laboratory in Ames, Iowa.

Suggestive Necropsy Findings: If anthrax is suspected as the cause of death, the affected carcass should not be opened. However, in the event an infected carcass is inadvertently opened, postmortem examination of ruminants may show the following: a rapidly decomposing carcass, bloody discharges from the nose, mouth, or anus, a lack of rigor mortis, the presence of dark, tar-like unclotted blood, lesions consistent with generalized septicemia, and an enlarged spleen having a blackberry jam consistency. In horses, lesions are generally confined to the edematous infiltration of the tissues in the neck area. In swine, there is often extensive edema around the lymph nodes.

Period of Communicability: Spores can survive for 2 years in water, 10 years in milk, and approximately 71 years in silk threads.

Prevention/Control: Anthrax can form spores which are released into the environment from the discharge of an infected animal or an opened infected carcass. Even in extreme environmental conditions, spores are highly resistant. For this reason, any carcass that is a suspect for anthrax should not be necropsied nor burned. Burial should be in accordance with Georgia's Dead Animal Disposal Act and in a manner to prevent contamination of the site and personnel.

Vaccine: A vaccine is available for livestock and humans, but the human vaccine is not yet available for the general public. Anyone who may be exposed to anthrax, including certain

members of the U.S. armed forces, laboratory workers, and workers who may enter or re-enter contaminated areas, may be vaccinated. Also, in the event of a terrorist attack utilizing anthrax as a weapon, potentially exposed people should be vaccinated. There is not a vaccine available in the U.S. for use in companion animals.

Zoonotic Risk: Naturally occurring anthrax is rare in the United States. The risk of exposure to this organism is greatest for veterinarians, laboratory personnel, and people handling animal carcasses and by-products. Spread of anthrax from person to person is rare. It is strongly recommended that post-mortem examination not be performed on animals suspected of anthrax due to the high risk of human infection secondary to this procedure and to prevent contamination of the environment with spores. In February of 2006 in New York City, a drum maker that purchased animal hides from West Africa was naturally exposed to anthrax spores and diagnosed with respiratory anthrax. Officials reported this incident to be a result of an accidental exposure and not related to terrorist activity.

Potential as Biothreat Agent in Humans/Animals: Anthrax is considered a potential bioterrorism agent and is classified by the CDC as a priority A agent. It is also included on the HHS/USDA High Consequence Livestock Pathogens and Toxins/Select Agents (Overlap Agents). Anthrax spores can be concentrated into a powder form than can easily become airborne. In the U.S. the first case of anthrax due to bioterrorism was diagnosed in a journalist in Florida on October 4, 2001. This case of anthrax and 21 others resulted from the intentional dissemination of the organism through the mail.

Reporting Requirements: Any person who makes a laboratory confirmation of anthrax in an animal shall report it by the close of the next business day to the State Veterinarian's office at (404) 656-3667 or (404) 656-3671 in Atlanta, or 1-800-282-5852 outside of Atlanta, or to the USDA Area Veterinarian in Charge at (770) 922-7860.

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