

CLIENT EDUCATION HANDOUT

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ANTHRAX

Overview

Anthrax is a bacterial disease that many animals are susceptible to including humans. In ruminants, it causes acute bacteremia, septicemia and usually death. It is caused by *Bacillus anthracis* which is present in the soil. It occurs most often in wild and domestic ruminants and is highly pathogenic. In most areas, anthrax is a reportable disease and the regional veterinary authorities should be notified of an outbreak. In the USA, *B. anthracis* is listed in the Federal Select Agent Program

Species and Animal Groups Affected

Goats, sheep, cattle and bison are more susceptible than other species such as horses, pigs, and dogs.

Signs

Commonly animals will be found dead and clinical signs not observed. Clinical signs include fever up to 107°F (41.5°C), congested mucus membranes, excitement, depression, stupor, dyspnea, ataxia, muscle tremors, collapse, convulsions, and death. Younger animals will have less severe signs including upper respiratory edema that presents as calf diphtheria. If the animal lives long enough, bloody diarrhea, hematuria, and localized swellings maybe seen as well as abortion.

Causes

Anthrax is caused by *B. anthracis* which is a large (1um by 3-5um) gram positive rod that is rectangular with square ends and commonly forms chains. *B. anthracis* exists in two forms the spore and vegetative cell. Once the spore infects the animal it germinates into the vegetative form. The vegetative form in infected tissues of the dead animal only survives up to 1-2 weeks. However, when exposed to air vegetative bacteria will sporulate in several hours. Sporulation is oxygen dependent

Risk Factors

Risk Factors include animals residing in endemic pastures or range. Exposure to disturbed soil in endemic areas. Disturbances can be due to flooding, excavations, cattle disturbing soil around wet pastures or shrinking surface water sources. Grazing plants close to the ground as seen in over stocking range or pasture or drought in endemic areas. It is important not to necropsy the carcass to limit the spore formation and therefore keeping contamination of the environment to a minimum. Scavengers and biting insects may mechanically disseminate anthrax after feeding on affected carcasses.

Treatment

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Blackwell's 5-Minute Veterinary Consult: Ruminant 2nd Ed.

Often no therapeutic approach is available as the disease is peracute. Sick animals are treated with antibiotics. *B. anthracis* is generally antibiotic sensitive but some strains can be resistant to penicillin. *B. anthracis* is susceptible to many antibiotics, including but not limited to penicillin and tetracycline.

Management Considerations

Consideration should be given to limiting access to suspected sources of exposure in affected herds. This may include moving livestock to a different pasture, fencing livestock away from low-lying water sources, where spores may recently have been exposed due to drought conditions, providing insect control and proper disposal of affected carcasses. Hygiene and carcass disposal are of paramount importance in halting an outbreak and preventing future disease occurrence. Autolysis of the carcass destroys the vegetative forms of *B. anthracis* and, therefore, if carcasses are not opened, the potential for contamination of the environment is minimized. Carcasses must be disposed of in accordance with state or local regulations. Livestock in endemic areas should be vaccinated with Sterne-strain spore vaccine at least 2-4 weeks prior to the expected seasonal onset. Booster vaccination is given 4-5 weeks following the initial vaccination, and then annually thereafter. The vaccine is a live nonencapsulated organism and therefore antibiotics should not be given within 7 to 10 days of vaccine administration. Following vaccination, there is a 60-day withdrawal time for the carcass, and milk should be discarded for at least 72 hours.

Expected Course and Prognosis

In ruminants, the incubation period is 1 to 5 days and the course of the disease is from hours to 2 days and the usual outcome is death

Notes

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