Hemorrhagic septicemia

Hemorrhagic septicemia is a highly fatal bacterial disease seen mainly in cattle and water buffalo and expected to occur in all ages. In susceptible animals, the clinical signs often progress rapidly from dullness and fever to death within hours. Because the disease develops so quickly, few animals can be treated in time, and recovery is rare. Subclinical carriers can introduce hemorrhagic septicemia into a herd.

Etiology:

Hemorrhagic septicemia results from infection by Pasteurella multocida subsp. multocida, a Gram-negative coccobacillus in the family Pasteurellaceae. P. multocida multocida can cause a variety of diseases in animals, but only two serotypes of this organism classically cause hemorrhagic septicemia.

Epidemiology:

1. Affected spices: Epidemics of hemorrhagic septicemia occur mainly among cattle and water buffalo. These two species are also the major reservoir hosts. Outbreaks have been reported occasionally among pigs in some Asian countries, and cases are seen infrequently in sheep and goat.
2. Geographic distribution: Hemorrhagic septicemia is an important disease of cattle and water buffalo in Asia, Africa and the Middle East. The highest incidence is in Southeast Asia. Cases have also been reported in some countries of southern Europe.
3. Transmission: P. multocida is transmitted by ingestion or inhalation, either during direct contact or via fomites such as contaminated feed and water. Some animals become carriers, maintaining the organism in the lymphatic tissues associated with the upper respiratory tract, and periodically shedding it in nasal secretions. Excretion may be triggered by stress. Rainy conditions and high humidity facilitate transmission.
4. The morbidity rate depends on environmental conditions, herd management, the animals' immunity and other factors. The case fatality rate is nearly 100% unless the animal is treated very early; few animals survive once the clinical signs have become apparent. A few spontaneous recoveries may be seen, especially late in an outbreak. Up to 20% of the survivors can become carriers for a short period after an outbreak

   Infection occurs by contact with infected oral or nasal secretions from either healthy carrier animals or animals with clinical disease, or by ingestion of contaminated feed or water. Infection begins in the tonsil and adjacent nasopharyngeal tissues. Subsequently,

bacteremia leads to dissemination and rapid growth of bacteria in various locations, tissue injury, a host cytokine response, and release of lipopolysaccharides that results in a rapidly progressing endotoxemia

Clinical Signs:

1. The incubation period is usually 3 to 5 days but some animals can carry the organism for varying periods without symptoms.
2. Most cases in cattle and water buffalo are acute or peracute. buffalo tend to have more severe clinical signs and a shorter course of disease.
3. A fever, dullness and reluctance to move may be the first signs.
4. Salivation and a profuse serous nasal discharge develop.
5. edematous swellings become apparent in the submandibular region. These swellings spread to the neck and brisket.
6. In calves, hemorrhagic gastroenteritis has also been reported.
7. Respiratory distress occurs, with frothing at the mouth, and the animal usually collapses and dies 6 to 48 hours after the initial clinical signs.
8. Either sudden death or a prolonged course up to a few days is also possible. Animals with clinical signs, particularly buffalo, rarely recover. Chronic cases have not been reported.

Post Mortem Lesions (necropsy finding):

1. cattle and buffalo often have widespread hemorrhages, edema and hyperemia. Subcutaneous edema is usually present in the submandibular region and neck, sometimes extending to the brisket and musculature.. The edema consists of a gelatinous mass with straw–colored or bloodstained fluid. lymph nodes may be enlarged, and the thoracic and abdominal cavities and pericardial sac often contain blood– tinged fluid.
2. Petechiae are frequently found on many organs, especially on the serosal surface, throughout the body. Ecchymotic hemorrhages are sometimes noted, especially on the heart.
3. The lungs are diffusely congested and edematous.
4. The gastrointestinal tract may be hyperemic and congested to varying degrees, and the abomasum may contain petechial hemorrhages and ecchymoses.

Diagnosis:

1. Clinical sings.(rapid course of infection, and fever and edematous swellings in the throat, neck and brisket. A high herd incidence and high case fatality).
2. Laboratory tests :
   - Hemorrhagic septicemia is usually diagnosed by culturing P. multocida on blood agar, chocolate agar or Dextrose starch agar .
   - PCR
   - Indirect hemagglutination test.

Differential diagnosis :

The differential diagnosis includes other causes of sudden death such as:

lightning strikes, blackleg (Clostridium chauveoi infection), rinderpest and anthrax. Acute salmonellosis and pneumonic pasteurellosis should also be considered.

Treatment:

However, because HS progresses rapidly, therapy is often unsuccessful. During outbreaks, any animal with a fever should be treated with IV antimicrobials as soon as possible to quickly obtain systemic bactericidal antimicrobial concentrations. Various sulfonamides, tetracyclines, penicillin, gentamicin, kanamycin, ceftiofur, enrofloxacin, tilmicosin, and chloramphenicol have been used effectively to treat HS.

Control

1. Hemorrhagic septicemia can be eradicated with quarantines, movement controls, tracing of contacts, euthanasia of infected and exposed animals, and cleaning and disinfection of the premises. P. multocida is susceptible to most common disinfectants, as well as to mild heat (55°C/131°F).
2. In endemic areas, this disease is mainly prevented by vaccination ,various vaccines can provide protection for 6–12 months. The removal of carriers from the herd is also helpful. Management to keep the animals in good condition can reduce the risk of clinical signs and/or transmission of the organism. Animals should not be crowded or stressed, especially during wet weather. Antibiotic treatment is effective only if it is started very soon after the onset of clinical signs.
3. Hemorrhagic septicemia must be reported to state or health authorities immediately upon diagnosis or suspicion of the disease.