Lecture title: Bacillary hemoglobinuria

Synonyms: Red water disease, Bacillary icterohemoglobinuria

Lecturer Affiliation: Department of Internal and preventive medicine

Summary:

Definition: is an acute , infectious , highly fatal , toxemic disease of cattle and sheep ,characterized clinically by high fever , hemoglobinuria , jaundice and necrotic infarcts in the liver.

Etiology: *Clostrdium novyi* type D (*haemolyticum*)

Epidemiology:

Transmission and mode of infection:

1- The feces and urine of inapparent carrier animals (Many healthy animals carry the organism in their liver and kidneys) or the carcasses of dead animals are considered the most important sources of contamination for pasture and soil.

Susceptible hosts :

1-It is more common in adult cattle , less often in sheep and rarely in horses .
2- The animals in good condition are more susceptible.
3- Liver fluke infestation is a common predisposing cause.

Pathogenesis:

A- *Cl. Novyi* type D spores in soil contaminate food and are ingested by animals. Some spore penetrates the gastrointestinal wall, enter the portal blood or lymphatic

system and transport into the liver.In normal liver the viable spores may remain latent for several weeks since the oxidation reduction potential is too high for germination. B- Fluke penetration and migration , liver biopsy or invasion by other parasites causes damage to the liver parenchyma and results in hypoxia , creating conditions suitable for spore germination and bacterial proliferation.The development of a thrombus in the subterminal branch of the portal vein produces the large, anemic infarct which is characteristic of the disease. Most of the bacteria are to be found in this infarct and produce large amounts of toxins(hemolysin and necrotizing agent) , causing signs of severe toxemia , hemolysis, hemolytic anemia , endothelial damage , extravasation of blood into the tissues and plasma into serous cavities.

Clinical signs:

A. The incubation period varies from 7 to 10 days, there is a low morbidity rate (usually sporadic). The mortality rate is up to 25% or more . The course of the disease usually varies from12 hours to 4 days.

B. The peracute cases are characterized by sudden death without previous illness.

C. The typical acute cases are characterized by high fever in the early stages. Complete cessation of rumination , feeding , lactation and defecation, animal show signs of abdominal pain , pale or icteric mucous membranes, bile or hemoglobin stained feces, hemoglobinuria , shallow rapid respiration and death , pregnant cows may abort.

Postmortem lesions:

1-Rigor mortis develop quickly , anemic and dehydrated carcass, subcutaneous gelatinous edema and extensive petechial or diffuse hemorrhages in the subcutaneous tissues.

2- The characteristic lesions of the disease are in the liver , one or more pale infarcts 5-20 cm in diameter (as typical necrosis) , surrounded by a zone of congestion , may be present any part of the liver(superficial or deep).

3- Evidence of recent invasion with liver flukes, such as channels and damaged liver tissue , may be present.

4- Excessive amounts of fluid varying from clear to blood stained and turbid are present in the pleural , pericardial and peritoneal cavities.

5- Red urine may be present in the kidneys and urinary bladder.

Diagnosis:

Field diagnosis: History and typical signs and postmortem lesions such as presence of snail , sudden death ,and necrotic foci in liver especially with presence of immature flukes.

Laboratory diagnosis

1-Impression smear from the periphery of the lesion, stained for detection of bacteria.

2- Bacterial isolation.

3- Detection of toxin by direct ELISA or by mouse neutralization test.

4- Histopathological examination of the liver.

5- Detection of immature flukes.

Prognosis: In early stages is favorable, in later stages it is unfavorable.

Differential diagnosis: Babesiosis , postparturient hemoglobinuria and leptospirosis.

Prevention and control

1-Hygienic disposal of carcasses by burning.

2- Control of snail and treatment of liver flukes.

3- Vaccination.