Health Information from Milford Animal Clinic

Epizootic Hemorrhagic Disease

This is an important update on a life threatening disease which producers in our area and around the country are dealing with at this time. In the past few weeks, we have had deer with positive laboratory diagnosis for the virus EHD. In attempt to help prevent disease outbreak and to help educate our producers we have compiled this newsletter.

If you have specific questions or think you may have animals exhibiting these symptoms, we encourage you to contact our office. We are suggesting that animals be sent into the laboratory for necropsy and positive diagnosis of suspected EHD cases. Since there is not a commercial vaccine available on the market, it is through diagnostic testing that autogenous vaccines are able to be produced and used privately.

Our office currently has an autogenous vaccine available for purchase that contains Bluetongue type-1; EHD types 1, 2, and 6; Clostridium perfringens type A; Tureperella pyogenes; Pasteurella multocida; and Fusobacterium necrophorum. Contact our office if you are interested in purchasing vaccines.

Importance

Epizootic hemorrhagic disease (EHD) is one of the most important diseases of deer in North America. The epizootic hemorrhagic disease viruses (EHDV) are widespread in white-tailed deer and periodically cause serious epidemics in wild populations. Some of these viruses can also cause disease in cattle. In the United States, EHD in cattle is uncommon, rarely fatal, and usually associated with an epidemic in deer.

Species Affected

The epizootic hemorrhagic disease viruses can infect most wild and domestic ruminants. Clinical signs are seen mainly in white tailed deer, with mule deer and pronghorn antelope affected to a lesser extent. Other wild animals found to be seropositive include black-tailed deer, red deer, wapiti, fallow deer, and roe deer. Rare outbreaks of EHD have been reported in cattle. Sheep can be infected experimentally but rarely develop clinical signs, and goats do not seem to be susceptible to infection.

Transmission

The viruses of the EHDV serogroup are transmitted by biological vectors, usually biting midges in the genus Culicoides, also referred to as “midges” and “no-see-ums”. Some species of gnats and mosquitoes can also transmit EHDV. Infected deer can be viremic for up to 2 months.

Incubation Period

The incubation period for epizootic hemorrhagic disease in deer is 5 to 10 days.

Clinical Signs

Three syndromes may be seen in deer, peracute, acute, and chronic.

Peracute disease is characterized by high fever, anorexia, weakness, respiratory distress, and severe and rapid edema of the head and neck. Swelling of the tongue and conjunctivae is common. Deer with the peracute form usually die rapidly, typically within 8-36 hours; some animals may be found dead with few clinical signs.

In the acute form (classical EHD), these symptoms may be accompanied by extensive hemorrhages in many tissues including the skin, heart, and gastrointestinal tract. There is often excessive salivation and nasal discharge, which may both be blood-tinged. Animals with the acute form can also develop ulcers or erosions of

the tongue, dental pad, palate, rumen, and omasum. High mortality rates are common in both the peracute and acute forms.

In the chronic form, deer are ill for several weeks but gradually recover. After recovery, these deer sometimes develop breaks or rings in the hooves caused by growth interruptions, and may become lame. In severe cases, animals slough the hoof wall or toe; some of these deer may be found crawling on their knees or chest. Deer with the chronic form may also develop ulcers, scars, or erosions in the rumen; extensive damage to the lining of the rumen can cause emaciation even when there is no shortage of food.

Post Mortem Lesions

In deer, the lesions of epizootic hemorrhagic disease vary with the form of the disease. In the peracute form, there may be severe edema of the head, neck, eyes, and lungs. In the acute form, widespread hemorrhages and edema can be seen in the many parts of the body including the mucous membranes, skin and viscera, particularly the heart and gastrointestinal tract. There may also be erosions and ulcerations in the mouth, rumen, and omasum. Dry, gray-white necrotic lesions can sometimes be found in the hard palate, tongue, dental pads, esophagus, larynx, rumen, and abomasum. The lesions of the chronic form may include rings or breaks on the hooves, or sloughing of the tips or walls of the hooves. Deer with chronic disease can also develop ulcers, scars, or erosions in the rumen.

Morbidity and Mortality

In North America, most outbreaks of epizootic hemorrhagic disease occur in late summer or early autumn, and are often associated with wet weather. The onset of freezing weather usually stops the appearance of new cases, but hoof sloughing can be seen throughout the year. Among cervids, epizootic hemorrhagic disease is most severe in white-tailed deer. In this species, the morbidity and mortality rates may be as high as 90%. However, the severity of the disease varies from year to year. It also varies with the geographic location. In the southeastern U.S., most cases are mild and the mortality rates are low.

In the Midwest and Northeast, EHD typically recurs each year, but can vary from a few scattered cases to severe epizootics with high mortality rates. This variability is thought to be caused by many factors including the abundance and distribution of the insect vectors, the EHDV serotype, existing herd immunity, and genetic variations in the susceptibility of the host. Surviving deer develop long-lived neutralizing antibodies. Nearly 100% of the deer population can be seropositive in some regions.

Diagnosis

Acute or peracute EHD should be suspected in deer with swelling of the head and neck, respiratory distress, or excessive blood-tinged salivation. This disease should also be considered in cases of sudden death, particularly when the animal is found dead near water (an indication of high fever). Chronic disease can be the cause of hoof abnormalities and emaciation.

Laboratory Tests

In deer, EHDV infections should be confirmed by virus isolation, immunofluorescence, or molecular techniques. EHDV can be isolated in a variety of cell lines or embryonated chicken eggs. Immunofluorescence can be used to identify the virus in frozen tissue sections.

Epizootic Hemorrhagic Disease

Samples to Collect

In deer, the preferred tissues for virus isolation are spleen, lymph node, and unclotted whole blood in EDTA or heparin. Other useful samples may include serum (for serology), liver, and lung. Both fresh and fixed tissues should be collected if possible. Samples for virus isolation should be transported under refrigeration.

Quarantine and Disinfection

Viruses of the EHDV serogroup are transmitted between animals by Culicoides vectors and are not directly contagious. There are few practical measures to prevent infection; however, vector controls such as modifying the environment to reduce Culicoides breeding areas, spraying with insecticides or larvacides, and using insect repellents could theoretically decrease the risk of infection. Effective disinfectants for EHDV serogroup viruses include acids, oxidizing agents such as sodium or calcium hypochlorite at 20,000-30,000 ppm (2-3%), alkalis such as sodium hydroxide at 2% (w/v), or glutaraldehyde at 2% (w/v). These viruses are, like most nonenveloped viruses, resistant to lipid solvents. They can be inactivated by heat treatment at 50°C for 3 hours, 60°C for 15 minutes, or 121° C for 15 minutes.

Public Health

None of the epizootic hemorrhagic disease viruses are known to infect humans.