Epizootic hemorrhagic disease (EHD) – Information from the NDSU-VDL

7 serotypes proposed for EHDV

No correlation between virulence and serotypes

VP7 is the serogroup specific immuno-dominant protein and is highly conserved among the EHDV serotypes

In North America, the occurrence of EHDV reflects the distribution of *Culicoides sonorensis*, and cases are noted in late summer and autumn

Severe clinical signs have been observed in cattle infected with EHDV 2, 6 and 7.

Following infection, virus replicates in endothelial cells of the lymphatics and lymph nodes draining the infection, then accesses the bloodstream and disseminates to spleen and other lymph nodes. In the bloodstream, the virus becomes associated with lymphocyte and erythrocytes.

Experimentally, viremia in deer noted from 4 to 50 days post infection

Experimentally, viremia in cattle noted up to 3 months

Neutralizing antibody cannot completely remove the virus from circulation; *therefore it is possible to find neutralizing antibody and virus at the same time.*

Maternal antibodies found in young deer up to 18 weeks of age

Experimental seroconversion in calves has occurred at 9 and 11 days post infection; titers greater than 2.5 were obtained in all calves from 18 to 51 days post infection

Isolation of blood from clinically healthy deer and cattle suggest that disease free animals are likely to act as a reservoir for the onward transmission of EHDV

Presence of passive immunity in fawns could not prevent infection or viremia, but did protect against severe clinical disease

Fecal shedding of EHDV-1 has been reported in white-tailed deer

Deer surviving infection with EHDV develop long lived neutralizing antibodies

Clinical disease: 1) peracute – fever, anorexia, weakness, dyspnea, edema of head/neck, swelling of tongue and conjunctivae, bloody diarrhea, hematuria, dehydration; 2) acute - aforementioned signs plus hemorrhages in multiple tissues including skin, heart and gastrointestinal tract, excessive salivation, blood-tinged nasal discharge, oral and lingual ulcers, gastrointestinal ulcers; 3) chronic – animals ill for several weeks, but recover; may

see growth interruption, hoof abnormalities, hoof sloughing, ruminal ulcers/scars/erosions

Virus isolation can be done from blood, spleen, lung and lymph node (can take 2 to 4 weeks)

Serotype identification done through serum neutralization (SN) testing

RT-PCR assays have been developed, however positive RT-PCR does not indicate infectious status – particularly if virus isolation is not attempted. *RT-PCR only detects viral RNA, it does not tell whether the sample is infectious or not.*

SN detects and quantifies serotype-specific antibodies. Biggest disadvantage to this assay is the need to include all suspected serotypes in the assay – very time consuming and labor intensive. Titer greater than or equal to 1:10 is considered specific for EHDV. SN test requires 3 to 5 days to complete.

References

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