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Equine herpesvirus-1 (EHV-1) is a prevalent viral pathogen associated with several different clinical syndromes in horses, including respiratory disease, abortion, neonatal foal death and neurological disease. Abortion rates of up to 75% in outbreaks have been reported but, due to improved management practices and vaccination, such ‘abortion storms’ are now uncommon. EHV-1 infection accounted for 6.7% and 6.5% of abortions in surveys in Newmarket (Ricketts et al. 2001; Smith et al. 2003). EHV-4 is also associated with respiratory disease and causes sporadic cases of abortion and neonatal infection.

Rapid and accurate diagnosis is key to management and prevention of further cases of abortion, necessitating experienced necropsy investigations of the fetus or foal and placenta.

Diagnosis of EHV abortion is based on the presence of characteristic gross and histopathological lesions in the fetus/foal and placenta, combined with virus detection by polymerase chain reaction (PCR) or virus isolation in cell culture.

Gross lesions commonly encountered with EHV-1 abortion are an excess of yellow-amber pleural or abdominal fluid, white spots (multifocal necrosis) on the liver capsule and cut surfaces, firm lungs with subpleural oedema, petechial haemorrhages, jaundice, periportal oedema and sometimes placental oedema. The carcass is usually fresh/well-preserved. An excess of fluid in the body cavities, petechial haemorrhages and periportal oedema are also usually seen with EHV-4 abortion.

Histopathological features of EHV-1 abortion include bronchiolar epithelial necrosis, multifocal hepatocellular necrosis, lymphoid necrosis (spleen, thymus) and adrenocortical necrosis. Infected cells adjacent to the areas of necrosis may contain intranuclear viral inclusion bodies. In some cases, the fetus or foal survives a sufficient period prior to abortion for an inflammatory response to develop within the lesions, and viral inclusion bodies may be very sparse in these cases. In EHV-4 abortion, lesions and viral antigen are not normally present in the lung and necrotising lesions in the liver may be very sparse or absent; in contrast, viral antigen is often detectable in the splenic red pulp, accompanied by necrosis. Differences in lesion distribution and severity between EHV-1 and EHV-4, as well as between different stages of infection, highlight the importance of sampling multiple tissues for diagnostic purposes.

Detection of viral antigen in tissue sections by immunofluorescence or immunohistochemical methods can be useful when other results are equivocal.

Serological examinations of sera from mares that have aborted are of little diagnostic use, in terms of making a diagnosis, because antigenic challenge by natural respiratory disease and/or vaccine is common and cannot be differentiated from a serological response to EHV abortion. It is recognised that a small percentage of feti or foals will have viral neutralising antibodies in their serum.

Samples should be submitted to a laboratory experienced in dealing with equine abortions:

Submit:
1. The entire fetus/foal and placenta, or
2. Formalin-fixed lung, liver, spleen, thymus, kidney, adrenal gland and chorioallantois samples, together with a record of the gross pathological findings and unfixed lung, liver, spleen, thymus and chorioallantois tissue samples (in a sterile container or viral transport medium) for virus isolation/PCR.

In a live foal with clinical signs and haematological features consistent with EHV infection, diagnosis of EHV infection can be attempted with virus isolation or PCR from nasopharyngeal swabs, and from the buffy coat of heparinised or EDTA blood samples. Results will be affected by fluctuations in the degree of shedding via the respiratory route and the timing of viraemia. If available, formalin fixed and unfixed samples of the chorioallantois should be submitted for PCRVirus isolation and histopathology. Precollstral serum from foals may also contain virus neutralising antibodies.

Thorough investigation of equine fetal losses and perinatal death is strongly encouraged to help prevent spread within affected and to other stud farms (Horse race Betting Levy Board 2011) and as a means of improving the reproductive health of individual broodmares and the efficiency of stud farm enterprises. For members of the Thoroughbred Breeders’ Association (TBA), the cost of these investigations are subsidised.

References and further reading


