

EQUINE PROTOZOAL MYELOENCEPHALITIS (EPM) IN WYOMING

EPM is considered the most common, economically important neurological disease in horses in the USA. Common early clinical signs are ataxia, and weakness in one or more limbs. These may increase in severity within days or weeks, resulting in affected horses becoming recumbent and unable to rise. Circling in one direction and facial nerve paralysis may occur, sometimes before ataxia is seen. The spectrum of clinical signs is determined by the area or areas of the central nervous system damaged. Lesions may involve the spinal cord, brain, brainstem or any combination of those areas. Multifocal, destructive lesions are common.

In the USA, the disease is most commonly caused by *Sarcocystis neurona*, which develops in the intestinal tract of the North American opossum. Oocysts and sporocysts that are shed in the feces of the opossum initiate systemic infection in horses that ingest the cysts in contaminated feed or water. Asymptomatic infections are common, based on serological studies. Other protozoa closely related to *S. neurona* that are capable of infecting and causing neurological damage in horses are *Neospora hughesi* and *Toxoplasma gondii*. These agents are much less prevalent in clinically normal as well as diseased horses than *S. neurona*. Other, unidentified species of *Sarcocystis* may also be capable of infecting horses and causing neurological signs. Some may cross-react with the reagents that are currently used to serotest for *S. neurona*.

The current standard diagnostic test is the Western Blot (WB) analysis of serum or cerebrospinal fluid (CSF). A positive WB or ELISA of serum indicates only that a horse has been infected with *S. neurona*, and is not necessarily a positive diagnosis of EPM. A positive WB of CSF is considered a more reliable indication of EPM in symptomatic animals than serotesting, but is not absolutely definitive. Contamination of a CSF sample by blood during sampling, the demonstrated presence of antibodies in the CSF of clinically normal chronically infected animals, and other factors complicate the interpretation of sample analysis. Polymerase chain reaction (PCR) tests are available for *S. neurona*, but in a high proportion of infected horses there is no detectable DNA due to the absence of the parasite in CSF. The PCR test is useful in determining the identity of the agent post-mortem, when the intracellular agents can be extracted from tissue.

In Wyoming, *S. neurona*-seropositive horses were recently identified near Sheridan, Buffalo and Cody. In addition, one horse died of EPM due to *N. hughesi* encephalitis and several seropositive herdmates were found in the Pinedale area. Serum samples from horses showing EPM-like signs have been referred by the WSVL to a diagnostic laboratory in Kentucky for WB analysis, and some practitioners submit samples directly from their clinics to a laboratory that provides the test. The prevalence of agents capable of causing EPM in horses in Wyoming is unknown, but is probably low compared to states with large opossum populations. A diagnosis of EPM, confirmed at necropsy, is rare in Wyoming horses. The known range of the North American opossum in Wyoming is the southeast corner of the state near the Platte River outflow. The lowest altitudinal point in Wyoming, where the Belle Fourche River flows into South Dakota, and the point of exit of the Bighorn river into Montana are very likely areas for opossum habitation, since both neighboring states are known to have opossum populations and EPM. EPM is most likely to occur in Wyoming horses that have been out of state in areas where infected opossum populations occur. Feeds, especially hay imported from areas with a high endemic prevalence of opossums and *S. neurona*, are a potential source of infection for native animals.

Clinical signs of EPM are most often seen in horses from 1 to 3 years of age, but are also common in older animals. In states where large serologic surveys have been performed, including Illinois, Ohio, Kentucky, Pennsylvania, Oregon and others, the prevalence of infected animals often exceeds 50%. As animals age, the percentage of seropositive animals increases.

Wyoming practitioners who have dealt with horses exhibiting clinical signs suggestive of EPM advocate quick initiation of treatment, prior to or following a positive serotest. Arrest or improvement of condition has been achieved, although complete restoration of function should not be expected. Pyrimethamine-sulfadiazine, pyrimethamine-trimethoprim/sulfa and diclazuril have all been used for treatment, which is usually administered for at least 3 months. Toxicity of pyrimethamine and trimethoprim is a consideration, especially in pregnant mares, and folic acid supplementation is known to enhance toxicity of the drugs. Diclazuril efficacy is about equal to that of the other 2 drugs, side effects are minimal, and the cost of use is less.

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