Equine Protozoal Myeloencephalitis

Overview

Equine protozoal myeloencephalitis (EPM) is a progressive and potentially fatal neurological disease in horses. It is caused by a protozoal (single cell) microorganism that, after gaining access to the central nervous system, can damage any region of the brain and/or spinal cord. Sarcocystis neurona is the most common cause of EPM, but Neospora hughesi can also cause EPM.1

How Horses Get Infected

Opossums, the primary intermediate host in the life cycle of S. neurona, excrete parasite oocysts (akin to an egg) in their feces, which subsequently develop into sporocysts (infective spores). Horses become inadvertently infected when they ingest the sporocysts while grazing. The sporocysts migrate from the horses’ gastrointestinal system via the blood and lymphatic system across the blood-brain barrier, and take up residence in the central nervous system.2 EPM is thought to be the most commonly diagnosed neurological disease in horses. Approximately 50-85% of horses in North America have antibodies in their blood against S. neurona, indicating they have been exposed to the parasite (the exact prevalence varies from state to state).3 Not all horses that ingest the sporocysts become infected or develop clinical signs of disease. In fact, the incidence of EPM in horses older than six months of age is estimated to be as low as 14 new cases of EPM per 10,000 horses per year.4

Signs of EPM

Because the protozoal sporocysts can damage any region of the brain or spinal cord, the clinical signs of EPM are remarkably varied and usually asymmetrical (worse on one side of the body). Signs can be as mild as a slight decrease in performance or as severe as narcolepsy, seizing, and collapse. EPM can mimic many other neurological diseases, including wobbler syndrome (cervical stenotic instability), West Nile virus, the neurological form of equine herpesvirus-1, rabies, and Eastern or Western equine encephalitis.

Master of Disguise

Diagnosing EPM is challenging because none of the available tests is 100% accurate. The “gold standard” test is finding the actual parasite in the brain and/or spinal cord (which can’t be done in a live horse).5,6 Alternatively, four tests are available for diagnosing EPM in live horses: Western blot (immunoblot) test, an indirect fluorescent antibody test (IFAT), an ELISA (enzyme linked immunosorbent assay), and a DNA-based polymerase chain reaction (PCR) test. Western blot is widely endorsed as the test of choice and can, like the IFAT and ELISA, be performed on either serum (blood) or cerebral spinal fluid (CSF, the fluid that bathes the brain and the spinal cord).6

When performed on serum samples, the Western blot, IFAT, and ELISA simply indicate if a horse has been exposed to S. neurona, but do not directly provide proof the horse is currently infected. Positive results from these three tests on CSF samples raise suspicion the horse in question actually does have an active infection.

In contrast to the Western blot, IFAT, and ELISA, the PCR test attempts to detect genetic material from S. neurona. If the parasite damaged the spinal cord or brain and was then cleared by the horse’s immune system, however, the horse can still exhibit clinical signs of disease, but it will no longer have detectable parasitic DNA. Thus, a negative PCR test doesn’t mean the horse doesn’t have EPM.

Treatment

Once other neurologic diseases have been ruled out and the results of diagnostic testing are indicative of EPM, treatment can be instituted. Currently, only one Food and Drug Administration-approved EPM medication is being marketed: Marquis* (15% ponazuril) antiprotozoal oral paste. Infected horses might also be treated with non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, dimethylsulfoxide (DMSO), vitamin E, folic acid, and/or complementary and alternative therapies. Consult your veterinarian to discuss the most appropriate treatments for your horse.

Prognosis

Early diagnosis and treatment are key to achieving an acceptable outcome.
According to Martin Furr, Dipl. ACVIM, PhD, an associate professor of medicine at Virginia Tech:10

- About 70% of properly treated cases improve;
- One-third of cases that improve achieve a complete recovery;
- Early treatment improves the chances of achieving a complete recovery; and,
- Less severe cases have the best chance for a complete recovery.

**Prevention**

It isn’t easy to kill the parasites in the environment, and sporocysts are resistant to even the most intense disinfectants. Steam cleaning is the only way to kill the parasite. Prevention is primarily aimed at avoiding exposure of horses to opossums and opossum feces. Owners are encouraged to prevent opossums from gaining access to pastures and barns.

Notwithstanding, potential EPM risk factors have been reported:7

**Age** The highest risk of infection occurred in horses aged 1-5 years. This could be due to the use of young horses in competitive situations and associated stress.

**Location** Horses on farms with previously infected horses had a higher risk of developing EPM, likely due to the presence of protozoa in the feed or water.

**Seasonal effects** Fewer EPM cases occur in winter, possibly related to hot weather acting as a stressor and more travel in warmer weather.

**Stress** An increased risk of EPM associated with stressful events (e.g., injury, accident, foaling, surgery, transport, and illness) might be related to suppression of the horse’s immune system.

**Natural water source** Presence of water sources (creek or river) on the farm provided a preferred habitat for opossums away from the horse barns, thereby decreasing exposure and risk.

**Food storage** Securing feed and water sources from opossum fecal contamination is important to limit exposure.

**Living with cats** A known intermediate host for S. neurona, the cat has also been identified as a risk factor for EPM. The authors of the study suggest that while it is possible cats play a role in the natural occurrence of EPM, more research is needed before banning cats from barns.9

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**REFERENCES**


Further reading and free horse health e-newsletter: www.TheHorse.com/EPM

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