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Neurologic Equine Herpes Virus (EHV-1)

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Background

Equine Herpes Virus (EHV) can affect the respiratory, reproductive, and nervous systems causing a wide variety of diseases. Of the nine types of herpes virus found in equidae, type-1 (EHV-1), type-3 (EHV-3), and type-4 (EHV-4) are commonly found in horses. EHV-1, EHV-3, and EHV-4 are genetically and antigenically distinct groups of herpes viruses. These viruses are ubiquitous in horse populations worldwide. EHV-1 and EHV-4 cause an acute febrile respiratory disease called Rhinopneumonitis. EHV-3 causes coital exanthema, a contagious genital infection (vulva in mares, penis and scrotum in stallions). Horse owners routinely vaccinate at least twice per year for Rhinopneumonitis. EHV is spread by direct contact from horse to horse.

The herpes virus has a unique adaptive mechanism to ensure survival. The virus, once infected, can become latent. Latency enables the virus to avoid the host's immune system. Then at an opportune time (i.e., levels of high stress) the virus emerges and can be silently shed, infecting other horses that come into contact with the "silent" shedder.

In rare cases, EHV-1 can also cause neurologic disease. While this phenomenon has been recognized for quite some time, there seems to be an alarming increase in frequency of this disease. Researchers have identified a genetic mutation within a single EHV-1 gene that is associated with strains that cause neurologic disease. While it is still unclear how this mutation causes the virus to have increased affinity for nervous tissue, further research is ongoing to determine this affect.

Clinical Signs

Neurologic EHV-1 can cause an acute paralytic syndrome in horses where they are weak and ataxic in the hind legs. This weakness and paralysis of the muscles of the hind limbs gives rise to incoordination,

gait abnormalities and, in some cases, the inability to rise from the sitting position. This "dog sitting" stance can be associated with EHV-1 (Figure 1). The neurologic disease can progress to full recumbency. Horses are often humanely euthanized once full recumbency is reached. There have been reports of urine scalding or dribbling with cases of EHV-1 as urinary incontinence can be a consequence as the disease progresses.

Diagnosis

The neurologic form of EHV-1 is diagnosed by virus isolation and typing. EHV-1 causing neurologic disease has a distinct genetic mutation that seems to predispose infection of neurologic tissues. Looking for this mutation helps to differentiate the neurologic form from the more common Rhinopneumonitis strain.



Figure 1. A horse in the classic neurologic "dog sitting" stance that is unable to rise into a normal stance. (Photo courtesy of Dr. George Allen)

Treatment

Treatment of neurologic EHV-1 revolves around supportive care to prevent further injury while the horses are recumbent or exhibiting neurologic signs. There are no antiviral treatments approved for EHV-1. This supportive care may include fluids and anti-inflammatory drugs to minimize the side effects from the disease. The biggest challenge with caring for this

neurologic disease is to provide support when the horse becomes recumbent. Horses in this condition can cause significant self-inflicted trauma as they struggle to stand.

Vaccination

There is not a vaccine available that affords protection to the neurologic form of EHV-1. Opinions vary on the question, should I use the current vaccines for Rhinopneumonitis (EHV-1 and EHV-4) to provide cross protection and therefore helping to prevent the neurologic form of EHV-1? While this debate continues, vaccinating for other EHV diseases is a sound preventive health decision (i.e., Rhinopneumonitis and abortion). Therefore, it is recommended that horses continue to be vaccinated for EHV-1 and EHV-4, depending on their specific disease risk, to prevent the respiratory and reproductive forms of the disease.

Not all equine neurologic disease is caused by EHV-1. Other diseases that can cause neurologic signs are:

- Equine encephalitis (EEE, WEE)
- Tetanus
- West Nile Virus (WNV)
- Cervical Stenosis (Wobblers Disease)
- Equine Protozoal Myeloencephalitis (EPM)

It is important that you consult a veterinarian should your horse exhibit any signs of neurologic disease.

Prevention

Preventive measures are focused on good sound biosecurity principles to prevent the exposure and spread of EHV. Sound preventative principles include:

1. Not sharing tack
2. Cleaning and disinfecting your horse trailer after transporting horses other than your own
3. Proper food, water, and shelter to minimize stress
4. Isolate new additions to your herd for a minimum of 30 days
5. Contacting your veterinarian immediately should your horse exhibit any neurologic signs
6. Making sure your horse is annually vaccinated for other causes of neurologic disease (e.g., EEE/WEE, Tetanus, WNV, and EPM (if endemic in your area))

While these simple measures will not guarantee prevention of EHV-1 they will go a long way in minimizing exposure and risk.

Summary

Although previously recognized as causing neurologic disease in horses, Equine Herpes Virus Type-1 (EHV-1) has been emerging as a more common neurologic phenomenon. It is not fully understood why this emergence is happening and ongoing research is trying to work out the puzzle. Current vaccinations do not provide protection against neurologic EHV-1. Horse owners should consult their veterinarian to determine which vaccinations should be given in their area to minimize the risk for other EHV diseases. Without a proven vaccine, horse owners should be extremely vigilant in observing basic biosecurity principles to minimize the risk of disease transmission to their horses. And finally, consult your veterinarian immediately should your horse exhibit any neurologic signs.

Additional Information

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) has generated a fact sheet on the emerging phenomena of neurologic EHV-1. This USDA, APHIS, VS fact sheet can be accessed online at: http://www.aphis.usda.gov/vs/ceah/cei/taf/emergingdiseasenotice_files/ehv.pdf

Several institutions are doing research on EHV-1. The Gluck Equine Research Center at the University of Kentucky has developed a Web site with extensive information and literature search regarding EHV-1. It is accessed through the following link:

<http://www.ca.uky.edu/gluck/BiblioEHV1.asp>

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