

Equine Herpesvirus in Horses

By William J. McGuire¹

aces.nmsu.edu/pubs • Cooperative Extension Service • Guide B-716

The College of Agricultural, Consumer and Environmental Sciences is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through academic, research, and extension programs.



All About Discovery!TM
New Mexico State University
aces.nmsu.edu

INTRODUCTION

Increasingly, various equine events are experiencing quarantines and restrictions of equine movements due to outbreaks of equine herpesvirus. Equine herpesvirus (EHV) is a common viral disease of horses



LINDSAYHELMS | DREAMSTIME

and is known to infect horses worldwide. How common is EHV? It is estimated that most horses have been infected by two years of age, with initial exposure and infection thought to occur between the mare and the foal. Economic losses from EHV include pregnant mares that may experience abortions, and the interruption of training in young horses. The form of the disease that is of most concern is the neurologic form, which often results in infected horses being euthanized.

EQUINE HERPESVIRUS (EHV) OVERVIEW

EHV is known to exist as nine strains worldwide. Of these, the three that pose the greatest health risk are EHV-1, EHV-3, and EHV-4. EHV-1 normally manifests as a respiratory disease, abortion, or neonatal loss. EHV-3 results in a venereal disease that affects the external genitalia. EHV-4 is commonly seen as a respiratory disease in foals and is rarely associated with abortion. Equine herpesvirus myeloencephalopathy (EHM) is the neurologic form of the disease that is caused by EHV-1 or its mutated form. This form of EHV-1 is the result of a genetic mutation that codes for one single amino acid substitution in the viral DNA polymerase, the enzyme responsible for copying the virus DNA once it gets into a host cell. These two forms are known as D₇₅₂ (mutated) and N₇₅₂ (wild type). Both forms can actually cause EHM, but the mutated form is responsible for causing 85% of the neurologic disease while the wild type is responsible for causing 15%. It is not known what causes the virus to mutate, and genetic sequencing indicates that the mutated form may actually be the oldest form of the virus.

¹County Program Director/Extension Agriculture Agent, Mora County Extension Office, New Mexico State University.

Almost all horses are infected and become carriers with latent infections of EHV-1; the virus escapes detection of the immune system by hiding in white blood cells that are part of the immune system. It is unclear what causes reactivation of the virus and the expression of the disease. It appears that stress may be a factor, since many of the horses that develop the disease are performance horses. Advanced age and a compromised immune system also increase a horse's risk. As the virus becomes reactivated, it multiplies and is found in the bloodstream, known as viremia. In the neurologic form, the virus then does damage to the small blood vessels surrounding the brain and spinal cord. Blood clots form and neural tissue is damaged from ischemia, or lack of blood flow.

SYMPTOMS

After exposure, symptoms typically develop within four to six days, but onset of symptoms can be as short as 24 hours or up to a week to ten days. EHV-1 typically has a biphasic fever, spiking early around the first or second day with a second peak around day six. This is usually accompanied by nasal discharge and watery eyes, but usually not associated with coughing. Lymph nodes under the jaw may remain swollen for an extended period of time. Most horses that exhibit symptoms of EHV-1 do not develop the neurologic form, EHM. When horses do manifest EHM, typically there are reduced respiratory symptoms, with elevated temperature (<102°F) being the primary warning sign. Neurologic symptoms appear rapidly after the onset of fever, often as soon as 24 hours.

Symptoms of EHM include:

- Nasal discharge
- Lethargy
- Incoordination
- Urine dribbling
- Being down, often leaning against something while standing
- Loss of tail tone and weakness in rear legs

Diagnosing the disease depends on veterinary evaluation of the symptoms, clinical tests on blood samples, and nasal swabs to determine the presence of the virus. The virus can live outside the horse's body from one week up to a month under ideal conditions. The virus is spread airborne around a horse that is shedding the virus, or via contact with infected horses or contaminated equipment, tack, clothing, or personal contact.

TREATMENT

Currently, there is no effective treatment for EHM. Treatment options are limited to supportive therapy and the use of anti-inflammatory agents such as flunixin meglumine or corticosteroids. Antibiotics may be useful in combatting secondary infections that may arise. Infected horses must be isolated and quarantined for a period of at least two weeks after the last signs of the disease.

PREVENTION

Currently, there are no vaccines that are labelled as effective against EHM. Many racetracks, shows, and other equine venues require vaccination and a recent booster for EHV-1. While this has not been proven to prevent EHM, it has been shown to decrease nasal shedding of the EHV-1 virus during an outbreak of the respiratory form of EHV-1, and may provide limited protection. Currently, good biosecurity practices are the best method of preventing EHM. Keep horses away from nose-to-nose contact with strange horses, and do not share water sources, trailers, buckets, equipment, or tack. Avoid handling unknown horses and, if you must, wash your hands thoroughly and change clothes if possible before returning to your own horse. Never handle a potentially sick horse before a healthy one. Cleaning and disinfecting facilities, equipment, and tack can help stop the spread of the disease. A dilution of one part bleach to ten parts water can be used for disinfecting equipment and premises. A good reference for proper biosecurity practices is "Awakening the Dormant Dragon: Neurological Form of Equine Herpesvirus-1" (see references).

REFERENCES

- American Association of Equine Practitioners. 2017. FAQ: Regarding equine herpesvirus (EHV) [Online]. Available at <https://aaep.org/horsehealth/faq-regarding-equine-herpesvirus-ehv>
- Burgess, B.A., N. Tokateloff, S. Manning, K. Lohmann, D.P. Lunn, S.B. Hussey, and P.S. Morley. 2012. Nasal shedding of equine herpesvirus-1 from horses in an outbreak of equine herpes myeloencephalopathy in western Canada. *Journal of Veterinary Internal Medicine*, 26, 384–392. doi:10.1111/j.1939-1676.2012.00885.x
- Center for Equine Health and the William R. Pritchard Veterinary Teaching Hospital. 2011. Awakening the dormant dragon: Neurological form of equine herpesvirus-1 [White paper]. Davis: School of Veterinary Medicine, University of California. Available at http://www.vetmed.ucdavis.edu/ceh/local_resources/pdfs/currenthealth_whitepaperEHM.pdf
- Lunn, D.P., N. Davis-Poynter, M.J.B.F. Flaminio, D.W. Horohov, K. Osterrieder, N. Pusterla, and H.G.G. Townsend. 2009. Equine herpesvirus-1 consensus statement. *Journal of Veterinary Internal Medicine*, 23, 450–461.
- Traub-Dargatz, J.L., A.M. Pelzel-McCluskey, L.H. Creekmore, S. Geiser-Novotny, T.R. Kasari, A.M. Wiedenheft, E.J. Bush, and K.E. Bjork. 2013. Case-control study of a multistate equine herpesvirus myeloencephalopathy outbreak. *Journal of Veterinary Internal Medicine*, 27, 339–346. doi:10.1111/jvim.12051
- USDA–APHIS. 2008. Equine herpesvirus (EHV) myeloencephalopathy: A guide to understanding the neurologic form of EHV infection [Program aide no. 1985]. Fort Collins, CO: Author.



William J. McGuire is an Assistant Professor and Extension Agriculture Agent for NMSU in Mora County. He received his M.S. in animal science from Kansas State University and Ph.D. from Colorado State University. His Extension programs focus on livestock production and equine care.

Contents of publications may be freely reproduced for educational purposes. All other rights reserved. For permission to use publications for other purposes, contact pubs@nmsu.edu or the authors listed on the publication. New Mexico State University is an equal opportunity/affirmative action employer and educator. NMSU and the U.S. Department of Agriculture cooperating.