

## Equine Herpes Virus – is it just a runny nose

With the recent announcement of a positive neurological case of equine herpes virus in Winnipeg, it seems a fitting time to discuss this disease in more detail. Equine herpes virus (EHV) – also known as rhino or rhinopneumonitis - usually causes a mild upper respiratory tract infection that generally doesn't cause any major issues for the horse. Unfortunately, in rare cases, the virus has the potential to also attack the neurological system of the horse. When this happens, it can be a life and death struggle for your horse.

Equine herpes viruses have been found in horse for hundreds of years. This is not a new virus by any means. There are several different forms of the virus and they tend to be known scientifically via a numbering system. The important subtypes are EHV-1, which has the potential for respiratory and neurological infection as well as being able to cause abortion during the second and third trimesters; EHV-3 which causes a reproductive associated condition in mares; and EHV-4 which causes a respiratory infection in young unvaccinated horses. There are several other known types of EHV but their importance is less given the rarity that they cause significant disease.

The focus here will be on EHV-1 and the diseases that can manifest from infection. The primary disease caused by EHV-1 is actually abortion. This form of the virus gained notoriety for causing mares to abort within the last 4 months of gestation. Since the virus can be spread rapidly through small droplets on the breath, the virus quickly infects adjacent horses and can cause large groups of mares to abort all within a brief period of time. This is also referred to as an abortion storm. During the height of the PMU industry, abortion storms from EHV-1 infections occurred almost yearly. The other common outcome of infection that came with these abortions was the frequent upper respiratory tract infection. These horses would develop a low grade respiratory tract infection like the common cold in humans, then two weeks later the abortions would begin. When you really dig into the numbers of those infected, we also find that occasionally there were a couple horses that developed a neurological problem as well. Going back many years in history, there are records of the occasional horse that developed neurological symptoms following or during a mild upper respiratory tract infection.

One of the unique things about the herpes virus family is the ability of the virus to infect the horse and cause disease but then go into hiding within the cells of the body until a later date. This is the same mechanism that human herpes simplex virus uses that causes people to develop recurrent cold sores. This crafty mechanism also makes the virus very difficult for the horse's body to fully eradicate. There is a very complex interaction of the immune system with the virus but essentially, if the virus can hide inside certain cells, the horse's immune system cannot touch it. The long term consequence of this being that the virus has the potential to be carried around for many years before coming out again when the opportunity presents.

Almost all horses will be exposed to the herpes virus at some point in their early life. Most horses (70%) that are tested for the virus will have the virus in their body. The usual course of infection results in a mild upper respiratory tract infection that clears in about 2-3 weeks. The typical signs are a fever (>38.5C), runny nose, off feed, and mildly depressed. Most of the time the virus is easily handled by the horse and no ill effects are noted. This form of the virus is very common! This is also why testing for the virus can be very complicated – but that will be discussed later.

The virus is spread during the incubation period and for about 7-9 days after the clinical signs begin. The incubation period can be anywhere from 2-7 days and sometimes longer. The transmission is via the small water droplets from the breath. This means that nose to nose contact is a very effective means to spread the virus. The virus can also live on inanimate objects like pails, buckets, brushes, blankets, clothing, foot wear and vehicles. This secondary means of transmission can be very concerning. The virus cannot infect humans but can be carried on our clothing between horses.

The neurological form of EHV-1 is also called equine herpes myeloencephalopathy (EHM). EHM is the result of a mutation in the EHV-1 DNA that allows for the virus to enter the central nervous system. Once it enters the spinal cord and brain, the virus causes small blood clots to form in the blood vessels that supply those tissues. The resulting spinal cord and brain damage gives the additional neurological deficits that we see. These include depression, complete lack of appetite, difficulty urinating or unable to urinate, increasing fever (>38.5C or 101F) and uncoordinated movement of the hind limbs (and possibly forelimbs). These horses will be stumbling with their back legs and in some cases will fall down. Once they fall, they may not be able to rise again. The reason the DNA mutation occurs or why certain horses can become infected with the neurological strain and yet not become infected is unknown.

Once neurological damage has begun, the treatment for the disease is supportive care. Maintaining good hydration and nutrition, decrease inflammation with anti-inflammatory drugs, monitoring for urinary issues and placing urinary catheters as needed are all the primary things that are done medically. There are anti-viral drugs that can be used, but at great expense. Horses that go down as a result of the damage do not have a good prognosis. Horses that are able to maintain balance on their feet will usually recover but some do not ever recover fully or functionally.

Testing horses for the virus is complicated by the fact that 70% of horses already carry it in their cells. So positive tests without any signs of disease are very hard to interpret without some reference such as if the horse tested was standing next to a horse that was infected – in that case, it is likely that the tested horse is shedding the same virus. Testing is reserved for horses that have clinical signs of infection with the neurological form. The test can differentiate between the respiratory form and the neurological form which is very helpful, however, approximately 15-20% of the horse herd in North America carries the neurological form of EHV-1 yet are unaffected. These horses only shed the virus and are otherwise healthy. Identifying them is only possible if they are actively shedding the virus (as the virus hides inside the cells otherwise). Shedding typically occurs when the horse becomes stressed such as entering training, other illness, new herd mates, long trailer rides, etc.

Prevention is the key to limiting the spread of this virus. This begins with vaccination against EHV-1. Almost all the vaccine companies have a product that will protect against EHV-1. The way they work is by providing the immune system with a means to rapidly recognize the EHV-1 when it gets into the body and quickly eradicate it before it can enter the cells. The vaccine is not always a 100% effective and depends on a large number of factors, however, it is the best means we have to protect our young horses and limit the shedding from our older horses. In addition, there are a couple vaccines specifically for EHV-1 alone that provide an additional booster. These are used to pump up the immune response and are given either on their own or as a booster to provide additional protection.

Biosecurity is a buzz word used when talking about preventing the spread of virus and infection. The best protection your horse has are the practices taken by you, the owner, in maintaining a clean, hygienic, isolated herd or horse. That doesn't sound like much fun but with some common sense the

general goals of biosecurity can be accomplished. When it comes to EHV-1, we know that nose to nose contact is a main mechanism of spread so you want to limit that contact between your horse and other horses that you may meet with an unknown background for disease. When you are at a show, rodeo, or event and you have your horse tied by the trailer or stables on the ground, limit the number of unknown horses nearby and limit the nose contact with unfamiliar horses. When new horses come to your stable or herd, if possible, give them a 2 week isolation from your group of horses until you are sure they have not developed any signs of infection. When at an event, don't share buckets or feed pail between horses. This virus is killed by detergents followed by bleach so cleaning your clothes regularly and disinfecting boots, trailers, tires, etc. can be easily accomplished. Since humans can spread this virus easily without knowing, limit the people going from horse to horse petting them or feeding them treats from a common source. Ensure your vets and farriers are practicing good hygiene.

When facing an outbreak or potential for outbreak, increase the stringency of these guidelines to limit horse movement on and off a farm for 2 weeks at least and limit people movement on and off the farm for the same time period. Vaccinate the herd with an EHV-1 specific booster vaccine. Take the temperature of all horses twice a day (as the fever can be high in the morning and normal in the evening or the opposite with this disease). Any fever should be reported to your veterinarian for an examination and if warranted, isolating and EHV-1 swab testing.

This virus is not going to go be eliminated from all horses anytime soon. It has been within the horse population for hundreds of years. As an industry, we need to recognize the potential for problems from this virus but not panic or over react when we hear of its presence. This virus can be controlled through some fairly simple practices and common sense. There is strength in knowledge. As with any viral or bacterial infection out there, some horses will get sick and a few will die but we can minimize the spread and number of horses affected with our own horsemanship and hygienic practices. There are a number of very good resources for reading online through the AAEP and many university veterinary hospitals (UCDavis). There are also links to these resources through our practice website and other veterinary websites. If you need further information about EHV-1, contact your veterinarian and they can direct you to the resources that best suit your needs.