



Questions and answers

2014 outbreak of Equine Herpes Virus -1 myeloencephalopathy.

Summarised by the Animal, Marine and Food Response Team, Investigation Diagnostic Centres and Response Directorate
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Where did this disease come from?

Equine herpesvirus 1 (EHV-1) is endemic in New Zealand; it probably arrived in the country with the first horses. Many foals become infected from their dams and infected foals may or may not show clinical signs of respiratory disease. Like the human cold sore virus, EHV-1 can enter a latent state in a previously infected animal and it can reactivate in later life, often at times of increased stress.

The neurological form of EHV-1 has been known to occur in countries such as North America, Europe and Australia. This is the first time it has been confirmed in New Zealand.

How has this disease presented in New Zealand?

The reported cases have occurred on one property in a group of thoroughbred mares without recent history of travel. Horses have presented with central nervous system signs including ataxia and weakness or paralysis of limbs. In several cases, affected horses were found laterally recumbent without previous clinical signs. All affected horses have been within adjacent areas of the farm, with either nose-to-nose contact or shared contact with equipment or handlers. Horses on this farm were up-to-date on EHV-1 vaccines, and vaccination history did not prevent illness.

The owner of the farm has voluntarily quarantined the affected paddocks and put the following biosecurity measures in place:

- No routine procedures involving handling of the animals have been conducted on the stud farm.
- There are five paddocks on the stud farm and no-one has entered these paddocks since 20 January.
- The farm has provided disinfection footbaths and overboots.
- Personnel handling the sick animals are showering afterwards

As EHV-1 myeloencephalopathy has not been reported elsewhere in New Zealand, no other properties have needed to implement quarantine measures for it.

Is this neurological form of EHV-1 caused by a different strain of virus to the respiratory and abortion forms?

There are genetic variants of EHV-1 that have been linked to outbreaks of neurological disease in the USA and these have been named “neuropathogenic strains”. However, this situation is far from clear, and it is apparent that not all outbreaks of neurological disease are caused by these “neuropathogenic” variants. All strains of EHV-1 should be regarded as potentially able to cause neurological disease.

Why has neurological EHV-1 disease not been reported in New Zealand before?

EHV-1 is a necessary but not the sole cause of equine herpes viral myeloencephalitis. The cause of disease is multifactorial and quite complex. There are many other reported risk factors in outbreaks that occur. The other risk factors may be more or less important in different situations.

What are the risk factors that horse owners and vets should be aware of?

- The presence of an infected horse, shedding virus in the herd.
- Older animals (over 3 years of age) are more likely to show neurological signs than younger ones. (Yearlings can also develop neurological signs.)
- Horses with high fever (temperatures >103.50F or 39.7°C) during the early stages of disease are more likely to progress to develop neurological signs.
- Introduction of new horses to a herd is sometimes reported before the development of EHV-1 outbreaks.
- Larger breeds are more commonly affected by neurological disease than ponies and smaller breeds.
- Mares are more commonly affected by neurological disease than geldings or stallions..
- Outbreaks of EHV-1 disease are anecdotally associated with stressors, including weaning, transportation, and concurrent infections.
- Confinement of animals in a shared airspace can accelerate the spread of disease.

Are horses from the affected stud farm a risk to the general horse population of New Zealand and should they be quarantined permanently?

Equine Herpes Virus-1 (EHV-1) is a common virus in the horse population in New Zealand and around the world. Many horses are carriers of the virus and may shed virus intermittently when stressed. Due to the often silent nature of the virus there are no reliable screening tests for live horses and New Zealand routinely imports horses from countries with EHV-1 circulating.

International standards for controlling outbreaks of EHV-1 myeloencephalopathy focus on maintaining quarantine of clinically affected horses for 21-28 days after the cessation of clinical signs of disease on the property. The virus is widespread in New Zealand and so permanently quarantining all exposed animals is not reasonable. Furthermore since the infection remains dormant until an animal is stressed, outbreaks of EHV-1 can occur in closed populations of horses without new horses being introduced.

In reference to the current outbreak in the Waikato, the neuropathogenic strain of EHV-1 has been detected in samples from one affected horse; however, the non-neuropathogenic strain has also

been detected from one other affected horse on the same property. This demonstrates the complex association between EHV-1 variants and clinical disease. There are no clinically affected horses or horses that have been in contact with affected horses leaving the stud farm. Any horses that have come from this farm, including yearlings, are healthy. All horses that are sick are located in one area of the stud farm, which is under quarantine. The area with affected horses is separated from the yearling operations. All routine work, including vet work and farriery has been suspended on this area of the farm. Quarantine measures will not be lifted on this farm until it is certain that no horses on the property are clinically affected or actively shedding virus.

Laboratory results from a sample of yearlings from the stud farm have come back as negative by PCR on nasal swabs and blood. This adds confidence to the yearling operation not having been exposed up to the date of sampling. And provides assurances of the efficacy of the farm biosecurity practices to date.

The attending veterinarian and MPI are confident that active infection related to the current outbreak of EHV-1 in the Waikato appears to be contained. This outbreak is localised to a single property that does not pose a risk to other farms in the area. Veterinarians and horse owners should be reminded that despite the rare presentation of the neurological form of EHV-1 it should be expected to occur sporadically in New Zealand, as it has done in other countries around the world.

Can this disease be eradicated from New Zealand?

EHV-1 is endemic throughout the horse population in New Zealand and around the world, it cannot be eradicated. Detecting the presence of the neuropathogenic strain using ante-mortem tests is difficult as horses have to be actively shedding the virus at the time of testing. Many horses may be latent carriers of the virus and this is difficult to test for.

Disease control involves individual owners protecting their animals from disease by ensuring that new animals coming onto a property are quarantined for 21 days after arrival. Any animals that show clinical signs of disease should be isolated and the owner should contact their veterinary surgeon as soon as possible. Movement control and strict biosecurity measures are key to controlling this disease.

Should this disease be given a notifiable status in New Zealand?

EHV-1 is widely distributed throughout the horse population in New Zealand and many animals carry latent virus. Horses that recover from clinical disease may remain carriers for life. There is no effective treatment, and vaccination does not appear to confer protection against the neurological strain. The ante-mortem detection of the neuropathogenic strain is difficult and results are not 100% reliable, making it impractical to declare this disease notifiable.

Transmission

How does the neurological form of EHV-1 disease spread?

EHV-1 is spread through the respiratory route. This can be due to direct contact with an infected horse, or via shared equipment or the hands and clothes of people handling horses.

The virus does not spread far in air (less than 50m), but could be spread throughout a property and between properties by people and equipment.

The virus can survive for up to 30 days in the environment, but it is susceptible to all common disinfectants.

Pathogenesis

What causes the neurological symptoms?

The neurological symptoms arise subsequent to a cell-associated viraemia; they are associated with endothelial cell damage and vasculitis and can occur at any level of the brain or spinal cord. There are minimal to no gross lesions.

Why do neurological signs occur less frequently than respiratory signs?

There is much that is not understood about this sporadic disease, but risk factors other than exposure to the virus itself must play important roles in the development of clinical disease. Good recording of epidemiological information from outbreaks is required in order to gain a more complete understanding of the triggers for this disease.

Diagnostics

What are the clinical signs of the neurological form of EHV-1 infection?

The severity of signs shown varies between individual horses. Some animals may only develop a bi-phasic fever with no accompanying neurological signs. A neurologically affected horse is likely to show some or all of the following: poor coordination, urine dribbling, loss of tail tone, hind limb weakness, and paralysis of hindlimbs or all limbs.

What should I do if I suspect a case?

Horse owners should contact their veterinarian if they are concerned about an animal under their care. Veterinarians are being asked to contact MPI if they encounter a suspect case.

What samples should be collected from a suspect case?

The ante-mortem diagnostics are complicated for this disease. Most horses will have been exposed to EHV-1 at some stage during their lives and will show an antibody response. For an affected animal it is advisable to take nasal swabs, and to collect whole blood and serum. Due to the difficulties in detecting virus in advanced neurological cases, sampling all animals that are in contact with the case is advisable. Detecting a four-fold rise in neutralising antibody titre would be indicative of recent infection and requires a second blood sample taken 10-14 days after the first

Treatment and prevention

What treatments are available for an affected horse?

There are no specific treatments available for this disease. Antiviral treatments have been used in some outbreaks in other countries, but their efficacy is unproven.

Which vaccines offer protection against the neurological form of disease?

None of the vaccines available offer protection against the neurological form of this disease. Vaccinated animals are likely to shed less virus this could decrease the spread of disease. However, vaccinating exposed animals may actually predispose to developing neurological disease and vaccinating in the face of an outbreak is not advised.

How can horse owners protect their animals from developing this disease?

Strict biosecurity and quarantine measures are key to preventing spread of this disease. All horses introduced onto a property should be quarantined for 21 days. Horse owners should seek veterinary advice immediately if any horse aborts or shows signs of neurologic disease.

If a suspect case is seen then separate sick horses from healthy horses. Stop movements of horses off premises where there are sick horses. Do not bring pregnant mares onto premises where active EHV is circulating.

It is extremely important that people in contact with horses on an affected property use proper biosecurity measures, such as:

- Washing their hands adequately between handling different horses.
- Using dedicated clothing and footwear when working with a sick horse and changing out of these clothes before leaving the isolation area and handling other horses.
- The person caring for a sick horse should not work with healthy horses (if not practical, healthy horses should be handled first and sick horses last).
- Wearing disposable gloves and changing gloves between horses.
- Using disinfectant to sanitize footwear can also help minimize the risk of people spreading the virus between animals.
- Do not share equipment among horses on the property, as the virus can be spread through contaminated objects such as water and feed buckets, even bridles.
- Disinfect and destroy contaminated bedding; clean and disinfect premises, equipment and vehicles used for horse transport under the direction of the attending vets.
- Follow the instructions of vets and disease management authority (MPI) if a case of EVH-1 is suspected.

For more information on preventing and managing an outbreak of EHV-related disease, the guidelines of the Horserace Betting and Levy Board in the UK are recommended:

<http://codes.hblb.org.uk/>