Equine Herpesvirus Infections (EHV)

There are five herpesviruses that are found in the horse environment and which are associated with a variety of equine disease syndromes. They are called Equine herpesviruses 1, 2, 3, 4 and 5 (EHV-1, EHV-2, EHV-3, EHV-4 and EHV-5).

What are the signs of infection?

In its most common form, EHV-1 causes respiratory disease in foals, yearlings and young horses in training. They show variable signs, which include elevated temperature, watery nasal discharge, enlarged glands under the jaw and coughing. Some cases may progress to secondary pneumonia. In horses in training, symptoms may be mild but 'epidemic' loss of performance may occur. EHV-1 can cause single or multiple abortions (‘virus abortion’) in mares during mid to late pregnancy. Also, infected foals may be born alive prematurely or at term but soon fade and die while others are born dead at full term. Epidemics (‘abortion storms’) can occur in susceptible pregnant mare populations. The virus can also cause paralysis, in horses of all ages and types, often first involving weakness of the hind limbs but then progressing to involve all four limbs and resulting in death or a requirement for euthanasia.
EHV-2 and EHV-5 do not usually cause disease on their own but are believed to cause suppression of the horse's immunity to other viral infections and allow them to cause signs of disease, usually respiratory infection, i.e. elevated temperature, watery nasal discharge, enlarged glands under the jaw and coughing.

EHV-3 causes 'coital exanthema' which is an infection of the external genital region (vulva in mares, penis and scrotum in stallions) characterised by numerous small blisters or spots, sometimes called 'the pox'. The blisters burst and become secondarily infected by skin colonising bacteria and then heal leaving white (de-pigmented) skin spots. The infection spreads venereally, usually from carrier mare to stallions and then to other mares. It has no direct effect on the fertility of stallions or mares but natural mating must be stopped to allow the disease to take its natural course (usually 10 days to 2 weeks to complete healing) and to prevent further spread of infection. Occasionally, infected stallions may become unwell, with a raised temperature, sore penis and sometimes enlarged inguinal lymph glands.

EHV-4 is a common cause of coughing and loss of performance in racehorses. Usually the respiratory disease is not severe but the disruption to training and performance programmes and consequent economic losses can be very significant. Rarely, EHV-4 is a cause of isolated abortions in mares.

What is the treatment?

Abortion cannot be treated but must be managed to proceed as easily and safely as possible in terms of the mare’s health and that of others. She must be isolated from all other pregnant mares, including those that she has lived with throughout her pregnancy because she, her placenta and her placental fluids are highly infectious to other mares after she has aborted. Viraemic ‘fading’ newborn foals cannot be treated but must be isolated and supported until the diagnosis is confirmed and euthanasia is performed.

Attempt to support an EHV1 infected paralysed horse in slings
How does the infection spread?

These herpesviruses spread, mainly by inhalation of infectious material, either from nasal discharge or from fluid which may be coughed or sneezed over a wide area. Aerosol spread of infection from horse to horse within closed horse housing, e.g. ‘American’ barns, is particularly efficient. Following abortion, the placenta, its fluids, the foetus or dead foal are heavily contaminated with virus and are a potent source of infection by inhalation for other mares.

It is possible for horses to spread the virus even when they are not showing signs of illness, i.e. they can be symptomless carriers. These horses are called 'shedders' and are very difficult to detect because they may only spread virus when stressed by transport, illness, competition etc.

Coital exanthema is spread venereally, i.e. by direct genital contact during mating. The blisters contain fluid that contains virus and is highly infectious and breeding must stop until all spots have healed.

In a group of horses which have not been previously infected or vaccinated, introduction of the virus usually results in disease of varying severity in all of the animals. Horses that have been previously infected or vaccinated may exhibit reduced or no clinical signs of infection.

How can a diagnosis be made?

Specific blood tests can be used to determine if a respiratory infection is associated with EHV-1 or 4 infection. In most cases, two blood samples are taken 10 days to two weeks apart and tested to see if antibodies have been produced (titres have risen significantly in the second sample) to one of the viruses (seroconversion). While the horse is often well on the way to recovery by the time results are available, the information may help with the management of other horses in the same yard. New DNA (PCR) tests, performed on nasopharyngeal swabs, aborted foetal and placental tissues and cerebrospinal fluid (CSF) samples, as appropriate to the case, may enable a more rapid diagnosis.
It is not possible to predict or diagnose an abortion due to EHV-1 or 4 on the basis of a blood test. The mare may have been infected several weeks before the abortion occurred and even when seroconversion (a significant rise in specific blood antibody levels) is demonstrated, this cannot be differentiated from coincidental respiratory challenge. A specific postmortem examination must be performed on the dead foetus or foal and the mare’s placenta to look for characteristic pathological changes and specific samples must be collected for laboratory examination to detect the virus. EHV-1 and -4 DNA (PCR) testing has made this a far more accurate and rapid process.

Coital exanthema is usually diagnosed and acted upon on the basis of typical clinical signs (residues of pustules on the stallion’s penis and on the vulvas of the mares that he has covered). In some cases the infection maybe confirmed by demonstration of EHV-3 antibody seroconversion in paired blood samples collected 10 days apart and by isolation of EHV-3 virus from fluid collected from the blisters.

**Control and prevention**

Ideally, all horses should be vaccinated against Equine herpesviruses 1 and 4 to reduce the incidence of herpesvirus diseases and to minimise the shedding of virus into the horse environment (see below). If an outbreak of respiratory disease occurs, affected animals should be isolated until they have fully recovered. Where possible, horses should be kept in small groups and these groups kept constant to minimise the risk of disease spread from one group to another.

A variety of anti-herpesviral 'nutraceutical' feed additives are being marketed but time and experience of their use is required before claims can be reliably substantiated.

Pregnant mares should be kept in small fixed groups according to their stages of pregnancy and no young horses or horses out of performance training should be introduced to their groups. Each group should have plenty of paddock space and separate stable accommodation and pregnant mares should never be kept in overcrowded conditions. If an abortion or stillbirth occurs, contact your veterinary surgeon without delay. The aborted foetus and the placental membranes should be hygienically wrapped in two strong plastic sacks and transported to a veterinary pathology laboratory experienced in equine abortion investigations. The affected mare and foetus should be immediately isolated from all pregnant mares, including those that she has lived with throughout her pregnancy, until the results of the postmortem examination are known and EHV-1 infection has been ruled out. The stable used by the mare should be thoroughly steam cleaned and disinfected before being used by another horse. In-contact pregnant mares should not be relocated and should be isolated in their small in-contact group until they either abort or produce a healthy live foal.

**Herpesvirus vaccines**

Vaccines available against EHV-1 and EHV-4 infection are available and are being progressively more widely used. They do not completely protect individual horses from infection but they reduce the risk of spread of infection to other horses and the severity of clinical signs if infection occurs. Vaccinated horses may show no clinical signs of disease but may still show a rise in antibody level after natural infection. All pregnant mares should be fully vaccinated and stud farms who board mares for foaling should not accept pregnant mares who have not been fully vaccinated. Individual 'virus' abortions still occur and although abortion 'storms' are now rarely seen in vaccinated mare populations, multiple cases do sometimes occur. Most pregnant Thoroughbred mares are now vaccinated and it is probable that the incidence of abortion would be significantly higher if they
were not.

Equine Herpesvirus vaccine

Vaccination in the face of disease, i.e. where an abortion of paralysis case has occurred is not recommended as horses who are incubating infection may react badly to vaccination.

The vaccine should be given according to the manufacturer's recommendations. For non-pregnant horses this is a primary course of two injections 4-6 weeks apart followed by booster vaccinations at six-month intervals. Pregnant mares are additionally vaccinated at 5, 7 and 9 months of pregnancy and it is advisable to make sure that mares do not lapse more than 6 months between vaccines when waiting year to year for their 5 month pregnancy stage. Therefore it is considered prudent to vaccinate all equine animals on stud farms twice yearly, i.e. in December/January and June/July, and in addition to vaccinate all pregnant mares at 5, 7 and 9 months unless these dates coincide with the routine 6-monthly boosters. Foals can start their vaccination courses from 5 months of age.

Unfortunately, neither natural infection nor vaccination produces long lasting immunity to Equine herpesvirus infections. This reflects the nature of the virus, but experience suggests that disease incidence is significantly lower in vaccinated horse populations and is widely recommended.

The benefits of vaccination therefore include:

- Reduced risk of infection.
- Reduced shedding of virus by infected horses, so less viruses circulating in the horse population
- Reduced severity of clinical signs.
- Less time off exercise.
- Lower cost of veterinary treatment.
Codes of Practice: Control of Equine Herpesviral Infections

Since 1978, the Horserace Betting Levy Board (HBLB) has annually updated and reproduced its highly successful Codes of Practice for the control of equine venereal diseases, which includes a section on Equid herpesvirus infections. This document contains detailed advice and recommendations on the diseases and their effects, diagnosis, control and prevention. This Code has been adopted by the Thoroughbred breeding industry of UK and other participating countries and has been adapted by many other equine horse breeding industries. Your veterinary surgeon will have a copy of the Codes and copies may be obtained from the Horserace Betting Levy Board, 52 Grosvenor Gardens, London SW1W 0AU, Tel: 0207 259 8375, Fax: 0207 333 0041, website and email. Although a voluntary code it has become the industry standard for the benefit of all and all horse breeders should read it and follow its advice.

For further information and advice, consult your veterinary surgeon

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