

# Equine Herpesvirus Infection

(Equine viral rhinopneumonitis, Equine abortion virus)

Introducing...

## Introduction:

This article printed below, could / should hopefully shed some light on Equine Herpes virus, and the possibly affects on horses together with control measures.

This is a world-wide problem spreading very fast. It might appear at a stable with either a respiratory sign complex; or in very few cases with neurological sign complex; or in a breeding establishment non-conception or abortion.

Any mixing of horses from different areas / stables / horse shows might establish contact to potentially infect susceptible horses. Any infection might - but not necessary - develop in clinical signs, as described below. Clinical symptoms might be present for a couple of days, then subside.

Every stable community or stable owner or horse owner should be informed of this problem with resultant decision making to his future control approach , may it be for pleasure riding, competitiveness or breeding;

## We suggest:

**Keep** horses as stress free as possible, with good quality nutrition in an hygienic environment

**With pregnant mares** stabled at a stable either avoid new incoming horses, till they have foaled down; or if not possible keep them in quarantine for about 4 weeks – not intermingling with other horses and keeping them definitely apart from the pregnant mares till after foaling.

**Vaccination:** primary vaccine with repeat booster 4 weeks later. Since the vaccine immunity according to the literature can last an average of 2-4 months- should / could vaccinate 2 or three time yearly – (cost implications)-, or if all horses in a stable are healthy and not showing any sign of respiratory problems you might decide that once yearly herpes virus incl. in the Influenza vaccine is enough.

For **pregnant mares vaccinate** during pregnancy at month: 3/5/6/9 or 5/7/9. To hope that the mare produces enough anti-bodies to prevent abortion, in case she should come in contact or if being a chronic carrier, the pregnancy stress might activate the virus to potentially cause abortion, or if the stable environment is clinically sound do nothing and hope for the best.

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(This article was draw From the Merck Manual on Eq. Herpes Virus. It is written in an understandable context - hopefully)

## Clinical Findings:

The incubation period of EHV is 2-10 days. Susceptible horses develop fever of 102-107°F (38.9-41.7°C), neutropenia and lymphopenia, serous nasal discharge, malaise, pharyngitis, cough, inappetence, and/or submandibular or retropharyngeal lymphadenopathy. Horses infected with EHV-1 strains often develop a diphasic fever, with cell-associated viremia coinciding with the second temperature peak. Secondary bacterial infections are common and manifest with mucopurulent nasal exudate and pulmonary disease. The infection is mild or inapparent in horses immunologically sensitized to the virus.

Mares that abort after EHV-1 infection seldom display premonitory signs. Abortions occur 2-12 wk after infection, usually between mo 7 and 11 of gestation. Aborted fetuses are fresh or minimally autolyzed, and the placenta is expelled shortly after abortion. There is no evidence of damage to the mare's reproductive tract, and subsequent conception is unimpaired. Mares exposed late in gestation may not abort, but give birth to live foals with fulminating viral pneumonitis. Such foals are susceptible to secondary

bacterial infections and usually die within hours or days.

Outbreaks with specific strains of EHV-1 infection result in neurologic disease (see [DISEASES OF THE SPINAL COLUMN AND CORD, \*Diseases of the Spinal Column and Cord: Introduction\*](#)). Clinical signs vary from mild incoordination and posterior paresis to severe posterior paralysis with recumbency, loss of bladder and tail function, and loss of sensation to the skin in the perineal and inguinal areas. In exceptional cases, the paralysis may progress to quadriplegia and death. Prognosis depends on severity of signs and the period of recumbency. Neurologic disease associated with EHV-1 is thought to occur more commonly in mares after abortion storms, but it has been reported in barren mares, stallions, geldings, and foals after an outbreak of EHV-1 respiratory infection.

### Lesions:

The pathogenetic mechanisms of EHV-1 and EHV-4 differ significantly. EHV-4 infection is restricted to respiratory tract epithelium and associated lymph nodes; EHV-1 strains have a predilection for vascular endothelium, especially the nasal mucosa, lungs, adrenal, thyroid, and CNS. EHV-1 gains access to peripheral tissues via cell-associated viremia, which may manifest as abortion or neurologic disease.

Gross lesions of viral rhinopneumonitis are hyperemia and ulceration of the respiratory epithelium, and multiple, tiny, plum-colored foci in the lungs. Histologically, there is evidence of inflammation, necrosis, and intra-nuclear inclusions in the respiratory epithelium and germinal centers of the associated lymph nodes. Lung lesions are characterized by neutrophilic infiltration of the terminal bronchioles, peribronchiolar and perivascular mononuclear cell infiltration, and serofibrinous exudate in the alveoli.

Typical lesions in EHV-1 abortion include interlobular lung edema and pleural fluid; multifocal areas of hepatic necrosis; petechiation of the myocardium, adrenal gland, and spleen; and thymic necrosis. Intranuclear inclusions are found in lung, liver, adrenal, and lymphoreticular tissues.

Horses with EHV-1-associated neurologic disease may have no gross lesions, or only minimal evidence of hemorrhage in the meninges, brain, and spinal cord parenchyma. Histologically, lesions are discrete and comprise vasculitis with endothelial cell damage and perivascular cuffing, thrombus formation and hemorrhage, and in advanced cases, areas of malacia. Lesions may occur at any level of the brain or spinal cord.

### Diagnosis:

Equine viral rhinopneumonitis cannot be clinically differentiated from equine influenza ([Equine Influenza](#)), equine viral arteritis ([Equine Viral Arteritis: Introduction](#)), or other equine respiratory infections solely on the basis of clinical signs. Definitive diagnosis is determined by virus isolation from samples obtained via nasopharyngeal swab and citrated blood sample (buffy coat) early in the course of the infection and by serologic testing of acute and convalescent sera.

In cases of suspected EHV-1 abortion, a diagnosis is based on characteristic gross and microscopic lesions in the aborted fetus, virus isolation, and demonstration of viral antigen in fetal tissues. Lung, liver, adrenal, and lymphoreticular tissues are productive sources of virus. Serologic testing of mares after abortion has little diagnostic value. Diagnosis of herpesvirus myeloencephalopathy depends on demonstration of characteristic vascular lesions in sections of CNS tissue of horses that die or are destroyed. Otherwise, the diagnosis is presumptively based on clinical signs and CSF analysis (xanthochromia, albuminocytologic dissociation).

### Treatment:

There is no specific treatment for EHV infection. Rest and nursing care are indicated to minimize secondary

bacterial complications. Antipyretics are recommended for horses with a fever  $>104^{\circ}\text{F}$  ( $40^{\circ}\text{C}$ ). Antibiotic therapy is instituted upon suspicion of secondary bacterial infection evidenced by purulent nasal discharge or pulmonary disease. Most foals infected prenatally with EHV-1 succumb shortly after birth despite intensive nursing and antimicrobial medication. If horses with EHV-1-associated neurologic disease remain ambulatory, or are recumbent for only 2-3 days, the prognosis is usually favorable. Intensive nursing care is necessary to avoid pulmonary congestion, pneumonia, ruptured bladder, or bowel atony. Recovery may be complete, but a small percentage of cases have neurologic sequelae.

### **Control:**

Immunity after natural infection with either EHV-1 or EHV-4 involves a combination of humoral and cellular immunity. While little cross-protection occurs between virus types after primary infection of immunologically naive foals, significant cross-protection develops in horses after repeated infections with a particular virus type. Most horses are latently infected with EHV-1 and EHV-4. The infection remains dormant for most of the horse's life, although stress or immunosuppression may result in recrudescence of disease and shedding of infectious virus. Immunity to reinfection of the respiratory tract may persist for up to 3 mo, but multiple infections result in a level of immunity that prevents clinical signs of respiratory disease. Diminished resistance in pregnant mares allows cell-associated viremia, which may result in transplacental infection of the fetus.

For prevention and control of EHV-4- and EHV-1-related diseases, management practices that reduce viral spread are recommended. New horses (or those returning from other premises) should be isolated for 3-4 wk before commingling with resident horses, especially pregnant mares. Management-related stress-inducing circumstances should be avoided to prevent recrudescence of latent virus. Pregnant mares should be maintained in a group away from the weanlings, yearlings, and horses out of training. In an outbreak of respiratory disease or abortion, affected horses should be isolated and appropriate measures taken for disinfection of contaminated premises. No horse should leave the premises for 3 wk after recovery of the last clinical case.

Parenterally administered modified live vaccines are licensed in some countries but banned in others. An inactivated vaccine is the only product currently recommended by the manufacturer as an aid in prevention of EHV-1 abortion. Vaccine should be administered during mo 3, 5, 7, and 9 of pregnancy. Humoral immunity induced by vaccination against EHV-1 and EHV-4 generally persists for only 2-4 mo. Antigenic variation within each virus type means that available vaccines do not cover all strains to which horses can be exposed. Vaccination should begin when foals are 3-4 mo old and, depending on the vaccine used, a second dose given 4-8 wk later. Booster vaccinations may be indicated as often as every 3-6 mo through maturity. Vaccination programs against EHV-1 should include all horses on the premises.