



Respiratory Diseases in Horses

What You Can Do to Prevent Them

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Respiratory diseases can be costly for the horse owner/manager in many ways. Some respiratory diseases may cause abortion, and the expense of veterinary care associated with respiratory diseases can be significant. Early detection of respiratory disease is important for successful treatment and to minimize days lost in training, racing, showing, or poor performance, which often is the greatest cost.

Acquiring an understanding of respiratory disease is the best way to develop a plan for management that will help reduce related expenses. We also should understand at the outset that with current knowledge and available prophylactic procedures, it is impossible to completely eliminate respiratory diseases from our horses. Instead, we should endeavor to decrease the incidence and severity of these diseases, thereby decreasing the associated costs.

The major categories of respiratory diseases affecting horses are those caused by viruses and bacteria. There are also important internal parasites that migrate through the respiratory system and are capable of producing respiratory disease. Although for this discussion we will consider these diseases individually, be aware that in individual animals more than one disease may be present, and one organism may produce respiratory tract damage that paves the way for another organism to cause a more serious condition.

Viral Respiratory Disease

The most important viral respiratory diseases affecting horses are equine herpes virus (rhinopneumonitis), equine influenza, viral arteritis, and rhinovirus. Equine herpes virus and influenza probably cause the majority of viral respiratory diseases seen in our area. However, the incidence of rhinovirus infection is unknown.

Equine Herpes Virus (EHV)

Equine herpes virus is one of the most common respiratory diseases affecting horses. There are at least four equine herpes viruses. EHV₁ and EHV₄ are the two herpes viruses that commonly cause respiratory disease. The viruses are closely related and can cause other clinical syndromes including neonatal disease and abortion. EHV₁ can also cause neurologic disease. The respiratory form of the disease is most common in young horses (foals, weanlings, and yearlings); however, any age horse can develop the disease. The incubation period of EHV is two to three days. Outbreaks tend to occur in groups of horses with a high percentage of susceptible horses developing the clinical disease. This disease is often

fatal for newborn foals that acquire the infection in the uterus. However, the disease has a low mortality rate in older foals and adult horses.

The severity of illness associated with this disease depends on prior exposure and the immune status of the individual animal. Affected horses will have an increased body temperature of 102-106°F, which will usually persist for one to seven days and often is higher in the afternoons. They will show varied degrees of depression and anorexia. Secondary bacterial infection commonly appears as a consequence to the viral infections. Nasal discharge is usually clear at first but often changes to pus-like after a few days. Horses will typically develop a mild cough and some will have minor lymph node enlargement under their jaws (intermandibular lymph nodes). In uncomplicated cases, most horses will recover in seven to fourteen days.

As with other herpes virus diseases, the immunity after natural infection or vaccination is often short-lived. Horses may become reinfected within four to six months of having the disease. Repetitive infections are thought to boost a horse's immunity, so reinfected horses are often asymptomatic.

Equine Influenza Virus

Equine influenza is caused by two distinct virus types (A-equi-1 and A-equi-2), with A-equi-1 usually causing the milder disease. A-equi-2 can cause severe disease often resulting in viral pneumonia. Outbreaks of influenza occur most commonly in the spring and fall. Influenza has a short incubation period of only one to three days and therefore can spread rapidly through a group of susceptible horses. Coughing horses disperse the virus into the air, and other horses are infected when they inhale the virus particles. The virus attacks and damages the lining of the respiratory tract. It takes three weeks for the lining of the respiratory tract to regenerate, which predisposes the tract to bacterial infections. Some of the lining may actually slough and result in multiple areas of denuded respiratory tract lining. Most horses will be infectious for at least five days after onset of clinical illness. The length of time the virus is excreted will vary among horses, depending on their immunity.

The clinical signs seen with influenza are similar to those associated with other viral respiratory diseases. Fever is usually present and ranges from 103-106°F. Horses have varied degrees of depression and anorexia. In uncomplicated

influenza cases, most clinical signs last from two to ten days, but affected horses often develop a dry, nonproductive cough that can last two to three weeks or longer. The nasal discharge is usually clear at first but becomes thick and pus-like. Intermandibular lymph nodes may become slightly enlarged, and some horses appear to have muscle soreness. Those horses with A-equi-2 will show the most severe signs. These horses will often have high respiratory rates, and some will have difficulty breathing. The severe clinical signs seen with A-equi-2 will often be present for seven to ten days. Immunity to equine influenza will last approximately one year after natural infection and two to three months after vaccination.

Equine Viral Arteritis (EVA)

Equine viral arteritis causes respiratory disease and can result in abortions. The disease is not commonly detected in Oklahoma; however, in 1988 there was an outbreak on an Oklahoma farm, so Oklahoma horsemen should be on the lookout for this disease. EVA has an incubation period that is longer than the other viral respiratory diseases, ranging from three to fourteen days. The virus is shed in nasal secretions. Stallions affected with EVA may shed the virus in their semen for years and are capable of transmitting the disease to mares. As with other viral respiratory infections, EVA is acquired by inhalation.

The clinical signs associated with EVA infection are similar to other viral respiratory diseases but can vary from severe to subclinical. However, this disease should be suspected if the following are present:

- more discharge from the eyes than usually seen with other respiratory diseases
- red and inflamed lining in the nasal passages
- swelling in the limbs and ventral abdomen
- abortions during or within a few days of the illness

EVA is a viral disease that is reportable to the state veterinarian's office.

Treatment of Viral Respiratory Diseases

Viral respiratory diseases can mimic more serious respiratory diseases. The attending veterinarian should examine affected horses to determine the seriousness of the illness. Only the symptoms are treated, rather than the cause, with the most important component of therapy for uncomplicated viral respiratory diseases being rest. Stress should be kept to a minimum. If possible, the horse should not be hauled long distances, and forced exercise of any kind should be discontinued. Affected horses should be housed in an area with good ventilation, and dust should be kept to a minimum. Unless the weather is inclement, outside in the sunshine and fresh air may be the best environment for recovery.

It is important to remember that antibiotics are not effective against viruses. The old saying that "a cold without treatment lasts seven days, and with treatment only lasts one week" is probably worth consideration. However, for the horse with severe viral respiratory disease or one that is stressed for another reason, appropriate antibiotics should be administered prophylactically to decrease the chances of an opportunistic bacteria causing a more severe disease.

Complications of Viral Respiratory

Diseases

Uncomplicated viral respiratory diseases are usually self-limiting, and the affected horses recover with no long-lasting ill effects. However, horses with viral respiratory diseases that are also stressed by shipping, training, racing, surgery, etc. may develop severe and sometimes fatal pneumonia. Frequent examination of the affected horse's respiratory tract is indicated to monitor for secondary complications like pneumonia, pleuropneumonia, and myocarditis. There is also some indication that viral respiratory disease may predispose a horse to chronic obstructive pulmonary disease (heaves) and exercise-induced pulmonary hemorrhage (bleeders).

Bacterial Respiratory Disease

Many bacteria are capable of causing respiratory disease in horses. Some bacteria only cause disease when viruses or other agents have first damaged the respiratory tract. Other bacteria are capable of producing disease independently. For this discussion, we will consider the two most important bacterial diseases for Oklahoma horses: Strangles and *Rhodococcus equi*.

Strangles

Strangles is a bacterial disease caused by *Streptococcus equi*. It is most commonly seen in one- to five-year-old horses. However, any age susceptible horse can get the disease, and older horses that have waning immunity may develop the disease even if they had it at a younger age. There is usually a two- to six-day incubation period, and 30-100 percent of the horses on the farm may develop the disease. Horses affected with this disease have a copious thick nasal discharge that contains high numbers of the bacteria.

They contaminate the environment, including feed tubs, water buckets, and walls with the bacteria. Anything in the horses' environment contaminated with the bacteria (such as handlers' boots and clothes, flies, brushes, or halters) can be a source of infection for other horses. Horses acquire the disease by direct contact with the bacteria either by inhalation or ingestion.

The bacteria itself will survive in the environment for a few weeks. This disease is difficult to eradicate because some horses shed the bacteria for long periods. Affected horses will typically shed the bacteria for at least four to six weeks. One survey reported that one mare shed the bacteria for ten months, and long-term carriers may be more common than previously thought. Natural immunity to the disease after infection is usually long-lasting. However, some individuals may acquire the disease more than once.

Clinical signs associated with strangles include fever (104-106°F), serous nasal drainage evolving to a thick and copious nasal discharge, depression, and decreased or nonexistent appetite. Lymph node swelling between the mandibles and behind pharynx is usually present. The lymph node swelling with strangles is frequently severe and results in abscesses that often rupture and drain pus.

Strangles can have a high incidence (up to ten percent) of complications. Complications include becoming a chronic carrier of the disease, asphyxia due to enlarged lymph nodes compressing the larynx or windpipe, bastard strangles (spread-

ing to other areas of the body), pneumonia, guttural pouches filled with pus, purpura hemorrhagica, and heart disease. The average length for the course of this disease is 23 days.

***Rhodococcus equi* Pneumonia**

Rhodococcus equi pneumonia is a sporadic disease that usually occurs in one- to six-month-old foals. It is endemic on some farms, and the disease will appear in one to ten percent of each foal crop. Most infections will be in foals two to three months of age, which is when maternal antibody concentration is waning. The organism is commonly found in the soil and can often be cultured from the feces of dams that had affected foals and of normal horses. Foals probably become infected by inhalation of the bacteria from the soil. The disease does not appear to be transmitted by direct contact between horses.

One of the major problems in dealing with *Rhodococcus* pneumonia is that it has an insidious onset. Foals usually start with a low-grade fever but may have temperatures up to 106°F. They may or may not cough in the initial stages of the disease. Often there is no abnormal nasal discharge early in the disease process. As the disease progresses, the foals become depressed, nursing is diminished, difficult breathing becomes apparent, and weight loss or failure to grow may be evident. In addition to respiratory disease, *Rhodococcus equi* can cause diarrhea, septic and nonseptic synovitis, bone infection, and intra-abdominal abscessation.

The fundamental components of *Rhodococcus* pneumonia treatment are early detection, rapid and accurate diagnosis, and specific antibiotic therapy. It is often necessary to continue the antibiotic therapy for several weeks.

Control of *Rhodococcus equi* pneumonia is most difficult with current knowledge and available products. There is no commercial vaccine available. Prophylactic hyperimmune serum administered intravenously has been reported to be effective. Since it is thought that the natural disease is acquired by inhalation and we know the bacteria are in the soil, it may be beneficial to reduce dust and properly ventilate housing. As with all respiratory diseases, reduce stress by not overcrowding and by keeping the handling of foals to a minimum. Frequent removal of manure will help minimize environmental contamination and may reduce the incidence of infection. It is also important to verify that the foal has had proper colostrum intake shortly after birth.

Respiratory Diseases Caused by Internal Parasites

Two equine internal parasites migrate through the lungs as a portion of their life cycle. The equine roundworm is one of the most common internal parasites of young horses. It is probably present on every horse farm in Oklahoma. After this parasite is ingested by the horse, it then migrates from the intestine to the liver and then to the lung, where it is coughed up and swallowed to become an adult in the intestine. Foals given large numbers of the parasite experimentally develop a cough and nasal discharge similar to other respiratory diseases. In uncomplicated cases, the horse's temperature remains near normal. It is unknown if under natural conditions this parasite causes clinically detectable respiratory disease. However, it is quite possible that the damage caused by this parasite predisposes young horses to other respiratory diseases. For this reason, a good deworming program is recommended for all foals. Most horses develop a resistance to roundworms by two to three years of age.

The equine lungworm is not commonly seen in Oklahoma. It causes chronic coughing in affected horses. Horses are not the favorite host of this parasite and do not usually transmit the disease to other horses. In most instances, horses acquire this disease when pastured with donkeys.

Vaccination Program to Control Respiratory Diseases

Each farm, in consultation with the attending veterinarian, should develop a written vaccination program that is appropriate for their situation. Accurate vaccination records should then be maintained on all horses. Although vaccination programs may vary from one farm to another, the following information should be helpful in developing a vaccination program for your farm. All horses should be vaccinated in the spring for eastern and western encephalomyelitis and tetanus. Broodmares should be vaccinated for EHV on the fifth, seventh, and ninth month of gestation to prevent abortion. Approximately four to six weeks prior to foaling, they should receive booster vaccinations using only killed agents. Booster vaccinations typically include tetanus, encephalitis, influenza, EHV, and sometimes streptococcus equi. To further boost the passive immunity of the colostrum transfer to the foal, it is also advantageous to keep the mare at the facility where she is to foal at least six to eight weeks prior to foaling.

Foals obtain protection from respiratory diseases from their dams' colostrum. This colostrum protection provides passive immunity. Colostrum protection or passive immunity lasts a varied amount of time, which is related to the amount of protective antibodies in the colostrum and how fast the antibodies are used up by the foal. Colostrum antibodies against some diseases last longer than others. In general, the protective levels of antibodies acquired from the dam are too low to be protective by two to three months of age. But if you vaccinate a foal at this age, a problem arises because the residual maternal antibodies will cause the foal's immune system to be unresponsive to vaccinations. This effect can last for weeks or months.

Current available EHV vaccines will not completely prevent infection. However, vaccinating horses against EHV may reduce the severity of clinical signs. If foals are vaccinated for EHV, initial vaccinations should not start before four months of age.

Because of the interference of maternal antibodies, researchers at the University of Kentucky currently recommend vaccinating foals (from vaccinated mares) against influenza at nine, ten, and eleven months. The intranasal vaccines are reported to work better because they promote a better immune response in the mucous membrane lining the respiratory tract. Vaccination with EVA vaccine or the disease itself will cause the horse to test positive serologically. This positive test can result in the inability to export the horse to some countries. Check with your local veterinarian if you have questions concerning the need for EVA vaccinations on your farm or about export regulations.

Vaccination against strangles will, at best, reduce the incidence and the severity of the disease. The use of an intranasal vaccination to protect against strangles may be superior because it stimulates a better immune response. According to scientific reports, strangles vaccination of foals appears to be of value in a situation of high risk to exposure. A variety of

problems like vaccine failure and abscesses at the injection site have occurred with intra-muscular strangles vaccinations. As a result, this vaccine is best given under the supervision and advice of a veterinarian. Research on efficacy of this vaccine suggests clinical infection rate is decreased by fifty percent in vaccinated versus unvaccinated horses.

Horses, once vaccinated with an effective vaccine and then revaccinated, have what is termed an anamnestic response. This response is very rapid (just a few days) and produces high levels of protective antibodies. With some planning, the anamnestic response can be utilized to protect horses that will subsequently be stressed or exposed to respiratory diseases. For this reason, horses going to sales, shows, racetracks, etc. can be better protected by a booster shot two to four weeks prior to the event.

Vaccination is not a substitute for good management practices. Respiratory infections spread through groups of horses by direct contact between animals, handlers, and contaminated surfaces, or through inhalation. A producer can minimize the spread of infectious organisms by quarantining all animals

brought onto the farm, especially those returning from events such as shows, racetracks, or sales. It may be necessary to quarantine these animals for up to four weeks before they are allowed to commingle with resident horses. If possible, pregnant mares should be kept in a group away from other horses, especially weanlings and yearlings. When there is an outbreak of respiratory disease or abortion, all affected horses should be isolated and not allowed to commingle or leave the premises until three weeks after recovery. Handlers caring for the sick horses should limit their contact with healthy horses, and stalls, trailers, and equipment that has come in contact with sick horses should be disinfected with products containing phenols, chloride, or quaternary ammonium. It is also best for healthy horses to be housed in a separate airspace from sick horses.

Consult your veterinarian concerning vaccination protocols. A veterinarian can evaluate each horse as an individual considering age, health, and environment to recommend vaccination and management programs that will provide maximum protection for each horse.