

## Potomac Horse Fever

Potomac Horse Fever (PHF) is the common name given to the equine infectious enterocolitis (an inflammatory condition involving the small intestine and colon) caused by the rickettsial organism *Neorickettsia risticii* previously named *Ehrlichia risticii*. The disease was first reported along the Potomac River in Maryland in 1979 but presently has been confirmed throughout the United States, Canada, and Europe. Potomac Horse Fever has a seasonal occurrence generally from June through September with most cases seen in the summer. It is frequently reported to be associated with close geographical proximity to a body of water such as a river, stream, or pond although this is not a prerequisite.

### Clinical Signs

The disease may be characterized by one or more of the following clinical signs: high fever (up to 107 F), depression, anorexia (off-feed), dehydration, diarrhea, colic and laminitis. Horses with PHF manifest signs of colitis (inflammation of the colon) of varying degrees. The onset of clinical signs occurs 1 to 3 weeks post-infection. Clinical signs are apparent following a transient, often subclinical (undetected) fever 2-4 days post-infection that may or may not be associated with a decreased appetite. Diarrhea develops in 10% to 30% of cases of PHF even though it is considered to be a primary clinical sign. Fever and laminitis may be the primary clinical signs occurring without diarrhea. Late term abortions, early pregnancy loss, and birth of "dummy" foals have also been associated with Potomac Horse Fever.

It is an infectious and minimally contagious disease. Although experimental oral infection of horses via nasogastric administration of feces from infected horses has been successful in causing the disease and large numbers of infective *Neorickettsia risticii* are shed into the colon at the time of the diarrhea and for 4-8 days after it has begun, casual contact with infected horses and contaminated feces does not generally provide a high enough level of exposure to result in natural infection. Individual horses must come into direct contact with the infective organisms concentrated in snails and aquatic insects to develop clinical signs. Inadvertent ingestion of snails and insects with high concentrations of infective organisms is the mode of transmission. Studies have found the rickettsial organisms in fresh water snails, caddisflies, and mayflies and researchers have experimentally reproduced the disease in horses using these organisms as vectors.

### Diagnosis

Diagnosis can be difficult. Unlike the other common rickettsial disease of horses, Equine Ehrlichiosis, caused by *Anaplasma phagocytophilum* (formerly *Ehrlichia equi*), PHF cannot be diagnosed on a blood smear. Test results must be interpreted carefully, taking into consideration clinical signs, season and time of year, vaccination history, and CBC and chemistry results in addition to specific PHF tests such as serology and PCR (polymerase chain reaction). The IFA

(indirect fluorescent antibody) is a serologic test that measures a horse's antibody titer to *Neorickettsia risticii*. The higher the titer is, the greater the correlation is with PHF clinical disease. Generally a titer of 80 or higher in acute infection is suggestive of PHF. A definitive diagnosis can be made by detecting a rise in titer in consecutive serum samples taken 5-7 days apart. A four-fold or greater increase in IFA titer is diagnostically significant in rickettsial disease as stated by the Center for Disease Control (CDC). Failure to seroconvert (increase the antibody titer) does not rule out infection because the onset of clinical signs can be delayed as long as 14 days and the horse may have already seroconverted at the time of the first sample. Another complicating factor is that horses in endemic areas (where the disease is prevalent) may maintain high titers for prolonged periods of time without clinical disease.

The PCR is a test that is not influenced by vaccination and detects small amounts of DNA from *N. risticii* in a horse's blood sample. The advantages include quick results and aiding in the interpretation of low IFA titers in clinically sick horses but it is limited in its ability to detect different strains of the organism. The CBC and chemistry panel usually reveal an initial low white blood cell count (WBC) followed by a rebound high WBC, decreased electrolytes (sodium, potassium, chloride), decreased protein levels, increased packed cell volume (PCV), and occasionally low platelet counts. The bottom line in accurate diagnosis of PHF is considering the overall picture including clinical signs, geographic location and season of year, and using this information to interpret test results.

### **Treatment**

Treatment often requires hospitalization for intensive care therapy including IV fluids, electrolytes, anti-inflammatory medications, antibiotics, and specific laminitis treatment or prevention therapy. Most frequently antibiotic therapy is oxytetracycline administered IV 1-2 times daily for 5-7 days. Response to therapy can be dramatic and is therefore diagnostic with improvement in attitude and fever seen within 24-48 hours. If medications are administered prior to the onset of diarrhea it may not develop at all. The anti-inflammatory medication of choice is flunixin meglumine (Banamine) to treat the abdominal pain, endotoxemia, intestinal inflammation, and laminitis associated with PHF. The usual time for recovery is about a week in the absence of complications.

### **Prevention**

Although multiple horses on a farm may contract the disease, the means of transmission is from ingestion of infected snails and aquatic insects and not from horse to horse contact. Studies have shown no increase in the incidence of disease in healthy horses stabled with infected horses. Environmental control including decreasing the snail population or pasturing horses away from endemic areas may decrease the incidence of disease. Commercial vaccines are available but efficacy is questionable. Some vaccinated horses are still susceptible to the disease and vaccination offers short-lasting less intense

immunity. Possible explanations for poor vaccine response include decreased antibody response of the horse to the vaccine and the existence of different strains of *N. risticii*. Even if complete protection is not achieved, vaccination may lessen the severity of the disease and is therefore still recommended. Recommendations are to vaccinate horses in endemic areas every 3-4 months during the peak season. No serious adverse vaccine reactions have been reported and the vaccine has not been proven unsafe for pregnant mares. Horses that recover from PHF are reported to be resistant to infection for at least 20 months due to natural immunity. Therefore, vaccination is not necessary for up to 2 years in horses that have recovered from natural infection.

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