Eastern Equine Encephalitis

Winter is nearly upon us, bringing mosquito season to a close, and many horse owners are breathing a sigh of relief. Mosquitoes are not only a nuisance but can carry several diseases which can infect horses and humans alike. Of these, Eastern Equine Encephalitis (EEE, ‘Triple E’, or ‘Sleeping Sickness’) made the headlines this year with an unprecedented number of cases in equines throughout New England.

EEE, unlike the name suggests, occurs across the US and parts of Canada, as well as extending into Central and South America. The disease is caused by a virus that is maintained in wild birds, which usually show no signs of disease. The virus reaches high levels in the bloodstream of these birds, where it is picked up by the mosquito and may then be transmitted to a horse (or human) the mosquito later bites. Horses are considered a ‘dead end’ host for EEE, meaning that they do not produce enough virus in the blood to allow transmitting the disease to another animal or human. The peak incidence of this disease is during mosquito season (spring to fall), and tends to be highest late in the summer.

Once the virus is introduced into a susceptible horse, it enters and multiplies in white blood cells and cells lining the blood vessels. The virus then spreads through the blood to nerve tissue in the brain. It may take 1-3 weeks after the virus enters the body for clinical signs to develop. Horses with EEE usually show depression and fever at the outset, and neurologic signs follow. Early on, the horse may show anorexia, ataxia (unsteadiness) and proprioceptive deficits (lack of awareness of limb positioning). The horse may then develop signs such as severe depression or ‘sleepiness’, hyperexcitability to stimuli, compulsive walking in circles, blindness, and have cranial nerve deficits (drooping of the ear, eyelid, or lip, abnormal position of the head or eyes, trouble swallowing). As the disease continues to progress, affected horses will typically become recumbent, unable to rise, and enter a comatose state. Horses who reach this point have a very poor prognosis for survival, and humane euthanasia is typically recommended. Horses who survive severe infection usually have life-long neurologic deficits as a result of the disease.

While infection with the disease confers long-lasting immunity against later infection, this is small comfort if the horse is no longer able to lead a normal life. Diagnosis of the disease is often made on clinical signs and an unvaccinated status. Analysis of cerebrospinal fluid (CSF) is the most common laboratory test, and can reveal elevation of white blood cells and protein. It is also possible to recover virus from CSF, or brain tissue post-mortem, though this process takes much longer.

While the disease is devastating to affected individuals, vaccination is highly effective. One of the core vaccines recommended by the American Association of Equine Practitioners, the EEE vaccine is given 1-3 times per year, depending on the level of risk for the disease. While the South is usually thought of as being the place of highest risk, and horses in the Northeast have long been vaccinated only on an annual basis, the recent outbreak would suggest that vaccination at least twice per year would be prudent. The vaccine is usually given in the spring, before the start of mosquito season, but incorporating it into the fall vaccine group is recommended for increased protection.
While mosquitoes are not obviously present in the winter, the mild fall weather and earlier spring thaw can result in mosquito presence beyond what we would normally consider ‘mosquito season’. Vaccinated horses who are bitten by an infected mosquito stand an excellent chance of clearing the virus without ever developing clinical signs, and in the few cases in which signs develop, they tend to be far less severe and the horse is much more likely to survive. As they say, ‘an ounce of prevention is worth a pound of cure,’ especially in the case of EEE, where an inexpensive vaccine can save the life of your horse. Mosquito control is another important component to controlling mosquito-borne disease, so eliminate sources of standing water and use insect repellant on horses and humans alike, especially when mosquitoes are most active.

If you have any questions about EEE, other neurologic diseases, or vaccination protocols for horses, please contact your veterinarian or the veterinarians at New England Equine Medical and Surgical Center.

Susan Barnett, DVM
Jacqueline Bartol, DVM, DACVIM