West Nile Virus Encephalitis

Since the first United States occurrence of West Nile Virus (WNV) in New York in 1999, the virus has spread all the way down the East Coast, and as far west as Colorado and Nebraska. This Arbovirus belongs to the Japanese Encephalitis group along with Saint Louis Encephalitis. Arboviruses are vectored by mosquitoes; birds are the natural reservoir hosts. In other words, the virus replicates in birds, and is transmitted to others when a mosquito bites an infected bird and then passes the virus along during its next blood meal. Horses and humans are dead end hosts, meaning that they are not part of the viral replication cycle, and cannot directly pass the disease on to others.

West Nile Virus produces lesions in the gray matter of the midbrain, hindbrain, and spinal cord. Lesions tend to increase in severity the closer they are to the hindquarters. Lesions can be symmetrical or asymmetrical, effecting both or only one side of the horse. They can also be in more than one location, so combinations of clinical signs may vary.

Clinical signs of West Nile Virus include fever (in about 60% of cases), muscle weakness, and neurologic problems including ataxia (staggering or incoordination), abnormal mental state (depression, lethargy, behavior changes), and muscle fasiculations (trembling) of the head and neck. Some cranial nerves may also be involved producing drooping of the facial muscles, difficulty swallowing, and problems with normal tongue function. Any number and combination of these signs is possible. Prognosis is variable, and depends on severity of clinical signs, and prompt veterinary attention. Horses that are recumbent and unable to rise have a worse prognosis than those who are ataxic but able to stand.

Diagnosis of West Nile Virus is normally done by blood test. There are two tests commonly in use at the moment, and current recommendations are to test with both. The most definitive diagnosis of the disease is made when results from both tests are positive.
Common diseases that will produce similar clinical signs in horses include other encephalidites (such as Eastern or Western Equine Encephalitis (EEE) or (WEE)), Equine Protozoal Myelitis (EPM), Rabies, and Wobbler Syndrome. Because EEE and Rabies are usually fatal, and because they pose a human health risk, it is important to attempt a definitive diagnosis. Treatment also varies for each disease, so again, diagnosis is key.

West Nile Virus positive horses may also test positive for EPM due to break down in the blood brain barrier, and leakage of antibodies to EPM into the cerebrospinal fluid. Many horses have been exposed to EPM and therefore have antibodies without ever having manifested the disease. This makes diagnosis

confusing, because it is not possible to determine whether the horse has concurrent WNV and EPM, or simply has decreased blood brain barrier integrity due to inflammation caused by WNV. Treatment in these cases is often for both diseases. Treatment for WNV positive horses includes anti-inflammatory medications, fluids, and supportive care.

Prevention is key to disease control. Vaccination is recommended starting with an initial two vaccine series three to four weeks apart, timed so that the second vaccine is administered one month before the beginning of mosquito season. Twice yearly boosters are necessary thereafter. However, in Florida, where mosquito season is year round, many veterinarians are recommending boosters every four months.

Other preventative measures include eliminating standing water, insecticide spraying, avoiding exposure at dawn and dusk when mosquitoes are most active by keeping horses in stalls with strong fans, and screening in stalls.

There is currently controversy surrounding the WNV vaccine. Several mare owners have claimed the vaccine has caused abortions in their mares. These claims are being investigated by the USDA; however, the vaccine was proven to be safe in its original testing. The vaccine is a killed virus, and therefore unlikely to cause abortion. Currently, the USDA strongly recommends that owners continue to vaccinate their horses. Mares abort for many different reasons and currently there is no scientific evidence to suggest that WNV vaccine causes abortion.