

West Nile Virus

Controlling the risk to your horse

How It Began

First isolated in Uganda in 1937, West Nile virus (WNV) is a virus that is transmitted principally by various species of mosquitoes and can cause inflammation of the brain and spinal cord (encephalomyelitis). Clinical disease caused by this virus is seen primarily in birds, equines and humans and very infrequently in goats, sheep, dogs, llamas, various reptiles and bears, among other species. Prior to its discovery in the northeastern U.S. in 1999, WNV was widely distributed in Africa, the Middle East, southwest Asia and parts of Europe.

West Nile virus was first recognized in the western hemisphere in September 1999, when it was isolated from the tissues of sick flamingoes and pheasants at the Bronx Zoo and from dead crows in the New York City area. By 2002 over 15,000 horses were diagnosed with West Nile Virus in 41 states.

Birds & Mosquitoes Play A Role In Transmission

Like Eastern and Western equine encephalomyelitis viruses, which historically have been identified with sleeping sickness in humans and equines in the U.S., WNV circulates in nature between birds and mosquitoes. Various species of birds serve as amplifying hosts of the virus, with at least 36 species of mosquitoes acting as vectors of WNV and transmitting it to a wide range of species. The strains of WNV present in North America are capable of causing disease in certain domestic and exotic species of birds, especially crows and blue jays, in which the infection is usually fatal. Humans, horses and a diversity of other mammalian species can also be infected with WNV. WNV infection in mammals does not result in large amounts of the virus in the bloodstream, as is seen in various bird species. This is important in terms of disease transmission. Because there is only a very small amount of the virus in the blood of infected horses, mosquitoes are unable to transmit the virus from horse to horse or from horse to human. The virus is transmitted when a mosquito takes a blood meal from an infected bird, then feeds on a horse. During the process of taking a blood meal from the horse, the virus is transmitted by the infected mosquito.

Clinical Signs

Horses and humans can become clinically affected by WNV. Typical of numerous other viral infections, many horses experience no clinical illness following exposure to the virus for the first time.

In horses infected with WNV, the virus may breach the blood-brain barrier and damage the brain and spinal cord. While the clinical signs of WNV encephalomyelitis can vary in range and severity, those most frequently observed include incoordination or ataxia (especially of the hind limbs); twitching of the muzzle and lower lip; and twitching of the

muscles in the neck, shoulders or pectoral region. Signs may be bilateral or unilateral. Also reported are behavioral abnormalities (e.g., depression or heightened sensitivity to external stimuli, stumbling, toe dragging, leaning to one side and in severe cases, paralysis of the hindquarters, recumbency, coma and death. Other clinical signs that may be noted include fever, generalized weakness, impaired vision, inability to swallow, aimless wandering and convulsions. The nature and severity of clinical signs depend largely on the area(s) of the central nervous system affected by the virus and the extent of damage. The incidence of disease tends to be greater in older horses, where a favorable clinical outcome is less likely.

Diagnosis of WNV encephalomyelitis is usually based on the nature of the clinical signs displayed by an affected horse together with the detection of antibodies to the virus in the blood by laboratory examination. It is important to emphasize that many of the clinical signs of WNV encephalomyelitis closely resemble those observed in a number of other equine neurological diseases (e.g., Eastern equine encephalitis, rabies, equine protozoal myeloencephalitis, equine herpesvirus-1 and botulism) from which it must be distinguished.

Treatment

At the present time, there is no specific anti-viral treatment for WNV encephalomyelitis. Management should focus on controlling pain and inflammation. Anti-inflammatory drugs should be provided as soon as possible to control inflammatory changes in the central nervous system. Other supportive measures such as intravenous fluids, sedatives and nutritional support can be important components of therapy. It is important to consult your veterinarian immediately if you suspect your horse is affected with WNV encephalomyelitis so that the appropriate treatment measures can be implemented without delay.

Prevention

A number of measures can be taken to help protect your horse against WNV. These are comprised of management strategies to reduce exposure to mosquitoes and immunizing against the disease. Horses vaccinated against Eastern, Western or Venezuelan equine encephalomyelitis are not protected against WNV. In February 2003, a vaccine was licensed by the USDA's Center for Veterinary Biologics for use in healthy horses. The vaccine has been used extensively to prevent WNV infections in horses. The vaccine should be administered as a series of two doses given three to six weeks apart. Foals should receive three immunizations starting at 6 months of age if the mare was immunized against WNV 30 days prior to foaling. The duration of immunity from vaccination is not known. It is recommended to vaccinate every four months in regions where the virus is active. Contact your veterinarian for the appropriate vaccination schedule for your location. In 2003, a recombinant canarypox vaccine was licensed for vaccination against WNV in horses. The vaccine has yet to be scrutinized in field conditions, but experimental studies reveal that it is protective against development of viremia involving WNV-infected mosquitoes.

Aside from vaccination against WNV, other measures should be taken to reduce the risk of your horse being bitten by a virus-infected mosquito. Concerted efforts should be made to eliminate or reduce potential mosquito breeding sites by disposing of old receptacles, tires and containers and eliminating areas of standing water on farms or at racetracks and wherever horses congregate.

Clean clogged roof gutters and turn over plastic wading pools or wheelbarrows when not in use. Thoroughly clean livestock watering troughs at least monthly. When it is not possible to eliminate particular breeding sites, measures should be taken to control mosquito populations through the selective use of larvicides and, under special circumstances, adulticides. Such action should only be taken, however, in consultation with your local mosquito control authority. If the application of such preparations is not advisable, use a species of fish that feed on mosquito larvae before they hatch. Keep horses indoors during peak mosquito activity periods (dusk to dawn). Screen stalls (if possible) or at least install fans over the horses to help deter mosquitoes. Avoid turning on lights inside the stable during the evening or overnight. Because mosquitoes are attracted to light, placing incandescent bulbs around the perimeter of the stable will attract mosquitoes away from the horses. Lights can also be used to draw mosquitoes to electric bug zappers.

The use of insect repellent that contain pyrethrin on horses can also reduce the chance of being bitten by mosquitoes. Remove any birds (including chickens) located in or close to a stable. Some veterinarians have success by hanging cattle ear tags on horse halters. These ear tags have been impregnated with insecticide and often reduce the effects of not only mosquito biting, but also midges and the effects of “fly-strike” dermatitis around the ears.

Because WNV can affect humans as well as horses, don't forget to take actions to protect yourself as well. When outdoors in the evening, wear clothing that covers your skin and apply plenty of mosquito repellent.

Conclusion

You as a horse owner need to become well-informed of the potential consequences of infection with this virus, as with all diseases, and take appropriate measures to reduce the risk of transmission of WNV to your horse(s). Prevention is key to the control of this infection. You should consult your local veterinarian on how best to protect your horse(s) against this disease.

For more information, contact your veterinarian.

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