



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.

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; 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., rabies, equine protozoal myeloencephalitis and botulism, from which it must be distinguished.

TREATMENT & PREVENTION

At the present time, there is no specific anti-viral treatment for WNV encephalomyelitis. Supportive care should be implemented as soon as possible after the onset of clinical signs. Intravenous fluids are indicated, and anti-inflammatory drugs should be provided to help decrease the inflammatory changes in the central nervous system. 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.

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. In February 2003, a vaccine was licensed by the USDA's Center for Veterinary Biologics, for use in healthy horses as an aid in the prevention of West Nile viral disease.

At this point, well over seven million doses of the vaccine have been distributed, without any significant reports of adverse side effects. There is mounting evidence following its extensive use in the field that vaccination provides a significant degree of protection against WNV encephalomyelitis in the majority of vaccinated horses. In view of the widespread distribution of the virus in many states, it is recommended that horse owners seriously consider having their horse(s) vaccinated against the disease. They need to do so in consultation with their veterinarian, who can best advise on the most appropriate vaccination schedule.

The vaccine should be administered as a primary course of at least two doses given three to six weeks apart, with a second dose given not less than one month prior to the onset of mosquito season. A booster vaccination should be administered annually or more frequently in areas of extended vector activity. You should consult your veterinarian on the earliest age to initiate vaccination of foals and the frequency of

booster vaccination. It must be emphasized that horses vaccinated against Eastern, Western or Venezuelan equine encephalomyelitis are not protected against WNV.

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. Where 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 preparations on horses can also reduce the chance of being bitten by mosquitoes. Not all insect repellents or foggers are effective against mosquitoes, so read the label carefully before using. Remove any birds, including chickens, located in or close to a stable.

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.

About the author: *A native of Dublin, Ireland, Dr. Peter Timoney received his veterinary degree from the National University of Ireland, University College Dublin in 1964 and earned an MS from the University of Illinois, PhD from the University of Dublin (Trinity College) and FRCVS from the Royal College of Veterinary Surgeons, London. Dr. Timoney is Director of the Maxwell H. Gluck Equine Research Center, Frederick Van Lennep Chair in Equine Veterinary Science at the University of Kentucky and Chair of the Department of Veterinary Science.*