



Prevention of West Nile Virus Infection in Horses

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West Nile encephalitis (inflammation of the brain) is caused by a mosquito-borne virus. This virus was first recognized in the United States in August of 1999. Infection with this virus does not always cause illness in animals, but can cause fatal encephalitis in people and horses.

Transmission

Mosquito vectors (carriers) become infected with the West Nile Virus (WNV) by feeding on infected wild birds. Occasionally, infected mosquitoes can transmit the virus to people and horses when biting to consume blood. Humans and horses are thought to be incidental hosts. Incidental hosts are animals that once infected cannot be a source of infection for mosquitoes or other animals. The only vector proven to be involved in West Nile Virus outbreaks in the U.S. is mosquitoes. There have been 24 different species of mosquitoes identified positive for the West Nile Virus in the U.S. since 1999. Infection with this virus does not always lead to disease. Horses tend to be infected with the virus more than other animals.

Clinical Signs

The West Nile Virus infects the central nervous system of animals and people. Infected horses showing clinical signs of disease will eventually show neurological signs relating to encephalitis or inflammation of major nerves. The clinical course of the disease will progress from non-specific signs such as fever, loss of appetite, and depression to severe neurological signs. Neurological signs are related to damage to the central nervous system. These signs may include behavioral changes, ataxia (wobbliness), head pressing, excitability, teeth grinding, incoordination, muscle tremors of face or neck, blindness, inability to swallow, seizures, and coma. It is important to remember that other serious diseases like Eastern Equine Encephalitis, Western Equine Encephalitis, and rabies can cause similar symptoms in a horse. A blood test is necessary to confirm a diagnosis of WNV infection in the live horse.

Treatment and Prevention

Only supportive therapy can be used to treat horses infected with WNV because there is no specific treatment for this viral infection. It is critical to accurately diagnosis the cause of equine encephalitis since it can be a vector-borne disease. The occurrence of West Nile encephalitis indicates

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that there are mosquitoes in the area that are infected with the virus.

Mosquito control and vaccination of horses may significantly reduce the incidence of this disease. Vector (mosquito) control is the most important step that can be taken to prevent the spread of this virus to people and other animals. Mosquito control will involve removing mosquito-breeding sites to decrease the number of mosquitoes hatching which will reduce the mosquito population in a geographical area. Mosquitoes may breed in even small amounts of stagnant water; eliminating as many sources of standing water as possible is important. Mosquitoes will breed in any water that stagnates for four days or longer. Ways to eliminate man-made mosquito-breeding sites include the following.

1. Store or dispose of all water-holding containers or objects such as pots, buckets, or old tires to prevent unwanted standing water sources.
2. Thoroughly clean and refill livestock watering troughs or buckets every few days.
3. Drill holes in containers left outside to promote drainage and prevent water retention.
4. Keep roof gutters clean of leaf litter and debris to prevent clogging.
5. Turn over outdoor equipment like wheelbarrows and plastic children pools.
6. Change water in birdbaths every three days.
7. Eliminate areas of standing water on property whenever feasible.
8. If water drainage is not possible, then mosquito larvicides may be used in some situations to control immature mosquitoes. Products which contain *Bacillus thuringiensis*, *Bacillus sphaericus*, or methoprene are typically safe products which are available in granular or briquet formulations and are host specific for mosquito control. Always read and follow label directions before using any pesticide product for larval control.

Another aspect of mosquito control is reducing exposure of horses to mosquitoes. There are several steps that can be taken to minimize exposure. Topical application of insect repellants applied according to manufactures' label instructions should reduce exposure. Insect repellants should not be the only protection used to prevent exposure to mosquitoes. If possible, horses should be stalled at night in barns with well-maintained insect window screens and fans. During evening

and night hours, avoid using yellow incandescent lights because mosquitoes are attracted to this type of lighting. Also, fogging horse premises in the evening may help minimize the adult mosquito population. There are numerous wild bird species that are potential reservoirs for the West Nile Virus, so another aspect of prevention is to eliminate areas where birds might roost around horse housing.

Although mosquito and bird control measures are helpful in reducing a horse's risk of WNV, a newly available equine vaccine offers a first line defense against the disease. The vaccine is a killed virus product given in the muscle. Two vaccinations are given three to six weeks apart, followed by a booster. The time to booster will vary according to the vaccine brand given. If a horse develops symptoms of illness suggestive of West Nile encephalitis, it may not be possible to differentiate between a vaccinated horse and a horse naturally infected with WNV. Therefore, it is critical that accurate vaccination records are maintained for each horse receiving the vaccine. The vaccine is restricted to veterinary use only. Contact your local veterinarian about using the WNV vaccine to protect your horses.

Public Health

WNV infected horses are not considered to be a source of infection for other horses, animals, people, or mosquitoes.

The only way WNV has been transmitted in the U.S. so far is through the wild-bird-mosquito-cycle. People are exposed to the WNV from the bite of a mosquito infected with the virus. As in horses, human infection with the WNV does not always cause clinical illness. Most people with a WNV infection will experience, fever, body aches, headache, skin rash, and swollen lymph nodes lasting two to four days. People greater than 50-years-old are at greater risk of the severe form of WNV infection. Severe human cases of WNV may include additional signs such as neck stiffness, convulsions, disorientation, paralysis, and coma.

For more information on West Nile encephalitis contact a local veterinarian or county health personnel.

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