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THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

Veterinary Preventive Medicine, 1900 Coffey Road, Columbus, OH 43210

West Nile Virus Fact Sheet For Veterinarians

West Nile Virus (WNV) had never been seen in the Western Hemisphere prior to 1999. It has a geographic range greater than any other known arbovirus. It is found throughout Africa and north to central Europe and eastern Asia. The earliest epidemic of West Nile fever occurred in Israel and involved more than 500 hospitalized patients; this epidemic was recognized retrospectively. The largest epidemic of WN fever on record occurred in South Africa during 1974. This epidemic involved an area of about 2,500 km^2 in the Karoo and southern Cape provinces and resulted in thousands of human infections. More recently, epidemics of West Nile fever have occurred in Romania (1996-97), Czechland (1997), Italy (1998), Russia (1999), and Israel (2000) so that it is considered a reemerging mosquito-borne disease in Europe. How WNV managed to be introduced into the United States is unknown. Nor is it known how long it has been here. There is speculation that it was through the importation of birds or possibly a mosquito transported to the United States by ship or airplane.

West Nile Virus is a member of the Japanese encephalitis virus complex of the genus *Flavivirus*, family Flaviviridae. This genus includes nine viruses distributed around the world. In the United States, the complex has two other representatives — Powassan and St. Louis Encephalitis (SLE) viruses. Both cause encephalitis in humans. The epidemiology of WNV is nearly identical to that of SLE virus. Both are principally carried by species of *Culex* mosquitoes and have birds as the reservoir. They differ in that WNV causes disease and mortality in humans, wildlife (birds, particularly crows and blue jays), and domestic animals, particularly horses. St. Louis encephalitis does not cause any remarkable disease in wildlife or mammals other than man.

Epidemiology

Early outbreaks of WNV in horses occurred in 1962 in France, 1963 in Egypt, 1996 in Morocco, 1998 in Italy, and in 1999 and 2000 in the United States. In France, they recorded a 10% morbidity with a 30% mortality rate. In Egypt, they reported prevalence of infection from 14 to 89%, depending on the area tested. However, morbidity and mortality data were not available. In Morocco, the case fatality rate was 44.7% (42/94) and in Italy it was 42% (6/14). In the United States in 1999, 9 of 25 (36%) horses with clinical signs of the disease died or were euthanized. In 2000, 60 cases of WNV were reported in horses from seven states, and 23 horses either died or were euthanized (38%). As of December 1, 2001, more than 500 horses have developed clinical signs of WNV infection in 19 states, with 73 fatalities to date.

Clinical Signs

In the Italian outbreak, all cases exhibited varying degrees of ataxia and weakness in the hind limbs. Asymmetric weakness was detected in the rear limbs of some horses. Some cases also had involvement of one or both forelimbs. In six cases, there was progression of clinical signs with ascending paresis leading to tetraplegia and recumbency within nine days. Depressed mental

state and tremors were noted in a few cases; however, there were no behavioral or head posture abnormalities or cranial nerve involvement. In the U.S. cases, for the horses that died or were euthanized, death usually occurred within five days.

Pathology

No gross pathologic lesions were detected. Histologically, all animals exhibited slight to moderate nonsuppurative encephalomyelitis, primarily in the spinal cord and lower brainstem affecting both grey and white matter. The most severe lesions were in the thoracic and lumbar spinal cord.

Differential Diagnosis

Rabies, botulism, EPM, CVM, EHV1, EDM and other encephalitis such as WEE, EEE, and VEE, would all have to be considered. Many of the cases have looked similar to commonly diagnosed neurologic diseases, particularly EPM. Therefore, diagnostic rule-outs are necessary. See The Ohio State University web site given later in this fact sheet for aids in differential diagnosis.

Diagnosis

Due to the zoonotic potential of WNV, all horses that develop neurologic signs from August to October should be considered WNV suspects, particularly if the virus has been detected in Ohio close to the animal you are examining. **Whole blood, serum, and CSF (if collected) samples should be submitted to ODA/ADDL. Complete histories should be submitted with all samples (form available on the OSU web site).** If the animal is demonstrating rapidly progressive neurologic signs with recumbency, the animal should be submitted to the Ohio Department of Agriculture/Animal Disease Diagnostic Laboratory in Reynoldsburg, Ohio, for rabies and WNV testing. Other diagnostics include PCR of CNS tissues and immunohistochemistry. If you decide to perform a postmortem in the field, please refer to USDA guidelines. (See the OSU web site.)

Treatment

In the Italian outbreak, no treatments were effective. Similar findings occurred in the U.S. cases, as well. Regardless of the treatment, horses that survive usually recovered very quickly. Supportive care is the only therapeutic alternative.

Prevention

There is a new vaccine available for prevention of WNV infection in horses. This is a killed vaccine that must be given in two doses initially, three to six weeks apart. Both doses should be completed at least three weeks prior to mosquito season. Efficacy data is not available at this time; however, the vaccine is considered very safe. Reduce mosquito breeding sites; decrease exposure to adult mosquitoes; provide screened housing; use insect repellents; and reduce outdoor exposure. Local mosquito-control authorities may be able to help in assessing the mosquito breeding risks associated with a specific property.

Contact Veterinarian

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What Is the Status of WNV in Ohio?

As of August 2001, **WNV has been confirmed in Ohio.** Infected mosquitoes and birds were found in 29 Ohio counties in 2001. Therefore, it is likely that the virus is present throughout the state. Contact your local health department or log on to the web sites listed here.

For the current status on WNV in Ohio and for more information, you can log on to the following web sites:

Ohio State University:
http://prevmed.vet.ohio-state.edu/

Ohio Department of Health:
http://www.odh.state.oh.us/ODHPrograms/ZOODIS/ZooMain1.htm

Visit Ohio State University Extension's WWW site "Ohioline" at:
http://ohioline.ag.ohio-state.edu

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