TO: Vermont Health Care Providers and Veterinarians
DATE: August 7, 2024
FROM: Natalie Kwit, DVM, MPH, DACVPM, State Public Health Veterinarian

Mosquito- and Tickborne Virus Detections in Vermont

Summary

Eastern equine encephalitis (EEE), a mosquito-transmitted arbovirus that can cause serious and potentially fatal disease in humans and animals, was detected in mosquitoes collected in Alburgh and Swanton on July 22. West Nile virus has also been detected this year in Alburgh, Hardwick, St. Albans and Vergennes.

Requested Actions

- Test for arbovirus infections in patients presenting with signs and symptoms of meningitis or encephalitis.
- Report all suspect or confirmed arbovirus infections to the Vermont Department of Health by calling 802-863-7240.

Background

As mosquitoes become more active during the summer, the risk of illnesses spread by mosquitoes increases in the state. There have been no human cases of EEE or West Nile in Vermont this year. The most recent confirmed cases of EEE were in two people in 2012, both of whom died. While arbovirus activity is still relatively low statewide, these early detections of EEE virus in Vermont raise the potential for illnesses in humans and susceptible animals until a hard frost.

Also of concern is Powassan virus disease, a rare but serious illness spread by ticks that is on the rise in the northeastern United States. The first two confirmed cases of Powassan virus disease in Vermont residents since 1999 were reported from Windsor County in 2022, and Orange County in 2023. Jamestown Canyon, another mosquito-borne arboviral disease, has not been reported in Vermont to date but the virus has been detected in mosquitoes and has caused human illnesses in neighboring states.

The Health Department tests mosquitoes for WNV and EEE virus to help inform communities about potential risk. Mosquito collection and testing typically occurs from July to mid-October. Mosquito testing results and reports of human and animal illnesses are summarized on the Department's mosquito surveillance webpage.

Clinical Presentation and Evaluation

Most persons infected with EEE virus have no apparent illness. Symptomatic infection is characterized by fever, chills, malaise, arthralgia, and myalgia. Most people recover completely in 1 to 2 weeks unless central nervous system involvement is present. Less than 5% of infected

individuals develop meningitis or encephalitis. Persons aged >50 and <15 years seem to be at greatest risk for developing severe disease. Signs and symptoms in patients with neuroinvasive disease include headache, confusion, focal neurologic deficits, meningismus, seizures, or coma. EEE neuroinvasive disease is estimated to have a 30% case fatality rate and results in neurologic sequelae (such as seizure disorders, hemiplegia, and cognitive dysfunction) in more than 50% of survivors.

EEE virus disease should be considered in any person with a febrile or acute neurologic illness who has had recent exposure to mosquitoes, especially during late summer months in areas where virus activity has been reported.

In addition to other more common causes of encephalitis and aseptic meningitis (e.g., herpes simplex virus and enteroviruses), other arboviruses (e.g., West Nile, Powassan, and Jamestown Canyon viruses) should also be considered in the differential etiology of suspected EEE illness.

Diagnostic Testing

Serologic testing is the primary method for diagnosing WNV, EEE virus, JCV, and Powassan virus infection. If samples taken early in the course of illness are negative, a convalescent sample may be necessary for accurate diagnosis. Ideal timing of specimens for serology:

Acute: three to 10 days after onset of symptoms
Convalescent: two to three weeks after acute sample

A rapid and accurate diagnosis of acute arboviral disease can be made by the detection of virus-specific IgM antibody in serum or cerebrospinal fluid (CSF). The detection of only IgG antibody is not suggestive of an acute infection. PCR on a CSF sample can also be diagnostic when testing is done early in the course of illness.

WNV, EEE virus, and Powassan virus antibody tests are available commercially. However, a positive IgM test result should be confirmed by neutralizing antibody testing at the CDC, arranged through the Health Department Laboratory. Contact the Infectious Disease Epidemiology Program at the Health Department by calling 802-863-7240 to coordinate confirmatory testing.

For Veterinarians

Both WNV and EEE virus infections can cause severe illness and death in unvaccinated, susceptible animals. Consider diagnostic testing in animals with one or more of the following clinical signs:

- Ataxia or stumbling and incoordination
- Inability to stand
- Acute paralysis or limb weakness
- Sudden death with no other diagnosis
- Severe hemorrhagic enteritis (EEE in emus)

The Vermont Department of Health can coordinate free postmortem testing of highly susceptible species (e.g., horses, donkeys, mules, alpacas, llamas) by request. For antemortem diagnostic testing, please submit serum or CSF specimens to your routine veterinary diagnostic reference laboratory for IgM-capture ELISA and PCR testing. Report cases of WNV or EEE in animals by calling the Health Department at 802-863-7240.

Additional Resources

- Mosquito Surveillance webpage (Vermont Department of Health)
- Eastern Equine Encephalitis Virus webpage (CDC)
- Eastern Equine Encephalitis webpage (Vermont Department of Health)
- West Nile Virus webpage (CDC)
- Powassan Virus webpage (CDC)
- Jamestown Canyon Virus webpage (CDC)
- Eastern Equine Encephalitis and West Nile Virus Testing in Animals (Vermont Department of Health)

If you have any questions, please contact State Epidemiologist Patsy Kelso, PhD, at: Patsy.Kelso@vermont.govi.

To be removed from the HAN or have your information updated please email the Vermont HAN Coordinator at: vthan@vermont.gov.

HAN Message Type Definitions

Health Alert: Conveys the highest level of importance; warrants immediate action or attention.
Health Advisory: Provides important information for a specific incident or situation; may not require immediate action.
Health Update: Provides updated information regarding an incident or situation; unlikely to require immediate action.
Info Service Message: Provides general correspondence from VDH, which is not necessarily considered to be of an emergent nature.