



NORAD-USNORTHCOM/SG

West Nile Virus

Guidelines for Clinicians

This information has been collected and distributed for informational use on West Nile Virus (WNV) by the NORAD-NORTHCOM Command Surgeon.

Mild Infection

Most WNV infections are mild and often clinically unapparent. Approximately 20% of those infected develop a generally mild illness (West Nile fever). The incubation period is thought to range from 3-14 days. Symptoms generally last 3 to 6 days, though fatigue may persist for longer. Earlier outbreaks describe the mild form of WNV infection as a febrile illness of sudden onset accompanied by:

- malaise
- anorexia
- rash
- headache
- myalgias
- eye pain
- nausea
- vomiting
- lymphadenopathy

Severe Infection

Approximately 1 in 150 infections will result in severe neurological disease. The most significant risk factor for developing severe neurological disease is advanced age. Encephalitis is more commonly reported than meningitis. Symptoms seen among patients hospitalized with severe disease included:

- fever
- weakness
- gastrointestinal symptoms
- change in mental status

A minority of patients with severe disease developed a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs.

Several patients experienced severe muscle weakness and flaccid paralysis. Neurological presentations included:

- ataxia and extrapyramidal signs
- cranial nerve abnormalities
- optic neuritis
- polyradiculitis
- myelitis
- seizures

Although not observed in recent outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have been described.

Clinical Suspicion

Diagnosis of WNV infection is based on a high index of clinical suspicion and results of specific laboratory tests. WNV, or other arboviral diseases such as St. Louis encephalitis, should be strongly considered when:

- Adults >50 years of age develop unexplained encephalitis or meningitis in summer or early fall.
- WNV is present in the local animal or human population.
- Recent travel history indicates possible exposure.

Note: Severe neurological disease due to WNV infection has occurred in patients of all ages. Year-round transmission is possible in warm climates. Therefore, WNV should be considered in all persons with unexplained encephalitis and meningitis. However, enteroviruses are more commonly responsible for aseptic meningitis and must also be considered.

Diagnostic Testing

WNV testing for patients with encephalitis, meningitis, or other serious central nervous system infections can be obtained through local or state health departments.

Ideally, MAC-ELISA testing should be performed on CSF or serum specimens collected within 8 days of onset of illness, using both WNV and SLE virus. If the MAC-ELISA results for WNV and SLE are similar, it is necessary to use the plaque-reduction neutralization test (PRNT) to confirm either a WNV or SLE virus infection.

Note: Patients who have been recently vaccinated against or recently infected with related flaviviruses (e.g., yellow fever, Japanese encephalitis, dengue) may have positive WNV MAC-ELISA results. Again, a recent travel history will help in determining risk.

Laboratory Findings

Among patients in recent outbreaks:

- Total leukocyte counts in peripheral blood were mostly normal or elevated, with lymphocytopenia and anemia also occurring.
- Hyponatremia was sometimes present, particularly among patients with encephalitis.
- Examination of the cerebrospinal fluid (CSF) showed pleocytosis, usually with a predominance of lymphocytes.
- Protein levels were universally elevated.
- Glucose levels were normal.
- Computed tomographic scans of the brain typically did not show evidence of acute disease, but in about one-third of patients, magnetic resonance imaging showed enhancement of the leptomeninges, the periventricular areas, or both.

Treatment

Treatment is supportive, often involving hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections for patients with severe disease.

- Ribavirin in high doses and interferon alpha-2b were found to have some activity against WNV in vitro, but no controlled studies have been completed on the use of these or other medications, including steroids, antiseizure drugs, or osmotic agents, in the management of WNV encephalitis.

Reporting Suspected WNV Infection

Refer to local and state health department reporting requirements:

http://www.cdc.gov/ncidod/dvbid/westnile/city_states.htm

- WNV encephalitis is on the list of designated nationally notifiable arboviral encephalitides.
- Aseptic meningitis is reportable in some jurisdictions.

The timely identification of persons with acute WNV or other arboviral infection may have significant public health implications and will likely augment the public health response to reduce the risk of additional human infections.