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CDC HEALTH ADVISORY

Distributed via Health Alert Network
Wednesday, August 21, 2002, 13:05 EDT (01:05 PM EDT)
CDCHAN-00092-2002-08-21-ADV-N

West Nile Virus (WNV) Infection - Information for Clinicians

Clinical Features

Mild Infection

Most WNV infections are mild and often clinically unapparent.

- Approximately 20% of those infected develop a mild illness (West Nile fever).
- The incubation period is thought to range from 3 to 14 days.
- Symptoms generally last 3 to 6 days.

Reports from earlier outbreaks describe the mild form of WNV infection as a febrile illness of sudden onset often accompanied by

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

The full clinical spectrum of West Nile fever has not been determined in the United States.

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.

In recent outbreaks, symptoms occurring among patients hospitalized with severe disease include

- 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 and nerve abnormalities
    - myelitis
    - optic neuritis
    - polyradiculitis
    - 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 obtaining specific laboratory tests.

- WNV, or other arboviral diseases such as St. Louis encephalitis, should be strongly considered in adults ≥50 years who develop unexplained encephalitis or meningitis in summer or early fall.
- The local presence of WNV enzootic activity or other human cases should further raise suspicion.
- Obtaining a recent travel history is also important.

Note: Severe neurological disease due to WNV infection has occurred in patients of all ages. Year-round transmission is possible in some areas. Therefore, WNV should be considered in all persons with unexplained encephalitis and meningitis.

Diagnosis and Reporting

Procedures for submitting diagnostic samples and reporting persons with suspected WNV infection vary among states and jurisdictions. Links to state and local websites are available at

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

Diagnostic Testing

WNV testing for patients with encephalitis or meningitis can be obtained through local or state health departments.

- The most efficient diagnostic method is detection of IgM antibody to WNV in serum or cerebral spinal fluid (CSF) collected within 8 days of illness onset using the IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA).

- Since IgM antibody does not cross the blood-brain barrier, IgM antibody in CSF strongly suggests central nervous system infection.

- 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.

Reporting Suspected WNV Infection

Refer to local and state health department reporting requirements: **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.

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 was universally elevated.
- Glucose was normal.
- Computed tomographic scans of the brain mostly 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.

For additional clinical information, please refer to Petersen LR and Marfin AA, "West Nile Virus: A Primer for the Clinician [Review]," Annals of Internal Medicine (August 6) 2002: 137:173-9.

For clinical and laboratory case definitions, see "Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, 2001," at *www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm*

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