

West Nile Virus Update

August 1, 2008

2008 update

Clark County's first probable human case of West Nile Virus (WNV) infection for the 2008 season was reported on July 28, 2008. In addition to receiving the first human case report, the Southern Nevada Health District (SNHD) Environmental Health (EH) vector control program detected WNV in a cluster of mosquitoes in Clark County in 89122 zip code area. In Nevada, WNV has also been found in mosquito pools in Lovelock, Pershing county.

Generally, the peak season for reported WNV cases in Nevada is between early July and mid-September. While Nevada only had 12 cases of WNV last year, this season may see a higher number of cases due to hot weather and budget cuts that resulted in limited mosquito control activities.

Background

WNV is a single-stranded RNA virus of the family Flaviviridae and is a member of the Japanese encephalitis complex, which includes: Japanese, St. Louis, Murray Valley encephalitis, and Kunjin (Australian subtype of WNV). The close antigenic relationships among these viruses often results in serologic cross-reactivity in diagnostic laboratory testing (1).

WNV is primarily maintained in nature in the bird-mosquito transmission cycle. Humans, horses, and other mammals are primarily infected when bitten by a mosquito that has previously fed on an infected bird. In rare cases, WNV has been spread through blood transfusions, organ transplants, breastfeeding, and during pregnancy from mother to baby. However, mammals are considered to be dead end hosts, as they do not maintain high enough viral loads to transmit WNV (1).

WNV Surveillance

SNHD EH specialists routinely survey and treat known breeding sources for mosquitoes and trap them for identification. In addition to testing for WNV, mosquitoes are tested for western equine encephalitis and St. Louis encephalitis. SNHD mosquito surveillance covers Clark, Lincoln, Nye, and White Pine counties.

Clinical Description

Most individuals infected with WNV (80%) experience no symptoms. Nearly 20% of those infected develop a syndrome referred to as West Nile fever; only 1 in 150 infections results in severe neurological disease. Individuals over the age of 50 years are at increased risk of developing severe neurologic disease although these symptoms have occurred in individuals of all ages. Table 1 lists symptoms associated with both West Nile Fever and West Nile encephalitis/meningitis (2).

Laboratory findings/testing

Table 1: WNV Symptoms

West Nile Fever	West Nile encephalitis/meningitis
Fever	Fever
Anorexia	Muscle weakness
Nausea	Gastrointestinal symptoms
Vomiting	Change in mental status
Eye Pain	Flaccid paralysis
Headache	Cranial nerve abnormalities
Myalgia	Myelitis
Rash	Optic neuritis
Lymphadenopathy	Polyradiculitis
Malaise	Seizures
	Ataxia and extrapyramidal signs

Laboratory findings among patients in recent outbreaks include:

- Peripheral blood total leukocyte counts were mostly normal or elevated, with lymphocytopenia and anemia also occurring.
- Hyponatremia was sometimes present, particularly among patients with encephalitis.
- CSF pleocytosis, usually with a predominance of lymphocytes.
- CSF protein was elevated and glucose was normal.
- CT scans of the brain did not show evidence of acute disease in most cases. In approximately one-third of patients, MRI revealed enhancement of the leptomeninges, the periventricular areas, or both.

During WNV season, SNHD recommends that health-care providers who have patients with aseptic meningitis or unexplained febrile illness consider testing for WNV. The recommended diagnostic analyses for patients suspected of having WNV infection include tests for both IgM and IgG WNV serum antibodies. Specimens for IgM analysis should be collected within 8-14 days of symptom onset. Cerebrospinal fluid can also be analyzed from patients with neuroinvasive disease but must be tested in conjunction with serum. These tests are available through commercial laboratories (2).

Prevention

In addition to identifying and confirming cases of WNV, healthcare providers can also play a role in minimizing the number of WNV cases by educating patients about the disease and encouraging them to take protective measures against infection. Surveys from cases in 2004 and 2005 indicated that although most cases were familiar with WNV and how it was transmitted, few took action to protect themselves against infection. Thus, it is important for individuals to receive education on simple measures that can be taken to minimize exposure to mosquitoes (2). Examples of such measures are included in Box 1 below:

Box 1: Protective Measures Against Mosquito Bites

- When outdoors, use insect repellents containing DEET, Picaridin, or oil of lemon eucalyptus, according to manufacturer's instructions.
- Wear pants and long sleeved shirts when outdoors.
- Avoid spending time outside at dawn and dusk, when mosquitoes are most active.
- Eliminate areas of standing water, including bird baths and unmaintained swimming pools.
- Make sure doors and windows have tight-fitting screens without tears or holes.

If you have any questions or need to report positive WNV results, please contact the SNHD Office Of Epidemiology at 702-759-1300, Monday thru Friday, 8am-4:30 pm.

For patient education materials, please visit our website at:

http://www.southernnevadahealthdistrict.org/west_nile_virus/west_nile_related_websites.htm

References:

- (1) Centers for Disease Control and Prevention, Division of Vector-Borne Infectious Diseases, West Nile Virus. West Nile Virus: Epidemiologic Information for Clinicians. Accessed at: <http://www.cdc.gov/ncidod/dvbid/westnile/clinicians/epi.htm>
- (2) Daley, Katie. August 2006-West Nile Virus Update. Southern Nevada Health District Epidemiology Newsletter. Aug 2006. Accessed at: http://www.southernnevadahealthdistrict.org/physician/download/newsletter_06_aug.pdf