

## WEST NILE VIRUS: FIRST LOCALLY ACQUIRED CASE IN LOS ANGELES COUNTY

### BACKGROUND

West Nile virus (WNV) was first isolated in the West Nile district of Uganda in 1937. WNV was first recognized in North America when an arboviral encephalitis outbreak was investigated by the New York City Department of Health and Mental Hygiene in Queens in August 1999. Since that time, WNV has spread to 46 states in the US with human cases reported from 45 states in 2003. The basic transmission cycle involves mosquitoes feeding on wild birds infected with the West Nile virus, then spreading the virus to other birds during subsequent feeding. Infected female mosquitoes incidentally transmit West Nile virus to humans and other animals when taking a blood meal.

Human-to-human transmission of WNV generally does not occur. However, human WNV infection was associated with WNV-infected blood transfusion and organ transplants in 2002. Beginning in June 2003, blood and organ donations are screened for WNV infection.

The incubation period for WNV infection is accepted to be between 3–14 days. Most individuals, about 80%, who are infected with WNV will have asymptomatic infection. In about 20% of those humans infected with WNV will develop “West Nile fever”, a mild dengue-like illness of sudden onset, with a duration of 3–6 days. The signs and symptoms include fever, muscle pain, lymph node swelling, headache, abdominal pain, vomiting, rash, eye pain and anorexia. About 1 in 150 infected persons develop meningitis or encephalitis, which may be accompanied by an acute flaccid paralysis syndrome in rare instances. Advanced age is the primary risk factor for severe neurological disease and death.

Case History: In the summer of 2002, the first locally acquired case of WNV infection was reported in a healthy 31-year old female resident of Los Angeles County (LAC). In early August, she developed severe headache, fevers, stiff neck, nausea, and muscle weakness. She made two visits to a local hospital emergency room. On the second visit, she was admitted to the hospital for treatment of bacterial meningitis and observation with the diagnosis of viral versus bacterial meningitis. Her physician completed a thorough medical evaluation for both viral and bacterial meningitis including cerebral spinal fluid (CSF) testing for WNV infection. Her clinical course and laboratory results supported the diagnosis of viral meningitis and she was released from the hospital after 2 days.

The infectious disease consultant in this case had seen the article in *The Public's Health*<sup>\*</sup> on arboviral and WNV testing and requested testing from the LAC Public Health Laboratory (PHL). The patient's CSF specimen was sent to the LAC PHL and the Centers for Disease Control and Prevention (CDC) EIA IgM antibody was positive for WNV. Acute and convalescent serum specimens were subsequently obtained and were also IgM positive by the CDC EIA methodology for WNV infection. These laboratory results were duplicated at the State of California Department of Health Services Viral and Rickettsial Disease Laboratory. Further confirmatory WNV testing of the serum, using the Plaque Reduction Neutralization Testing, performed at the University of California at Davis, supported the diagnosis of WNV.

Interviews conducted by a medical epidemiologist at ACDC did not reveal any known risk factors for acquiring WNV infection. The case lived in southwestern LAC and reported no recent travel outside of California or LAC. She denied travel outside of the US. She lived near a park and cemetery and had no pets or ill household members. She reported no mosquito bites or seeing mosquitoes within 2 weeks prior to symptom onset. The case visited a local park 4 days prior to onset during the afternoon, and no mosquitoes were noticed. She worked in downtown Los Angeles delivering packages part-time during the day and reported no mosquito exposure during working hours. The patient denied ever having a blood transfusion, receiving any blood products, or having used IV drugs.

---

\* Acute Communicable Disease Control. West Nile virus heading for California. *The Public's Health* 2002;2(6):1,5. Available at: [www.lapublichealth.org/wwwfiles/ph/ph/ph/TPHJune\\_2002.pdf](http://www.lapublichealth.org/wwwfiles/ph/ph/ph/TPHJune_2002.pdf)

Local WNV surveillance in mosquito pools, sentinel chicken flocks, dead birds and sick equines revealed no evidence of WNV in Southern California during the summer of 2002. In response to this first WNV case, additional sentinel chicken flocks and mosquito traps were placed in the case's urban work routes and residential and recreational areas. Additionally, the local vector control district fogged the downtown Los Angeles area, which has *Culex quinquefasciatus* mosquitoes in the storm sewer system. Despite intensified mosquito and sentinel flock WNV surveillance in these areas, no additional local evidence for endemic WNV infection was noted.

In summary, the origin of the first case of WNV in LAC is not known—possible etiologies included exposure to WNV infected mosquitoes transported through airline or trucking from states endemic for WNV in 2002.

Public Health and Vector Control Districts Responses: Public information was provided on the DHS LAC Public Health web site and printed educational material were distributed to the media. Medical provider information was distributed to selected infectious disease specialists, neurologists, emergency room physicians, hospital administration including infection control practitioners and laboratory directors including clinical information as well as how to report cases of meningitis/encephalitis and submit clinical specimens to the PHL.

Surveillance was increased by the vector control districts, with increased testing of sentinel flocks and chickens through 2002. Dead bird testing was coordinated through LAC DHS Veterinary Public Health and the CA DHS.

## **PREVENTION**

Mosquito Control: The most effective prevention consists of residential mosquito habitat elimination: emptying buckets, birdbaths and other containers of stagnant water, maintaining ponds and swimming pools, and not over watering residential and recreational lawns. It is essential to ensure screens are in place on doors and windows and in good repair. Complaints of mosquito problems should be made to local vector control districts so that they can evaluate and initiate control measures.

Personal Protection: Avoidance of mosquito bites is essential to prevent WNV infection. This includes avoiding mosquito-prone areas (especially at dawn and dusk), use of protective clothing such as long sleeves and pants, and use of DEET based mosquito repellants when outdoor.