WESTERN EQUINE ENCEPHALITIS

Bioterrorism Agent Profiles for Health Care Workers

Causative Agent: Western Equine Encephalitis (WEE) is a mosquito-borne illness caused by an alphavirus of the *Togaviridae* family.

Routes of Exposure: Humans are primarily exposed to WEE through the bite of an infected mosquito.

Infective Dose & Infectivity: The infective dose is unknown. All people are considered susceptible though children are more likely to be severely affected.

Incubation Period: The incubation period is usually 5-10 days.

Clinical Effects: Most infections are asymptomatic. Mild cases often present with a nonspecific febrile illness or aseptic meningitis. Severe infections are usually marked by acute onset, headache, high fever, meningeal signs, stupor, disorientation, coma, tremors, occasional convulsions (especially infants) and spastic (but rarely flaccid) paralysis. Physical examination typically reveals nuchal rigidity, impaired sensorium, and upper motor neuron deficits with pathologically abnormal reflexes.

Lethality: The overall mortality rate for WEE is less than 3-4%, but is closer to 10% among children and older adults.

Transmissibility: WEE infection occurs when a person is bitten by an infected mosquito. The virus is not directly transmitted from person-to-person.

Primary Contamination & Methods of Dissemination: As a bioterrorism weapon, WEE would most likely be delivered via aerosolization.

Secondary Contamination & Persistence of Organism: Secondary transmission does not occur and WEE particles are not considered to be stable in the environment.

Decontamination & Isolation:

Patients – Standard precautions should always be practiced. Enteric precautions are appropriate for aseptic meningitis of unknown etiology until enterovirus meningoencephalitis is ruled out. When the diagnosis of WEE is known, specific isolation procedures are not indicated.

Equipment, clothing & other objects – 0.5% hypochlorite solution (one part household bleach and 9 parts water = 0.5% solution) is effective for environmental decontamination.

Laboratory testing: By the end of the first week of illness IgM, hemagglutination inhibition antibodies, and neutralizing antibodies can generally be found. During the next week they increase in titer. Complement fixation responses generally appear in the second week and rise thereafter. Four-fold titer rises are diagnostic, but because of serologic cross-reactions with other alphaviruses, neutralization tests are preferred. Examination of the CSF reveals a lymphocytic pleocytosis ranging from 10 to 400 mononuclear cells per microliter. WEE virus may occasionally be isolated from the CSF or throat swabs taken within the first 2 days of illness and is frequently recovered from brain tissue on postmortem examination.

Therapeutic Treatment: There is no specific therapy. Patients who develop severe illness may require anticonvulsant and intensive supportive care to maintain fluid and electrolyte balance, adequate ventilation, and to avoid complicating secondary bacterial infections. The extremes of high fever occasionally produced by WEE infection may require aggressive antihyperthermia measures.

Prophylactic Treatment: An investigational formalin-inactivated vaccine is available, but it is poorly immunogenic.

Differential Diagnosis: The differential diagnosis includes a number of infections including cytomegalovirus, herpes simplex encephalitis, St. Louis encephalitis, West Nile encephalitis, eastern equine encephalitis, Venezuelan encephalitis, leptospirosis, lyme disease, cat scratch disease, bacterial meningitis, tuberculosis, fungal meningitis, malaria, and *Naegleria* infection.

References:

Chin J. Control of Communicable Diseases Manual, Seventeenth Edition, American Public Health Association; 2000.

Smith JF, Davis K, Hart MK, et al. Viral Encephalitides. In: Zajtchuk R, Bellamy RF, eds. Medical Aspects of Chemical and Biological Warfare. Washington, DC: Office of the Surgeon General, U.S. Department of the Army; 1997:561-589.
Available at http://www.nbc-med.org/SiteContent/HomePage/WhatsNew/MedAspects/contents.html

For more information call (602) 364-3289

Frequently Asked Questions About Western Equine Encephalitis

What is Western Equine Encephalitis?
Western Equine Encephalitis (WEE) is a mosquito-borne viral disease that can affect the central nervous system and cause severe complications and death.

How do people become infected with WEE virus?
WEE virus is transmitted to humans through the bite of an infected mosquito. The main WEE transmission cycle is between birds and mosquitoes. Horses can also become infected with, and die from, WEE virus infection.

What causes WEE?
WEE is caused by a virus that is a member of the family *Togaviridae*, genus *Alphavirus*. It is closely related to Eastern and Venezuelan equine encephalitis viruses.

Where is WEE found?
WEE is found in North, Central, and South America, but most cases have been reported from the plains regions of the western and central United States.

What are the signs and symptoms of WEE?
Infection can cause a range of illnesses, from no symptoms to fatal disease. People with mild illness often have only a headache and sometimes fever. People with more severe disease can have sudden high fever, headache, drowsiness, irritability, nausea, and vomiting, followed by confusion, weakness, and coma. Young infants often suffer seizures.

How soon after exposure do symptoms appear?
Symptoms usually appear in 2 to 10 days after the bite of an infected mosquito.

How common is WEE?
Human cases occur relatively infrequently and can occur in isolated cases or in epidemics. Human cases in the US are usually first seen in June or July.

Who is at risk for developing WEE?
Anyone can get WEE, but those at increased risk include people who engage in outdoor work and recreational activities and people living in or visiting areas where the disease is common. WEE occurs in all age groups.

How can people avoid infection with WEE virus?
Though a vaccine is available to protect horses, there is no licensed vaccine for human use.

To avoid infection people should avoid mosquito bites by employing personal and household protection measures, such as using insect repellent containing DEET, wearing protective clothing, taking precautions from dusk to dawn when mosquitoes are most likely to bite, and controlling standing water that can provide mosquito breeding sites.

For more information or call (602) 364-3289