

VEE Virus and Related Alphaviruses as Bioterrorist Agents

Agent: Alphaviruses (formerly known as group A arboviruses) could theoretically be produced in either wet or dried form and stabilized for weaponization. Although most experts think that VEE virus is the alphavirus most likely to be used, other New World viruses include Western Equine Encephalitis (WEE) and Eastern Equine Encephalitis (EEE). The new world viruses typically cause encephalitis; old world alphaviruses include Chikungunya, O'nyong-nyong, Mayaro, Ross River, and Sindbis, and typically cause fever, rash, and arthropathy. If delivered by aerosol route, disease in humans and other animals would occur simultaneously. Attack in areas populated with horses, ratites (ostriches, emus, rheas, and cassowaries) and/or appropriate mosquito vectors could initiate both an epizootic and epidemic. The virus does not persist in the environment for long periods of time.

Disease: Venezuelan equine encephalomyelitis (VEE)

Incubation Period: 1-6 days

Signs/Symptoms: VEE may be characterized by sudden onset with malaise, high fever (101-105°F), severe headache, rigors, photophobia, myalgias (especially in the legs and lumbosacral area), cough, sore throat, and vomiting. These symptoms may be followed by a prolonged period of asthenia and lethargy. With natural infection children, and rarely adults, may develop encephalitis. Although the overall case fatality rate is less than 1%, in children with encephalitis it may reach 20-35%. The incidence of CNS disease may be higher after a bioterrorist attack.

Diagnosis:

Differential Diagnosis: Cases with VEE may be difficult to distinguish from those with influenza. Appearance of cases with neurological symptoms may suggest the diagnosis. Other potential bioterrorist agents that cause flu-like illnesses (*Bacillus anthracis*, *Yersinia pestis*, *Coxiella burnetii*) need to be considered. More common causes of meningitis and encephalitis should be considered in patients with neurologic symptoms.

Diagnostic Tests: Virus may be isolated from blood or throat swabs during the acute phase of illness. Blood may be collected for culture in a tiger-top (SST) or red-top tube. Throat swabs may be collected for culture up to 5 days after onset of symptoms. Cerebrospinal fluid (CSF) may also be collected for culture from patients with neurologic symptoms.

Send specimens for laboratory confirmation in a triple container to the Oregon State Public Health Laboratory, 1717 SW Tenth Avenue, Portland, OR 97201. Prior notification is requested by calling the laboratory at (503) 229-5882 and Acute and Communicable Disease Prevention at (503) 731-4024.

Supportive Tests: Leukopenia and lymphopenia are common. Elevated serum glutamic-oxaloacetic transaminase (SGOT) levels are common. CSF may be under increased pressure in cases with encephalitis, and contain up to 1000 white cells (predominantly mononuclear cells)/mm³ and exhibit mildly elevated protein concentration.

Treatment: Supportive therapy should be given. Some patients may be treated with analgesics to relieve headaches and myalgias. Patients who develop encephalitis may require anticonvulsant and intensive care to maintain fluid and electrolyte balance, and ventilatory support.

Infection Control: Standard blood precautions and barrier-nursing techniques must be employed. Patients should be isolated. The virus is destroyed by heat (80°C for 30 minutes) and regular disinfectants.

Report: Immediately report any suspect cases to your local health department or the Oregon Health Division at (503) 731-4024 during working hours (8:00 am to 5:00 pm Monday through Friday) or (503) 731-4030 nights, weekends and holidays.

Adapted with permission from the Texas Department of Health