DENGUE FEVER

(Breakbone Fever, Dandy Fever)

REPORTING INFORMATION

- Class A(2)
- Report by the end of the next business day
- Confidential Case Report Card (3812.11 rev. 12/81), lab report (3833.11) or telephone

AGENT

Dengue viruses 1,2,3,4: flaviviruses. There is substantial serologic cross-reaction with other flaviviruses, e.g., St. Louis encephalitis, Yellow Fever, Japanese B encephalitis.

Infectious Dose: One bite of an infectious mosquito is sufficient.

CASE DEFINITION

Clinical description

An acute febrile illness characterized by frontal headache, retro-ocular pain, muscle and joint pain, and rash. The principal vector is the *Aedes aegypti* mosquito and transmission usually occurs in tropical and subtropical areas. Severe manifestations (e.g., dengue hemorrhagic fever and dengue shock syndrome) are rare, but may be fatal.

Laboratory criteria for diagnosis

- Isolation of dengue virus from serum and/or autopsy tissue samples, or
- Demonstration of a 4-fold or greater rise or fall in reciprocal immunoglobulin G (IgG) or immunoglobulin M (IgM) antibody titers to one or more dengue virus antigens in paired serum samples, or
- Demonstration of dengue virus antigen in autopsy tissue or serum samples by immunohistochemistry or by viral nucleic acid detection

Case classification

Probable: A clinically compatible illness with supportive serologic findings (a reciprocal IgG antibody titer of $\geq$ 1280 or a positive IgM antibody test on a single acute (late)- or convalescent-phase serum specimen to one or more dengue virus antigens).

Confirmed: A clinically compatible case that is laboratory confirmed.

Comments

Dengue hemorrhagic fever is defined as an acute febrile illness with minor or major bleeding phenomena, thrombocytopenia (less than or equal to 100,000/mm^3), and evidence of plasma leakage documented by hemoconcentration (hematocrit increased by $\geq$ 20%) or other objective evidence of increased capillary permeability. The definition of dengue shock syndrome follows all of the above criteria for dengue hemorrhagic fever and also includes hypotension or narrow pulse pressure ($\leq$ 20 mm Hg).

Another severe and fatal form of hemorrhagic dengue has also been described which does not meet the WHO case definition. These patients have severe hemorrhage, usually from the upper gastrointestinal tract. The development of shock appears to be secondary to blood loss rather than increased capillary permeability.

SIGNS AND SYMPTOMS

Sudden onset of chills, headache, intense pain in joints, muscles, fever (103-6ºF), facial edema, and erythematous eruption. Remission develops about day three, lasting two to three days. Fever and pains recur for about one to two days. Eruption recurs. Hemorrhagic symptoms are thought to result on second encounter with a dengue virus of a different serotype.

DIAGNOSIS

The CDC in San Juan, Puerto Rico can perform ELISA-IgM and virus isolation on the acute serum. Proper protocol is to send the sample(s) to the CDC Dengue Laboratory via the ODH lab. Call ODH (614) 644-4659 to arrange for shipment of serum or other specimens to CDC. A convalescent serum should be obtained two weeks later and also sent to the CDC.

The diagnosis of dengue fever can be confirmed by isolating dengue virus from the acute blood sample, by demonstrating specific IgM antibody in appropriately timed serum sample(s) (obtained between 5 and 60 days after onset of illness), or by demonstrating a 4-fold or greater change in IgG antibody titer to dengue virus in a serum pair. Individuals who have had one or more flavivirus infections, including yellow fever immunization, may produce heterologous antibodies to a wide range of flavivirus antigens. A specific dengue diagnosis can still be made, however, by virus isolation or inferred from epidemiologic associations.

EPIDEMIOLOGY

Source

Humans are the vertebrate reservoir, with monkeys possibly being involved.

Occurrence

Endemic in tropical Asia, East and West Africa, Polynesia, Micronesia, Tahiti. Dengue is also endemic in the Caribbean, northern South America and Central America. Dengue is periodically epidemic in the Western Hemisphere, with thousands of cases diagnosed. Travelers are always at risk when visiting endemic countries. About one or two imported cases are identified annually in Ohio.

Mode of Transmission

The virus is transmitted only by certain species of mosquitoes. *Aedes aegypti* is endemic to the southeastern Atlantic and Gulf Coast states in the United States. Two dengue vectors might occur in Ohio. *Aedes aegypti* probably cannot become established in Ohio due to severity of winters. *Aedes albopictus*, the Asian vector of dengue, has recently become established in Ohio. Since 1987, it has been found in Darke, Franklin, Hamilton, Hancock, Jackson, Lawrence, Scioto, Ross and Summit counties. The spread of *Aedes albopictus* is due primarily to commerce in used tires, in which it breeds.

Period of Communicability

Humans are infectious to biting *Aedes aegypti* or *Aedes albopictus* from the day prior to onset of symptoms to day five of illness. No human-to-human transmission occurs.

Incubation Period

3-15 days (5-6 most likely)

PUBLIC HEALTH MANAGEMENT

Case

Investigation A complete travel history for 15 days prior to onset for the patient must be obtained. Determine patient's yellow fever vaccine status.

Treatment/therapy

Symptomatic treatment with non-aspirin analgesics is indicated.

Isolation

No specific isolation procedures are indicated for the acute dengue patient in Ohio.

Follow-up specimens

If a convalescent serum sample was not obtained, a late convalescent sample should be obtained. Autopsy blood and/or tissue samples may also be taken. Proper protocol is to send the sample(s) to the CDC Dengue Laboratory via the ODH lab (See **DIAGNOSIS**, above).

Public Health Significance
High in endemic areas.

Special Information
There is a low probability of endemic transmission occurring in Ohio because of the low prevalence of the vector mosquito.

Contact
No prophylaxis is indicated. There is no vaccine available.

Prevention and Control
Follow-up specimens
Does not apply if Dengue has been laboratory confirmed.

Travelers
Travelers entering endemic areas should be warned to avoid mosquitoes, use mosquito repellants, occupy screened quarters, and use mosquito netting over beds.

Vaccination
There is no vaccine available.

Vector Investigation
A survey should be performed by the local health department to determine if *Aedes aegypti* or *Aedes albopictus* are present near the patient's home or travel sites in Ohio. For advice on vector assessment, contact the Vector-borne Disease Program at (614) 752-1029 or via the ODH website (www.odh.state.oh.us).

SPECIAL INFORMATION
Accurate travel history and confirmation are desirable to document importation of dengue infections from endemic areas into the United States. Note if travelers had spent any time in the southeastern Atlantic or Gulf Coastal states, where *Aedes aegypti* or *Aedes albopictus* is endemic, before returning to Ohio. The CDC Dengue Branch may be contacted at (787) 766-5181 for special consultations.