disease prevention news

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Dengue in South Texas: a "Flu-like Illness"

Dengue fever, an arboviral illness common in tropical and subtropical areas, is caused by a flavivirus with four serotypes. Approximately 2.5 billion persons live in regions where dengue is endemic, and 50 to 100 million infections occur annually worldwide.[1,2] The Aedes aegypti *mosquito, which is present throughout Texas, is the primary vector in the Americas.[2-4] The* Aedes albopictus *mosquito is a primary vector in many other countries;[2] although also present in the Americas, this mosquito has not been associated with disease here. Although most dengue cases diagnosed in Texas are in travelers who have been infected elsewhere, endemic disease does occur. The dengue season in Texas is August through November. The Texas Department of Health conducted a study in 1999 to determine whether undiagnosed or unreported dengue cases had occurred in Laredo.[4] This article provides a summary of the findings, as well as two case reports from late summer 1999.*

Dengue fever is characterized by the sudden onset of fever that lasts 3 to 5 days (often biphasic), intense headaches, myalgias, arthralgias, retro-orbital pain, anorexia, nausea, vomiting, and a maculopapular rash around the time of defervescence. Dengue hemorrhagic fever (DHF) is characterized by fever, thrombocytopenia, and hemoconcentration. All of the above plus hypotension or a pulse pressure ≤ 20mm Hg are seen with dengue shock syndrome (DSS).

Although infection may result in lifelong homotypic immunity, cross-protective immunity does not occur between the four dengue virus serotypes. Infection with any dengue serotype can be asymptomatic or result in characteristic symptomatology of dengue, DHF, or DSS. The last two conditions are life-threatening.[5]

Epidemiology

Since the 1970s, outbreaks of dengue, DHF, and DSS have increased in frequency and severity in the Americas and the Caribbean.[1,2] Dengue outbreaks have been reported in communities along the Mexico–US border since 1980; however, from 1987 through July 1999, no cases were reported from Laredo, Texas (1999 population: 162,000).[6] From January through July 1999, approximately 300 to 325 dengue cases were reported from Nuevo Laredo, Tamaulipas, Mexico (1999 population: 274,000), a city across the Rio Grande from Laredo. To determine whether cases were going undiagnosed or unreported, the Texas Department of Health (TDH) reviewed medical records from 5 Laredo health facilities (the 2 city hospitals and the 3 largest of 5 community clinics).

Medical records were reviewed for patients who presented to any of the 5 facilities during July 23 through August 20, 1999. Dengue was suspected in a person aged ≥5 years with a temperature of 101° F (38.3° C) and rash of any duration or fever for ≥3 days without cough or diarrhea. During August 20 through October 31, blood was drawn from suspected dengue case-patients and serum samples were tested for antidengue IgG and dengue IgM antibodies at the TDH laboratory. Sera from patients with recent dengue infection have a positive IgM test or a 4-fold or greater increase in the IgG antibody titer between acute- and convalescent-phase serum samples.

Forty-nine suspected dengue case-patients were identified from 494 records; 24 (49%) were located and interviewed. Of these, 22 (92%) agreed to provide a serum sample. Eleven case-patients had serologic evidence of recent dengue infection; 10 (91%) of the 11 tested positive for both IgM and IgG antibodies. One case-patient was negative for IgM antibodies but had a 4-fold increase in IgG

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antibody titers over a 3-month period. Symptoms reported by the 11 confirmed case-patients included fever (100%), arthralgias (73%), headache (64%), malaise (64%), and rash (45%). Nine patients (82%) had been diagnosed with "viral syndrome," and 2 (18%) with "flu-like illness." Nine case-patients reported a history of travel to Mexico within 2 weeks of illness onset; 2 had not been outside Texas.

Case Histories from 1999 South Texas Epidemic

Dengue typically presents as an undifferentiated febrile illness that lasts 3 or more days; rash is present in only half of cases.

Case 1. A 47-year-old Hispanic resident of Willacy County (far south Texas) sought care from a local family practice physician on August 21 for a febrile illness that had begun 2 days earlier. Reported symptoms included cephalalgia, ocular pain and photosensitivity, ostealgia, arthralgias, nausea, anorexia, and extreme malaise. Although dengue fever was considered in the differential diagnosis, amantadine and doxycycline were prescribed. The patient sought further care at a rural health center on August 24, by which time a macular rash had developed over the forearms and ventral aspect of the body, as had bruising over the lower extremities. A blood specimen tested at TDH produced an IgM reaction against dengue virus by enzyme immunoassay. By the follow-up visit on August 27, fever had begun to subside, and relatively minor cephalalgia, malaise, and rash were present but resolving. Complete recovery followed.

Case 2. After a 3-day history of vomiting, constipation, dizziness, and increasing weakness, a prepubescent female was taken to a South Texas hospital emergency room by her mother. Upon admission, the child was afebrile but severely dehydrated with sunken eyes and dry oral mucosa. Her pulse was rapid but faint. Cyanosis was noted in the nail matrices but not the circumoral area, and a fine, petechial rash was seen over the lower extremities. Laboratory findings included marked thrombocytopenia and increased white blood cells. Cerebrospinal fluid was normal with no evidence of the major causal agents of bacterial meningitis. Her status did not improve with fluid replacement, and the rash became more diffuse. After approximately 11 hours, she was transferred to a tertiary care center, where the tentative admitting diagnoses were sepsis, dehydration, and meningococcemia. She was tachycardic and hypotensive, with a narrow pulse pressure. Intense efforts to prevent circulatory collapse failed, and she died just 5 days after initial onset of symptoms. The gross impression at autopsy was that of a hemorrhagic fever. Postmortem collection of spleen and fluid samples yielded dengue virus serotype 3; death was attributed to dengue hemorrhagic fever. Subsequent interview of the child's mother revealed regular travel to Mexico within the incubation period for dengue.

The first case is noteworthy because it is the most recent locally acquired dengue case to have been identified in a county that is not contiguous with the Mexican border. Preventive steps and surveillance must be taken seriously in interior counties as well as along the border. The second case is remarkable not only because of the abruptness and gravity of the outcome, but also because the infection occurred in December, a relatively cool, dry month usually associated with declining vector activity.

Diagnosis

Dengue can easily be confused with arthropod-borne viral disease, measles, rubella, or other febrile illnesses associated with a rash. Dengue typically presents as an undifferentiated febrile illness that lasts 3 or more days; rash is present in only half of the cases. Unless physicians retain a high level of suspicion, a dengue diagnosis may easily be missed in areas where the virus is not endemic. Consider dengue fever whenever a patient has the above symptoms.

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Laboratory testing is necessary for diagnostic confirmation. Viral isolation and serologic testing are available at TDH. For viral isolation and/or PCR, collect serum in a red top tube within the first 5 days of illness and refrigerate for several hours until clotted. Centrifuge the serum and then ship it overnight on dry ice.

For serologic testing, draw serum specimens in red top tubes during the acute phase of illness and submit at ambient temperature. Convalescent serum specimens may be required 10 to 14 days after onset to confirm a recent infection. Mail all specimens with the appropriate laboratory submission forms (G-1A or G-1B) to TDH Laboratory, 1100 West 49th Street, Austin, TX 78756. If a form is not available, include the name of the patient; address, age and sex; disease suspected; date of onset; date of specimen collection; and name and address of physician. *For further information call 800/252-8239.*

Prevention

An estimated 100 million crossings take place each year along the Texas-Mexico border between Brownsville and Laredo.[6] *Ae. aegypti* is found all along this area. Movement of infected persons can introduce the virus into dengue-free areas. Travelers to regions where dengue is endemic should avoid mosquito bites by using repellents and protective clothing and by staying in well-screened or air-conditioned quarters.[7] Residents of areas where dengue is endemic and US-Mexico border communities can reduce the *Ae. aegypti* population in and around homes by changing water in bird baths or flower vases daily, tightly covering stored water receptacles, and eliminating old tires, containers, tree holes, and other potential mosquito breeding sites.

Following identification of 1999 dengue cases, the Laredo Health Department implemented mosquito reduction activities (eg, aggressive refuse and tire disposal campaigns and insecticide fogging). Dengue alerts were sent to health-care providers, and mosquito reduction and personal protection information was distributed through health fairs and schools. Information exchange increased substantially between health officials from Laredo and Nuevo Laredo. Although no suspected cases were reported before the alerts were issued, sera from 161 suspected dengue cases were submitted from mid-August through December 1999; 18 tested positive for dengue. No cases were reported from Laredo in 2000.

Several cases of febrile illness suspected to be dengue were reported in 2000 from all along the Texas-Mexico border. There is currently a binational study being done of dengue along the US-Mexico border.

An estimated 100 million crossings take place each year along the Texas-Mexico border....

Recognition of dengue can be improved through heightened surveillance, professional and public education, and prompt reporting of cases by the health-care providers to local or state health departments. When a case of dengue is confirmed in a community, the public health response should include education of health-care providers and the public, intensified surveillance, and enhanced vector-control activities. *Additional information about dengue is available on the World-Wide Web,* http://www.cdc.gov/ncidod/dvbid/dengue.htm.

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2. Pan American Health Organization. Reemergence of dengue in the Americas. Epidemiological Bulletin of the Pan American Health Organization 1997;18:1–10.

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Free Hepatitis B Vaccine for HIV-Positive Adults

For many years the Centers for Disease Control and Prevention has recommended hepatitis B vaccine for adults who may be exposed to hepatitis B virus through high-risk lifestyle behaviors. In Texas most HIV positive adults are also at risk of acquiring hepatitis B virus infection through similar high-risk behaviors. The Texas Department of Health (TDH) has several thousand doses of hepatitis B vaccine available free to healthcare providers in Texas who treat HIV-positive clients. This vaccine, available in single dose vials, may be administered only to HIV positive adults, expires in February 2002, and must be given to HIV positive clients at no charge. Physicians and other health care providers may order the vaccine through the TDH Bureau of HIV and STD Prevention. There is no limit to the amount of vaccine healthcare providers can order, but they should order only as much as they can use before the upcoming expiration date and store properly at their facility. Please complete the information in the box below to order hepatitis B vaccine for HIV-positive patients at no charge.

Order Form: Hepatitis B Vaccine for HIV-positive Patients

Number of single dose vials you could use by February 2002: ____

Contact Person Name:_____

Facility Name:_____

Street Address:_____

(vaccines cannot be mailed to a PO Box)

City:_____,Texas

Zip Code:_____

Phone Number:_____ Fax Number: _____

Fax this form to Bureau of HIV/STD Prevention at 512/490-2544. *If you prefer to order vaccine by phone, please call* 512/490-2505. *If you have any questions please ask to speak with a nurse consultant.*

Mosquito-borne Encephalitis Virus Detected in Three Texas Counties

St. Louis encephalitis (SLE) virus has been detected in mosquitoes collected in Harris County and El Paso County. Eastern equine encephalomyelitis (EEE) has been confirmed in a Henderson County horse. SLE and EEE are two of several mosquito-borne viral diseases that occur in Texas. SLE usually occurs in the eastern part of the state from July through October. During the last 10 years there have been five SLE outbreaks, occurring in 1990-1993 and 1995); the number of cases in each outbreak ranged from 7 to 42. Sporadic cases were reported in 1994, 1996, 1998, and 2000; the number of confirmed cases ranged from 1 to 4. No cases were confirmed in 1997 and 1999. No cases of human EEE have been reported in Texas during the last 20 years.

Disease severity for both SLE and EEE ranges from asymptomatic to fatal. Patients with mild illness often have fever and headache or viral (aseptic) meningitis; those with more severe infections have headache, high fever, meningeal signs, disorientation, stupor, coma, tremors, and convulsions. Infection can result in long-term neurologic sequelae. Most SLE cases are aymptomatic; less than 10% of symptomatic cases result in death. As mentioned, EEE is uncommon. However, when diagnosed, cases are most often in children or the elderly. Approximately 30% of symptomatic EEE cases are fatal.

Specimens for virus isolation and serologic SLE or EEE testing may be submitted with completed G-1 A and/or B forms to the Texas Department of Health Laboratory, 1100 W 49th Street, Austin, TX 78756.

For virus isolation: **CSF** must be placed **on dry ice** and shipped overnight. **Brain tissue** should be submitted with prior notification and shipped cold but unfrozen (ie, **on wet ice**). Please call the laboratory at 512/458-7515 prior to shipment of these specimens.

For serologic testing: CSF and/or serum may be submitted. Single serum specimens are tested, but paired sera collected 10 to 14 days apart are preferred. (The pairing of sera enables the detection of an antibody titer rise, with a fourfold rise indicating a current infection). Specimens for serologic testing may be shipped at room temperature.

Mosquito-borne encephalitis is a notifiable condition in Texas. *Report suspect cases by calling* 800/705-8868 *or* 800/252-8239. *For more information call* 512/458-7228.

Two Primary Amebic Meningoencphalitis Deaths this Month

Reports this month of 2 deaths from primary amebic meningoencephalitis (PAM) prompted the Texas Department of Health (TDH) to issue a warning about swimming in lakes, rivers, and stagnant water. The children who died had been swimming in lakes in northeast Texas.

PAM is a fulminant, purulent infection of the gray matter of the brain. The causative organism, *Naegleria fowleri*, is a ubiquitous, free-living ameba that thrives in fresh water that is warm (usually > 80°F), particularly if it is stagnant or slow moving. It is found in almost all soil and untreated surface water.

Activities such as skiing and jumping into the water may increase a swimmer's risk of infection. It is hypothesized that such activities can force the organisms into the nasal passages, giving the amebae easy access to the brain and spinal cord.

Symptoms of the infection include severe headache, high fever, meningismus, nausea, vomiting, seizures and hallucinations or other mental status changes. On presentation patients typically have an elevated white count with a left shift. Cerebral spinal fluid findings in one series of 6 patients included pleocystosis (range 450-4,400) with a predominance of polymorphonuclear cells, hypoglycorrhachia (40< mg/dL), and elevated protein levels (>250 mg/dL).[1]

Diagnosis can be made by demonstration of the amebae in cerebrospinal fluid (CSF) or biopsy specimens. Motile trophozoites may be observed on a direct wet mount,

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or permanent smears may be prepared and stained with Wright's or Giemsa. The amebae can be recognized by their nucleii with a large karyosome; while living, the contractile vacuole characteristic of all free-living amebae can be observed. *Naegleria* can be cultured from CSF on non-nutrient agar, plated with attenuated *Escherichia coli* to amplify amebae numbers and allow detection. To distinguish *N. fowleri* from other amebae, like *Acanthameba* species, identification methods include indirect fluorescent antibody procedures for direct specimens, and transformation studies of cultured organisms (forcing amebae to transform to flagellated forms by manipulating environmental conditions). Hospitals and physicians wishing to submit specimens to TDH, should ship 0.5 ml of **unrefrigerated** CFS overnight (except on Friday or Saturday) to: TDH Laboratory, 1100 W 49th St., Austin, TX 78756.

From 1980 through 2000, 20 cases of PAM were reported in Texas, all fatal. Though the disease is rare, those infected usually die within a week. Only a handful of nonfatal cases have been reported; most of the individuals presented with CSF glucose levels that were uncharacteristically normal. Table 1 describes treatment regimens that have been successful in treating the few patients who have survived PAM.

Swimming pools that are properly cleaned, maintained, and treated with chlorine generally are safe, as is salt water. TDH recommends that people never swim in stagnant or polluted water and take "No Swimming" signs seriously. Also, people should hold their noses or use a plug when jumping into lakes, rivers, ponds, or other bodies of fresh water and avoid swallowing water when swimming.

Reference

Taylor JP, Hendricks KA, and Dingley DD. Amebic Meningoencephalitis. Inf in Med 1996;13(12):1017, 1024.

Table 1. Successful Treatment Regimens for Amebic Encephalitis[1]

	CSF Findings			Treatments Regimens		
Reference	**WBC**	**Glucose**	**Protein**	**Drug**	**Route**	**Dose/Duration**
Carter	12,000	—	—	Amphotericin B	IV	1mg/kg/day
				Amphotericin B	ITh	0.1mg every other day
				Ampicillin	—	—
				Penicillin	—	—
				Sulfadiazine	—	—
Seidel ,et al	2,640	56mg/dL	340mg/dL	Amphotericin B	IV	1.5mg/kg/day for 3 days, then 1.0mg/kg/day for 6 days
				Amphotericin B	ITh	1.5 mg/day for 2 days, then 1.0mg every other day for 8 days
				Rifampin	PO	10mg/kg/day for 9 days
				Miconazole	IV	350mg/m²/day for 9 days
				Miconazole	ITh	10mg/day for 2 days, then 10mg every other day for 8 days
				Sulfisoxazole		1g qid for 3 days
Brown	5,356	100mg.dL	61mg/dL	Amphotericin B	IV	75mg/day for 10 days
				Amphotericin B	ITh	0.5mg every other day for 10 days
				Rifampin	PO	600mg bid for 10 days
				Penicillin	IV	24 million units/day for <1 day
Wang, et al	—	normal	43mg/dL	Amphotericin B	IV	60mg/day
				Rifampin	—	450mg/day
				Chloramphenicol	—	1g qid

ITH = intrathecal; dash = data were not available

Further information on PAM, including swimming pool maintenance and swimmers' precautions, is contained in these issues of DPN: July 17, 1997 (Vol 57, No. 15) and July 16, 2001(Vol 61, No. 15). *You may also contact Neil Pascoe, Infectious Disease Epidemiology and Surveillance Division, at* 512/458-7676; neil.pascoe@tdh.state.tx.us.

Perspectives in Public Health: Maternal and Child Health Texas Department of Health Quarterly CME Conference

On Friday, September 28, 2001, from 8:00 AM to 4:00 PM, the Texas Department of Health (TDH) will present its Quarterly CME Conference, Perspectives in Public Health: Maternal and Child Health. Designed for public health and primary care physicians, the conference will be held at the North Austin Medical Center, in the Decherd Auditorium, 12221 Mopac Expressway N. in Austin, Texas. The program will consist of lectures supplemented by audiovisual slide presentations.

After attending this conference, the participants will be able to

- prevent, detect at an early stage, treat, control, or take remedial action against specific medical conditions that may adversely affect the health of individuals and populations in Texas;
- identify policies, processes, and products that promote and protect the health of people and preserve environmental quality; and
- establish relationships with other physicians concerned with public health and preventive medicine issues through dialogue with presenters and other participants.

Topics covered at the upcoming conference include

- Part I: Panel on Texas Health Steps
  Stephen Barnett, Consultant for TDH, Texas Health Steps Program, Austin, Texas
- Part II: Panel on Texas Health Steps
  Josie Williams, MD, Medical Director, Texas Health Quality Alliance, Austin, Texas
- Addressing a Silent Crisis: Childhood Obesity, Prevention and/or Management
  Stephen Barnett, MD, Consultant for TDH, Texas Health Steps Program, Austin, Texas
- Medical Management and Rehabilitation of the Most Complex Cases in Traumatic Brain Injury Coma Management
  Mary Carlile, MD, Medical Director, Traumatic Brain Injury Services, Baylor Institute for Rehabilitation, Dallas, Texas
- Part I: Sex Education: What Should We Tell Our Kids?
  Janet Realini, MD, Director of Family Planning,, San Antonio Metropolitan Health District, and Josh Mann, MD, MPH, Director of Research, The Medical Institute for Sexual Health, Austin, Texas
- Part II: Sex Education: What Should We Tell Our Kids?
  Janet Realini, MD, Director of Family Planning, San Antonio Metropolitan Health District, and Josh Mann, MD, MPH, Director of Research, The Medical Institute for Sexual Health, Austin, Texas

The Texas Department of Health designates this educational activity for a maximum of 6 hours in Category 1 credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

This program has been reviewed and is acceptable for 6 prescribed hours by the American Academy of Family Physicians.

The Texas Department of Health is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

For further information and to register, call the TDH Public Health Professional Education Program at ***(800) 252-8239, Press 4, or (512) 458-7677.*** *You may pay the registration fee at that time by credit card or you may send a check with the completed form located on the back page of this issue.*
Additional conference information is available on the TDH website at www.tdh.state.tx.us/phpep/cme/cmeevents.htm.

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4C423-001

Registration Form

Perspectives in Public Health: Maternal and Child Health
Texas Department of Health Quarterly CME Conference
Friday, September 28, 2001 8:00 AM - 4:00 PM

Registration Fee: ☐ *$50 Regular* ☐ *$25 Residents/Fellows (with verification letter)* ☐ *Please call me regarding special needs*

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