

7. Collins CH, Kennedy DA. Microbiological hazards of occupational needlestick and "sharps" injuries. *J Appl Bacteriol.* 1987;62:385-402.
8. Herwaldt BL. Laboratory-acquired parasitic infections from accidental exposures. *Clin Microbiol Rev.* 2001;14:659-88.

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Nosocomial Transmission of Dengue

To the Editor: Four viruses form the dengue complex of mosquito-borne viruses (family *Flaviviridae*, genus *Flavivirus*). Any of these viruses can cause dengue fever, an uncomplicated febrile illness with rash; however, these viruses are not transmitted person to person. The principal mosquito vector of these viruses is *Aedes aegypti*. These viruses are not known to exist in Europe; therefore, dengue virus infections in Europe are seen in patients returning from dengue-endemic areas (1). Nosocomial transmissions of dengue viruses by needlestick have been reported in three instances (2-4) and by bone marrow transplant in one instance (5). We describe the first case of nosocomial dengue fever diagnosed and treated in Hungary.

On September 6, 2003, a 46-year-old physician sought care from the Department of Infectology, ("Baranya County Hospital" Pécs, Hungary); he reported a 4-day history of fever, headache, malaise, maculopapular rash, and pharyngitis. He had recently returned from a trip to Thailand and recalled having been bitten by a mosquito at Bangkok airport 11 days earlier. The patient had no history of ill-

nesses before he left Hungary to go to Thailand. On examination, laboratory results indicated leukopenia (3,300 leukocytes/mm³) and mild thrombocytopenia (119,000 platelets/mm³). Leukopenia is characteristic of dengue virus and has been associated with suppression of bone marrow production (6). We conducted additional tests because thrombocytopenia could have been the first sign of a more severe form of dengue infection, dengue hemorrhagic fever, which is associated with hemorrhagic diathesis and shock (6). Lymphocytosis and monocytosis with 26% atypical lymphocytes and a high-normal level of alanine aminotransferase (56 U/L) were found. The C-reactive protein level and the erythrocyte sedimentation rate were normal. Blood smears for malarial parasites were negative.

Examination of the patient showed a maculopapular rash, pharyngitis, and conjunctivitis. Dengue fever was the clinical diagnosis based on the patient's history of a mosquito bite in a dengue-endemic country, the patient's symptoms, and the laboratory results. The patient's general condition was relatively good, so we treated him on an outpatient basis and recommended that he return for daily examinations.

On September 7, while collecting a blood sample from the patient, the patient's sister, also a physician, accidentally stuck her finger with the needle, which was contaminated with the patient's blood. Seven days later she became ill, with fever, headache, diffuse maculopapular rash, myalgia, cervical lymphadenopathy, and malaise. Her laboratory tests showed leukopenia with a normal thrombocyte level, C-reactive protein level, liver function tests, and erythrocyte sedimentation rate. On physical examination, painfully enlarged cervical lymph nodes and conjunctivitis were found. No complications were observed and the disease resolved within 10 days after onset in both

patients. The female patient had never traveled to a dengue-endemic region.

Serologic and virologic evidence confirmed the clinical diagnosis. Acute-phase serum samples from each patient were tested for immunoglobulin (Ig) M and IgG antibodies to dengue viruses by using a commercial enzyme-linked immunosorbent assay kit. IgM, but not IgG, antibodies to dengue viruses were detected in the serum sample from the male patient 7 days after the onset of his illness; a convalescent-phase serum sample was not available for further testing. The first serum sample was obtained from the female patient 6 days after onset of her illness. IgM and IgG antibodies were not found in that sample. In the serum sample obtained from the female patient 12 days after onset, IgM, but not IgG, antibodies to dengue viruses were found. Both IgM and IgG antibodies were found in serum samples from this patient 3 weeks after onset of her illness.

Diagnosis was also confirmed by reverse transcription-polymerase chain reaction assays of early serum samples of both patients by using universal flavivirus primers. Amplification products were directly sequenced (GenBank accession no. AY538627 and AY538628). The nucleotide sequences were identified with a BLAST search (<http://www.ncbi.nlm.nih.gov/BLAST/>) using the GenBank database. Highest similarity was with dengue virus type 2 strain ThNH76/93, which had been isolated from a patient in northeast Thailand during the epidemic season of 1993 (7). The virus-specific nucleotide sequences detected in the Hungarian patients showed 98% nucleotide identity with the corresponding sequences of the Thai strain.

Viremia and simultaneous antibody production has been observed in several studies of dengue (6,8,9). Virus isolation is possible in dengue infections early in the illness, and in our experience, virus RNA was

detected during the early febrile period. The male patient still had fever when the needle accident occurred, and the needle was contaminated.

Infectious disease specialists and other physicians should recognize that vector-borne diseases, such as dengue and malaria, are potentially life threatening. Therefore, they should consider these diseases in the differential diagnosis of febrile patients returning from tropical countries. In most patients, dengue fever resolves without hemocentration, an indication of dengue hemorrhagic fever. Nosocomial transmission of dengue viruses is not a common event, however, physicians must consider these diseases.

These unique cases demonstrate the possible introduction and transmission of exotic tropical viruses in a country within temperate zones; all that is needed are competent vectors. Whereas *A. aegypti* is not endemic in Europe, it could be introduced. The *A. albopictus* mosquitoes, an invader from Asia, already exists there, albeit in isolated areas (10). Patients returning from distant regions should be treated with increased attention and care. Although dengue viruses are rarely transmitted person to person, this incident emphasizes the importance of having reliable and rapid diagnostic methods available for early detection of imported infections with exotic viral agents.

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References

- Guzman MG, Kouri G. Dengue: an update. *Lancet Infect Dis.* 2001;2:33–42.

- De Wazieres B, Gil H, Vuitton DA, Dupond JL. Nosocomial transmission of dengue from a needlestick injury. *Lancet.* 1998;351:498.
- Langgartner J, Audebert F, Schölermerich J, Glück T. Dengue virus infection transmitted by needle stick injury. *J Infect.* 2002;44:269–70.
- Hirsch JF, Deschamps C, Lhuillier M. Metropolitan transmission of dengue by accidental inoculation at a hospital. *Ann Med Interne.* 1990;141:629.
- Rigau-Perez JG, Vondam AV, Clark GG. The dengue and dengue hemorrhagic fever epidemic in Puerto Rico, 1994–1995. *Am J Trop Med Hyg.* 2001;64:67–74.
- Kalayanaraj S, Vaughn DW, Nimmannitya S, Green S, Suntayakorn S, Kunentrasai N, et al. Early clinical and laboratory indicators of acute dengue illness. *J Infect Dis.* 1997;176:313–21.
- Pandey BD, Igarashi A. Severity-related molecular differences among nineteen strains of dengue-type 2 viruses. *Microbiol Immunol.* 2000;44:179–88.
- Kuberski T, Rosen L, Reed D, Mataika J. Clinical and laboratory observations on patients with primary and secondary dengue type 1 infections with hemorrhagic manifestations in Fiji. *Am J Trop Med Hyg.* 1977;26:775–83.
- Vaughn DW, Green S, Kalayanaraj S, Innis BL, Nimmannitya S, Suntayakorn S, et al. A dengue in the early febrile phase: viremia and antibody responses. *J Infect Dis.* 1997;176:322–30.
- Romi R, Pontuale G, Clufolini MG, Fiorentini G, Marchi A, Nicoletti L, et al. Potential vectors of West Nile virus following an equine disease outbreak in Italy. *Med Vet Entomol.* 2004;18:14–19.

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Human Crimean-Congo Hemorrhagic Fever, Sénégal

To the Editor: Crimean-Congo hemorrhagic fever (CCHF) virus, genus *Nairovirus*, family *Bunyviridae*, is transmitted to mammals and birds

by ticks. *Hyalomma* ticks, the primary vectors in CCHF transmission, are widespread throughout Europe, Asia, the Middle East, and Africa; evidence of CCHF virus has been found in all these regions. CCHF in humans is an acute viral disease that is transmitted by the bite of infected ticks, direct contact with blood or infected tissues from viremic animals, and direct contact with the blood or secretions of an infected person (1).

On January 26, 2003, a 22-year-old shepherd was treated at a health post in the Popenguine District, 60 km south of Dakar, Sénégal; he reported fever, epistaxis, arthralgia, myalgia of the lower limbs, and dark urine for the past 2 days. Without biologic confirmation of the infection, he was treated for malaria with two intravenous injections of quinine, followed by oral administration of chloroquine.

On January 31, the patient had a temperature of 39°C, conjunctival jaundice, bleeding gums, and was vomiting blood. He was seen again at the health post and was given antimicrobial drugs, intravenous quinine, and vitamin K; the next day, the bleeding stopped and the fever subsided. A serum sample was sent to the World Health Organization Collaborative Centre for Arboviruses and Viral Hemorrhagic Fevers at the Institut Pasteur, Dakar. Tests for anti-CCHF specific immunoglobulin (Ig) M antibody by enzyme-linked immunosorbent assay (ELISA) were positive, and CCHF virus by isolation on cell cultures (AP61 and Vero cells) and reverse transcriptase-polymerase chain reaction (RT-PCR) were negative. From January 31 to February 10, the IgM titer increased from 1/3,200 to >1/12,800 and IgG titer increased from 1/200 to 1/6,400.

Examination of the patient on February 10 showed he had recovered without sequelae, and no trace of tick bites was found. The patient stated that he had not traveled, noticed any tick bites, slaughtered any animals, or