

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

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

2. De Wazieres B, Gil H, Vuitton DA, Dupond JL. Nosocomial transmission of dengue from a needlestick injury. *Lancet.* 1998;351:498.
3. Langgartner J, Audebert F, Schölermerich J, Glück T. Dengue virus infection transmitted by needle stick injury. *J Infect.* 2002;44:269–70.
4. Hirsch JF, Deschamps C, Lhuillier M. Metropolitan transmission of dengue by accidental inoculation at a hospital. *Ann Med Interne.* 1990;141:629.
5. 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.
6. 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.
7. Pandey BD, Igarashi A. Severity-related molecular differences among nineteen strains of dengue-type 2 viruses. *Microbiol Immunol.* 2000;44:179–88.
8. 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.
9. 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.
10. 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

been in contact with people with fever for several weeks before his illness. He lived in close proximity to goats and cattle, but no blood samples were taken from these animals. Although no ticks were found on nearby goats, 10 *Amblyomma* and *Hyalomma* ticks were collected from three cattle. Ticks were negative for CCHF virus isolation on suckling mice and RT-PCR amplification.

No other case of fever accompanied by hemorrhage was reported in the area, and none of the patient's 14 close contacts became ill. Of the four close contacts from whom blood samples were taken, analyses for IgM and IgG antibodies against CCHF virus were negative by ELISA.

While no clinical case of CCHF has ever been reported in Senegal, studies dating from 1969 indicate that CCHF virus had been found in various locations in the country (2,3). In the village of Bandia, in the same district where the reported case was observed, a study conducted from 1986 to 1988 showed a prevalence of anti-CCHF IgG of 3.2% in the human population (4). Another study, conducted in the same area from 1989 to 1992, showed seroconversions for several ruminants and isolated the virus from ticks (5).

During CCHF outbreaks, an average of 30% of people who had the disease died (case-fatality ratio). It is often discovered during nosocomial outbreaks, as was the case in Mauritania, a country on Senegal's northern border, in 2003 (P. Nabeth, unpub. data). To prevent outbreaks of CCHF, public awareness campaigns aimed at the populations most at risk—livestock farmers, butchers, and health personnel—must be conducted, and the epidemiologic alert systems must be strengthened. In addition, conditions that enhance maintenance of the virus in nature and its transmission to humans must be better understood so adequate control measures can be developed.

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#### References

1. Hoogstraal H. The epidemiology of tick-borne Crimean-Congo hemorrhagic fever in Asia, Europe and Africa. *J Med Entomol.* 1978;15:307–417.
2. Chunikhin SP, Chumakov MP, Butenko AM, Smirnova SE, Taufflieb R, Camicas JL, et al. Results from investigating human and domestic and wild animal blood sera in the Sénégal Republic (western Africa) for antibodies to Crimean hemorrhagic fever virus. *Mater. 16. Nauchn. Sess. Inst. Polio. Virus. Entsefalitov (Moscow, October 1969)* 2, 158–60. 1969. NAMRU3-T810 (in English).
3. Wilson ML, LeGuennou B, Guillaud M, Desoutter D, Gonzalez JP, Camicas JL. Distribution of Crimean-Congo hemorrhagic fever viral antibody in Sénégal: environmental and vectorial correlates. *Am J Trop Med Hyg.* 1990;43:557–66.
4. Wilson ML, Gonzalez JP, LeGuennou B, Cornet JP, Guillaud M, Calvo MA, et al. Epidemiology of Crimean-Congo hemorrhagic fever in Sénégal: temporal and spatial patterns. *Arch Virol.* 1990;Suppl 1:323–40.
5. Zeller HG, Cornet JP, Diop A, Camicas JL. Crimean-Congo hemorrhagic fever in ticks (*Acari: Ixodidae*) and ruminants: field observations of an epizootic in Bandia, Sénégal (1989–1992). *J Med Entomol.* 1997; 4:511–6.

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## Influenza among U.K. Pilgrims to Hajj, 2003

**To the Editor:** Each year, approximately 2 million Muslims travel from all over the world to participate in hajj. Approximately 22,000 pilgrims

travel from the United Kingdom to Makkah, Saudi Arabia; of those, approximately 1,000 person reside in the east end of London. In the past, infectious diseases research conducted during these pilgrimages focused on meningococcal disease because of outbreaks associated with the hajj. Since 2000, the dates of the hajj have been moved back into the winter season; this time change could lead to a seasonal increase in outbreaks of respiratory infections caused by influenza and other viruses. From 1991 to 1992, influenza A was a common cause of respiratory infection in pilgrims tested in Makkah (1). However, the incidence rate of influenza among pilgrims from Europe is not well-known. A previous study of influenza-like illness among pilgrims from Pakistan reported rates of 36% in influenza-vaccinated pilgrims and 62% in influenza-nonvaccinated pilgrims; these results were based on clinical endpoints without microbiologic confirmation (2).

We assessed the risk for influenza infection among a cohort of pilgrims from the east end of London who participated in the hajj in 2003. From December 2002 to January 2003, we enrolled 115 participants who planned to take part in hajj in 2003. The study was approved by the North London Multicentre Research Ethics Committee and the Trustees of East London Mosque. Informed consent was obtained through appropriate translators. All participants attended the East London Mosque, Whitechapel, London; 30 were vaccinated with influenza vaccine (A/New Caledonia/20/99 [H1N1]-like strain, A/Moscow/10/99 [H3N2]-like strain, B/Sichuan/379/99-like strain). Venous blood samples were collected, and questionnaires were completed before the participants departed for the hajj and within 2–3 weeks of their return in February to March 2003.

Tests for influenza A and B were conducted by using hemagglutination