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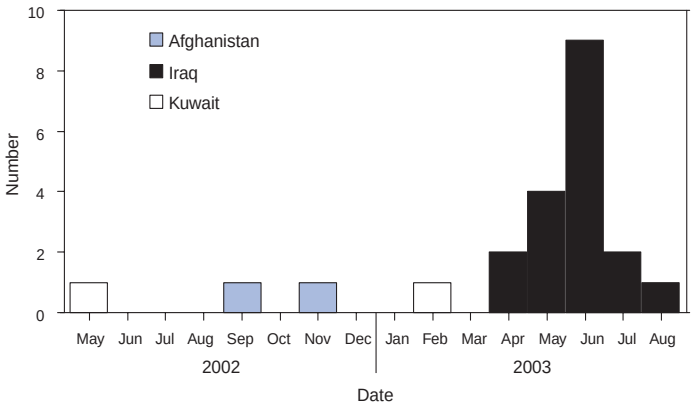
Cutaneous Leishmaniasis in U.S. Military Personnel — Southwest/Central Asia, 2002–2003

Cutaneous leishmaniasis (CL), a vector-borne parasitic disease, is a risk for persons, including military personnel, who travel to or live in areas of the tropics, subtropics, and southern Europe where the disease is endemic (*1–4*). This report provides preliminary data about 22 cases of CL in military personnel deployed during 2002–2003 to three countries in Southwest/Central Asia (Afghanistan, Iraq, and Kuwait) (Figure 1). The patients were evaluated and treated at Walter Reed Army Medical Center (WRAMC) in the District of Columbia during August 2002–September 2003. U.S. healthcare providers should consider the possibility of CL in persons with chronic skin lesions who were deployed to Southwest/Central Asia or who were in other areas where leishmaniasis is endemic.

Of the 22 patients with CL that was confirmed parasitologically*, 21 (95%) were men; 19 (86%) were non-Hispanic white, two (9%) were Hispanic, and one (5%) was non-Hispanic black. The median age of the 22 patients was 29 years (range: 21–48 years). The patients represented multiple branches of the U.S. military, including the Active Force, Reserve, and National Guard components of the Army, Air Force, and Marine Corps. On the basis of the patients' histories about their deployments, the majority (18 [82%]) probably were infected in Iraq, particularly in the urban and periurban areas of An Nasiriyah and Baghdad, and two (9%) probably were infected in areas of Kuwait adjacent to Iraq. An additional two (9%) persons were infected in Afghanistan.

FIGURE 1. Number* of cases of cutaneous leishmaniasis in U.S. military personnel, by self-reported onset of skin lesions — Afghanistan, Iraq, and Kuwait, May 2002–August 2003



* N = 22 (Afghanistan two, Iraq 18, and Kuwait two).

The patients had been deployed to these areas an estimated median of 60 days (range: 21–150 days) before first noting skin lesions. Self-reported dates of lesion onset ranged from May 2002 to August 2003 (Figure 1).

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*Detection of leishmanial parasites in specimens obtained from skin lesions (*1,5*), either by light-microscopic examination conducted by staff of the Armed Forces Institute of Pathology (District of Columbia) of Diff Quik (Dade Diagnostics, Puerto Rico)–stained slides (i.e., thin smears of tissue scrapings from ulcerative lesions or impression smears or tissue sections of skin-biopsy specimens) or by culture (e.g., of skin-biopsy specimens) performed by staff of Walter Reed Army Institute of Research (Silver Spring, Maryland).

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

West Nile Virus Infection Among Turkey Breeder Farm Workers — Wisconsin, 2002

In 2002, Wisconsin public health officials were notified of two cases of febrile illness in workers at a commercial turkey breeder farm (farm A) in county A. The Wisconsin Division of Public Health (WDPH) initiated an investigation that found a high prevalence of West Nile virus (WNV) antibody among farm A workers and turkeys. An associated high incidence of febrile illness among farm A workers also was observed. This report summarizes the results of this investigation, which indicate possible nonmosquito transmission among birds and subsequent infection of humans at farm A. Because the mode of transmission in this outbreak is unknown, turkey handlers should take appropriate precautions, including use of DEET-containing mosquito repellents, protective clothing and gloves, respiratory protection, and proper hand hygiene. Suspected occupationally acquired WNV infections should be reported immediately to local and state health departments.

During November 2002, WDPH and the Wisconsin State Laboratory of Hygiene (WSLH) confirmed that two ill residents of county A had been infected with WNV. Before these reports, only one human WNV infection had been reported in this county. Both persons worked at farm A and had febrile illness with rash during late September–early October. These human illnesses occurred after a suspected fowl pox outbreak among farm A turkeys in September. Workers were concerned the pox outbreak might be associated with their illnesses.

Farm A is one of six turkey breeder farms in county A owned by a company that also operates nonbreeder farms and a turkey meat processing plant in county A. The five other turkey breeder farms are located within 10 miles of farm A, and multiple private residences are within a quarter mile. In February 2003, county and state public health staff, in collaboration with the company, identified workers at the six turkey breeder farms, the nonbreeder farms, and the plant, and requested their consent to participate in a serosurvey. Serum samples were collected from participating workers (N = 93) to identify persons infected recently. A questionnaire was administered to identify persons who had a febrile illness during August–October 2002. Serum samples also were collected from residents (N = 14) who lived within a quarter mile of farm A. All serum samples were tested for WNV-specific IgM antibody at WSLH (*1*). IgM-positive specimens were confirmed by plaque-reduction neutralization tests at CDC (*2*). Of 107 total participants, 10 (9%) were seropositive. Of approximately 90 workers at the six breeder farms, 57 (63%) participated; of these, 10 (18%) were infected recently with WNV (Table). None of the meat processing workers or other area residents was infected. Of 11 persons who worked exclusively at farm A, six (55%) were WNV IgM-positive, compared with two (25%) of eight who worked at both farm A and other breeder farms and two (5%) of 38 who worked only at other breeder farms. Of the 10 IgM-positive workers, six (60%) reported febrile headaches during August–October (all occurring during the last week of September), compared with seven (7%) of 97 IgM-negative persons sampled (p = 0.0002 by Fisher exact test). All six IgM-positive persons who reported febrile headache had worked at farm A. All six noted a skin rash, and one had meningoencephalitis and was hospitalized; no deaths occurred. Reported mosquito exposures and bites were similar for IgM-positive (nine [90%] and eight [80%] of 10, respectively) and IgM-negative workers (67 [85%] and 54 [68%] of 79, respectively). Only one (2%) of 57 breeder farm workers reported using insect repellent while working.

Farm A includes two breeder bird barns and a juvenile flock barn. The breeder barns separate uncaged females from male turkeys with a solid plywood wall. The sides of the barns housing the female turkeys are covered with 1 in. x 1 in. mesh wire fencing and plastic curtains that can be adjusted to lower the temperature during warm months.

Serum from farm A turkeys and turkeys from the nearest breeder farm were collected in late January 2003. The farm A flock sampled was the group of birds housed in the juvenile flock barn from mid-June to early December 2002, at which time this flock was moved to a breeder barn on farm A to replace a flock slaughtered in November. The flock sampled on the nearby farm was a breeder flock also in place in

TABLE. Number and percentage of persons testing positive for West Nile virus (WNV)–specific IgM antibody, by exposure group — county A, Wisconsin, 2002

Exposure group	No. WNV–specific IgM positive	No. tested	Seroprevalence (%)
Farm A workers	8	19	(42)
Farm A workers exclusively	*6*	*11*	*(55)*
Farm A workers and other breeder-farm workers	*2*	*8*	*(25)*
Other breeder-farm workers	2	38	(5)
Non–breeder-farm workers	0	13	(0)
Turkey meat processing plant workers	0	22	(0)
Turkey meat processing plant workers and non–breeder-farm workers	0	1	(0)
Farm A residents*	0	14	(0)
Total	**10**	**107**	**(9)**

* Persons who lived on or within a quarter mile of farm A but did not work with the turkeys in any way.

September. Both flocks had suspected fowl pox outbreaks during September. Serum samples were submitted to the U.S. Department of Agriculture's National Veterinary Services Laboratories for WNV-neutralizing antibody testing. Of 135 farm A female turkeys, 130 (96%) had WNV-neutralizing antibody (measured at two dilutions, 1:10 and 1:100, and considered to be positive if a given dilution neutralized ≥90% of virus growth). No WNV-neutralizing antibody was found in 135 female turkeys tested from the nearby farm or 30 male turkeys tested from either farm.

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Editorial Note: The investigation described in this report found that workers at farm A had a higher incidence of febrile illness and prevalence of WNV antibodies than workers at other breeder and nonbreeder farms, workers at a turkey meat processing facility, or persons who lived on or near the affected farm and who did not work in the turkey barns. The mode of transmission to these workers is unknown. Although the majority of human WNV infections are mosquito-borne, transmission by less typical routes might have occurred, including percutaneous (e.g., exposure of broken skin or mucosa to infected turkey feces or serous exudates from dually-infected pox lesions), fecal-oral, or respiratory (e.g., exposure to aerosolized infected turkey feces).

The WNV seroprevalence (96%) among female turkeys on farm A was high. However, experimental evidence suggests that turkeys develop insufficient levels of WNV viremia to contribute to a bird-mosquito-bird amplification cycle (*3*). Although WNV was detected in the feces of these turkeys, no oropharyngeal shedding or transmission to cage mates was observed (*3*). Nonvector-borne WNV transmission has been demonstrated experimentally among rodents and among certain bird species other than turkeys (*4,5*). Once WNV was introduced to female turkeys at farm A (presumably by mosquitoes), widespread transmission within that flock might have taken place by fecal-oral, respiratory, or another atypical (e.g., percutaneous exposure associated with pecking behavior or vaccination) route. In addition, other unique conditions at farm A, including possible co-infection with an avian pox virus, might have resulted in higher WNV viremias or infectious materials with higher WNV titers than laboratory studies have suggested.

Despite uncertainty over the mode(s) of transmission, epidemiologic evidence suggests that this outbreak was related to occupational exposure. Occupationally acquired WNV infections have been reported previously among laboratory or field workers who experienced a known percutaneous injury or aerosol exposure while working with high concentrations of WNV in cell culture or infected animal tissues (*6–9*). In this investigation, no such exposure was documented. Because the mode of transmission in this outbreak is unknown, turkey handlers should 1) take personal protective measures, including wearing protective clothing and using mosquito repellents (e.g., those containing DEET on skin and clothing and those containing permethrin on clothing), as recommended for outdoor workers; 2) wear gloves; and 3) wash hands frequently. In addition, respiratory protection has been recommended for reducing other exposures to workers in turkey barns (*10*). Respiratory protection should be selected and used in accordance with the Occupational Safety and Health Administration (OSHA) respiratory protection standard (Title 29 CFR 1910.134).

Workers should receive training that reinforces awareness of potential occupational hazards and risks and stresses the importance of timely reporting of all injuries and illnesses of suspected occupational origin. Health-care workers should inquire about a patient's outdoor exposure and occupation when a human WNV infection is suspected or identified and consider WNV as a possible etiology among turkey farm workers with febrile headache or rash, meningitis, encephalitis, or other severe neurologic illness, especially when WNV illnesses exist among co-workers or birds. Suspected occupationally acquired WNV infections should be reported immediately to local and state health departments.

The investigation of turkey breeder farm workers in county A is ongoing. In addition, further studies are needed to determine the factors involved in this outbreak, to better define the occupational risk for WNV infections, and to assess appropriate personal protective measures. On the basis of recommendations from public health staff, the company has made mosquito repellent containing 30% DEET available at farm A and other turkey breeder farms. Recommendations that were outlined previously in place at the company farms include protective clothing, frequent hand washing, and an OSHA-required respiratory protection program. Gloves and safety glasses also are available to workers.

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References

1. Martin DA, Muth DA, Brown T, Johnson AJ, Karabatsos N, Roehrig JT. Standardization of immunoglobulin M capture enzyme-linked immunosorbent assays for routine diagnosis of arboviral infections. J Clin Microbiol 2000;38:1823–36.
2. Beaty BJ, Calisher CH, Shope RE. Arboviruses. In: Lennette EH, Lennette DA, Lennette ET, eds. Diagnostic Procedures for Viral, Rickettsial, and Chlamydial Infections, 7th ed. Washington, DC: American Public Health Association, 1995.
3. Swayne DE, Beck JR, Zaki S. Pathogenicity of West Nile virus for turkeys. Avian Diseases 2000;44:932–7.
4. Odelola HA, Oduye O. West Nile virus infection of adult mice by oral route. Archives of Virology 1977;54:251–3.
5. Komar N, Langevin S, Hinten S, et al. Experimental infection of North American birds with the New York 1999 strain of West Nile virus. Emerg Infect Dis 2003;9:311–22.
6. Pike RM. Laboratory-associated infections: summary and analysis of 3,921 cases. Health Laboratory Science 1976;13:105–14.
7. Sewell DL. Laboratory-associated infections and biosafety. Clin Microbiol Rev 1995;8:389–405.
8. Nir YD. Airborne West Nile virus infection. Am J Trop Med Hyg 1959;8:537–9.
9. CDC. Laboratory-acquired West Nile virus infection—United States, 2002. MMWR 2002;51:1133–5.
10. Reynolds SJ, Parker D, Vesley D, Janni K, McJilton C. Occupational exposure to organic dusts and gases in the turkey growing industry. Appl Occup Environ Hyg 1994;9:493–502.

Public Health and Aging

Nonfatal Injuries Among Older Adults Treated in Hospital Emergency Departments — United States, 2001

Because injuries generally are considered a problem of the young, injuries among older adults (i.e., persons aged ≥65 years) have received little attention. However, injuries are the eighth leading cause of death among older adults in the United States (*1*). In 2001, approximately 2.7 million older adults were treated for nonfatal injuries in hospital emergency departments (EDs); the majority of these injuries were the result of falls (*1*). To characterize nonfatal injuries among older adults, CDC analyzed data from the National Electronic Injury Surveillance System-All Injury Program (NEISS-AIP). This report summarizes the results of that analysis, which indicate differences in type and mechanism of injury by sex, suggesting that prevention programs should be designed and tailored differently for men and women.

NEISS-AIP is operated by the U.S. Consumer Product Safety Commission and collects data about initial visits for all