Medical News

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Needlestick Transmission of Both HIV and HCV

Researchers at the Massachusetts Department of Public Health and the CDC recently reported infection of a healthcare worker (HCW) with both human immunodeficiency virus (HIV) and hepatitis C virus (HCV) following an accidental needlestick injury from a patient with AIDS. In July 1990, a 48-year-old HCW sustained a deep injury with a blood-contaminated needle while performing phlebotomy on a patient with AIDS. Blood also spilled from the collection tube into the spaces between the cuffs of the HCW's gloves and her wrists, onto her hands, which were chapped with open cracks. Immediately after the incident, the HCW removed her gloves and washed her hands.

At the time of the exposure, the patient with AIDS was being treated with zidovudine therapy and was not recognized as having HCV infection. The HCW reported no related risk factors for HIV and declined zidovudine prophylaxis. Baseline HIV antibody testing was negative. No baseline testing was done for HCV, because the source patient was not identified initially as being HCV-infected. Serum obtained 11 months after the exposure was positive for HIV antibody, and the results were confirmed by Western blot. Seroconversion to HCV occurred between 9 and 13 months after exposure. Eighteen months after documented seroconversion to HIV, and 28 months after the needlestick injury, the patient developed hepatic coma and progressive renal failure and died.

The strains of HIV and HCV infecting the source patient and the HCW were compared after amplification by the polymerase chain reaction and genetic sequencing. The HIV and HCV strains from the HCW and the source patient were found to have a high degree of relatedness (the HCV strain being almost identical), providing evidence of transmission from the source patient and the infected HCW.

Several features of this occupationally acquired infection are unusual. Signs and symptoms of acute HCV infection appeared 8 months after exposure, suggesting an unusually long incubation period. The time from exposure to anti-HCV seroconversion also was unusually long. In previous reports of HCV transmission from percutaneous injury, the time to seroconversion ranged from 3 to 8 months. The rapid progression to hepatic failure and death is also remarkable. The time to HIV seroconversion in this HCW also was unusually long, one of the longest reported to the CDC. It is not known whether current, more sensitive versions of tests for HIV and HCV antibodies might have been able to detect seroconversion earlier.

The reasons for the unusual clinical and laboratory features of this HCW's illness are unclear. There was no preexisting immunodeficiency in this HCW. It may have been related to the simultaneous acquisition of the two infections; there is evidence of pathogenic interactions between the two viruses.

The risk of maternal-fetal transmission of HCV may be increased in women who also are HIV-infected. In HCV-infected patients with hemophilia, progressive liver disease was seen only in those also infected with HIV. One report has suggested that HCV transmission may be more likely if the source patient has dual infection.

The Public Health Service interagency working group on the management of exposure to HIV considered this case as part of a review of available data on the length of HIV seroconversion window. This group did not recommend routine HIV serologic follow-up beyond 6 months after exposure, because prolonged follow-up would detect a new infection only rarely and would prolong the anxiety of the exposed HCW unnecessarily. However, in the case of simultaneous occupational exposure to HIV and HCV, or in the event of clinical symptoms, or signs of infection more than 6 months after exposure, evaluation for late seroconversion may be needed. The authors recommend further study for possible pathogenetic interactions between HIV and HCV.

FROM: Ridzon R, Gallagher K, Ciesielski C, et al. Simultaneous transmission of HIV and HCV from a needlestick injury. *N Engl J Med* 1997;336:919-922.

Legionnaires' Disease From Whirlpool Spa Display

An outbreak involving 23 cases of legionellosis (with *Legionella pneumophila* serogroup 1 [Lp1]) in southwestern Virginia was reported recently by the CDC. A case-control study revealed that a history of having visited a large home-improvement center during the 2 weeks before the onset of illness was associated significantly with the cases defined as Lp1, identified by culture of sputum, antigen assays of urine, or fourfold rise in serum antibody titers.

For the 13 cases and 12 controls for whom there was a detailed in-store exposure history, cumulative duration of store visits averaged 79 minutes for cases compared to 29 minutes for controls. In addition, 10 case patients (77%) reported spending time in the area surrounding the whirlpool spa display compared to only three (25%) of the controls. Four case patients reported only walking by the spa display. No other activity, including drinking water from the store fountain, was associated with illness.

Sample cultures were taken from all water sources in the home-improvement center, including the whirlpool spa

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basin and filters, a greenhouse sprinkler system, a decorative fish pond and fountain, potable water fountains, urinals, and hot- and cold-water taps in rest rooms. Lp1 isolated from a whirlpool filter was an exact match, by monoclonal antibody subtyping and polymerase chain reaction, to the sputum from two of the cases.

In contrast to other spa- or whirlpool-associated outbreaks of legionnaires' disease, in this outbreak, none of the case patients actually entered the water. Instead, all most likely were exposed by walking by, or spending time in, the area surrounding the spa.

Although most communitywide outbreaks of legionellosis have resulted from transmission from an outdoor source (eg, cooling tower), this report underscores the potential for such outbreaks in association with contaminated indoor sources. The findings of the case-control study indicated that the source of the outbreak was the home-improvement center, and case patients were more likely than controls to have reported exposure to the spas, but this difference was not statistically significant. Thus, the laboratory findings were critical in identifying the exact source of exposure within the store.

Following this outbreak, the Virginia Department of Health recommended that whirlpool spas being used for displays be inspected regularly and maintained with biocides and that filters be changed and decontaminated regularly. In response to recent outbreaks of legionnaires' disease on a cruise ship, the CDC has developed guidelines for the maintenance of whirlpool spas on cruise ships. Based on this investigation, the CDC is assessing these guidelines to determine if modifications are necessary for land-based whirlpool spas, including those that are being operated while on display.

FROM: Centers for Disease Control and Prevention. Legionnaires' disease associated with a whirlpool spa display—Virginia, September-October 1996. *MMWR* 1997; 48:83-85.

The Changing Microbiology of Blood Cultures

The current understanding of the clinical significance of positive blood cultures has been shaped by many studies performed during the past 30 years. Factors such as the increased use of invasive or prosthetic devices, the increase in transplantations, emergence of human immunodeficiency virus (HIV) infection and AIDS, and the use of broader spectrum anti-infective therapies represent major changes in medical practice over the years.

Weinstein and coinvestigators recently reported the results of a major analysis of positive blood cultures among patients in three large medical centers. The authors reviewed 843 episodes of positive blood cultures in 707 patients with septicemia. The five most common pathogens were *Staphylococcus aureus, Escherichia coli,* coagulase-negative staphylococci (CNS), *Klebsiella pneumoniae,* and *Enterococcus* species. Although CNS were isolated most often, only 12.4% were clinically significant. Half of all episodes were nosocomial, and one quarter had no recognized source. Leading identifiable sources included intravenous catheters, the respiratory and genitourinary tracts, and intraabdominal foci. Septicemia-associated mortality was 17.5%. Patients who received appropriate antimicrobial therapy throughout the course of infection had the lowest mortality (13.3%). Multivariate analysis showed that age (relative risk [RR], 1.80), microorganism (RR, 2.86), predisposing factors (RR, 1.98), blood pressure (RR, 2.92), body temperature (RR, 2.04), and therapy (RR, 2.72) independently influenced outcome. Bloodstream infections in the 1990s are notable for the increased importance of CNS as both contaminants and pathogens, the proportionate increase in fungi and decrease in anaerobes as pathogens, the emergence of *Mycobacterium avium* complex as an important cause of bacteremia in patients with advanced HIV infection, and the reduction in mortality associated with infection.

FROM: Weinstein MP, Towns ML, Quartey SM, et al. The clinical significance of positive blood cultures in the 1990s: a prospective comprehensive evaluation of the microbiology, epidemiology, and outcome of bacteremia and fungemia in adults. *Clin Infect Dis* 1997;24:584-602.

Hepatitis B Transmitted by e-Antigen Negative Surgeon

Investigators from the Communicable Disease Surveillance Center in London, England, recently reported four cases of transmission of hepatitis B virus (HBV) infection to patients by four HBV-infected surgeons whose serum did not contain hepatitis B e-antigen (HBeAg).

Transmission of HBV to patients from infected surgeons who carry HBeAg has been documented repeatedly. In the United Kingdom, HBeAg-positive surgeons are not permitted to perform certain procedures that carry a risk that patients might be exposed to the blood of a healthcare worker. Most cardiothoracic, gynecologic, and abdominal surgery is considered to involve such a risk, as are most open orthopedic procedures. There are no practice restrictions for carriers of hepatitis B surface antigen (HBsAg) without detectable HBeAg, unless transmission has been documented.

Following the recognition of four unconnected cases of acute HBV in which surgery was identified as the possible source of infection, all the surgical teams were tested for serologic HBV markers. Three of the surgeons were found to be carriers (positive for HBsAg and negative for anti-HBc IgM), and the fourth surgeon was known to be an HBeAg-negative carrier of HBV. All four surgeons were negative for HBeAg. HBV DNA was detectable by liquid hybridization in the sample from one surgeon, but was not detectable from any samples from the other three surgeons. However, HBV DNA was detectable by enzyme-linked oligo-nucleotide assay in samples from all four surgeons. The nucleotide sequences of HBV DNA from the surgeons were indistinguishable from those of the corresponding patients. Screening of other exposed patients

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