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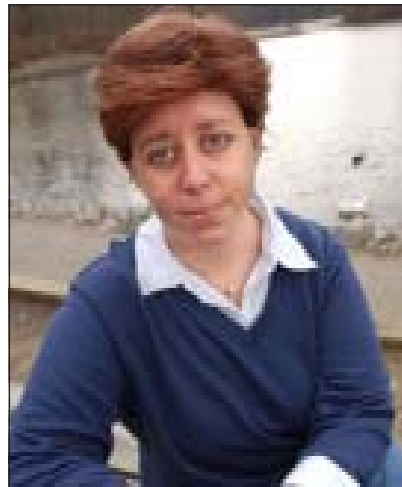
Occupational Co-Infection with HIV and HCV in Clinical Lab Via Blood Splash

Kristin Turner, a lab tech at Maryland General Hospital, was infected with HIV and HCV after a blood analyzer machine malfunctioned—and her PPE failed

By Jane Perry, M.A., and Janine Jagger, M.P.H., Ph.D.

EDITORS' NOTE - This article is based on an interview with Kristin Turner published in the Baltimore Sun on 3/19/04, Turner's testimony before a Congressional subcommittee on 5/18/04, and an article Turner wrote for the February 2005 issue of Medical Laboratory Observer.

IN MARCH 2003, THIRTY-ONE-YEAR-OLD Kristin Turner was working as a technologist in the clinical laboratory of Maryland General Hospital (MGH) in Baltimore. MGH is a 245-bed community teaching facility associated with the University of Maryland Medical System. According to Turner's estimates, the lab tested approximately 60 patient blood samples a week for HIV and hepatitis C¹; the testing was fully automated, performed by the Labotech Open Microplate Blood Testing System (Labotech), manufactured by Adaltis, Inc. More than 2,500 Labotech machines are reportedly in use worldwide.



Kristin Turner

Turner was hired in October 2002, and immediately underwent training on the Labotech. From the beginning, she noted that it frequently malfunctioned. According to a 12/7/03 letter she sent to MGH, the machine “showed alignment errors, cross contaminated samples and failed runs. [It] required hands-on intervention at every step and patient specimens were compromised[.]”² Turner repeatedly told her supervisor about the problems with the Labotech, but her complaints were ignored. Adaltis tried, unsuccessfully, to fix the problem: “Maryland General utilized three different Labotechs during the time of my employment, and all three consistently malfunctioned and failed runs. Adaltis ... many times each month sent people in to ‘fix’ [them], yet they were never able to be used for more than two or three days after each repair without having more problems.”³

On March 12, 2003, while running HIV and HCV tests, the machine displayed yet

AP photo

Kristin Turner: Occupational Co-Infection in a Clinical Lab

another error message. Turner opened it to make the indicated adjustment, then pushed a button to continue the test. “Shortly afterward ... the machine [again] malfunctioned—an arm slammed down on the test-tube samples, smashing the glass and splattering her with blood.”¹ The plate held blood samples from approximately 30 patients, as well as control samples containing HIV- and HCV-infected serum. A large quantity of blood splashed in her face, ran down under the top edge of her protective goggles into her eyes, and dripped behind her mask into her nose and mouth.

Turner washed off her face and, after looking unsuccessfully for a supervisor, reported to the emergency room. There, baseline tests for HIV and HCV were performed; the results were negative. She immediately started a course of HIV postexposure chemoprophylaxis (PEP). “I did everything I was instructed to do,” Turner says, “from the protective equipment I was wearing to how I handled the malfunction, and the treatment following the exposure.”³ But in June 2003, during a week-long hospitalization for a severe flu-like illness, she was retested and found positive for both HIV and hepatitis C.

Learning she was infected from an occupational exposure was “the worst nightmare of every medical worker,” Turner says. “Everything about my life changed. It tore it completely apart, turned it upside down.”¹

After her exposure and subsequent infection, Turner went on medical leave due to the side effects from the HIV PEP drugs. While on leave she continued to try to get the lab to address its safety problems, to no avail. When her dental

insurance card was refused, “I learned I had been terminated because I had not been able to return to work. I knew I was being swept under the rug, which actually just made me more determined,” she says. “Ultimately, I had no choice but to blow the whistle and go outside the hospital for help.”⁴

On December 7, 2003, Turner sent an e-mail to lab director James

Turner urges all lab workers to report hazardous situations and equipment. “Start with your direct supervisor; commit to following up and reporting to others in the organization or beyond if necessary. Keep documentation of every report you make and every conversation and phone call you have regarding the issue.”

Stewart and copied it to MGH administrators and city and state health officials. She described the history of problems with the Labotech and said there had been improper alteration of quality control results. Her complaint triggered an investigation by the Maryland State Office of Health Care Quality, which found that, over a 14-month period, 10% to 15% of HIV tests performed may not have been accurate. The problem affected at least 460 patients, most of whom were tested for HIV. Some patients may also have received false-negative HCV test results; at least one

patient who was told he was negative later tested positive for HCV.⁵

Turner’s whistle-blowing prompted not only a state health department investigation—including teams from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the Centers for Medicare and Medicaid Services (CMS)—but also a U.S. House hearing, requested by Maryland Congressman Elijah Cummings. The investigation and hearing shook the lab industry and caused the College of American Pathologists (CAP), which has “deemed status” from CMS to inspect and accredit clinical laboratories in the U.S., to reexamine and improve many of its processes for certifying labs.

As for Turner, her life has “changed in every way imaginable.”³ She takes 12 pills a day to treat her HIV and HCV infections; the side effects have, at times, been severe. At a time when people are presumably better educated about HIV/AIDS, she says some long-time friends have shunned her, and an anonymous flyer was circulated among residents of her apartment building revealing her infection status. She has since moved from the apartment building and out of Maryland altogether. She thinks frequently about what happened at MGH, and “the patients who were put at risk. I am haunted by the malfunction and go over it in my mind every day.” But, she says, “I know in my soul that I did everything possible to bring about changes and to create a safe environment for MGH employees and patients.”⁴

In March 2004, Turner filed a lawsuit against MGH, former lab director James Stewart, and Adaltis, Inc., seeking \$10 million in compensatory damages and \$20 million in punitive damages. In July 2004, the U.S. District Court in Baltimore dismissed MGH as a defendant,

Kristin Turner: Occupational Co-Infection in a Clinical Lab

based on the “exclusive remedy” provision which grants immunity to employers under workers’ compensation law. The lawsuit against the other defendants is on-going.

For Turner, one of the hardest things to accept is that her exposure and subsequent infections “could have been completely prevented,” as she said in her Congressional testimony. After her accident, she learned that Stewart had been aware of the problems with the Labotech from the first week it was introduced in the lab. In July 2002, before she was hired, another MGH lab worker, Theresa Williams, filed a letter of complaint with the hospital and the state, warning of serious and long-standing testing problems that put patients and employees at risk. Williams eventually quit MGH. According to Turner, “I later learned that on numerous occasions many of the laboratory staff requested that the machine be sent back and replaced by a different machine from a different company... Instead, another dysfunctional Labotech was brought in and put to use.” The lab manager “was allowed to choose profit over patient safety and his actions were never questioned by his superior.”³

Turner urges all lab workers to report hazardous situations and equipment. “Start with your direct supervisor; commit to following up and reporting to others in the organization or beyond if necessary. Keep documentation of every report you make and every conversation and phone call you have regarding the issue. Safety and health are more important than any job, and most organizations have ‘no retribution’ policies for ‘whistle-blowers.’ My advice is never give up until a situation is fixed.”⁴

An overlooked aspect of Turner’s exposure and infection is that the personal protective equipment (PPE) she was wearing failed to protect her. In particular, the goggles and faceshield she had on did not prevent blood from running down into her eyes or from getting

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into her nose and mouth. Exposure of healthcare workers’ eyes to HIV- and HCV-contaminated blood is a documented transmission route for infection (and co-infection) with these pathogens.⁶⁻⁸ Healthcare facilities should select protective eyewear with a seal above the brow to prevent blood or fluid from running down into healthcare workers’ eyes.⁹ PPE equipment should be tested to ensure that it does, in fact, provide adequate protection, particularly in the event of a massive exposure such as Turner experienced. Such trial testing is particularly important in clinical and research laboratories, where workers may handle concentrated forms of bloodborne viruses.

The National Institute for Occupational Safety and Health has developed a website on “Eye Protection for Infection Control,” intended to familiarize workers with various types of eye protection, their characteristics and applicable use. The site can be accessed at:

www.cdc.gov/niosh/topics/eye/eye-infectious.html. □

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