Editorial

Comprehensive Prevention of Occupational Blood Exposures: Lessons From Other Countries

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Occupational exposures to blood and bloodborne viruses (ie, hepatitis B virus [HBV], hepatitis C virus [HCV], and human immunodeficiency virus [HIV]) have been a concern in the United States for more than a decade. Several studies have been conducted to assess the magnitude of the problem and to evaluate prevention strategies.

The risk of occupational exposure to bloodborne pathogens is influenced by the prevalence of infection in the patient population and the nature and frequency of blood exposure, whereas the likelihood of acquiring infection after a single blood exposure event from an infected patient is influenced by the severity of the exposure (ie, route of entry and inoculum size) and viral type.

The surveys conducted in Brazil and Mexico by Ribeiro et al[1] and Kato-Maeda et al,[2] respectively, showed that the prevalence of all three bloodborne viruses—HBV, HCV, and HIV—in patients admitted to emergency departments was higher than in the general population, as represented by blood donors. Studies in the United States have reported similar results. The prevalence of each bloodborne virus in the two surveys differed, reflecting expected geographic differences; however, patients with more than one bloodborne virus infection, particularly HIV and HCV, were frequent in both surveys. In the study conducted by Kato-Maeda et al in Mexico City, 32% of HIV-infected patients were unaware of their HIV status, and several did not report a risk factor for HIV infection.

The results from these reports reinforce two important prevention concepts. One is the importance of following Universal or Standard Precautions with any patient during interactions when there is a potential for blood exposure, an approach that does not require knowledge of the patient's bloodborne infection status on the part of either the patient or healthcare provider. The other is the importance of testing source patients for all three bloodborne viruses after an occupational exposure, for optimal postexposure management.

Rabaud et al[3] conducted a survey in six nursing schools and six hospitals in Lorraine, France, to assess reasons for not reporting a blood exposure, to describe the behavior of French nurses after occupational exposure to blood, and to explore links between personality traits and exposures to blood. The rate of underreporting in this survey was similar to other studies. Underreporting of rates in US hospitals has ranged from 40% to 80%, depending on the institution and the occupational group. In annual surveys conducted in 1996 to 1998 in hospitals participating in the Centers for Disease Control and Prevention (CDC) surveillance system for occupational exposures and infections, the National Surveillance System for Healthcare Workers, the average rate of underreporting among nurses was 51% (P. Srivastava, MS, CDC, oral communication, March 2000).

One reason for not reporting exposures to blood in Rabaud's paper was "fear of being judged." Reports on the epidemiology of needlestick injuries in the United States from the 1970s and early 1980s often attributed the injury causation to "personal carelessness." The pervasiveness of this blame-the-worker attitude likely contributed to underreporting in the United States and is suggested as a contributing factor in Rabaud's report. Another reason for underreporting in Rabaud's paper is the most frequent reason for underreporting in US hospitals: the perception that the source of exposure is associated with low risk of infection. In some US hospitals, reporting of blood exposures increased after the publication of the 1996 CDC recommendations for HIV postexposure prophylaxis.[4] Since Rabaud's survey was conducted before publication of these

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recommendations, some reasons for not reporting (ie, local disinfection was enough, and vaccination for HBV was completed) might not be as frequent in year 2000.

The other objectives of Rabaud's paper were to describe the behavior of French nurses after an occupational exposure to blood and to link personality traits with exposures to blood. They found that certain personality traits, eg, having a high level of disinhibition or susceptibility to boredom, appeared linked to the risk of occupational blood exposure and underreporting. A study of nurses in one US hospital by DeJoy et al[5] examined multiple variables that influenced compliance with Universal Precautions to prevent occupational blood exposure. While having risk-taking tendencies was associated with lower compliance with Universal Precautions, a hierarchical regression analysis revealed that job or task and organizational factors were found to be the best predictors of compliance.

While the role of behavior and personality in determining health outcomes must be acknowledged, it is important to study the multiple determinants of health behavior and health outcomes and to identify the factors for which interventions may be developed. For example, several findings in Rabaud's paper highlight the importance of training and education of healthcare personnel for the prevention and proper management of exposures to blood: lack of knowledge of occupational bloodborne infection risks, low use of barrier precautions, and use of caustic agents (eg, bleach) for local care after exposure to blood.

These three articles are a reminder that preventing exposure to bloodborne pathogens in healthcare settings requires a comprehensive, multifaceted approach. As we look at what is occurring in other parts of the world, it is interesting to highlight the evolution of prevention recommendations and interventions that have been used in the United States.

During the late 1970s, the focus was primarily on safe work practices (eg, not clipping or recapping needles), followed by recommendations for rigid sharps-disposal containers and point-of-use access. With the emergence of the HIV epidemic, these strategies were integrated into a conceptual framework for preventing blood exposure (including sharps injuries), and Universal Precautions became the mantra for protecting healthcare personnel. Implementation of the Occupational Safety and Health Administration Bloodborne Pathogen Standard[6] in 1991 provided a regulatory approach that addressed prevention through education, vaccination, engineering and work practice controls, personal protective equipment, and post-exposure care. Thus, the hierarchy of controls, a term familiar to nonhealthcare industries, was promoted as a means for reducing bloodborne-hazard risks to healthcare personnel, and familiar items used to protect both healthcare personnel and patients (eg, gowns, gloves) became "personal protective equipment." With this also began an evolution of changes in needles and other sharp devices that were designed to "engineer away" injury hazards by removing or isolating the sharp. Today, through regulation and legislation, devices with engineered sharps injury-prevention features are considered a primary prevention strategy. More recently still, we have learned about the importance of creating a "culture of safety" to protect both healthcare personnel and patients.[7] As the focus has shifted from one intervention to another, perhaps what has been lost is a sense of the value and role that each intervention contributes to a comprehensive prevention approach.

Today we have an exciting opportunity to build model programs that will protect healthcare personnel from bloodborne infection risks by using a combination of available interventions. To implement these interventions effectively, we also must improve our understanding of the factors that motivate both healthcare personnel and leaders of healthcare organizations to become personally accountable for promoting and ensuring a safe work environment.

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