

TABLE

PREVALENCE OF HEPATITIS B INFECTION IN 155 MUNICIPAL AND 31 HOSPITAL WASTE COLLECTERS, RIO DE JANEIRO

| Antibody | Municipal | | Hospital | |
|---------------------|-----------|------|----------|------|
| | N | % | N | % |
| Anti-HBc + anti-HBs | 18 | 11.6 | 4 | 12.9 |
| Anti-HBc | 1 | 0.6 | — | — |
| Anti-HBs | 3 | 1.9 | — | — |
| Total | 22 | 14.2 | 4 | 12.9 |

Abbreviations: anti-HBc, anti-hepatitis B core antigen; anti-HBs, anti-hepatitis B surface antigen; CI₉₅, 95% confidence interval; OR, odds ratio.

OR, 0.9; CI₉₅, 0.24-3.05; P=.9246.

the present study, and thus it is not possible to know if the prevalence of hepatitis B in these workers is higher than in the general population. However, there is no doubt that these values can be considered high. The high level of accidents with sharp materials among these workers and the risks of infectious disease transmission³ argue that they should be vaccinated against hepatitis B.

REFERENCES

1. Stratton CW, Decker MD. Prevention of occupationally acquired infections in posthospital health care workers. In: CG Mayhall, ed. *Hospital Epidemiology and Infection Control*. Baltimore, MD: Williams & Wilkins; 1996:896-912.
2. Coelho HS, Artermenko SR, Martins CN, de Carvalho DM, Valenti J, Rodrigues EC, et al. Prevalence of virus B infection in a hospital community [in Portuguese]. *Rev Soc Bras Med Trop* 1990;23:71-76.
3. Reinhardt PA, Gordon J, Alvarado CJ. Medical waste management. In: CG Mayhall, ed. *Hospital Epidemiology and Infection Control*. Baltimore, MD: Williams & Wilkins; 1996:1099-1108.

João Alberto Ferreira, DSc, PE
Engineering School of Rio de Janeiro
State University—UERJ

Anamaria Testa Tambellini, DSc, MD
Carmem Lúcia Pessoa
da Silva, DSc, MD

Maria Angélica A.M. Guimarães, DSc
Microbiology Institute of Rio de Janeiro
Federal University—UFRJ
Rio de Janeiro, Brazil

Healthcare Workers' Perceptions of Occupational Exposure

To the Editor:

Healthcare workers (HCWs) are at risk for occupational exposure to bloodborne pathogens.^{1,3} Despite

documentation of this risk and the establishment of mandatory national standards for preventive practice, HCWs have low adherence to Universal Precautions.^{4,5} To understand this phenomenon, we conducted focus-group interviews with participants from high-risk occupational groups: students, residents, operating room (OR) staff and surgeons, and emergency department (ED) staff and physicians. Forty-eight individuals participated in 10 focus groups between February and March 1996. Each group was asked to describe factors that affected their risk of exposure, and how they responded to occupational risk. Discussions were transcribed and thematically analyzed, and the results were assessed for trustworthiness using accepted methods.⁶

The participants included 27 women and 21 men. Three of the focus groups were comprised of surgeons, four of nurses (OR and ED), and one each of medical residents, emergency physicians, and medical students. Participants' clinical experience ranged from less than 1 year to more than 10 years, and less than 10% reported a personal history of occupational exposure. The Table summarizes the categories of risk factors identified by participants. In this report, we highlight unexpected findings, using representative quotations, regarding risk factors for exposure and efforts to decrease occupational risk.

Only medical students and residents identified intimidation as a factor that led to increased risk of exposure. Intimidation by other residents and attending physicians led them to feel hurried or forced into actions that increased the risk of injury. A student reported, "I think there is a lot of

pressure not to say, 'Excuse me, I don't feel comfortable'." Despite a decade of educational and preventive efforts, surgeons and some residents still described exposure as an unavoidable job hazard. One participant said, "If your number's up, your number's up."

Surprisingly, some participants in all groups felt their risk was influenced by the behavior of other workers, not their own behavior. A surgeon reported, "Most of the sticks I've had were not sticks I inflicted on myself." An OR nurse echoed, "It's usually somebody else's fault that you got stuck; it's not your own fault that you got stuck." And a resident said, "I got stuck with a needle, and it wasn't even something I did; I thought it was someone else's carelessness."

Only surgeons and trainees indicated that one method they used to reduce occupational risk was to avoid invasive procedures and high-risk patients. They also indicated that they modeled preventive practices of senior staff. One reported, "Surgeons are inherently hero worshippers who focus on individuals and pattern themselves after individuals." Only nurses identified organizational strategies, such as safety guidelines and policies, as mechanisms for reducing exposure. They often cited that mandatory policies were the reason they used personal protective equipment. They noted, however, that policies were not uniformly applied or reinforced. "The big thing with policies is that they have to be enforced, and they have to be enforced 100% of the time for 100% of the people. And they're not." Another nurse noted, "Policies around here are like rain; you hear them, and then they're gone."

Our purpose was to use qualitative methods to identify factors that would help us to create effective intervention programs for decreasing occupational exposure. This study corroborated findings of earlier studies, underscoring the trustworthiness of the data, but also identified risk factors that had not previously been detailed or included in studies of occupational risk. The most noteworthy of these factors were intimidation and the attribution of occupational risk to others. The perception that one's risk of occupational exposure depended on someone else's carelessness, not on one's own behavior, was shared by different groups of HCWs. This phenomenon

TABLE

RISK FACTORS FOR OCCUPATIONAL EXPOSURE IDENTIFIED BY HEALTHCARE WORKERS

| Risk Factor | Representative Quotations |
|---------------------------------------|---|
| Mechanism of injury | "Hollow-bore needles pose the greatest risk." (surgeon) "I know two people who have been stuck, both with suture needles, not hollow-bore needles. It's better [to get stuck with a suture needle]." (student) |
| Intimidation | "Sometimes you're forced into doing things you really don't want to do [that put you at risk] because you don't want to look weak." (resident) "The intern was hurrying me up, basically telling me how weak I was, not going fast enough. He ordered me to change needles on a blood culture, and in the process, I got stuck." (resident recalling exposure while a student) |
| Professional risk | "I don't think there's any way for a cardiac surgeon to modify the way he or she does the procedure to increase the distance between them and the blood." (surgeon) "It's sort of the risk I'm taking as a healthcare worker." (resident) |
| Patient factors | "If I'm working with a gang leader or an IV drug user, I am definitely more aware that that person is giving me a risk." (nurse) "That little old lady could have raging hepatitis C, but it's still harder to get gowned up for that little old lady." (emergency room physician) |
| Procedural experience | "I think it is people who are inexperienced [who get exposed]." (resident) "People that have never done it [a procedure] are more likely to make mistakes [that lead to exposure]." (resident) |
| Situational factors | "It [concern about exposure] isn't because I don't use Universal Precautions; it's when I'm tired. Most people are usually tired when it happens." (resident) "The reason for an exposure is you're moving too fast." (nurse) |
| Lack of personal protective equipment | "If you have two layers of rubber [gloves] on, it does protect you as opposed to one." (surgeon) "I got squirted in the face once. I hadn't put on my glasses yet." (student) |

of attributing blame to others has been described previously in psychology literature.⁷ Although successful outcomes often are attributed to one's own behavior, failures are more likely attributed to "outside" causes. For example, an injury such as a needlestick is attributed to the situation or other people, circumstances outside of the individual's control. A worrisome finding is that, despite substantial educational and public message efforts, some medical trainees still perceive that occupational risk is unavoidable.

Our findings suggest that risk factors for occupational exposure and responses to risk can be unique to specific groups of health professionals. Thus, tailoring training programs to the target group may help to design programs that are more effective in reducing occupational exposure to bloodborne pathogens. For example, knowing that intimidation is a perceived risk factor and that role modeling is a cultural norm for learning preventive precautions among trainees suggests that this factor and teaching technique be specifically included in an intervention program. In contrast, nursing

professionals are less likely to find these to be pertinent issues. Intervention programs that emphasize organizational strategies are more likely to be effective for them.

Qualitative research methods can provide information about perceptions and practices that otherwise can be difficult to obtain.⁸ They cannot answer questions of magnitude or prevalence of risk factors, nor do they readily allow generalization of findings to other settings. This study suggests factors that, with additional research, may provide important insights in efforts to design interventions for specific groups of at-risk health professionals. Attention to these factors may allow training programs to be tailored appropriately to the target group and may result in effective programs for reducing occupational exposure to bloodborne pathogens.

REFERENCES

1. Lanphear BP, Linnemann CC Jr, Cannon CG, DeRonde MM, Pender L, Kerley LM. Hepatitis C virus infection in healthcare workers: risk of exposure and infection. *Infect Control Hosp Epidemiol* 1994;15:746-750.
2. Henderson DK, Fahey BJ, Willy M, Schmitt JM, Carey K, Koziol DE, et al. Risk for occu-

pational transmission of human immunodeficiency virus type 1 (HIV-1) associated with clinical exposures. A prospective evaluation. *Ann Intern Med* 1990;113:740-746.

3. McCray E. Occupational risk of the acquired immunodeficiency syndrome among health care workers. *N Engl J Med* 1986;314:1127-1132.
4. Gershon RR, Vlahov D, Felknor SA, Vesley D, Johnson PC, Delclos GL, et al. Compliance with Universal Precautions among health care workers at three regional hospitals. *Am J Infect Control* 1995;23:225-236.
5. Kelen GD, DiGiovanna TA, Celentano DD, Kalainov D, Bisson L, Junkins E, et al. Adherence to Universal (barrier) Precautions during interventions on critically ill and injured emergency department patients. *J Acquir Immune Defic Syndr* 1990;3:987-994.
6. Stiles WB. Quality control in qualitative research. *Clin Psychol Review* 1993;13:593-618.
7. Lau RR, Russell D. Attributions in the sports pages. *J Personal Soc Psych* 1980;39:29-38.
8. Inui TS. The virtue of qualitative and quantitative research. *Ann Intern Med* 1996;125:770-771.

Sunita Mutha, MD
Donna B. Jeffe, PhD
Lynn E. Kim, MPH
Paul B. L'Ecuyer, MD
Bradley A. Evanoff, MD, MPH
Victoria J. Fraser, MD

Washington University School of Medicine
St Louis, Missouri