

anti-HAV antibody is more likely to be associated with other factors, such as socioeconomic level or standards of hygiene. A relatively low level of HAV seropositivity was found among the group of physicians and nursing personnel younger than 31 years of age (10% and 23% for the groups of age of 18-24 and 25-31 years, respectively). Moreover, the prevalence of anti-HAV antibody has been falling over the last 2 decades, so it is likely that future healthcare personnel increasingly will be susceptible to HAV infection.<sup>7,8</sup> In addition, physicians and nursing personnel are more likely than the general population to have contact with contagious patients, and outbreaks of hepatitis A among healthcare personnel have been described.<sup>9,10</sup>

Studies to determine the incidence of hepatitis A in this population, as well as clinical studies to show the effectiveness of HAV vaccine in post-exposure prophylaxis and cost-effectiveness studies for different strategies, will be needed to formulate specific recommendations for the appropriate use of hepatitis A vaccines in healthcare personnel.

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**TABLE**

ASSOCIATION BETWEEN HEPATITIS A PREVALENCE AND PROFESSIONAL ACTIVITY, CONTROLLING FOR AGE AND DURATION OF ACTIVITY

|                           | Prevalence of Anti-HAV |            |                      |            |
|---------------------------|------------------------|------------|----------------------|------------|
|                           | Healthcare Worker      |            | Nonhealthcare Worker |            |
|                           | N                      | Prevalence | N                    | Prevalence |
| Age (y)*                  |                        |            |                      |            |
| 18-24                     | 72                     | 10%        | 17                   | 29%        |
| 25-31                     | 22                     | 23%        | 20                   | 35%        |
| >31                       | 20                     | 65%        | 31                   | 81%        |
| Duration of activity (y)† |                        |            |                      |            |
| 1-5                       | 84                     | 11%        | 34                   | 26%        |
| >5                        | 30                     | 45%        | 34                   | 82%        |

Abbreviations: CI<sub>95</sub>, 95% confidence interval; HAV, hepatitis A virus; OR, odds ratio.

\* Healthcare versus nonhealthcare: OR, 2.5; CI<sub>95</sub>, 1.1-5.9; P=.02.

† Healthcare versus nonhealthcare: OR, 4.1; CI<sub>95</sub>, 1.8-9.2; P=.0004.

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## Hepatitis B Morbidity in Municipal and Hospital Waste Collection Workers in the City of Rio de Janeiro

### To the Editor:

Occupational exposure of municipal and hospital waste collection workers has been the subject of some studies in recent years, mainly because of the growing public concern about environmental and worker health issues.

Stratton et al<sup>1</sup> identify hepatitis B virus (HBV) as an occupational risk for healthcare and related occupation workers. We studied occupational exposure of municipal and hospital waste collection workers to HBV with the aim to compare both populations and to evaluate their HBV morbidity and mortality and the necessity of occupational prevention.

A cross-sectional morbidity study of hepatitis B was conducted between May and July of 1996 among hospital collection workers and in a sample of municipal waste collection workers of Municipal Urban Cleaning Company of Rio de Janeiro (COMLURB).

The "exposed group" consisted of all workers serving specific hospital waste collection routes. As identi-

fied by COMLURB, 32 workers served those routes.

The "non-exposed group" consisted of a sample of the municipal waste collection worker population. As the hospital waste collection is carried out during the day, in the study, only the municipal waste collection workers who work daylight hours were considered, totaling 503 individuals. A sample of 156 workers was sought based on an estimated hepatitis B prevalence of 16% for this population.<sup>2</sup>

From each worker a blood sample of 10 mL was collected by vacuum-tainer. The samples were taken to the Virology Laboratory of the Pathology Clinic at Clementino Fraga Filho Hospital of the Federal University of Rio de Janeiro, where the serum was preserved in a cool chamber. The enzyme-linked immunosorbent assay tests AUSAB (anti-hepatitis B surface antigen [HBs]) and CORZYME (anti-hepatitis B core antigen [HBc]) were used (Abbott Laboratories, North Chicago, IL).

Workers were considered to have previous exposure if either anti-HBc or anti-HBs (without previous vaccination) were presented.

Two nonexposed workers did not agree to have their blood drawn. The blood collected from one of the exposed workers was insufficient to accomplish the tests. As shown in the Table, the prevalences of HBV markers among the remaining municipal and hospital waste collection workers were 14.2% and 12.9%, respectively, and did not statistically differ.

There are no prevalence data of hepatitis B for the Rio de Janeiro population to compare with the results of

**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; CI<sub>95</sub>, 95% confidence interval; OR, odds ratio.  
OR, 0.9; CI<sub>95</sub>, 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 transmission<sup>3</sup> argue that they should be vaccinated against hepatitis B.

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## Healthcare Workers' Perceptions of Occupational Exposure

### To the Editor:

Healthcare workers (HCWs) are at risk for occupational exposure to bloodborne pathogens.<sup>1,3</sup> Despite

documentation of this risk and the establishment of mandatory national standards for preventive practice, HCWs have low adherence to Universal Precautions.<sup>4,5</sup> 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.<sup>6</sup>

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