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The Costa Rican Experience on the Serological Response to the Hepatitis B Vaccine in Health Professionals

To the Editor:

In 1994, the Committee for the Control and Prevention of Intra-hospital Infections at the National Children's Hospital, San José, Costa Rica, performed a serosurvey of hepatitis B surface antibody (anti-HBs) among personnel vaccinated against hepatitis B. Only 64% of 86 vaccinees showed antibodies at protective levels. Those results worried the committee, which maintains a permanent immunization program against hepatitis B among hospital staff. If those results were valid, we might be creating a false confidence in the vaccinated population.¹ Therefore, we performed a study of 133 hospital employees who voluntarily accepted vaccination against hepatitis B in 1995 or 1996.

The Engerix B (SmithKline Beecham, Philadelphia, PA) vaccine was used following the recommended schedule at 0, 1, and 6 months; 20 µg was given intramuscularly in the deltoid region. Prior to administration of the first dose, blood samples were taken to determine the titer of anti-HBs, using the IMx test (Abbott Diagnostics, Abbott Park, IL); individuals who were anti-HBs-positive were excluded from the study. A second blood sample was taken 3 months after the third dose of vaccine to measure levels of anti-HBs and evaluate the response to vaccine. Statistical analysis was performed using Epi Info (version 6.0; Centers for Disease Control and Prevention, Atlanta, GA).

One hundred twenty individuals received three doses of the vaccine, and 116 (96.6%) had serum samples drawn after the last dose. Only one person, a 58-year-old woman, had less than 10 mIU/mL of antibody after three doses of vaccine (Table); 77% of women and 71.6% of men reached the protective levels of 500 mIU/mL or more, a result similar to those reported by others.

In this study, 39% of the population reported adverse reactions to the vaccine: 17% reported local, 16% general, and 6% both local and general adverse reactions. Adverse reactions were reported by 3% of individuals who developed levels of anti-HBs antibodies from 100 to 499 mIU/mL, by 5% of those with levels from 500 to 999 mIU/mL, and by 30% of those with levels of 1,000 mIU/mL or more. All adverse reactions to the vaccine were mild and resolved with symptomatic treatment. Regardless of the vaccine reaction, none of the individuals participating in this study were reluctant to receive other doses of the vaccine.

We found eight individuals with anti-HBs antibodies without a previously documented vaccination history; two of these individuals' work activities did not involve contact with patients or contaminated material. Age influenced the response to vaccine (Table), with younger persons more likely to mount high responses.

In conclusion, vaccination against hepatitis B should be applied to all hospital staff, independently of their profession or occupation, because there is a real hazard of getting the infection in the community. Because younger persons respond better to the vaccine, it is recommended to apply the vaccine at an early age.^{2,3} Because some persons do not respond to the vaccine, it is important to evaluate the response to the vaccine by measuring anti-HBs antibodies in adults after completing the vaccine series.

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TABLE
LEVELS OF SEROCONVERSION (ANTI-HEPATITIS B SURFACE ANTIBODIES) ACCORDING TO AGE AND GENDER

Levels (mIU/mL)	Female Age (y)				Male Age (y)				Total
	20<30	30<40	40<50	>50	20<30	30<40	40<50	>50	
<10	0	0	0	1 (1%)	0	0	0	0	1 (1%)
10<100	0	2 (2%)	0	0	3 (3%)	2 (2%)	0	1 (1%)	8 (7%)
100<500	3 (3%)	3 (3%)	3 (3%)	4 (3%)	4 (3%)	3 (3%)	0	0	20 (17%)
500<1,000	2 (2%)	3 (3%)	2 (2%)	3 (3%)	5 (4%)	1 (1%)	0	0	16 (14%)
1,000 or more	24 (21%)	14 (12%)	8 (7%)	2 (2%)	15 (13%)	6 (5%)	1 (1%)	1 (1%)	71 (61%)
Total	29 (25%)	22 (19%)	13 (11%)	10 (9%)	27 (23%)	12 (10%)	1 (1%)	2 (2%)	116 (100%)

Note: Percentages may not total to 100% due to rounding.