Benefits of Serologic Screening for Hepatitis B Immunity in Military Recruits

To the Editor—Scott et al. present rates of hepatitis B immunity among US military recruits and predict increasing immunity over time on the basis of their finding of increasing immunity in successive birth cohorts [1]. We present confirmation of this prediction, from recent serosurveillance efforts, which suggested widespread acceptance of childhood [2] and adolescent [3] immunization recommendations among the birth cohorts entering military service.

On the basis of the recent internal release of the results of Scott et al. [1], which revealed an overall seroprevalence of hepatitis B surface antibodies of 31.1% among Army recruits in 2001, General Leonard Wood Army Community Hospital began universal screening of its basic trainees for hepatitis B immunity before immunization. Before our initiation of serologic screening, all recruits aged 18 years and older received universal immunization with bivalent hepatitis A and hepatitis B vaccine (Twinrix; GlaxoSmithKline) as a 3-dose series. Under our screening algorithm, recruits found to be immune to hepatitis B would receive only the monovalent hepatitis A vaccine as a 2-dose series.

Between 31 May and 7 July 2005, our facility performed serologic screening for hepatitis B immunity on 2872 recruits aged 18 years and older, of whom 2210 (76.9%) were aged 18–19 years, 319 (11.1%) were aged 20–21 years, 131 (4.6%) were aged 22–23 years, and 212 (7.4%) were aged 24 years and older. Of the 2041 men (71.1%), 1574 were aged 18–19 years, 235 were aged 20–21 years, 85 were aged 22–23 years, and 147 were aged 24 years and older, composing 71.2%, 73.7%, 64.9%, and 69.3% of their age groups, respectively. Results of serosurveillance were collected for nonresearch purposes, and, therefore, we did not collect other demographic information and do not report results of testing of recruits aged 17 years.

Testing for hepatitis B immunity was performed on fresh serum using the Vitros ECi hepatitis B surface antibody quantitative immunometric assay (Ortho-Clinical Diagnostics). Borderline results were treated as negative results.

We found an overall rate of immunity in our recruits aged 18 years and older of 57.8%, with age-specific immunity of 61.9% in those aged 18–19 years, 57.4% in those aged 20–21 years, 38.9% in those aged 22–23 years, and 26.9% in those aged 24 years and older. Of note, the recruits aged 22–23 years are members of the birth cohort aged 18–19 years in 2001, in which Scott et al. [1] noted a rate of immunity of 37.0%. Sex-specific rates of immunity and confidence intervals are presented in table 1.

Given a per-dose cost to the Army of $30.90 for Twinrix and of $14.83 for monovalent hepatitis A vaccine [4] and a per-screening cost of $5.22 [5], we estimate that, in recruits aged 18 years and older, our screening program will save an average of $31.19/recruit. Serologic screening for hepatitis B immunity should be expanded to other Army training sites and to other military services.

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References

Table 1. Rates of hepatitis B immunity in army recruits at General Leonard Wood Army Community Hospital.

<table>
<thead>
<tr>
<th>Birth cohort</th>
<th>Age in 2005, years</th>
<th>No. immune/no. screened</th>
<th>Immunity, mean (95% CI), %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>1987–1988</td>
<td>18–19</td>
<td>1368/2210</td>
<td>967/1574</td>
</tr>
<tr>
<td>1985–1986</td>
<td>20–21</td>
<td>183/319</td>
<td>125/235</td>
</tr>
<tr>
<td>1983–1984</td>
<td>22–23</td>
<td>51/131</td>
<td>33/85</td>
</tr>
<tr>
<td>&lt;1982</td>
<td>≥24</td>
<td>57/212</td>
<td>31/147</td>
</tr>
</tbody>
</table>

NOTE. CI, confidence interval.
* Unadjusted for sex.

Potential conflicts of interest: none reported.

The views expressed are those of the authors and do not necessarily reflect the views of the United States Army or the Department of Defense

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Reply to Pablo et al.

To the Editor—We congratulate Pablo et al. [1] for initiating serologic screening at Ft. Leonard Wood and moving from universal to selective immunization with cost savings. We are encouraged that their data support the trend of increasing immunity with successive birth cohorts that we observed [2]. Pablo et al. reported a slightly higher prevalence of immunity in women, compared with that in men, in all birth cohorts. However, their overlapping confidence intervals suggest that the difference might be less than the significantly higher seropositivity we observed in female recruits [2]. A smaller sex difference in the study by Pablo et al. could reflect the impact of recent hepatitis B immunization policies and practices in the civilian sector or sampling differences between the 2 studies.

The current (2002) Department of Defense policy for hepatitis B immunization of recruits allows the military services discretion to do either universal or selective immunization based on serologic results [3]. Current practices vary. For example, the US Navy and Marine Corps administer vaccine to all recruits without medical record documentation of prior immunization (J. Monestersky and A. Wright, personal communication). The US Air Force serologically screens recruits. The estimated seroprevalence of hepatitis B immunity in Air Force recruits for the period from 1 August 2003 to 31 July 2005 is reported to be 46.9% (L. Brosch, personal communication). Complete seroprevalence information will be available in the Lackland Air Force Base annual report.

A prior cost-effectiveness analysis of hepatitis B immunization practices in the military found that a seroprevalence of >12% is the point at which screening for immunity was cost-effective [4]. The recent findings at Ft. Leonard Wood and Lackland Air Force Base support serologic screening and hepatitis B immunization of susceptible recruits. On the basis of observations of high and increasing seroprevalence of hepatitis B in military recruits, we encourage those responsible for immunization programs at uniformed services recruit-training centers to reassess their programs and consider the potential value of serologic screening.

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