and Gharavi. The focus of this symposium was standardization of the anticardiolipin-antibody assay; the conclusion was that the Loizou method is highly reproducible and reliable — more so than the other technique.

We have recently had the opportunity to review the predictive power of the Loizou assay for antibody to cardiolipin in 40 additional pregnant women with lupus erythematosus. On the basis of this experience, we found that the sensitivity of a positive test for predicting fetal death was 0.818, the specificity was 0.758, and the positive predictive value was 0.562 (Lockshin MD, et al.: unpublished data).

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IMPAIRED IMMUNOGENICITY OF HEPATITIS B VACCINE IN OBESE PERSONS

To the Editor: The plasma-derived hepatitis B vaccine (Heptavax B, Merck Sharp & Dohme) is currently recommended for medical personnel at high risk of acquiring hepatitis B.[1] This recommendation is based in part on field trials that showed the vaccine to be safe and capable of eliciting an antibody response in more than 85 percent of recipients.[2-4] However, antibody-response rates as low as 50 to 70 percent have recently been reported in some community hospitals,[5-8] with poor response rates variably linked with advanced age,[6] female sex[6,7] or injections into the buttocks rather than the deltoid.[8]

We previously described factors associated with a poor response to the vaccine among 194 employees of a community hospital who had been injected in the buttock with a 2.5-cm, 23-gauge needle.[9] Overall, only 55.7 percent of employees had detectable antibody to hepatitis B surface antigen 11 months after completion of the vaccine series. A multivariable analysis showed that older age, vaccine lot, and obesity were predictive of a lack of response. The weight–height index was used as the surrogate measure of obesity (weight[kg]/height[m]^p; females, $p = 1.5$, males, $p = 2$).[10]

More recently, we analyzed the response to vaccine among 94 employees of another community hospital who had received all three doses of the vaccine in either the buttock only or the deltoid only. The first and second doses of the vaccine were administered with a 3.75-cm, 22-gauge needle; either a 3.75- or 2.5-cm, 22-gauge needle was used for the third dose. Predictors considered in the multivariable model and statistical analyses were those previously described.[9]

Detectable antibody to the hepatitis B surface antigen (by Ausab EIA, Abbott) was noted 17 months after the completed immunization in only 24 of the 40 (60 percent) employees who received only deltoid injections and in only 26 of the 54 (48 percent) employees who received only buttock injections ($P>0.10$). As compared with responders, the nonresponders were older (42.0 vs. 36.1 years, $P<0.02$) and had an elevated weight–height index (36.4 vs. 30.0, $P<0.001$). Only 14 of the 39 employees (35.9 percent) with a weight–height index higher than the sex-adjusted 75th percentile (28 for men and 35 for women) in the United States had detectable antibody surface antigen, as compared with 36 of the 55 employees (65.5 percent) whose index was less than the 75th percentile ($P = 0.06$). Multivariable analyses revealed that age and weight–height index, but not site of injection, were significant independent predictors of a lack of antibody response to the vaccine (Table 1). After accounting for age and weight–height index, we found that sex, race, vaccine batch, timing of vaccine doses, timing of the postimmunization test for antibody to the hepatitis B surface antigen, needle size used for the third dose, and site of injection were nonsignificant predictors ($P>0.10$).

Table 1. Predictors of a Suboptimal Response to Hepatitis B Vaccine

VARIABLE	WALD P VALUE*	ODDS RATIO*	95 PERCENT CONFIDENCE INTERVAL*
Deltoid site only			
Age	0.45	1.5†	0.5–4.0
Weight–height index	<0.001	3.7‡	1.5–9.3
Buttock site only			
Age	0.052	2.1†	1.0–4.4
Weight–height index	0.041	2.6‡	1.0–7.3
Both deltoid and buttock in model			
Age	0.025	1.9†	1.1–3.4
Weight–height index	0.001	3.2‡	1.6–6.3
Site of inoculation	0.43	1.5§	0.6–3.8

*Relative to an initial model that includes age and weight–height index.
†Relative to a 15-unit change.
‡Relative to a 10-unit change.
§Relative to buttock (1) or other site (0).

These data suggest that obesity may be a key predictor of a poor antibody response to the vaccine, irrespective of injection site. The possible explanations include poor mobilization or processing of antigen in obese persons, linkage of immune-response genes and genes that influence obesity, and inadvertent injection of vaccine into adipose tissue. However, the last explanation seems unlikely, since the weight–height index was a significant predictor even in persons who received only deltoid injections. If confirmed, these data would suggest a possible role for postimmunization screening for antibody to the hepatitis B surface antigen in obese persons.

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CHANGES IN PLASMA LIPIDS AND LIPOPROTEINS DURING ISOTRETINOIN THERAPY FOR ACNE

To the Editor: I was intrigued to read the following sentence in the Methods section of the recent paper by Bershad et al. (Oct. 17 issue)*: "All statistical analyses were performed with the SAS package[17] available through the computer center of the City University of New York." This statement offers the reader no information on the statistical methods used in the study. I hope that this Methods section is a fluke that slipped by the reviewers and that it does not represent current *Journal* standards for describing testing. Otherwise, we might all condense our Methods sections to read "All samples were analyzed in a laboratory."

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