Letters to the Editor

Measles Immunization in HCWs

To the Editor:

See also pages 5,8,12, and 18.

Prior to the licensure of measles vaccine in 1963, there were over 500.000 cases of measles reported annually in the United States. After 1963, the number of cases declined to a low of slightly less than 3,000 cases per year between 1981 and 1988. In Philadelphia, a measles epidemic occurred in 1981, with 582 reported cases. Between 1982 and 1990, an average of only 11 cases occurred yearly in this city. This trend was abruptly halted in 1990, when 293 cases were reported and Philadelphia was declared a high-incidence measles area. In accordance with recommendations of the Philadelphia Department of Health, a measles immunization program for healthcare personnel was instituted at Hahnemann Hospital.

Mass immunization of medical personnel may be an effective strategy in assuring employee protection against disease and prevention of nosocomial infection. However, as cost-containment continues to be one of the major factors in the development and delivery of healthcare programs, medical institutions must evaluate this approach to the control of vaccine-preventable diseases. Antibody screening and selective vaccination is an alternative method for decreasing the number of susceptible individuals. We conducted a study to evaluate the cost-effectiveness of mass versus selective measles vaccination of healthcare workers in an urban hospital setting.

The study population consisted of 117 healthcare providers 21 to 60 years of age. Participation in this study was voluntary. Informed consent was obtained, and each subject completed a questionnaire pertaining to demographics, allergies, and history of previous measles infection or immunization. Pregnant women were excluded from the study. A prevaccine serum specimen was collected and stored at -70°C until testing. A 0.5-cc dose of live attenuated measles vaccine (Attenuvax, Merck, Sharp & Dohme, West Point, PA) was then administered subcutaneously. A second (postvaccine) serum sample was obtained four to six weeks later. Serum IgG antibodies in the paired prevaccine and postvaccine sera were measured by enzyme immunoassay (Measlestat, BioWhittaker Inc, Walkersville, MD) following the directions in the package insert.

Most subjects (108/117; 92.3%) possessed detectable antibody prior to vaccination. No antibody was detected in five subjects; another four had equivocal levels and were considered antibody negative. None of these nine individuals had a documented history of previous measles infection or measles immunization. All nine seroconverted following measles immunization. Our low susceptibility rate (9/117; 7.6%) is in agreement with previously reported rates among U.S. hospital employees of less than 1% to 8%.

If we had vaccinated only the nine employees shown to be antibody negative, our cost would have been $490.50 ($409.50 for screening and $81.00 for nine doses of measles vaccine). The total cost for vaccinating all subjects in our study population was $1,053.00 (117 persons at $9.00/person). The cost for screening serum samples for antibody was $409.50 (117 sera at $3.50/serum, which included supply and personnel costs).

Subbarao et al[1] developed a model for determining cost-effectiveness of preimmunization antibody screening. Adapting their model to our setting, antibody screening would be cost-effective even if the laboratory charge per specimen was as high as $14.00. At a cost of $3.50 per serum, screening would be cost-effective even if the rate of susceptibility was as high as 75%. We conclude that, unless one anticipates an implausibly high rate of susceptibility, antibody screening and selective vaccination is more cost-effective than mass immunization for the control of measles infection in healthcare workers.

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https://doi.org/10.1086/646808 Published online by Cambridge University Press