Varicella Vaccine for Susceptible Adults: Do It Today

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(See the article by Danovaro-Holliday et al. on pages 1633–9)

At the time of the varicella outbreak among immigrant workers at a poultry processing factory and at their apartment complex, reported in this issue of Clinical Infectious Diseases [1], live attenuated varicella vaccine had been licensed for routine use in the United States for 5 years [2]. Nevertheless, these highly varicella-susceptible young adults, most of whom had been born in Mexico or Central America, were not immunized, and 28% of those who were infected developed severe cases of varicella with complications, some of which required hospitalization. Fortunately, there were no fatalities from this preventable illness. Varicella outbreaks such as this one should no longer occur in the United States. An effective vaccine that is highly protective against varicella—and especially protective against severe cases of varicella—and that has decreased hospitalizations and deaths from this infection is widely available and should be universally used [3]. There is all the more reason to immunize varicella-susceptible adults because, as this study [1] well illustrates, adults are at higher risk to develop severe cases of varicella than are children. In a previous study [4], adults with varicella were 25 times more likely to develop severe cases than were children with varicella.

Current controversies regarding varicella vaccine include whether a second dose should be required to boost immunity in children. It is possible that routine administration of 2 doses of vaccine to children will better prevent outbreaks of mild to moderate disease among the vaccinated population and provide more lasting immunity than administration of a single dose. The second controversial issue is whether widespread use of varicella vaccine will increase rates of infection with varicella zoster virus (VZV) among those who have experienced varicella caused by wild-type strains [3]. Immunization of varicella-susceptible adults, however, is not controversial and should be a priority, because wild-type strains of VZV continue to circulate in our country, and varicella-susceptible adults are at risk to be exposed to this highly contagious virus. One might predict that hospital personnel, students and other young adults living in dormitories or other crowded conditions, and teachers are at particular risk if they remain susceptible to varicella.

Despite the need to vaccinate adults, however, there are some obstacles. These include the lack of availability of a reliable, inexpensive serological test to determine susceptibility to varicella and to document an immune response to the vaccine; the lack of a unified strategy to identify and vaccinate susceptible adults; and the age-old problem of getting adults to accept vaccination. Finally, there is the expense involved.

The most reliable means for identifying susceptibility to varicella continues to be the fluorescent antibody to membrane antigen (FAMA) assay [5]. This test requires the use of cultures of living cells infected with VZV. Although highly sensitive and specific, it remains a research test. A number of ELISAs are marketed for diagnostic use, but these tests show imperfect sensitivity and specificity, with variability from manufacturer to manufacturer [6,7]. Such ELISAs are used for identifying individuals who are susceptible to varicella, however, because they are accurate to a large extent and are the only tests available. Commercial ELISAs have not proven useful, however, in identifying persons who have responded positively to varicella vaccination (unlike the FAMA test) [8]. Obviously, better tests to measure antibody titers are sorely needed.

A reliable ELISA would transform the practicality of varicella vaccination by facilitating the identification of susceptible adults. In the absence of a highly reliable antibody test, other predictors of susceptibility can also be useful. The data presented by Danovaro-Holliday et al. [1] strongly suggest that adults from countries with tropical climates are more likely to be susceptible to varicella than are those raised in the continental United States, where the weather is more temperate.
Agreeing that varicella-susceptible adults should be vaccinated, the next question becomes how best to proceed to deliver the vaccine. Adults are notorious for avoiding immunization. Immunization programs are directed mainly at infants and children because, for one thing, they are a captive population that can be easily reached for vaccination. In the current study [1], many adults who received their first dose of vaccine did not return for the second dose. This should not be ascribed to possible adverse effects of the vaccine itself, because varicella vaccine is one of the safest vaccines in use today [8]. More likely, these adults had inertia or fear of an injection. Unfortunately, 2 doses of vaccine are necessary to protect adults well, in contrast to children [9]. Programs for vaccination of adults in the workplace would seem to be the best approach. Such programs have been used successfully in immunizing hospital employees, a population for which, in some instances, proof of immunization is required for employment [10]. The realization that adults may not be the optimal targets for immunization, however, is simply another reason to emphasize the importance of immunizing children. Although varicella vaccine does not seem to protect adults quite as well as children, it does offer significant protection, and severe cases of “breakthrough” varicella in vaccinated adults appear to be extremely rare [11].

The time has come when the number of varicella-susceptible adults should decrease in the United States, which will save both lives and money. Herd immunity from routine immunization of children has decreased the incidence of varicella in the unvaccinated population during the 9 years since varicella vaccine was licensed in the United States [3], but it did not protect these migrant workers in an outbreak situation. Both personal immunity and herd immunity to varicella are important, and programs to protect individuals at high risk for susceptibility to varicella should be instituted in the workplace. As indicated by Danovaro-Holliday et al. [1], should outbreaks occur, the control strategy should be tailored to the population at risk.

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References