While Waiting for Better Pertussis Vaccines, Let’s Use the Ones We Have

TO THE EDITOR—The excellent study by Koepe et al [1] on rapidly waning immunity of tetanus-diphtheria-acellular pertussis (Tdap) vaccines given in adolescence adds to the list of other well-done studies demonstrating that the duration of protection provided by acellular pertussis vaccines is substantially lower than that provided by whole-cell pertussis vaccines [2, 3].

We agree with the authors that their results reinforce the need for enhanced understanding of the correlates of protection against pertussis and for pertussis vaccines that induce more-durable immunity [4]. While whole-cell pertussis vaccines provided more-durable protection, they were also associated with a high incidence of local and systemic side effects [5]. Thus, any new pertussis vaccine will likely need to be an acellular one. The authors’ data suggest that pertussis toxin and filamentous hemagglutinin may be more important for immunity and perhaps higher doses of these components might provide more durable protection. This is certainly worth further study. However, immunity with any vaccine is unlikely to be superior to that afforded by natural infection, and reinfec­tion with Bordetella pertussis is well-described. It has been documented to occur as recently as 3.5 years after initial infection [6].

Thus, until a more durable vaccine is available, we believe a more aggressive vaccination strategy with our currently available vaccines is indicated. We propose starting Tdap vaccination at age 9 years instead of age 11 years. In addition, we recommend booster vaccinations for all persons every 2–3 years during a local pertussis outbreak.

In 2012 and 2013 combined, there were >72,000 cases of documented pertussis in the United States [7]. The highest rates were in infants in the first year of life, who also have the highest rates of severe disease and death. Many of these infants contract pertussis before they are old enough to complete the primary vaccine series. To address this issue, the Advisory Committee on Immunization Practices has recommended Tdap vaccine for all women during their third trimester of pregnancy [8]. While this strategy may allow for some protection of infants via transfer of maternal antibody [9], it will not allow for sufficient herd immunity to protect infants from community exposures. In addition, it will not impact the substantial morbidity that pertussis causes outside the period of infancy.

Not so long ago, influenza vaccination was recommended only for those at high risk for complications. Later, the recommendations were broadened to include those in contact with people at high risk. Now we recommend that everyone who is old enough to receive an influenza vaccine be vaccinated. Protecting our most vulnerable citizens against pertussis is going to require broader herd immunity, similar to vaccinating healthcare workers to protect our elderly patients against influenza.

A recent meta-analysis of the economic feasibility of broader pertussis immunization concluded that studies were generally in favor of pertussis booster vaccination but did not identify any optimal vaccination strategy [10]. As we debate the best approach, infants are dying from—pertussis. While waiting for better pertussis vaccines, let’s use the ones we have to the best effect. Our youngest generation will thank us.

Note

Potential conflicts of interest. All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Thomas George Boyce1,2 and Abinash Virk1,2
1Department of Medicine and 2Department of Pediatric and Adolescent Medicine, Division of Infectious Diseases, Mayo Clinic College of Medicine, Rochester, Minnesota

References
