Trends in Invasive Pneumococcal Disease in HIV-Infected Adults Since Introduction of Pediatric Conjugate Vaccine

Flannery B, Heffernan RT, Harrison LH, et al. Changes in invasive pneumococcal disease among HIV-infected adults living in the era of childhood pneumococcal immunization. Ann Intern Med 2006;144:1–9.

Study Overview

Objective. To compare trends in invasive pneumococcal disease among HIV-infected adults before and after the introduction of a pneumococcal conjugate vaccine for children.

Design. Active laboratory-based surveillance of 10.8 million adults, including 38,314 with AIDS.

Setting and participants. Residents aged 18 to 64 years from 7 Active Bacterial Core surveillance areas in the United States, from whom *Streptococcus pneumoniae* was isolated from a sterile site between 1998 and 2003.

Main outcome measures. Ratio of the number of cases of invasive pneumococcal disease among HIV-infected adults to the estimated number of adults aged 18 to 64 years with AIDS, trends in serotype-specific ratio of cases, and comparison of periods before and after introduction of pediatric conjugate vaccine.

Main results. 8582 cases of invasive pneumococcal disease were identified; 2013 (24%) occurred among HIV-infected adults. Between baseline (1998–1999) and 2003, the ratio of invasive pneumococcal disease in HIV-infected adults to the number of adults with AIDS decreased from 1127 to 919 cases per 100,000 AIDS population, a 19% reduction (P = 0.002). Although the ratio of pneumococcal disease caused by conjugate vaccine serotypes decreased in HIV-infected adults from baseline to 2003, there was a 44% increase in the ratio of pneumococcal disease caused by nonvaccine serotypes.

Conclusion. Since introduction of a pneumococcal conjugate vaccine for children, there was an overall decrease in invasive pneumococcal disease among HIV-infected adults but a small increase in pneumococcal disease caused by nonvaccine serotypes.

Commentary

S. pneumoniae is a major cause of community-acquired pneumonia, bacterial meningitis, sinusitis, and otitis media [1]. The Centers for Disease Control and Prevention Active Bacterial Core surveillance report for *S. pneumoniae* shows increasing resistance rates from 1997 to 2000. Factors contributing to the spread of nasopharyngeal carriage also facilitates transmission of resistant strains [2]. Among those factors are prolonged hospitalization and increasing number of immunocompromised patients. Therefore, new tools are needed to prevent the spread of *S. pneumoniae* and to protect those who are immunocompromised. In 2000, widespread use of the pneumococcal conjugate vaccine in infants caused steep declines in invasive pneumococcal disease in those immunized and was associated with decreased rates of disease among adults.

HIV-infected persons are particularly susceptible to invasive pneumococcal disease. The aim of this study by Flannery et al was to investigate trends in invasive pneumococcal disease among HIV-infected adults and to document changes before and after widespread pneumococcal immunization of children. The authors found that reductions in invasive pneumococcal disease were limited to serotypes included in the conjugate vaccine and were similar in adults with and without HIV infection. However, among HIV-infected adults, these reductions were partially offset by increased disease caused by nonvaccine serotypes.

Limitations of this study should be noted. The authors examined trends in invasive pneumococcal disease among HIV-infected adults by using the number of cases of pneumococcal disease in adults with HIV infection per 100,000 adults living with AIDS in the surveillance areas as a proxy for disease incidence. In addition, while the timing of changes in vaccine-type pneumococcal disease suggests an association with the conjugate vaccine, other factors (eg, secular trends in pneumococcal disease) may have influenced these trends during the postvaccine period.

"Outcomes Research in Review" is edited by Stephen D. Persell, MD, MPH, Department of Medicine, Northwestern University, Chicago, IL; Harvey J. Murff, MD, MPH, and Christianne L. Roumie, MD, MPH, Division of General Internal Medicine, Vanderbilt University Medical Center, Nashville, TN; David R. Spigel, MD, Sarah Cannon Research Institute, Nashville, TN; and Thomas D. Sequist, MD, MPH, Division of General Medicine, Brigham and Women's Hospital, Boston, MA; and Mark S. Horng, MD, VA Greater Los Angeles Healthcare System, Los Angeles, CA.

Applications for Clinical Practice

Use of the heptavalent pneumococcal conjugate vaccine is recommended by the American Academy of Pediatrics for use in all children aged 23 months or younger [3]. Widespread immunization may have the potential to greatly impact the burden of pneumococcal disease among all adults [4].

–Review by Christianne L. Roumie, MD, MPH

References

1. Virk A, Steckelberg JM. Clinical aspects of antimicrobial resistance. Mayo Clin Proc 2000;75:200–14.
2. Wang EE, Kellner JD, Arnold S. Antibiotic-resistant *Streptococcus pneumoniae*. Implications for medical practice. Can Fam Physician 1998;44:1881–8.
3. American Academy of Pediatrics. Committee on Infectious Diseases. Policy statement: recommendations for the prevention of pneumococcal infections, including the use of pneumococcal conjugate vaccine (Prevnar), pneumococcal polysaccharide vaccine, and antibiotic prophylaxis. Pediatrics 2000;106(2 Pt 1):362–6.
4. Whitney CG, Farley MM, Hadler J, et al. Decline in invasive pneumococcal disease after the introduction of protein-polysaccharide conjugate vaccine. N Engl J Med 2003;348:1737–46.

(continued on page 83)