ATUL KHASNIS, MD
Department of Rheumatologic and Immunologic Disease, Cleveland Clinic; Assistant Professor, Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH

Vaccination: Special populations are not all the same

Vaccination in special populations: Take-home points

Special populations are at increased risk of vaccine-preventable diseases

Each special population is unique, and generalization of observations may not be valid

Despite clinical uncertainties, patients in special populations should receive vaccines according to current recommendations

Further cost-effectiveness studies of vaccines in special populations are warranted

Guidelines exist, but so do uncertainties

Vaccination is the standard of care as part of health maintenance for healthy people and for patients with myriad medical conditions. In an article in this issue of *Cleveland Clinic Journal of Medicine*, Drs. Faria Farhat and Glenn Wortmann[1] make recommendations about vaccinations in special populations, including people with a disordered immune system or who are otherwise at heightened risk of infection (eg, because of older age, international travel, comorbidities, and medications).

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But special populations are not all the same in their responses to vaccination. For example, patients with systemic autoimmune diseases are a heterogeneous group with disease-specific immunologic perturbations and immunosuppression that vary by medication and dose, all affecting the response to vaccination. Also, two or more "special" situations may coexist in the same patient.

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AREAS OF UNCERTAINTY FOR CLINICAL PRACTICE

Several groups have issued guidelines and recommendations about vaccination in immunocompromised patients, but many areas of uncertainty exist in clinical practice. Most of these arise from a lack of data on immunogenicity and outcomes.

For example, although two pneumococcal vaccines are used in adults, no studies have compared the immunogenicity of the 13-valent pneumococcal conjugate vaccine (PCV13, which is T–cell-dependent) with that of the 23-valent pneumococcal polysaccharide vaccine (PPSV23, which is T–cell-independent) in immunocompromised adults.

Also, whether to use zoster vaccine in immunosuppressed patients ages 50 through 59 is debated. The vaccine is approved by the US Food and Drug Administration (FDA) for this age group, but the Advisory Committee on Immunization Practices (ACIP) does not recommend it, and the Infectious Diseases Society of America (IDSA) suggests that it be "considered" in patients on low-intensity immunosuppressive treatment.[2]

Testing to ensure optimal response to vaccination has been recommended in several articles and guidelines. However, antibody titers do not necessarily correlate with protection, and at this time no consensus exists about the timing of or need for testing for the response to immunization, the methods to use, how to interpret the results in terms of an adequate or inadequate response, or the role of booster immunization in routine clinical practice.

IS VACCINATION COST-EFFECTIVE?

Also relevant is whether vaccination is cost-effective.

Although vaccination with the PCV13 vaccine is possibly more cost-effective than PPSV23 in US adults based on a model that included immunosuppressed patients, the results of this study were sensitive to several assumptions, and the authors did not extrapolate their conclusion to immunocompromised individuals.[3]

In another cost-effectiveness analysis, immunocompromised patients were vaccinated with PCV13 at diagnosis and, starting a year later, were followed according to current PPSV23 vaccination guidelines. The PCV13 vaccine's efficacy against invasive pneumococcal disease and pneumonia based on the modeled program led to cost savings, added quality-adjusted life-years, and prevented invasive pneumococcal disease, mostly in patients with human immunodeficiency virus (HIV) infection and those on dialysis (unpublished data cited in a 2012 US Centers for Disease Control and Prevention [CDC] report).[4]

No cost-effectiveness studies of influenza vaccination in immunocompromised adults have been conducted in the United States.

The various recommendations by the FDA, the ACIP, and the IDSA regarding the appropriate age at which to give zoster vaccine may also have been influenced by cost-effectiveness studies. These have reported mixed results and have not specifically focused on special populations.[5]

IMPROVING VACCINATION RATES

Rates of vaccination in special populations are suboptimal, and remedial measures to improve coverage have been proposed. One-page vaccine questionnaires or handouts for patients as well as "pop-up" reminders for vaccination in the electronic health record for physicians have resulted in higher rates of indicated vaccinations. Both the CDC and the American College of Physicians (ACP) offer downloadable tools—the CDC Vaccine Schedules App[6] and the ACP Immunization Advisor,[7] respectively—that are based on the 2012 ACIP guidelines and are extremely useful for busy practitioners. The CDC also offers patients a vaccine questionnaire[8] that allows them to determine which vaccinations they may need and also to learn about those vaccines.

MOVING AHEAD

The development of vaccines is ongoing and will be driven by identification of new molecular targets. Advances in therapies for immunocompromised patients such as those with HIV infection will, we hope, decrease the risk of opportunistic infections. The list of vaccine-preventable diseases may continue to grow, as may the list of special populations. Optimal vaccination and outcomes may emerge from expected improved vaccine coverage as a result of the increased health insurance coverage resulting from the much-maligned Patient Protection and Affordable Care Act and ongoing studies regarding efficacy, safety, and cost-effectiveness, especially pertaining to specific patient populations.

Is PCV13 better than PPSV23 for immunocompromised patients?

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***ADDRESS**: Atul Khasnis, MD, Department of Rheumatologic and Immunologic Disease, A50, Cleveland Clinic, 9500 Euclid Avenue, Cleveland, OH 44195; e-mail: khasnia2@ccf.org*