Routine Vaccine Guidelines for Immunodeficient Patients

VACCINES SAVE THE lives of more than three million people worldwide each year and prevent millions of others from suffering from diseases and permanent disabilities.1 But, vaccines aren’t always safe, nor are they always effective, for everyone. This can be especially true for individuals who are immunocompromised. Following are some guidelines about which vaccines should and should not be administered to patients with primary and secondary immune deficiencies and their family members and caregivers.

What Are the Recommended Vaccines?

The Centers for Disease Control and Prevention (CDC) recommends routine vaccinations for individuals at different ages. For newborns and up to age 1, the recommended vaccines include hepatitis B, rotavirus oral, DtaP (diphtheria, tetanus, pertussis), Hib (H. influenzae), pneumococcal conjugate, poliovirus inactivated and seasonal influenza. Vaccines recommended for children ages 1 through 7 include MMR (measles, mumps, rubella), varicella, hepatitis A, boosters for earlier vaccines (except rotavirus) and seasonal influenza. For children ages 7 through 18, the recommended vaccines include Tdap (tetanus, diphtheria, pertussis), meningococcal conjugate, papilloma virus vaccine, boosters for incomplete vaccines, and seasonal influenza. Tdap is a booster immunization that offers continued protection from those diseases for adolescents and adults. Adults ages 18 through 59 are recommended to receive tetanus, adult diphtheria and acellular pertussis every 10 years, meningococcal vaccine (for college students), complete MMR, hepatitis A, hepatitis B, varicella and seasonal influenza. At age 60 and older, the recommended vaccines are pneumococcal polysaccharide, pneumococcal conjugate, Tdap, zoster (shingles) and seasonal influenza. There also are some additional vaccines for high-risk adults or for adults who have high-risk family members.2

Which Routine Vaccines Should Immunodeficient Patients Not Receive?

Live virus vaccines pose the greatest risk for individuals with immunodeficiencies. Those with severe antibody deficiencies (e.g., X-linked agammaglobulinemia and common variable immunodeficiency) should not receive the oral polio (OPV, although it is no longer available in the U.S.), smallpox, live Bacillus Calmette-Guérin (BCG), live oral typhoid (Ty21a), rotavirus or yellow fever vaccines, nor should they receive the live attenuated influenza nasal vaccine (LAIV). Individuals with less severe antibody deficiencies (e.g., selective IgA deficiency and IgG subclass deficiency) should not receive OPV, live BCG, rotavirus or yellow fever vaccines. However, other live vaccines appear to be safe.

All live vaccines should be avoided by those with T lymphocyte (cell-mediated and humoral) disorders, including those with complete defects (e.g., severe combined immunodeficiency disease and complete DiGeorge syndrome) and partial defects (e.g., most patients with DiGeorge syndrome, Wiskott-Aldrich syndrome and ataxia-telangiectasia). Patients with phagocytic function deficiencies (e.g., chronic granulomatous disease, leukocyte adhesion defect and myeloperoxidase deficiency) should avoid all live bacterial viruses.

There are no contraindicated vaccines for patients with complement deficiencies (e.g., persistent complement, properdin or factor B deficiency).3

Which Routine Vaccines Should Immunodeficient Patients Receive?

Inactivated vaccines do not represent a danger to immunocompromised individuals and generally should be administered as recommended for healthy persons. Certain vaccines are recommended or encouraged specifically because immunosuppression is a risk factor for complications...
from vaccine-preventable diseases. However, because a relatively functional immune system is required to develop an immune response to a vaccine, an immunocompromised individual may not be protected even if the vaccine has been given. And, those who are receiving immune globulin (IG) also may not receive any benefit from the vaccines because the antibodies in the IG already provide the protective effect. Even so, there are some vaccines that are specifically recommended that immunodeficient patients receive regardless of whether they may or may not be effective.

All individuals with primary and secondary immune deficiencies should receive the pneumococcal vaccine. Those with severe antibody deficiencies should also consider the measles and varicella vaccines. However, the effectiveness of any vaccine for these patients is uncertain and depends on the humoral response. In addition, IG interferes with the immune response to the measles vaccine and possibly to the varicella vaccine. So, in general, immunodeficient patients who make no antibodies don’t need routine vaccines. In those with less severe antibody deficiencies, all vaccines are likely effective; however, the immune response might be weakened.

Vaccines are likely ineffective in individuals with complete T lymphocyte defects. However, the effectiveness of a vaccine in those with partial T lymphocyte defects depends on the degree of immune suppression. And, it is recommended that individuals with partial defects also receive the meningococcal vaccine and Hib vaccine (if not already received as an infant).

For individuals with complement deficiencies, all routine vaccines are likely effective, but it is specifically recommended that they also receive the meningococcal vaccine. All live viral vaccines and inactivated vaccines are safe and effective for those with phagocytic function deficiencies.

It’s very important that all individuals, regardless of their type of immune deficiency, receive the annual seasonal influenza vaccine. This is especially true because the flu virus mutates from year to year, and immunodeficient patients are at increased risk of complications from the flu. In fact, the influenza vaccine may actually stimulate T cell immunity to provide patients with better recovery should they contract the flu.

**Vaccines and Immune Globulin**

Immunodeficient patients often wonder why they need to receive recommended routine vaccines when also receiving immune globulin (IG), since IG is a sterilized solution obtained from pooled human blood plasma that contains the immunoglobulins (or antibodies) to protect against the infectious agents that cause various diseases. It’s true that patients receiving IG don’t necessarily need or don’t respond to vaccines. However, those vaccines that are safe for immunodeficient patients are still recommended. The reason is that people receiving IG are using other people’s antibodies to help fight off or prevent an illness from occurring. But, this protection is temporary and should not be confused with getting an immunization, which provides longer-term protection.

**Vaccines for Family Members and Caregivers**

Family members and caregivers of immunodeficient patients also need to be concerned about which vaccines they receive. In general, all routine vaccines for children and adults in the household need to be kept up to date. Specific recommendations for household contacts include vaccination against influenza, Tdap, pneumococcal and MMR. The MMR vaccine, although consisting of attenuated, live viruses, is not contraindicated in household contacts of immunocompromised persons because transmission of vaccine viruses does not occur. Individuals 60 and older should ensure they receive the pneumococcal polysaccharide vaccine and the shingles vaccine.

**Better Safe than Sorry**

Routine vaccines may not provide the same protective benefits for immunodeficient patients as they do for those with healthy immune systems. However, for those vaccines that are safe for patients to receive, the benefits far outweigh the risks. Therefore, patients — even those being treated with IG — should be sure to receive those routine vaccines that are recommended. And, it is essential that family members and caregivers of immunodeficient patients keep up to date on their vaccines and that they avoid vaccines that are contraindicated for loved ones and patients, unless noted.

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References are available upon request by emailing editor@IGLiving.com.