Weigh Special Issues in Immunocompromised Kids

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ASPEN, COLO. — Two groups of immunocompromised children present special challenges in community-based practices, Elizabeth J. McFarland, M.D., said at a conference on pediatric infectious diseases, sponsored by Children's Hospital, Denver.

Weakened immune systems can make some vaccinations worrisome for youngsters taking high-dose steroids to control asthma or rheumatic diseases and can make other vaccinations vital for children without a spleen, said Dr. McFarland, director of the hospital's immunodeficiency clinic.

Even more serious, she warned, is the risk of sepsis, with high mortality rates from postsplenectomy sepsis. One-half of sepsis cases occur within 2 years of spleen removal, but 3% have been documented 20 years afterward (Br. J. Surg. 1991;78:1031-8).

Steroid Concerns

Dr. McFarland acknowledged that steroids are "important drugs" for controlling inflammation. The problem is that by interfering with cytokine production and lessening immune cell activity, steroids reduce the body's "ability to mount immune response or react to vaccine."

According to Dr. McFarland, the American Academy of Pediatrics supports giving inactivated virus vaccines to children who are prescribed steroids, but she cautions that immunogenicity is uncertain. Live virus vaccines should be delayed until high-dose steroids are stopped.

If children take a high-dose steroid daily or on alternate days for more than 14 days, doctors should wait 1 month after stopping steroid use before giving vaccines, Dr. McFarland said. She also said that if the dosage period is less than 14 days, live virus vaccines can be given after stopping, but some experts recommend waiting 2 weeks.

AAP recommends inactivated influenza vaccine for patients with asthma. Dr. McFarland said studies have shown similar antibody responses to the influenza vaccine in patients receiving inhaled steroids and short-course oral steroids, when compared with patients not receiving steroids at the time of immunization.

The live varicella zoster virus (VZV) vaccine is not recommended during high-dose steroid use, because vaccine safety is not established in this population. However, Dr. McFarland said a health maintenance organization study found that inhaled steroids given 3 months prior to VZV vaccination were not associated with increased risk of breakthrough disease (Pediatrics 2003; 112:e98-e113), but the study did find increased breakthrough disease after VZV vaccination when oral steroids were given in the 3 months prior.

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Postsplenectomy Issues

European studies have shown that about a quarter of physicians do not comply with guidelines for postsplenectomy care, Dr. McFarland said. She could not find any similar studies in the United States.

Although splenectomies in children may be necessary after trauma, she said the operation is being done less often owing to greater recognition of the spleen's importance to immune defense and to newer splenic salvage techniques.

Dr. McFarland urged pneumococcal vaccination for postsplenectomy patients. About two-thirds of sepsis cases have been traced to *Streptococcus pneumoniae* in this population.

If the regular pneumococcal conjugate vaccine (PCV) series was not given before age 24 months, doctors should give two doses of PCV, she said. She recommended one dose of pneumococcal polysaccharide vaccine 6-8 weeks after PCV, and a second dose 3-5 years afterward.

Postsplenectomy patients also should be vaccinated against meningococcus, according to Dr. McFarland. The new meningococcal conjugate vaccine (MCV4) is preferred for patients aged 11-55; only meningococcal polysaccharide vaccine (MPSV4) is approved for patients aged 2-

Continued on following page

Continued from previous page

11. Optimally, vaccinations for the encapsulated bacteria should be given prior to a planned splenectomy.

She suggested giving an extra dose of *Haemophilus influenzae* type b (Hib) vaccine prior to splenectomy, if possible. Afterward, these children also should receive annual influenza shots, she said.

Daily antibiotic prophylaxis is recommended, especially in the first 2 years after splenectomy.

However, Dr. McFarland said the randomized studies supporting its use were performed in young sickle cell anemia patients with functional asplenia.

Determining when to discontinue daily prophylaxis is difficult, she said, as there are no direct data for children with splenectomies. Physicians should discuss the risks and benefits with their patients. The recommended dosages are 125 mg of penicillin V twice daily in children under age 5 and 250 mg twice daily in children over age 5; some experts use amoxicillin (20 mg/kg daily).

Empiric therapy is another option, often used if daily prophylaxis is discontinued. At the first sign of a fever, the parents administer a dose of oral antibiotics and then bring in the child "pronto" for further evaluation. Dr. McFarland recommended 50 mg/kg of amoxicillin/clavulanate potassium (Augmentin) divided into 2-3 dosages daily or an alternative, possibly a cephalosporin, if the child is allergic to penicillin.

Pneumococcal resistance to penicillin is a concern, she said, and she urged physicians to find out the rate in their community. For sepsis cases, however, she recommended starting with vancomycin and a cephalosporin.

Without a spleen, patients also are at high risk for malaria and other insect-borne infections. Physicians should ask about mosquito and tick exposure and teach parents travel precautions.

Indeed, family education is a priority when caring for a child who has lost a spleen. "You need to give them something written, as you want them to understand the risk of infection," she said. "And you want to do it more than once." ■

Teach Parents About Zoonoses

Many physicians—Dr. McFarland among them—do not have the heart to banish all pets from the home of an immunocompromised child.

"The better you can take care of your animal … the less likely your pet will get sick," is the message she urged physicians to give to parents of immunocompromised patients. Keeping the animal healthy will help the child stay well.

Dr. McFarland said the U.S. Public Health Service has identified five zoonoses of particular concern that immunocompromised children can pick up from animals: salmonellosis, campylobacteriosis, bacillary angiomatosis (*Bartonella henselae,* or cat scratch disease), cryptosporidiosis, and toxoplasmosis.

She also summarized the benefits of pet ownership, including decreased loneliness and increased feeling of intimacy and constancy.

The first principle of pet safety, she said, is to buy or adopt a healthy animal, preferably an adult. Young animals are more vulnerable to pathogens. No animal with diarrhea should be handled by the child.

Second, keep the animal healthy by preventing exposure to pathogens. Don't let cats or dogs roam. Fleas and ticks are a concern, as well as exposure to other animals and their feces, and anything else the pet might eat off the street.

Keep the animal inside, and keep the toilet seat down so the pet does not use the fixture as a fountain. Feed the animal well, and make sure it does not get into the garbage.

Third, avoid all contact with feces.

Dr. McFarland offered additional recommendations for patients, including children, who undergo hematopoietic stem cell transplants (MMWR 2000;49[RR10]:1-128). Parents should be advised of the risks, but children don't need to be forced to part with their pets.

Animals should be fed high-quality commercial pet food, according to Dr. McFarland, and at the first suspicion of a pet's illness, the animal should be taken to the vet.

Even with these precautions, some animals are prohibited as pets. She listed all reptiles (with a warning against reptile fomites), ducklings or chicks, and exotic pets, including nonhuman primates.

For more information, including brochures to download, Dr. McFarland recommended referring parents to www.cdc.gov/healthypets.