Abnormal Immunity: An Overview

What is abnormal immunity?

- The immune system helps protect the body from infections and cancers.
- The immune system is very complex and requires many parts to work well together. When one piece of the puzzle is missing, some parts of the immune system may work and others might not function adequately.
- Children can have abnormal immunity at birth or they can develop it.
- Sometimes, the child's immune system is intentionally suppressed by a health care professional to care for the child, such as after a transplant to prevent organ rejection. Other times, the immune system is suppressed to reduce inflammation, such as that caused by juvenile idiopathic arthritis.
- Causes of an abnormal immune system include
  - HIV
  - A genetic condition such as a B- or T-cell deficiency (present at birth)
  - Steroids and other medications that suppress the immune system
  - A chronic illness such as nephrotic syndrome, diabetes, or metabolic disease
  - A spleen that is missing or not working properly (eg, spleen removed after trauma or because of sickle cell disease)
  - Cancer treatment, which lowers white blood cell count
  - Transplantation (eg, of an organ or bone marrow)

How common is it?

No one knows for sure how many children have abnormal immune systems. It is becoming more common as more children receive transplants and survive serious problems with their immune systems, such as HIV. Some children have temporary alterations in their immune systems brought about by medications, but the immune system returns to normal when the medication is stopped.

What are some common characteristics of children who have abnormal immunity or of abnormal immunity as children present with it?

- There are a few common characteristics of children with immune problems. Some of the infections and diseases that tend to be the biggest problems are pneumonia, chickenpox, measles, and herpes febrilis (cold sores).
  - Measles and chickenpox vaccines have drastically reduced the number of cases of those diseases. It's crucial that all the children and staff are fully immunized, including with annual influenza vaccine. This principle is even more important if a child who is known to have abnormal immunity is enrolled in a program.
  - It is important for all children and staff who come into contact with an immune-suppressed child to be fully vaccinated. Very mild cases of chickenpox can occur in children who have received the vaccine (breakthrough cases). They can be missed because they are so mild. Most of the time, this occurrence is not a problem for children with healthy immune systems, but it can be a problem for children with abnormal immune systems.
  - Children with abnormal immunity should avoid direct exposure to the lesions of a child or caregiver with an active cold sore.
- Fever is a serious sign in children with immune abnormalities and should be evaluated immediately by a medical provider. Most parents/guardians recognize this seriousness and will seek treatment for their children promptly.
- Because there are so many reasons a child could have an immune system problem, it is possible that the child could enter child care or school with the diagnosis or develop it while enrolled. The immune problem can occur for a short time, such as with children on steroids for a few weeks, or it can occur for a long time, such as with children with transplants.

Abnormal Immunity: An Overview (*continued*)

What adaptations may be needed?

Adaptations for children with immune suppression depend on the specific disease. It is important to have a complete and up-to-date Care Plan that is reviewed with the child's parents/guardians.

Medications

- Some children will have enough of a problem responding to weakened-virus vaccines that they cannot safely receive live-virus vaccines. Such children will have medical records that document their medical exemptions from live-virus vaccines, that is, that excuse them from regulatory requirements for these specific vaccines (ie, varicella, measles). They will receive only the vaccines that do not contain live material.
- Children with HIV might take different medications.

Physical Environment and Other Considerations

- Handwashing is always important, but it is extra important for children with abnormal immunity.
- Avoid direct contact with animals.

What should be considered an emergency?

- Fever is an emergency until proven otherwise for a child with a suppressed immune system.
- It is critical that emergency medical services (911) first responders know that the child has an abnormal immune system.

What types of training or policies are advised?

Staff should recognize the need for prompt action for fever.

What are some related Quick Reference Sheets?

- Cancer (page 91)
- Diabetes (page 111)
- HIV Infection (page 149)
- Kidney and Other Urinary Tract Problems (page 157)
- Mitochondrial Disorders (page 163)
- Special Diets and Inborn Errors of Metabolism (page 187)
- Spleen Problems (page 191)

What are some resources?

Nemours KidsHealth: "Immune System" (Web page), http://kidshealth.org/en/parents/immune.html

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