Leukemia

Symptoms or Behaviors

Infection-fighting white blood cells are defective in children. These children may experience:

- Increased fevers
- Increased infections

Children may become anemic because leukemia affects the bone marrow's production of oxygen-carrying red blood cells. As a result the child may:

- Appear abnormally pale
- Fatigue easily

Leukemia destroys the bone marrow's ability to produce clot-forming platelets resulting in:

- Bruising
- Bleeding easily
- Nosebleeds
- Bleeding for a long time even in minor cuts

Other symptoms include:

- Pain in bone or joints
- Swollen lymph nodes
- Abnormally tired
- Poor appetite
- Vomiting
- Headaches
- Confusion
- Sweating, especially at night

Minnesota Low Incidence Project

About the Disorder

Leukemia refers to cancer of the white blood cells, also called leukocytes. When a child has leukemia, large numbers of white blood cells are produced in the bone marrow. These abnormal white cells crowd the bone marrow and flood the bloodstream, but they cannot perform their proper role of protecting the body against disease because they are defective. As leukemia progresses, the cancer interferes with the body's production of other types of blood cells, including red blood cells and platelets. This results in anemia (low number of red cells) and bleeding problems, in addition to the increased risk of infection caused by white cell abnormalities. Initially, abnormal leukemia cells appear only in the bone marrow and blood, but later they may spread elsewhere, including the lymph nodes, spleen, liver, brain, and testes.

Leukemia is classified into acute (rapidly developing) and chronic (slowly developing). In children about 98% of the leukemias are acute. Childhood leukemias are also divided into acute lymphocytic leukemia (ALL) or acute nonlymphocytic leukemia (ANLL), depending on whether they involve specific white cells called lymphocytes. These are a type of white cell linked to immune defenses. ANLL is also called acute myelogenous leukemia (AML).

ALL generally occurs in younger children ages 2 to 8, with a peak incidence at age 4. It is more common among white children than other races. Boys are affected more often than girls. AML may be seen in infants during the first month of life, but then becomes relatively rare until the teenage years. Leukemias account for about 25% of all childhood cancers and affect about 2,200 American children a year. About 60% of children with leukemia have ALL, and about 38% have AML. Slow-growing chronic myelogenous leukemia (CML) is very rare (fewer than 50 cases in a year in the United States).

Children who have inherited certain genetic problems such as Down syndrome, Kleinfelter syndrome, neurofibromatosis, have a higher risk of developing leukemia. Children who are receiving prescribed medication to suppress their immune systems after organ transplants or children who received radiation or chemotherapy for other types of cancer are also at higher risk for leukemia. Most leukemias are from non-inherited mutations (changes) in the genes of growing blood cells. Because these errors occur randomly and unpredictably, there is currently no effective way to prevent most types of leukemias.

Diagnosis is made by complete blood count (CBC), a blood smear, bone marrow biopsy and aspiration, lymph node biopsy or lumbar puncture (spinal tap). The spinal tap shows whether the leukemia has spread to the brain and spinal cord.

Children with ALL are treated with chemotherapy. The dosages and drug combinations vary. Radiation treatment is used for certain high-risk patients. Depending on the type of leukemia, a bone marrow transplant may be necessary. After treatment begins, the goal is remission of the leukemia. Maintenance chemotherapy is given over a period of 2 to 3 years to keep the cancer from reoccurring.

Developed with Minnesota Low Incidence funds, Region 10 Physical Health Disabilities Network, and School Nurse Organization of Minnesota (SNOM)

Leukemia

Educational Implications

High rate of absenteeism that may result from hospitalizations, treatments and treatment side effects can contribute to learning problems. Due to a weakened immune system, the child may be more prone to infectious disease. Children with leukemia often miss up to 10-20 weeks of school in one year. When a child misses this much school, they may experience depression, apathy, anxiety, frustration and poor self-concept.

Skills needed for learning such as attention, memory, nonverbal skills, language skills, and motor skills may be affected short or long term. A child with cancer can struggle with fatigue due to the treatments and their energy level may fluctuate from day to day, which will dictate how much they can do. The more the cancer interferes with social functioning of the child, the more it may compromise the general psychosocial adaptation of the child. Studies have shown the importance of having the student return to a normal routine as soon as, and as many activities as they can tolerate. School staff should become knowledgeable regarding the type of leukemia, the effects of the disease and its treatment.

Instructional Strategies and Classroom Accommodations

During Treatment:

- Work with parents/hospital staff to make sure schoolwork continues.
- Arrange for the child to visit with friends/classmates from school.
- Work with parents/hospital to attend school whenever possible
- Adjust the workload for the child so it is manageable.
- Teachers should know the specifics of how leukemia is affecting the child.
- Arrange for an educational re-entry session with classmates. This is done to help the children in class understand what is going on and the child with cancer establishes themselves as the expert (helps self-confidence, self-competence and reduces social isolation).

After Treatment:

- A neuropsychological evaluation is often done to look at cognitive, academic, memory, comprehension, attention/concentration, visual-spatial and visual-motor integration, processing speed and executive functioning and planning. These areas all can be affected by the leukemia and/or the treatment of it.
- The results of the testing will help determine if and what kind of instructional strategies and classroom accommodations are needed.
- Re-evaluate progress on a regular basis. Some effects may be short term, others may be long-term or permanent, and some may not occur for months or years until after treatment ends.
- Receiving a schedule of upcoming medical appointments can help the teacher prepare the child for future absences and impending work expectation.
- An Individual Health Plan (IHP) can address a weakened immune system (notifying parents of certain contagious illnesses), fatigue (allow for rest periods), limitations of the student's activities and address the physical side effects of cancer treatments (nausea, vomiting, diarrhea and hair loss).
- Encourage good hand washing.

Resources

The School Nurse's Source Book of Individualized Healthcare Plans
Volume I, II; Mary Kay B. Haas 1993

American Cancer Society, Minneapolis Area Chapter
Mendota Heights, 2520 Pilot Knob Rd, Ste 151
Telephone: 1-651-255-8100

The Leukemia and Lymphoma Society, Minnesota Chapter
5217 Wayzata Blvd
St. Louis Park, MN 55416

Candlelighter's Childhood Cancer Foundation
Telephone: 1-800-366-2223
http://www.candlelighters.org

National Children's Cancer Society
Telephone: 1-800-532-6459
http://www.children-cancer.com

American Cancer Society
Telephone: 1-800-ACS-2345
http://www.cancer.org

Educating the Child with Cancer
Edited by Patricia Deasy-Spinetta,MS andElizabeth Irvin

Cancervive, Teacher's Guide for Kids with Cancer
Telephone: 1-800-4-TOCURE
http://www.cancervive.org

For Children:

Angels & Monsters: A Child's Eye View of Cancer (Booklet Code #9513)

What happened to You, Happened to Me (Booklet Code # 4526)

For Young People:

Chemo, Craziness and Comfort, My Book About Childhood Cancer.
Candlelighters Childhood Cancer Foundation.
http://www.candlelighters.org

The Amazing Hannah, Look at Everything I Can Do!
Candlighters Childhood Cancer Foundation.
www.candlelighters.org

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