Leukemia: A Deadly Disease That Mostly Affects Kids Between Ages 2 and 4.

Leukemia, a malignant disorder of the hematopoietic system involves the bone marrow and lymph nodes. The exact cause of leukemia is unknown. Eighty percent of persons affected by acute lymphocytic leukemia are between the ages of 2 and 4.

Oct. 16, 2009 - *PRLog* -- Leukemia, a malignant disorder of the hematopoietic system involves the bone marrow and lymph nodes. It is a broad name given to a very complex disease classification system. An estimated 34,810 new cases of leukemia were diagnosed in the United States during the year 2005. This is a very devastating disease with very poor prognosis.
Leukemias are divided into acute and chronic types. The acute forms are: acute lymphocytic leukemia and acute myelogenous leukemia. The chronic kinds are: chronic lymphocytic leukemia and chronic myelogenous leukemia.

Epidemiology/Etiology:

The exact cause of leukemia is unknown. Eighty percent of persons affected by acute lymphocytic leukemia are between the ages of 2 and 4. An estimated 3970 new cases occur every year. The incidence of the disease declines past the age of 10 years.
Factors involved in the development of leukemia include the following:

- Radiation therapy
- Exposure to certain chemicals
- Exposure to certain drugs (for example benzene, chemotherapy agents, and bone marrow suppressants)
- Immunologic factors
- Genetic factors

Pathophysiology:

Acute lymphocytic leukemia is a malignant condition which comes from a single lymphoid cell with impaired maturation and hence accumulates in the bone marrow cells. The white blood cells are not normal. They invade the bone marrow and destroy it. The cancerous cells can also metastasize into the spleen, liver, testes, brain and the lymph nodes.
Acute myelogenous leukemia arises from a single myeloid stem cell and is usually characterized by the developments of immature myeloblasts in the bone marrow.
Chronic lymphoblastic leukemia is characterized by an increase of small, abnormal, mature B lymphocytes, often leading to decreased synthesis of immunoglobins and depressed antibody response.
Chronic myelogenous leukemia is caused by an abnormal stem cell leading to the uncontrolled spread of the granulocytic cells.

Clinical Manifestation:

- Fever
- Respiratory tract infections
- Anemia
- Ecchymoses
- Bleedeing of mucous membranes
- Lymphadenopathy
- Weakness
- Fatigue

- Splenomegaly
- Anorexia
- Weight loss

Lab Tests and Diagnostic Procedures:

- WBC (WBC count may be >100,000/mm3 at time of diagnosis.
- Differential count (to observe for shift to left, which is seen in chronic myelogenous leukemia)
- Leukocyte alkaline stain (to differntiate chronic myelogenous leukemia from other types of leukocytosis)
- Genetic karyotyping (to verify presense of Philadelphia chromosome, which is indicative of chronic myelogenous leukemia)
- Hematocrit, hemoglobin, and platelets
- Bone marrow aspiration
- Biopsy
- Bleeding times

Medical Management:

- Chemotherapy (radiation therapy)
- Medications (cetarabine, doxorubicin, daunorubicin, hydroxyurea, busulfan)
- Surgery (bone marrow transplant)
- Combination of the above

Nursing Management:

- Monitor for bleeding
- Place client in a private room
- Screen visitors carefully to avoid spread of germs
- Encourage good nutrition (low bacteria diet, avoid salads, raw fruits)
- Encourage fluid intake
- Encourage good personal hygiene
- Avoid crowds
- Assess health history
- Assess for fatigue and weakness
- Assess for history of arthralgia, malaise
- Assess for decreased exercise tolerance
- Assess for tenderness in the left upper quadrant
- Assess for sensation of abdominal fullness
- Assess for abnormal bruising or bleeding
- Monitor platelet counts daily
- Platelet transfusions may be indicated for patients whose platelet count are • Assess skin for petechiae and ecchymosis
- Assess IV lines and sites for bleeding
- Monitor stool and urine for blood
- Pain management
- Monitor and prevent falls
- Educate patient and family about the disease process
- Provide strategies to facilitate coping
- Administer medications as ordered by the physician

Nursing Care Plan 1:

Nursing Diagnosis: Risk for Injury
Goal: Patient will be free from injury during 12 hour shift.
Interventions:
- Monitor platelet counts daily because platelet transfusions may be indicated for patients whose platelet counts are below 20,000/mm3 and also shows signs of bleeding
- Assess skin for cuts and bleeding to prevent blood loss
- Assess all IV sites for bleeding to prevent blood loss
- Monitor stool and urine for blood in order to spot any blood loss due to bleeding
- Instruct patient to remain in bed and rise up slowly if need be
- Place call light within reach of patient to prevent injury due to falls
- Move all furniture and other obstacles away from patients path to prevent injury resulting from falls
- Place bed to lowest position to prevent injury resulting from falls
- Provide toothbrush with soft bristles to avoid bruising of gum and bleeding
- Encourage rest
- Encourage good nutrition
- Encourage adequate fluid intake if not contraindicated
- Plan activities to make room for rest periods

Nursing Care Plan 2:

Nursing Diagnosis: Risk for Infection
Goal: Patient will remain free from infection during 12 hour shift.
Nursing Interventions:
- Proper hand was before patient contact to prevent the spread of infectious pathogens
- Instruct family members to practice good hand wash technique (to wash hands with liberal amount of soap for at least 15 seconds and rinse thoroughly with warm running water) before coming in direct contact with patient. This will reduce the chance of infection.
- Check temperature and vital signs every 4 hours. Temperature spike is an indication of infection
- Instruct client not to eat fresh vegetables and fresh fruits because they may carry some bacteria that may cause infection due to low resistance
- Inspect IV puncture site for sign of redness or infection
- Place client in a private room
- Screen visitors carefully
- Avoid crowds of people around client

Conclusion:

What You Learned:

You learned a wealth of information about leukemia and its various kinds. You also learned about treatment modalities that are employed. Treatment is aimed at tackling each specific kind of leukemia, but generally treatment follows the general category of Surgical, Pharmacological, Chemotherapy, or a combination of two or three forms of these treatments. You learned a lot about the disease process; and this will equip you with the know-how to educate your patients in the clinical setting.

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Author: Nikolaos J. Tsagarakis.
Website: nux.cc/46rpzx.

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