

Genetics and cancer

[Health & Medicine](#), [Nursing](#)



Genetics and Cancer due: Diagnosis Laboratory and physical examinations reveal that the patient is suffering from acute lymphoblastic leukemia. The low blood count reveals anemia. The patient has a higher than usual count of Lymphocytes; approximately 97%; thus explains why the dicloxacillin administered failed to respond. The platelets count is 16/cmm; this is lower than the normal count. Thus, explains the unexplained bruising, bleeding gums, and dried blood in the nose resulting from a nose bleed. An enlarged spleen measuring 5cm results from an assemblage of leukemia cells in the spleen. Fever and headache reveal that the leukemia cells have spread up to the spinal cord. According to McCance & Huether (2014) chemotherapy and drug administration are the most appropriate treatment for this patient (p. 392-401).

Difference between childhood cancers and adult cancers

The commencement of modern cancer treatment revealed that pediatric and adult cancers have a considerable degree of variation. A chief variation is the higher 5-year survival rate for common pediatric cancers, when compared to common adult cancers. Current therapy of pediatric cancer cases, for instance acute lymphoblastic leukemia, have revealed a 5 year survival rate of children; as compared to adults who have the same condition to have a lower than 5 years survival rate. Childhood leukemia was viewed as a fatal condition 50 years ago, but currently approximately 70% of children with this condition have been cured (Agabegi & Ring, 2013 p. 355). Medical improvements have been made in the treatment of childhood cancers; however, little advancement has been made in adult cancer. This explains why adult cancer victims' survival rate has remained constant during the

years. Thus, due to the improvements done on pediatric cancer, there is a survival divergence with adult cancer; making adult cancer a public health concern (McCance & Huether, 2014 p. 442- 446).

Adult and childhood cancers differ by phenotype and genotype. In addition, the physiologic anatomy and co-morbid medical conditions varies between adults and children. A biological difference between adult and pediatric cancers is via the microscopic observation of the cells. On observation, adult cancers are carcinomas originating from epithelial tissue. This includes breast, lung, ovarian, prostate, colo-rectal, and uterine. Childhood cancers are sarcomas originating from non-ectodermal embryonal tissue; this includes nerve tissue, lymph glands, bone marrow, muscle, and bone. In addition, the dichotomies of adults are mature, and that of children are embryonic (Brashers, 2006 p. 113- 150). Some research has proven that carcinomas are resistant to cancer treatment (radiotherapy and chemotherapy), but sarcomas are more responsive to the treatment; thus the high cure rate of childhood cancers. Moreover, resilience of the patient matters. Children weighed against adults are resilient and recover faster from the aggressive toxic therapy, due to an efficient immune system (Bricker et al, 2011 p. 159).

Concept map of the pathophysiology of acute lymphoblastic leukemia

Formation of fusion genes/ dysregulation of proto-oncogenes (through its union to the promoter of another gene)

Activation of oncogenes & deactivation of tumor suppressor genes

Leukemia cells invade blood stream

Uncontrolled cellular growth

References

Agabegi, S. S., Agabegi, E. D., & Ring, A. C. (2013). Step-up to medicine. Philadelphia: Wolters

Kluwer/Lippincott Williams & Wilkins.

Brashers, V. L. (2006). Clinical applications of pathophysiology: An evidence-based approach.

St. Louis (MO: Mosby/Elsevier.

Bricker, J. T., Omar, H. A., & Merrick, J. (2011). Adults with childhood illnesses:

Considerations for practice. Berlin: De Gruyter.

McCance, K. L., & Huether, S. E. (2014). Pathophysiology: The biologic basis for disease in adults and children.