Leukemia

Leukemia is a form of cancer that targets the blood. Blood contains different types of cells such as red blood cells, white blood cells (WBCs), and platelets. The normal life cycle of these cells (formation, growth, function and death) is controlled in part by the bone marrow. In many instances, if the control over WBCs life cycle is disturbed, leukemia is the result. The number of WBCs will be higher than other blood cells, they will stop dying normally and they will not carry out their function in the body, such as fighting infections and healing wounds.

WBCs can be formed from different cell lineages, lymphoid or myeloid. The cell lineage affected by the cancer determines the kind of leukemia and the affect can be sudden or "acute" or can be developing slowly or "chronic". This results in 4 subtypes: acute lymphocytic leukemia (ALL) – most common in children, acute myelogenous leukemia (AML) – most common in adults, chronic lymphocytic leukemia (CLL) – most an adult disorder, chronic myelogenous leukemia (CML) – most common in adults.

In general, leukemia is the most common cancer in children. After disrupting the functions of the immune system, causing fevers and infections, the cancer interferes with the production of other blood cells, resulting in anemia and bleeding problems. An affected child may look pale, be often breathless and bruise and bleed easily and for a prolonged period of time. Leukemia cells can also accumulate in different organs in the body triggering a set of symptoms including headaches, confusion, joint or bone pains, and painful swellings.

Risk Factors

The cancerous state of leukemia initiates when the DNA of one or more white blood cells is damaged or mutated. In many instances, DNA damage results in the activation of oncogenes (cancer-promoting genes) and deactivation of tumor suppressor genes (cancer-preventing genes). The abnormal DNA is copied and passed on to many cell generations, which instead of maturing and dying off tend to multiply and accumulate within the body causing the complications of leukemia. DNA damage may be caused by a combination of genetic susceptibility factors and environmental exposures:

Age: About 60-70% of leukemics are older than 50 years.

Chemicals and radiation: The risk of developing acute leukemia increases in individuals exposed to hazardous chemicals (benzene) or to radiation.

Smoking: It is reported that many of the adult cases with leukemia are cigarette smokers.

Viruses: The human T-cell leukemia virus I (HTLV-I) causes acute lymphocytic leukemia (ALL). Similarly, other types of leukemia have been reported in workers who are exposed to animal viruses.

Genetic: Leukemia risk is increased 15-fold among children with Down syndrome. Other inherited diseases are also associated with a higher risk of developing leukemia such as: Fanconi anemia (a blood disorder associated with chromosomal breakage), Bloom's syndrome (a growth retardation disease associated with increased chromosomal breakage), ataxia telangiectasia (a central nervous system disorder), neurofibromatosis and Li-Fraumeni syndrome (inherited cancer diseases), Wiskott-Aldrich syndrome (inherited immunodeficiency disease), Klinfelter syndrome (males with this condition have an extra X chromosome), and Shwachman syndrome (an inherited disease characterized by signs of insufficient

absorption of fats and other nutrients due to abnormal development of the pancreas and improper functioning of the bone marrow).

Diagnosis and Management

The diagnosis of leukemia is not based on symptoms only since these can be caused by other conditions. Tests for confirmation include blood cell counts, liver and kidney function evaluation, spinal fluid analysis, bone marrow biopsy and analysis. Chromosomes are also checked for irregularities. After confirmation, the cancer is classified and correlated with the age and WBCs count in view of the appropriate treatment.

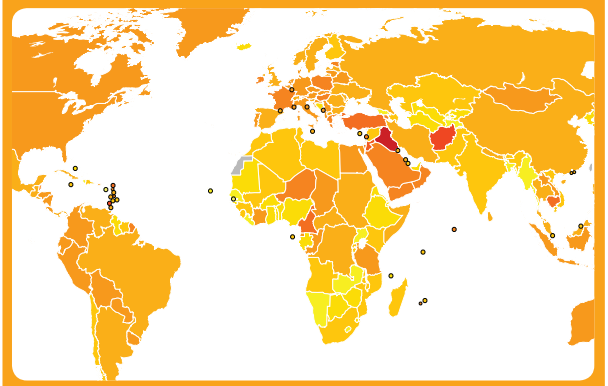
Aside from addressing the symptoms of leukemia, medical treatment designed to cure involves chemotherapy, interferon therapy and in certain cases a designated monoclonal antibody. Radiation therapy may be used although it carries significant side effects. Stem cell transplantation is a complementary treatment.

Leukemia in Arab Populations

Statistics have shown that leukemia is one of the 10 most common malignancies in Jordan, Lebanon, Bahrain, Egypt, Iraq, Libya, Kuwait, Oman, Qatar, Saudi Arabia, Syria, and the UAE. In most of these countries, leukemia is also the major form of pediatric cancer. The most common leukemic form is ALL, followed by AML (Kuwait: 44% and 32%, Saudi Arabia: 34% and 25%, respectively). In the UAE, a recent study found a high rate of ALL (32%) among males. Several studies in Arab populations have shown that the high rate of consanguinity does not affect the incidence of leukemia. Genetic studies are taking place in Lebanon, Morocco, and the UAE to improve the diagnosis and treatment methods.

In Iraq, the number of patients with leukemia increased dramatically following the Gulf War. This might be attributed to the exposure to depleted uranium (a radioactive element used in ammunition) as well as to the exposure to toxic fumes in oil field fires during the war.

Age-standardized death rates from leukemia by country (per 100,000 inhabitants) according to WHO statistics for year 2004. Darker areas indicate higher rates.



Arab Country	Rate	World Rank
Iraq	12.6	1
Jordan	8.4	4
Yemen	6.9	10
Lebanon	6.8	11
Oman	6.7	12
Saudi Arabia	6.4	15
Egypt	5.1	28
Bahrain	4.9	30
Sudan	4.6	33
Somalia	4.5	34
Kuwait	4.1	38
Libya	3.9	40
Qatar	3.7	42
Syria	3.7	42