Leukemia

Leukemia is a heterogeneous group of **hematopoirtic cancers**, based on individual elements of hematopoiesis a lymphopoiesis. However, there are also types of leukemias for which normal leukemia cell analogues are not known.

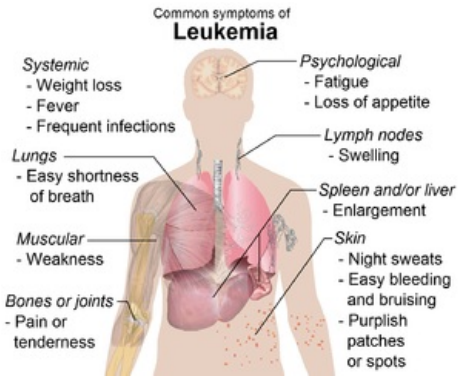
Leukemia (hemoblastoses) are the **most common childhood cancers** (followed by CNS tumors, lymphomas and neuroblastomas). **The incidence** is 13 new cases per 100,000 population per year. Leukemic cells **lose their ability to differenciate**, losing the phenotype of the parent cell. They maintain or even increase their **proliferative potential**. In a patient with leukemia, there are two cell populations side by side:

- based on **normal stem cells**,
- originating from **malignantly transformed stem cells** maturation and differentiation defect) - these immature cells (blasts) are washed out into the peripheral blood and are found as diffuse or nodular infiltrates in various organs. It forms histohomological metastases to the liver, spleens, nodules, but also others.

Clinical signs

The leukemic population gradually displaces normal cells. In addition, leukemia cells tend to be functionally inferior, which explains some of the clinical symptoms:

- **erythrocyte deficiency** – anemia, paleness, fatigue,
- **Platelet deficiency** – bleeding,
- **granulocyte and lymphocyte deficiency** – susceptibility to infections.
- pain in the bones,
- anorexia,
- reticulo-endothelial infiltration: hepatosplenomegaly, lymphadenopathy.[1]



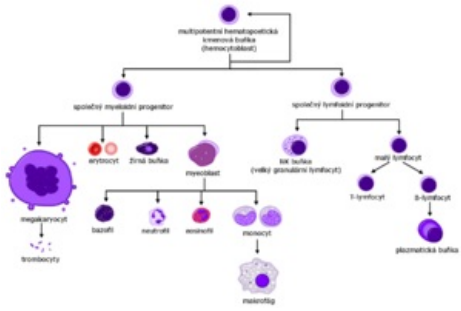
Clinical signs of leukemia.

division

According to whether malignant transformation affects **myeloid cells** (the final stages are granulocytes, monocytes, erythrocytes and platelets) or **lymphoid** cells (the final stages are T and B-lymphocytes, plasma cells and NK cells), we divide leukemias into two groups:

- myeloid (myeloses) - most often based on elements of granulocytopoiesis,
- lymphoid (lymphoblastic, lymphadenoses) - most often based on B-cell precursors.

However, there may be a malignant transformation of the **pluripotent stem cell**, from which the precursors of the myeloid and lymphoid lineages emerge. This transformation is the cause of CML.


Hematopiesis.

According to the clinical course, we divide myeloses and lymphadenoses into **acute** (untreated ends in death within a few months) and **chronic** (patients can survive for several years):

- **ALL** – most common in children (accounting for 80% of acute leukemias in children).
- **AML** – can occur at any age, more in the elderly.
- **CLL** – the most common leukemia in adulthood, occurs in older adults (over 40 years), survival up to 20 years.
- **CML** – mainly affects adulthood, peak in 30 and 60 years, survival is about 4 years.

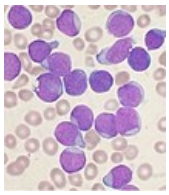
ALL is most common in children and **CLL** in adults.

Cause

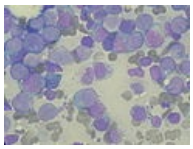
The following can be used as causes of leukemia:

- **ionizing radiation**,
- **chemical substances** – benzene and other aromatic hydrocarbons, cytostatics, alkylating agents and other carcinogens,
- some **genetic diseases** – syndromes: Down, Klinefelter, Wiskott-Aldrich, Fanconi anemia,
- **viruses** – HTLV-1 causes T-cell leukemia in adults.

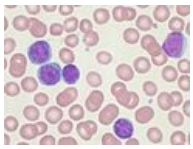
Pictures



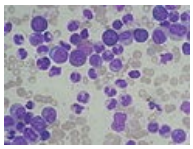
ALL − lymphoblasts.



AML.



CLL − mature lymphocytes.



CML.

Link

related articles

- Acute myeloid leukemia
- Acute lymphatic leukemia
- Chronic myeloid leukemia
- Chronic lymphatic leukemia
- Hair cell leukemia
- Diseases of the white blood component

Source

- PASTOR, Jan. *Langenbeck's medical web page* [online]. ©2006. [cit. 26.9.2010]. <http://langenbeck.webs.com/pathologie.htm>.

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- ws:Leukemie

1. LISSAUER, Tom – CLAYDEN, Graham. *Illustrated Textbook of Paediatrics.* 3. edition. Spain : Elsevier, 2007. pp. 350-351. ISBN 978-07234-3398-9.