Childhood Leukaemia

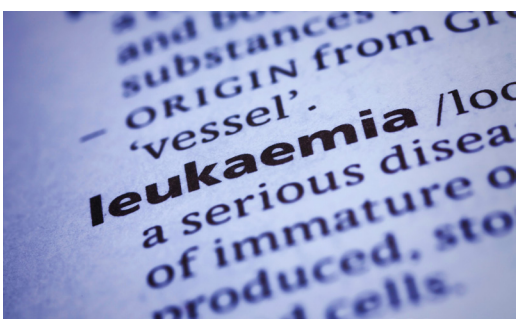
Key Statistics on Childhood Leukaemia

According to the American Cancer Society, Leukaemia is the most common cancer among children and teenagers, constituting almost one-third of all cancer instances within this age group. Despite its frequent occurrence among young individuals, childhood Leukaemia is categorised as a rare ailment.

Approximately 75% of Leukaemia's diagnosed in children and teens are classified as acute lymphocytic Leukaemia (ALL), with the majority of the remaining cases falling under the category of acute myeloid Leukaemia (AML).

- Acute Lymphocytic Leukaemia (ALL) is most common in early childhood, especially between ages 2 and 5. On the other hand, Acute Myeloid Leukaemia (AML) tends to appear more consistently throughout childhood, with a slightly higher frequency in the first 2 years of life and during the teenage years.
- Acute Lymphocytic Leukaemia (ALL) is more prevalent among Hispanic and White children compared to African American and Asian American children. Additionally, it occurs more frequently in boys than in girls.
- Acute Myeloid Leukaemia (AML), on the other hand, occurs with similar frequency among boys and girls.
- Chronic Leukaemia's are rare occurrences in the paediatric population, and when present, they are mostly represented by Chronic Myeloid Leukaemia (CML), which tends to manifest more frequently in teenagers than in younger children.
- Juvenile Myelomonocytic Leukaemia (JMML), another infrequent form, typically emerges in young children, with an average age of around 2 years. It shows a slightly higher prevalence in boys compared to girls.

https://www.cancer.org/cancer/types/leukemia-in-children/about/key-statistics.html



What is Leukaemia?

Cancer begins when cells in the body experience uncontrollable growth, and this unchecked proliferation can manifest in cells across various regions of the body. Leukaemia specifically stems from cells that would ordinarily mature into different types of blood cells. Generally, Leukaemia starts in the initial phases of white blood cell formation, although there are cases where specific types of Leukaemia may originate in other blood cell types.

Types of Childhood Leukaemia:

Leukaemia has various types, primarily categorised by:

1. Acute Leukaemia:

Most childhood Leukaemias are acute and progress rapidly, requiring prompt treatment. The primary types of acute Leukaemia include:

• **Acute Lymphocytic Leukaemia (ALL):** Approximately 3 out of 4 childhood Leukaemias belong to the ALL category. These Leukaemias initiate in early forms of white blood cells known as lymphocytes.

• **Acute Myeloid Leukaemia (AML):** Also referred to as Acute Myelogenous Leukaemia, acute Myelocytic Leukaemia, or Acute Non-lymphocytic Leukaemia, AML constitutes most of the remaining cases of childhood Leukaemia. AML originates from myeloid cells responsible for forming white blood cells (excluding lymphocytes), red blood cells, or platelets.

Both ALL and AML have subtypes. Read more: Childhood Leukaemia Subtypes

2. Chronic Leukaemia:

Chronic Leukaemias are uncommon in children, characterised by a slower growth rate compared to acute Leukaemias, yet proving more challenging to cure. These chronic Leukaemias can be categorised into two primary types:

• **Chronic Myeloid Leukaemia (CML):** Also called Chronic Myelogenous Leukaemia, CML is rare in children. Treatment is like that used for adults.

• **Chronic Lymphocytic Leukaemia (CLL):** This Leukaemia is extremely rare in children.

3. Juvenile Myelomonocytic Leukaemia (JMML):

This uncommon form of Leukaemia falls between the categories of chronic and acute. Originating in myeloid cells, it generally exhibits a growth rate that falls between the rapid pace of AML and the slower progression of CML. It is more prevalent in young children, typically with an average age of 2 years.

Symptoms may include pale skin, fever, cough, easy bruising or bleeding, difficulty breathing (due to an excess of white blood cells in the lungs), rash, and enlargement of the spleen, liver, and lymph nodes.

Learn more:
https://www.cancer.org/cancer/types/leukemia-in-children/treating/children-with-jmml.html

Causes and Risk Factors:

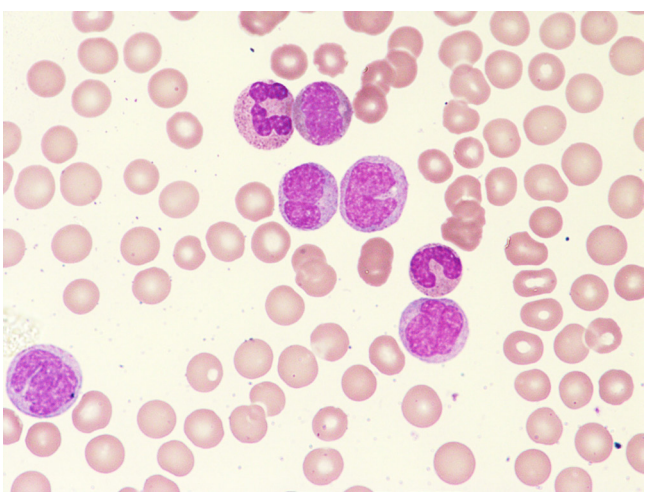
The exact cause of childhood Leukaemia is not well understood. However, certain genetic and environmental factors may contribute to its development. Some risk factors include:

• **Genetic factors:** Certain genetic conditions, such as Down syndrome, are associated with an increased risk of Leukaemia.

• **Exposure to radiation:** High levels of exposure to ionising radiation may increase the risk of developing Leukaemia.

• **Chemical exposure:** Some studies suggest that exposure to certain chemicals, such as benzene, may be linked to an increased risk.

• **Infections:** Certain viral infections, like the human T-cell Leukaemia virus (HTLV-1), have been associated with an increased risk.



Symptoms:

The symptoms of childhood Leukaemia can vary, but common signs may include:

- **Fatigue and weakness:** Due to a decrease in normal blood cells.
- **Frequent infections:** Because of a compromised immune system.
- **Easy bruising or bleeding:** Resulting from a shortage of platelets.
- **Joint or bone pain:** Caused by the infiltration of Leukaemia cells into the bone marrow.

Diagnosis and Treatment:

To identify childhood Leukaemia, the physician will conduct a comprehensive review of the patient's medical history and perform a physical examination. Diagnostic tests play a crucial role not only in confirming the presence of childhood Leukaemia but also in categorising its specific type:

• Blood tests to quantify blood cell counts and assess their morphology.
• Conducting bone marrow aspiration and biopsy, typically extracted from the pelvic bone, to validate a Leukaemia diagnosis.
• Performing a lumbar puncture, also known as a spinal tap, to examine the presence of Leukaemia cells in the cerebrospinal fluid surrounding the brain and spinal cord.

Treatment:

Prior to commencing cancer treatment, a child may require intervention to address complications arising from the illness. For instance, alterations in blood cells can lead to infections or serious bleeding, potentially impacting the oxygen levels reaching the body's tissues. Interventions may encompass the administration of antibiotics, blood transfusions, or other measures to combat infections.

The primary approach to treating childhood Leukaemia is chemotherapy. Anticancer drugs are administered orally, intravenously, or into the spinal fluid. To prevent Leukaemia recurrence, there may be a regimen of maintenance therapy conducted in cycles spanning 2 or 3 years.

In some cases, targeted therapy is employed, focusing on specific components of cancer cells and differing from standard chemotherapy. Particularly effective for certain types of childhood Leukaemia, targeted therapy often results in milder side effects.

Additional treatment modalities may include radiation therapy, utilising high-energy radiation to eliminate cancer cells and reduce tumour size. This approach can also aid in preventing or treating the spread of Leukaemia to other body parts. Surgery is seldom considered as a viable option for treating childhood Leukaemia.

If conventional treatment is deemed less effective, a stem cell transplant may be the preferred course of action. This involves transplanting blood-forming stem cells after initial whole-body radiation and high-dose chemotherapy to eliminate the child's bone marrow.

For children and young adults up to the age of 25 with B-cell ALL that doesn't respond to other treatments, the FDA has sanctioned a type of gene therapy. Researchers are actively developing a version of this treatment for individuals over 25 and for other forms of cancer.

CAR T-cell therapy utilises the patient's own immune cells, specifically T cells, to combat cancer. Doctors extract these cells from the patient's blood and modify them by introducing new genes. The modified T cells exhibit enhanced efficacy in locating and eliminating cancer cells.

Read more:
https://www.cancer.org/cancer/types/leukemia-in-children/treating.html

Prognosis:

Advancements in treatment have significantly improved the prognosis for childhood Leukaemia. Many children with Leukaemia can achieve complete remission with appropriate therapy. However, the long-term effects of treatment, including potential late side effects, are also considered in managing the overall health of childhood Leukaemia survivors.

It's important for parents to work closely with a paediatric oncology team to develop an individualised treatment plan for their child. The outlook for childhood Leukaemia has improved over the years, and ongoing research continues to enhance our understanding of the disease and refine treatment approaches.