Leukosis Among Children

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ABSTRACT

This paper examines the problem of the development of leukosis, or blood cancer, in children, which accounts for a significant proportion of all pediatric oncological diseases. In Uzbekistan, leukosis and other oncohematological diseases are considered serious and pressing issues and require special attention from the healthcare system.

The paper reviews the main causes of this pathology, including mutations and disruptions of hematopoiesis in the bone marrow due to genetic predisposition, exposure to chemical carcinogens, viruses and radiation. The article also briefly presents current data on the prevalence of leukosis both in Uzbekistan and globally, allowing an assessment of the scale of the problem.

Keywords:

Introduction

Blood cancers are one of the most common pediatric oncological diseases and hold an important place in modern medicine.

According to statistical data, the symptoms of acute leukemias occur more often in children aged between 2-3 to 5-6 years. This disease is associated with a malignant lesion of the hematopoietic system, in which mature blood cells are replaced by immature blast elements of the leukocyte series. Such cells can migrate from the bloodstream into other organs and lymph nodes and cause metastases. The relevance of the issue of childhood leukosis is also due to the fact that the number of cases increases every year, and this pathology has a significant impact on children's health both worldwide and in Uzbekistan. In children, the consequences of blood cancer are particularly important because their bodies are still developing. Anemia may subsequently develop due to a lack of erythrocytes. Because of a reduction in the number of normal leukocytes, the body cannot adequately perform its immune function and becomes especially vulnerable to various infections. Leukemic cells can also affect organs such as the liver, spleen, lymph nodes, central nervous system, and bones and joints. Acute lymphoblastic leukosis is the most common form. Thus, studying the causes, prevalence, and consequences of leukosis in children is an important and timely issue and has practical significance for the healthcare system.

Aim and objectives of the study

To study the causes, risk factors, and prevalence of leukosis in children, as well as to establish the significance and relevance of this disease in the healthcare system of Uzbekistan.

1. Conduct a comprehensive analysis and study of the prevalence of leukosis among children.
2. Study the main causes of the development of this disease.
3. Consider the characteristics of how blood cancer manifests in children.
4. Analyze the impact of leukosis on a child's development.
5. Compare global statistics with those of Uzbekistan.

6. Identify effective directions for leukosis prevention.

1.Prevalence of leukosis

Leukemias are the most common group of oncological diseases among children worldwide. Globally, according to the WHO (World Health Organization), 400,000 children and adolescents aged from 0 to 19 are diagnosed with cancer each year, with leukosis being its most frequent type. This demonstrates that the problem has a holistic nature and requires special attention.

In Uzbekistan, leukosis also has great significance. According to data provided by the Republican Specialized Center of Oncology and Radiology in Uzbekistan, more than 4,500 children with oncological diseases are registered, and about 900 new cases are identified annually.

At the same time, the initial stages of leukosis may not be noticed immediately and are often masked: sleep disturbances, reduced activity, poor appetite, and periodic fever. These symptoms can be mistakenly taken as signs of a cold or viral infections.

Leukosis causes numerous psychological, physical, and social consequences. It is noted that children aged 2 to 5 years are particularly vulnerable to this disease, as this is a period of active formation of the immune system and hematopoiesis, and bone marrow cells respond more severely to mutations. Studies show a relation between leukosis risk and environmental factors such as ionizing radiation, air pollution, and exposure to various toxins on the young body. At the same time, detection and survival rates are often region-specific.

In high-income countries, diagnosis and treatment of this disease are significantly better than in low-income countries. In Uzbekistan, childhood leukosis is also an important issue due to unequal access to specialized medical care across different regions of the country. Thus, childhood leukosis remains a highly prevalent pathology, as confirmed by international and national studies.

2.Causes of leukosis

Despite many years of research, the mechanisms by which blood cancer develops are still not fully understood. It is believed that the disease happens as a result of a genetic mutation in a hematopoietic bone marrow cell, after which it begins to proliferate uncontrollably. Nevertheless, a number of factors have been identified that adversely affect a child's body and may directly or indirectly trigger the development of this disease. The main factor is prolonged or single large-scale exposure of the child's body to radiation and unfavorable environmental conditions. It has been established that the likelihood of developing leukosis is higher in children with certain congenital syndromes such as Down syndrome, Fanconi anemia, Bloom syndrome, and a number of other genetic diseases. These conditions are accompanied by increased genetic instability of cells, which contributes to the emergence of mutations. Physical factors, such as ionizing radiation, also play an important role. High-dose exposure can cause DNA damage to bone marrow cells and increase the risk of malignant blood diseases. Exposure to radiation during prenatal development and early childhood is considered particularly dangerous. Contact with benzene and other toxic substances is also regarded as a factor in the development of leukosis in children.

Prolonged exposure to such compounds can disrupt hematopoietic processes and contribute to mutations in blood cells. It should be noted that in most cases of childhood leukosis, a specific cause cannot be identified. Modern science considers leukosis as a multifactorial disease arising from a combination of genetic predisposition and various harmful environmental influences. Studying the causes of leukemia remains one of the most important tasks of pediatric oncohematology both in Uzbekistan and worldwide, since understanding the mechanisms of disease onset makes it possible to improve methods of prevention, early diagnosis and treatment.

3.Features of leukosis developing in children

One of the main features of leukosis in children is the rapid development of the pathological

process. The disease begins in the bone marrow, where there is
uncontrolled proliferation of immature blood cells — so called “blasts”. These cells gradually displace normal hematopoietic elements, leading to anemia, reduced immune defense, and impaired blood coagulation. The clinical developments of leukosis in children are often not specific, which can complicate early diagnosis. Pediatric leukosis is characterized by enlargement of the lymph nodes, liver, and spleen, as tumor cells accumulate in these organs. In some cases, the central nervous system is affected, which often manifests as headaches, visual disturbances, vomiting, and other neurological symptoms.
An important feature of leukosis in children is the high sensitivity of tumor cells to modern antitumor therapy.
Thanks to advances in diagnostic and treatment methods, survival rates have improved significantly. At present, with timely detection and comprehensive treatment, the majority of children achieve long-term remission and complete recovery.

4.Consequences of leukosis

Since the disease affects the hematopoietic system, the production of normal blood cells is disrupted. It negatively impacts the function of virtually all organs and systems.
For this reason, leukosis has a serious effect on a child's body and can lead to numerous complications. One of the most common consequences is anemia resulting from a reduced number of erythrocytes. A lack of oxygen in tissues can slow a child's growth and development.
Another important consequence is impaired blood coagulation due to a decrease in platelet count. This manifests as bruising, nosebleeds and bleeding gums. A reduction in the number of normal leukocytes leads to a weakened immune system. Even mild infectious diseases may require longer treatment.
Some consequences may be associated not only with the disease itself but also with its treatments. Chemotherapy and radiation therapy can cause temporary or long-lasting side effects, including hair loss, growth impairment, reduced reproductive function, and an increased risk of other diseases in the future.

Conclusion

The study established that leukosis is a multifactorial disease, the development of which is often associated with genetic predisposition, exposure to radiation, chemical carcinogens, and other adverse environmental factors. At the same time, in most cases it is not possible to determine the exact cause of the disease. A characteristic of childhood leukosis is the rapid progression of the pathological process and the nonspecific nature of early symptoms, which often complicates early diagnosis.
The analysis showed that the problem of childhood leukosis has not only medical but also social significance. Despite advances in modern medicine and a significant improvement in survival rates, the disease remains a serious issue for healthcare systems both worldwide and in Uzbekistan. Measures aimed at early detection, increasing oncologic vigilance among healthcare workers and parents, and ensuring access to specialized medical care for children in all regions of the country are of particular importance. Thus, further development of early diagnosis programs, improvement of treatment methods, and implementation of preventive measures can significantly increase the effectiveness of efforts against childhood leukosis, improve patients' quality of life, and reduce mortality from this disease.

List

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