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## THE ROLE OF THE STANDARD CYTOGENETIC STUDY OF BONE MARROW CELLS IN THE DIAGNOSIS OF ACUTE LYMPHOBLASTIC LEUKEMIA IN CHILDREN

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**Introduction:** Acute lymphoblastic leukemia is a disease of the hematopoietic system caused by a violation of certain functions of the bone marrow. The disease is characterized by excessive proliferation of white blood cells. Acute lymphocytic leukemia is one of the most common nosologies among pediatric oncology, which occupies 80% of the total number of available forms of leukemia. According to the clinical protocols (ALL IC-BFM 2009) for oncohematology, the standard cytogenetic study of metaphases in leukemic cells is one of the most important methods for diagnosing the most significant and common numerical and structural aberrations.

**Methods:** The department of clinical and genetic diagnostics is accredited according to the ISO 15189-2012«Medical laboratories - Requirements for quality and competence» in this field of accreditation. The study involved 152 children under the age of 18 with a diagnosis of acute lymphoblastic leukemia whose linearity was determined by cytological examination of the bone marrow and flow cytometry. Short-term cultivation of bone marrow cells in a medium with bovine serum and colcemide was performed using a standard method. Analysis of G-banding with a resolution of 550-bands was carried out using the Imager Z1 (ZEISS) karyotyping system.

**Results:** During the analysis of the obtained material 30 (20%) patients were found to have such aberrations as t(6;16)(q13;p13.1), t(8;21)(q21.3;q22), t(4;12)(p14;q13), t(1;11)(p36.1;q23), del(16)(p11), i(17)(q10), t(9;10)(q34;q22), der(9)(q32) and the presence of marker chromosomes. In the studied bone marrow cells, 16% of patients had a hypodiploid set of chromosomes ( $\leq 44$ ) which gives a poor prognosis, since the survival rate of patients in this case is only 30%. However, 60% of patients had a hyperdiploid set ( $\geq 47$ ) which according to some clinical data allows these cases to be attributed to a more favorable prognosis. 80% had a normal diploid set of chromosomes.

**Conclusions:** Nowadays cytogenetic study of bone marrow cells in the diagnosis of acute lymphoblastic leukemia is one of the main and mandatory methods of biological characteristics of the disease that allows identifying chromosomal abnormalities that are of great importance to stratify the risks, treatment and prognosis of the disease.