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FEATURES OF THE IMMUNE PHENOTYPE OF MIXED-PHENOTYPE LEUKEMIA

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Relevance. Leukemia is a neoplastic disease of the blood system that develops as a result of the malignant transformation of a stem or committed hematopoietic cell and is characterized by excessive production of abnormal and immature leukocytes, the formation of blast infiltrates, and the appearance of extramedullary hematopoietic foci, leading to damage to the body's structures and functions. Leukemia accounts for approximately 2.5% of new cancer cases annually and is responsible for 3.1% of cancer patient deaths worldwide.

Biphenotypic acute leukemia, now often classified as Mixed-Phenotype Acute Leukemia (MPAL), is a rare, high-risk blood cancer where leukemia cells simultaneously display markers of both myeloid and lymphoid (B or T cell) lineages. It makes up roughly 2–5% of acute leukemias, usually carries a poor prognosis, and requires specialized, often intensive, treatment.

Acute leukemia with a mixed phenotype is the least studied form of leukemia and the most difficult to diagnose and treat, as the bone marrow and peripheral blood of patients often lack clear signs of blast differentiation along one of the cell lines. Therefore, the search for new methods for differentiating mixed forms of acute leukemia for more accurate diagnosis and successful treatment is of great importance.

Aim: to identify the most common clinical and laboratory features of acute leukemia with a mixed phenotype.

Materials and methods. The medical records of 12 patients treated at Minsk City Clinical Hospital No.9 between 2016 and 2024 and diagnosed with acute leukemia with a mixed phenotype were analyzed. Statistical data processing was performed using MS Excel.

Results and their discussion. Nine patients in the study group were men and three were women. The average age of the study group was 41 years. Fatal outcome was recorded in 5 patients. Genetic chromosomal abnormalities were detected in 3 of 12 patients and included trisomy 11, translocation of the long arm of chromosome 11, t(15; 17), and t(13; 21). Myelo-/lymphocytic leukemia was detected in 6 patients, another 3 patients had lympho-/myeloleukemia, and for the remaining patients, differentiation of the predominant cell population was difficult. The minimum blast content in the red bone marrow was 51.5%, the maximum was 94.7%. Statistical analysis of immunohematological studies revealed the most common blast cell markers: CD7, CD13, CD34, CD38, CD54, CD71, CD99, CD109, CD117, cyCD3, and cyTdt.

Conclusions. Acute leukemia of mixed phenotype is more common in men (75% of cases) than in women (25%). Mortality in the study group was 41%. Genetic chromosome abnormalities were detected in 25% of cases. Blast cell antigens most commonly found in acute leukemia of mixed phenotype were identified, and the predominant type of the population was characterized. The incidence of MPAL in Belarus is low, which explains the small sample size and the paucity of information on this form of blood disease. However, the low prevalence does not eliminate the need for treatment and diagnosis of the corresponding blood diseases, so the prospect for future research is the search for reliable markers, as well as a more accurate determination of the predominant blast cell population, which will allow for the prescription of individually targeted treatment that ensures a better prognosis.