DIAGNOSTIC SIGNIFICANCE OF MYELOGRAM FINDINGS AND THE MORPHOLOGICAL PROFILE OF BONE MARROW HEMATOPOIESIS IN MYELODYSPLASTIC SYNDROMES

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Background. Myelodysplastic neoplasms (MDS) are a heterogeneous group of clonal myeloid neoplasms in which morphological assessment of the bone marrow remains a cornerstone of diagnosis (Platzbecker U, et al., 2023; Yuen LD, Hasserjian RP, 2023). Particular diagnostic importance is attributed to the detection of dysplastic changes involving multiple hematopoietic lineages. Morphological abnormalities are essential for differentiating MDS from reactive conditions, other myeloid neoplasms, and a number of non-neoplastic causes of cytopenias (Oster HS, Mittelman M, 2024; Komrokji RS, Lanino L, Ball S, et al., 2024). The contemporary morphological approach includes assessment of bone marrow aspirates and biopsies, peripheral blood findings, blast percentage, ring sideroblasts, cellularity, and the extent and lineage distribution of dysplasia.

The aim. The analyze quantitative and morphological changes in the myelogram of patients with myelodysplastic syndromes (MDS).

Materials and Methods. A retrospective analysis was performed in 50 patients with MDS who were followed at the Khorezm Regional Multidisciplinary Medical Center between 2020 and 2026. The mean age of the patients was 52.2±2.3 years.

The cellular composition of the bone marrow and the morphology of hematopoietic cells were assessed by manual microscopic examination using a LEICA ICC50 E microscope (Germany). The statistical significance of quantitative differences was assessed using Student’s *t*-test, with calculation of *P*-values following assessment of the normality of data distribution by the kurtosis test and equality of population variances using Fisher’s *F*-test. Associations were evaluated

using a rank correlation coefficient. A *P*-value <0.05 was considered statistically significant.

Results. Morphological examination of the myelograms revealed a complex pattern of abnormalities reflecting ineffective bone marrow hematopoiesis. The most pronounced changes involved the erythroid and granulocytic lineages, although qualitative abnormalities were also identified in the monocytic and megakaryocytic compartments. The erythroid lineage was characterized by an increased proportion of erythroblasts. In the original dataset, erythroblasts accounted for 3.7±0.18% compared with a reference range of 0.2–1.1% (*P*<0.001). However, the most diagnostically relevant findings were not limited to quantitative changes and included marked structural abnormalities such as erythroblast multinuclearity, internuclear bridging, nuclear fragmentation, cytoplasmic vacuolization, and the presence of ring sideroblasts. The granulocytic lineage demonstrated impaired maturation accompanied by an increased blast component. In the original dataset, the proportion of myeloblasts was 6.8±0.43%, reaching 7.1±0.27% and 15.1±0.58% in individual groups. The proportion of neutrophils was 45.1±2.4% in the overall dataset and decreased to 34.5±2.1% in patients with more pronounced abnormalities (*P*<0.01), accompanied by morphological features of granulocytic dysplasia.The monocytic lineage did not demonstrate pronounced quantitative abnormalities; however, morphological examination revealed nuclear hypersegmentation and azurophilic cytoplasmic granulation.

Conclusion. Myelogram assessment represents a central morphological component of the laboratory verification of MDS. From a diagnostic perspective, the most significant finding is the combination of quantitative alterations in bone marrow cellular composition with characteristic morphological features of dysplasia. Therefore, the diagnostic value of myelogram examination cannot be determined by a single parameter and should instead be based on an integrated assessment of all major hematopoietic lineages. Contemporary laboratory verification of MDS should combine morphological examination of the bone

marrow with peripheral blood analysis, cytogenetic studies, immunophenotyping, and molecular genetic testing.