Morphofunctional characteristics of hematopoietic progenitor cells in myelodysplastic syndrome in culture *in vitro*

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Background. Myelodysplastic syndrome (MDS) is a group of heterogeneous clonal diseases, which are based on the defection of hematopoietic stem cells, and leads to dysplastic changes in the bone marrow and ineffective haematopoiesis (Gluzman et al., 2017; Shastri et al., 2017). MDS is characterized by a high risk of transformation to acute myeloid leukaemia (AML) (Will et al., 2012). Therefore, the study of the characteristics of hematopoietic progenitor cells in culture is of a paramount importance for understanding the mechanisms of transformation of MDS to AML.

Objective. The aim of the current study was determination of morphofunctional features of hematopoietic progenitor cells in myelodysplastic syndrome *in vitro*.

Methods. Bone marrow samples of 18 patients with myelodysplastic syndrome, namely, refractory anaemia with an excess of blasts I and II were cultured in DMEM medium with 20 % FBS, 1 % of antibiotics (penicillin/streptomycin) and L-glutamine and 50 ng/ml GM-CSF in semisolid agar *in vitro* for 14 days. The obtaining colonies and clusters were examined under an inverted microscope, with further study of their cellular composition.

Results. 18 bone marrow samples of patients with myelodysplastic syndrome were analysed. It has been shown that hematopoietic progenitor cells have a reduced ability to colony (5.0 ± 2.3 per 1×10^5 of explanted cells) and cluster's formation (9.0 ± 2.1 per 1 x1 0^5 of explanted cells) than control (38.5 ± 1.2 and 65.0 ± 3.5 per 1×10^5 of explanted cells, respectively), and they have a whimsy shape. In addition, among other cellular aggregates, colonies of fibroblast-like cells (1.1 ± 0.1 per 1×10^5 of explanted cells) and colonies with adipocytes on their surface (6.6 ± 1.4 per 1×10^5 of explanted cells) were distinguished in some patients (5 patients). Cellular composition of colonies testified to their morphological alterations.

Conclusions. Hematopoietic progenitor cells of patients with myelodysplastic syndrome have a reduced ability to form colonies and clusters. Furthermore, cell aggregates were distinguished by their changes in cellular composition and shape. Colonies with fibroblast-like cells and with adipocytes on their surface were identified.

Acknowledgements. The authors declare the absence of conflict of interest.