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Prognostic value of apoptosis of tumor clone bone marrow cells in patients with multiple myeloma

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Abstract

Purpose: To study the apoptosis of tumor cells (plasma cells, PC) in bone marrow of patients with multiple myeloma (MM) and to evaluate the possibility of using this parameter as a predictor of treatment efficacy.

Materials and Methods: The study comprised 34 patients with active stage MM. Myelogram: PC 11.4–86.4%. Apoptosis of PC was detected by binding Annexin V-FITC with a membrane marker of early apoptosis–phosphatidylserine. The analysis was performed using the Flow Cytometer "Cytomics FC 500 Beckman Coulter", USA. Apoptosis of PC was evaluated before and after a course of specific therapy.

Results: It was demonstrated that initially spontaneous apoptosis of PC in all MM patients was on average 25.4±3.3%. But in 32% (11) of patients apoptosis was significantly lower than average (15.6±2.9%),while in 68% (23) of patients PC apoptosis was significantly higher than average (35.2±3.0%). After treatment there was a 2.5-fold (39.1±4.1%) increase of apoptosis index in those patients with an initial decrease. This coincided with an occurrence of clinical–hematological remission in this group. In patients with a higher initial spontaneous apoptosis, its increase had not been noted in any case (34.6±2.8%), and clinical therapeutic effect was also absent.

Conclusion: Initially decreased apoptosis of bone marrow PC is a predictor of a more favorable course of disease and of therapeutic efficacy. On the contrary, a higher level on initial spontaneous PC apoptosis is prognostically an unfavorable marker, because tumor cells remain refractory to chemotherapy and the induction of the apoptotic process is insufficient.

Keywords: multiple myeloma, apoptosis, plasma cells