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Molecular and functional characterization of bone marrow derived mesenchymal stem cells from chronic myeloid leukemia patients

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Background and Objectives: Mesenchymal stem cells (MSCs) of bone origin provide a supportive micro-environmental niche for hematopoietic stem cells. We aimed to isolate and characterize MSCs derived from bone marrow (BM) of untreated chronic myeloid leukemia (CML) patients, and to determine the presence of the BCR-ABL fusion gene in such MSCs, as well as their potential to support hematopoietic stem cells (HSCs) in order to evaluate the safety and effectiveness in autologous transplantation.

Materials and Methods: Diagnostic BM samples of CML patients (n=12) were cultured to isolate MSCs. Cells were characterized by flow cytometry and differentiation potential. Detection of Philadelphia chromosome was done by real time polymerase chain reaction, fluorescent in situ hybridization and karyotyping. Their supportive potential for HSCs was assessed by their coculture with umbilical cord blood mononuclear cells.

Results: CML MSCs expressed typical MSCs phenotype by flowcytometry, hadosteogenic and adipogenic differentiation ability. CML MSCs don't harbor the Philadelphia chromosome and could support in vitro cord blood expansion.

Conclusion: MSCs are devoid of BCR-ABL fusion gene and are able to support hematopoietic stem cells hence they could be used as co-transplantation in stem cell therapy for CML.

Key words: BCR /ABL, CML leukemia, Mesenchymal stem cells, transplantation.

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