ISOLATION, CHARACTERIZATION AND ANGIOGENIC POTENTIAL OF MESENCHYMAL STEM CELL FROM LIPOSUCTION TO OPTIMIZE PANCREATIC ISLET TRANSPLANTATION

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Introduction: Pancreatic islet transplantation is a promising alternative for the treatment of Diabetes Type 1. However, considerable loss of pancreatic islets occurs after tissue isolation, which is still susceptible to the action of the host immune system. Co-transplantation of pancreatic islets with mesenchymal stem cells from adipose tissue (MSC-AT) seeks to improve transplant viability by promoting immunomodulation, revascularization, and providing survival elements.

Objective: In vitro monitoring of the angiogenic potential of MSC-AT aiming revascularization and increase the viability of human pancreatic islets.

Materials and Methods. MSC-AT isolated from liposuction tissue were cultured and characterized by flow cytometry and real time PCR. These cells were subjected to differentiation into chondrocytes, adipocytes and osteocytes. Endothelial cells from umbilical vein were isolated and cultured in EBM-2. MSC-AT conditioned medium was obtained and frozen. The angiogenic capacity was analyzed for assay of sprouting and model of sandwich, both with fibrin.

Results and discussion. Flow cytometry analysis showed that MSC-AT express characteristic markers (CD29+, CD105+, CD90+, CD146+, CD34dim, CD45-). Immunophenotyping results were confirmed by real time PCR. In multilineage differentiation assay, MSC-AT showed a great capacity for conversion in three mesodermal lineages, being more pronounced for adipogenic lineage. MSC-AT also showed a great expansion potential until passage 6.

Conclusion. Our data provide direct experimental evidence that cultures of adipose tissue-derived mesenchymal cells contain individual cells that fulfill two essential stem cell criteria: (i) self-renewal capacity and (ii) multi-lineage potential. In vitro angiogenic assay of MSC-AT revealed higher angiogenic capacity compared with MSC-BM, assay of cell migration and proteomics analysis of the conditioned medium are still under development. MSC-AT may represent a viable alternative to the
maintenance of graft integrity in pancreatic islet transplantation.

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