PARACRINE EFFECT 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. However, considerable loss of pancreatic islets occurs after tissue isolation, which is still susceptible to the action of the host immune system. We hypothesized that the paracrine effects of mesenchymal stem cells from adipose tissue (MSC) may improve pancreatic islets transplant viability by promoting immunomodulation, revascularization, and providing survival elements.

Objective: *In vitro* monitoring of the angiogenic potential of MSC conditioned medium (CM) aiming improvement of viability of endothelial cells and pancreatic islets revascularization.

Materials and Methods. MSC isolated from liposuction tissue were cultured and fully characterized by flow cytometry and real time PCR. These cells were, expanded and submitted to hypoxia and normoxia. Conditioned medium production was standardized with total protein and alkaline phosphatase assay. Endothelial cells from umbilical vein (HUVEC) were isolated and cultured in EBM-2. The effect of CM on endothelial cell angiogenic capacity, migration, viability and apoptosis was investigated.

Results and conclusions. Flow cytometry analysis showed that MSC express characteristic markers ($CD105^+$, $CD90^+$, $CD73^+$, $CD29^+$, $CD146^-$, $CD45^-$, $CD34^{dim}$, Anti-$HLADR^-$). Immunophenotyping results were confirmed by real time PCR. In multilineage potential assay, MSC showed great capacity for differentiation, being more pronounced for adipogenic lineage. MSC also revealed a great expansion potential until 20^{th} passage. Hypoxic CM from MSC showed higher angiogenic capacity compared to normoxic CM. Hypoxic CM increased viability and prevented apoptosis of serum-deprived HUVEC. In a wound healing assay, hypoxic CM showed greater potential to induce HUVECs migration. Thus, hypoxic MSC-derived conditioned medium may represent a viable alternative

to the maintenance of endothelial cell integrity, encouraging pancreatic islet transplantation success.

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