**The role of beta catenin protein in high glucose-induced cellular senescence**

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Abstract

Diabetes is one of the most common metabolic diseases that disrupts the functioning of different body's organs. Mesenchymal stem cells (MSc) with high reproducibility and differentiation capacity have important role in the maintenance of tissue hemostasis. Recent study showed the influence of hyperglycemic in affecting MSc function. The beta-catenin protein and the Wnt signaling signaling pathway play an important role in many cellular processes such as proliferation, differentiation, migration, apoptosis, and senescence. The purpose of this study was to investigate the role of beta-catenin on induction of senescence in mesenchymal stem exposed to hyperglycemic conditions.

The MScs were cultured in MEM-alpha media for 7-14 days under the influence of concentrations of 20, 30, 40, 50, 60 mM glucose. The MTT assay was used to evaluate the cells viability, beta-galactosidase test to assess cell senescence and gene expression was measured by Real time-PCR.

The results of this study showed that concentrations of 20,30,40,50,60 mM glucose increased the percentage of senescence. There was no change in glucose during 7 to 20 days at different concentration of glucose mesenchymal stem cells. The results also showed a significant increase in beta-catenin expression in response to glucose in a dose dependent manner.

Therefore, the present study suggests further studies in this field to identify the role of beta-catenin protein and its signaling pathway in induction of senescence in response to high glucose conditions. This research can lead to the discovery of valuable therapies for the prevention and treatment of tissue impairment in diabetic patients.

Key words: Diabetes mellitus, Mesenchymal stromal cells, induced senescence, Beta-catenin protein