

عنوان مقاله:

The effect of human wharton's jelly-derived mesenchymal stem cells on MC4R, NPY, and LEPR gene expression levels in rats with streptozotocin-induced diabetes

محل انتشار:

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نویسندگان:

Fatemeh Sabet Sarvestani - *Transplant Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*

Mohammad Ali Zare - *Transplant Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*

Forough saki - *Endocrinology and Metabolism Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*

Farhad Koohpeyma - *Endocrinology and Metabolism Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*

خلاصه مقاله:

Objective(s): Type 1 diabetes (T1D) is an autoimmune disease resulting from inflammatory destruction of islets β -cells. Nowadays, progress in cell therapy, especially mesenchymal stem cells (MSCs) proposes numerous potential remedies for T1D. We aimed to investigate the combination therapeutic effect of these cells with insulin and metformin on neuropeptide Y, melanocortin-4 receptor, and leptin receptor genes expression in T1D. **Materials and Methods:** One hundreds male rats were randomly divided into seven groups: the control, diabetes, insulin (Ins.), insulin+metformin (Ins.Met.), Wharton's Jelly-derived MSCs (WJ-MSCs), insulin+metformin+WJ-MSCs (Ins.Met.MSCs), and insulin+WJ-MSCs (Ins.MSCs). Treatment was performed from the first day after diagnosis as diabetes. Groups of the recipient WJ-MSCs were intraportally injected with 2×10^6 MSCs/kg at the 7th and 28th days of study. Fasting blood sugar was monitored and tissues and genes analysis were performed. **Results:** The blood glucose levels were slightly decreased in all treatment groups within 20th and 45th days compared to the diabetic group. The C-peptide level enhanced in these groups compared to the diabetic group, but this increment in Ins.MSCs group on the 45th days was higher than other groups. The expression level of melanocortin-4 receptor and leptin receptor genes meaningfully up-regulated in the treatment groups, while the expression of neuropeptide Y significantly down-regulated in the treatment group on both times of study. **Conclusion:** Our data exhibit that infusion of MSCs and its combination therapy with insulin might ameliorate diabetes signs by changing the amount of leptin and subsequent changes in the expression of neuropeptide Y and melanocortin-4 receptor.

کلمات کلیدی:

Diabetes Mellitus, Leptin, Melanocortin, Neuropeptide Y, Receptor, Stem cells, Wharton jelly

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