9th Yazd International Congress and Student Award on Reproductive Medicine with 4th Congress of Reproductive Genetics

Poster Presentations

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Investigation and comparison of the effect of TGF-β3, kartogenin and Avocado/Soybean unsaponifiables on the in-vitro and in-vivo chondrogenesis of human adipose derived stem cells on fibrin scaffold

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Background: There are lack of suitable therapeutic approaches to cartilage defect.

Objective: This study was designed to determine the effect of TGF-β3, avocado/soybean (ASU) and Kartogenin (KGN) on chondrogenic differentiation in human adipose-derived stem cells (hADSCs) on fibrin scaffold.

Materials and Methods: hADSCs seeded in fibrin scaffold and cultured in chondrogenic media. These cells divided in to 4 groups (control, TGF-β3, ASU and KGN). Cell viability was estimated by 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide, or MTT assay, differentiated cells evaluated by histological and immunohistochemical techniques. Expression genes [sex determining region Y-box 9 (SOX9), Aggrecan (AGG), type II collagen (Coll II) and type X collagen (Coll X)] assessed by real-time PCR. For study on animal model, differentiated cells in fibrin scaffolds were subcutaneously transplanted in rats. Histological and immunohistochemistry was done in animal model.

Results: The results of the real-time PCR indicated that *SOX9*, *AGG* and *Col II* genes expression in TGF-β3, KGN and ASU groups were significantly higher ($p < 0.01$) compared to the control group, *Col X* gene expression only in TGF-β3 group was significantly higher ($p < 0.01$) compared to the control group. The glycosaminoglycan (GAG) deposition was higher in TGF-β3, KGN and ASU groups compared to the control group. The immunohistological analysis showed the distribution of collagen type X in the extracellular matrix in fibrin scaffold TGF-β3 group was significantly higher in control, KGN and ASU groups, ($p < 0.001$).

Conclusion: ASU, and in particular KGN was suitable for successful chondrogenic differentiation of hADSCs and a suppressor of the consequent hypertrophy.

Key words: *TGFβ3, Avocado/Soybean, Kartogenin, Human adipose-derived stem cells.*