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Effect of PRP on angiogenesis induction in adipose derived MScs chondrogenesis

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Introduction: Application of activated Platelet-Rich Plasma (PRP) has achieved a considerable attention for chondrogenic differentiation in cartilage tissue engineering and other tissue engineering fields and most importantly in clinical applications. Using autologous PRP with its vast range of cytokines encourages its applications. Despite its positive effects on cell expansion and differentiation, because of having various angiogenic factors, its possible angiogenic effects during chondrogenic differentiation or after intra-articular injection, should be monitored to fully characterize PRP effects on cell/tissue fate. Initiation of angiogenesis and formation of blood vessel in cartilage, are among the indices of cartilage related diseases.

Aim: The aim of this study was to investigate the effects of PRP (expression of tissue specific markers and possible induction of angiogenesis) on adipose derived MSC chondrogenesis.

Materials & Methods: To fulfill that, MSCs were differentiated using different PRP concentrations. Changes in gene expression levels for cartilage specific markers (Collagen II, Aggrecan, Versican, and Sox9) were appraised by real time PCR. Also chondrogenesis was assessed by measuring secreted glycosamin glycan in the medium or that kept in cell ECM. The angiogenesis induction potential was evaluated by measuring the VEGF secretion from differentiated cell using ELISA technique. Further, the yield of secreted VEGF effect on VEGFR2 activation was determined by Western blot.

Results: The results will be illustrative for appropriate clinical usage and wise application of PRP in tissue engineering related studies.

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