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Osteogenic differentiation of canine Wharton's Jelly derived mesenchymal stem cells

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Full text:

Abstract

Background: *Wharton's Jelly derived mesenchymal stem cells (WJ-MSCs) show mesenchymal cells properties and may represent an attractive source of tissue engineering in veterinary medicine. WJ-NSCs are primitive stem non-specialized cells with self-renewal and differentiation capacity. The aim of our study was to evaluate the osteogenic potential of canine WJ-MSCs.*

Methods: *mesenchymal stem cells were obtained from canine umbilical cord following Caesarean section. Flow cytometry analyses confirmed positive expressions of mesenchymal cell-associated markers, negative expressions of hematopoietic and endothelial markers. For differentiation the cells were cultured at 2.5 x 10^4 cells/cm^2 in normal propagation medium until confluence. The propagation medium was replaced with DMEM-LG supplemented with 10% FBS, 0.1 μM dexamethasone (Sigma-Aldrich), 50 μM ascorbic acid-2-phophate (Sigma-Aldrich), and 10 mM beta-glycerophosphate (Sigma-Aldrich), and the cells were cultured for 21 days. Osteogenic differentiation was evaluated using Alizarin red S staining; the ALP activity was measured using an ALP assay kit.*

Results and conclusions*: After 21 days large number of mineral nodules was observed. The level of Alizarin Red S staining was intense compared with control culture, ALP activity were also significantly higher ($p < 0.05$). Our data confirmed that the characterized WJ-MSCS have osteogenic potential and may represent an ideal source for bone repair procedures.*

Keywords: *canine, stem cells, Wharton's Jelly, differentiation, osteogenic*