

Abstracts (Oral Presentation)

The Expression of Alkaline Phosphatase in Metformin-treated Umbilical Cord-derived Mesenchymal Stem Cells

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Abstract

Introduction: Mesenchymal stem cells (MSCs) have gained more interest in regenerative medicine. The umbilical cord, the alternative source of MSCs, has thus been increasingly recognized as a good MSC source for bone tissue regeneration and bone defect repair. Metformin, an anti-hyperglycemic drug, has been reported that promotes the osteogenic differentiation of BM-MSCs.

Objectives: This study aims to investigate the viability and the expression of alkaline phosphatase in metformin-treated umbilical cord-derived MSCs (UC-MSCs) during osteogenic differentiation.

Methods: The UC-MSCs were obtained from pregnant women after normal delivery. After characterization, UC-MSCs were cultured with different metformin concentrations (0 - 160 μ M). The cell viability and alkaline phosphatase (ALP) expression were observed by MTT and alkaline phosphatase activity assay.

Results: The result showed that metformin at a concentration of 0 - 160 μ M did not decrease the viability of UC-MSCs. Interestingly, the alkaline phosphatase activity of metformin-treated UC-MSCs was significantly increased, compared with untreated UC-MSCs in a dose-dependent manner.

Conclusions: The data suggested that metformin could enhance the expression of alkaline phosphatase and the osteogenic differentiation ability of MSCs derived from the umbilical cord.

Keywords: Mesenchymal stem cells, Metformin, Osteogenic differentiation, Umbilical cord, Alkaline phosphatase

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