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Correction to: Prolotherapy agent P2G is associated with upregulation of fibroblast growth factor-2 genetic expression in vitro

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Following publication of the original article [1], the below Abstract was missing.

Abstract

Purpose: Osteoarthritis (OA) is a prevalent, progressively degenerative disease. Researchers have rigorously documented clinical improvement in participants receiving prolotherapy for OA. The mechanism of action is unknown; therefore, basic science studies are required. One hypothesized mechanism is that prolotherapy stimulates tissue proliferation, including that of cartilage. Accordingly, this in vitro study examines whether the prolotherapy agent phenol-glycerin-glucose (P2G) is associated with upregulation of proliferation-enhancing cytokines, primarily fibroblast growth factor-2 (FGF-2).

Methods: Murine MC3T3-E1 cells were cultured in a nonconfluent state to retain an undifferentiated osteochondroprogenic status. A limitation of MC3T3-E1 cells is that they do not fully reproduce primary human chondrocyte phenotypes; however, they are useful for modeling cartilage regeneration in vitro due to their greater phenotypic stability than primary cells. Two experiments were conducted: one in duplicate and one in triplicate. Treatment consisted of phenol-glycerin-glucose (P2G, final concentration of 1.5%). The results were assessed by quantitative Reverse Transcriptase-Polymerase Chain Reaction (qRT-PCR) to detect mRNA expression of the FGF-2, IGF-1, CCND-1 (Cyclin-D), TGF-β1, AKT, STAT1, and BMP2 genes.

Results: P2G - treated preosteoblasts expressed higher levels of FGF-2 than water controls (hour 24, $p<0.001$; hour 30, $p<0.05$; hour 38, $p<0.01$). Additionally, CCND-1 upregulation was observed ($p<0.05$), possibly as a cellular response to FGF-2 upregulation.

Conclusions: The prolotherapy agent P2G appears to be associated with upregulation of the cartilage cell proliferation enhancer cytokine FGF-2, suggesting an independent effect of P2G consistent with clinical evidence. Further study investigating the effect of prolotherapy agents on cellular proliferation and cartilage regeneration is warranted.

The original article [1] has been corrected.

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