



Molecular response of human cervical and lumbar nucleus pulposus cells from degenerated discs following cytokine treatment

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ABSTRACT. We investigated the molecular response of degenerated human cervical and lumbar nucleus pulposus (NP) cells following cytokine treatment. Degenerated cervical and lumbar discs (8 each) were obtained from patients who underwent discectomy for degenerative disc disease; NP cells were isolated and cultured. The mRNA expressions of aggrecan, alkaline phosphatase, type I collagen, type II collagen, osteocalcin, and Sox9 in the 2 groups were compared by real-time PCR, before and following treatment with rhBMP-2 and TGF- β 1. Immunoreactivity was analyzed to check protein activity. Type I collagen expression was significantly higher in cervical compared with that in lumbar disc cells. The mRNA expression was significantly increased after rhBMP-2 and TGF- β 1 treatment. After rhBMP-2 treatment, mRNA expression of type I and II collagens increased significantly more in cervical than in lumbar NP cells. Following TGF- β 1 treatment, the increase in mRNA expression was not significantly different between cervical and lumbar disc cells. Protein immunoreactivity, before and after cytokine treatment was similar to mRNA expression data. The matrix-related gene expression of cervical

and lumbar NP after rhBMP-2 and TGF- β 1 treatment increased similarly, with the exception of collagen expression.

Key words: Aggrecan; Alkaline phosphatase; Collagen; Osteocalcin; rhBMP-2; TGF- β 1