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Upregulation of fibroblast growth factor 1 in the synovial membranes of patients with late stage osteoarthritis

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ABSTRACT. Osteoarthritis (OA) is a degenerative disease of the systemic joint that involves multiple cytokines and growth factors. Fibroblast growth factor 1 (FGF-1) is increased in patients with rheumatic arthritis. The aim of this study was to determine whether the expression and secretion of FGF-1 differed in synovial tissue from patients with late stage OA from that in normal tissues. We selected eight patients with late stage OA and eight healthy donors for this study. An enzyme-linked immunosorbent assay was used to determine the amount of FGF-1 in the synovial fluid and in the culture medium of synovial fibroblasts. Real time quantitative polymerase chain reaction

(qPCR) analysis was performed to examine the expression levels of *FGF-1* and FGF receptor 2 (*FGFR2*) in synovial and cartilage tissues. We detected FGF-1 in the synovial fluid from all eight donors, as well as in the culture medium of synovial fibroblasts. Synovial fluid from patients with OA and culture medium of OA synovial fibroblasts contained significantly more FGF-1 than those from controls. *FGF-1* expression was also lower in the synovial membranes of normal donors than in those of OA patients. *FGFR2* expression was also higher in OA cartilage than in normal cartilage. Overall, these results demonstrated that FGF-1 synthesis and secretion by synovial fibroblasts were significantly increased in OA. *FGFR2* expression was also shown to be upregulated in patients with OA. These findings suggest that increased FGF-1 signaling correlates with an OA pathological condition.

Key words: Fibroblast growth factor 1; Osteoarthritis; Cartilage; Chondrocytes

