



Association between hypoxia-inducible factor-1a levels in serum and synovial fluid with the radiographic severity of knee osteoarthritis

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ABSTRACT. Osteoarthritis (OA) is primarily characterized by articular cartilage degradation. Hypoxia-inducible factor-1a (HIF-1a), a subunit of the basic helix-loop-helix-containing PER-ARNT-SIM (PAS) domain transcription factors, plays a vital role in the survival of articular chondrocytes to the hostile hypoxic microenvironment and complicates the progression of OA. In this study, we examined whether HIF-1a levels in the serum and synovial fluid (SF) of patients with knee OA were increased and whether the increase was correlated with the radiographic severity of the disease. A total of 278 knee OA patients and 203 healthy controls were enrolled in this study. Knee OA radiographic grading was performed according to Kellgren-Lawrence (KL) grading system by evaluating X-ray changes observed on anteroposterior knee radiography. HIF-1a levels in the serum and SF were determined using an enzyme-linked immunosorbent assay. Serum HIF-1a levels in patients with knee OA were higher than those in healthy controls. Knee

OA patients with KL grade 4 showed significantly elevated HIF-1a levels in the serum and SF compared with those with KL grades 2 and 3. Knee OA patients with KL grade 3 showed significantly higher SF levels of HIF-1a than those with KL grade 2. HIF-1a levels in the serum and SF of knee OA patients were significantly correlated with disease severity according to KL grading criteria. HIF-1a levels in the serum and SF were closely related to the radiographic severity of OA and may serve as an alternative biomarker for the progression and prognosis of knee OA.

Key words: HIF-1a; Osteoarthritis; Radiographic severity; Synovial fluid