# The short-term therapeutic effect of recombinant human bone morphogenetic protein-2 on collagenase-induced lumbar facet joint osteoarthritis in rats

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## 摘要

## Abstract

OBJECTIVE: To determine whether an intra-articular injection of recombinant human bone morphogenetic protein-2 (rhBMP-2) alleviates cartilage degradation in a rat model of osteoarthritis (OA) of the lumbar facet joint. METHOD: The right-side facet joint OA model was created by an intra-articular injection of collagenase (type II) 2 weeks before treatment. The OA rats were divided into four groups: (1) no treatment, or intra-articular injection of either (2) saline, (3) rhBMP-2 10 ng, or (4) rhBMP-2 100 ng. The left-side facet joint served as the normal control. At 3 and 6 weeks after treatment, histological analyses were performed on the cartilage, synovium, subchondral bone and bone marrow. The cartilage and synovium were graded using a modified Mankin score and a synovium score system. Extracellular type II collagen was evaluated by immunohistochemistry. RESULTS: Intra-articular injection of collagenase causes OA-like changes in the facet joint. OA rats treated with rhBMP-2 at both dosages tested showed reduced severity of their cartilage lesions compared with untreated and saline-treated groups. There was a statistically significant difference in the modified Mankin score compared to the untreated and saline-treated groups. However, some rhBMP-2-treated rats at the higher dose (100 ng) showed, as a side effect, joint space obliteration caused by cartilage overgrowth. Also OA rats treated with 100 ng of rhBMP-2 displayed a significant synovium reaction at 3 weeks compared with that in other groups. Immunohistochemical analysis showed that treatment with rhBMP-2 significantly increased the content of type II collagen. CONCLUSION: This study demonstrates the potential efficacy of rhBMP-2 in the alleviation of arthritic changes in a rat model of OA of the lumbar facet joint. However, treatment with a high dosage of rhBMP-2 caused adverse side effects in

some animals.