

Synvisc® – Bessere Chondroprotektion als niedermolekulare Hyaluronsäure

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Effects of different molecular weight hyaluronan products on the expression of urokinase plasminogen activator and inhibitor and gelatinases during the early stage of osteoarthritis.

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Hyaluronan or hyaluronic acid (HA) has been used to treat osteoarthritic knees for more than 30 years. Here, we tested the hypothesis that HA with high molecular weight (MW) would have greater effects than HA with low MW on the expression of the plasminogen activator (PA)/ plasmin system and gelatinases [matrix metalloproteinase (MMP)-2 and MMP-9] during early development of osteoarthritis (OA). We compared the levels of MMP-2, MMP-9, urokinase-type PA (u-PA), and PA inhibitor-1 (PAI-1) in a series of chondral, meniscal, and synovial cultures of early OA after treatment with or without three different MW HA products (Hyalgan and Artz with low MW, and Synvisc with high MW). Gelatin zymography revealed that three different HA products could decrease the secretion of MMP-2 in all tissue cultures and MMP-9 in meniscal and synovial cultures time-dependently. Enzyme-linked immunosorbent assay showed that Artz and Synvisc had significant inhibition on u-PA and PAI-1 levels after 24 h, but Hyalgan did at 96 h. Compared with Hyalgan and Artz, Synvisc provided the greatest ability to inhibit MMP-2, MMP-9, u-PA, and PAI-1 expression. Our studies clearly demonstrate that the therapeutic effects of using HA to treat early OA may be partially dependant on downregulation of the PA/plasmin system and gelatinases expression, which delay the structural progression of the disease. HA with high MW might have a greater ability than that with low MW to offer effective protection for articular cartilage.

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