

## IGF-I and IGF-binding proteins in synovial fluid of patients with Lyme arthritis

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### ABSTRACT

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**Purpose:** Multiple cellular functions are stimulated by a Insulin-like Growth Factor-I (IGF-I). The biological activity of IGF-I is modulated by IGF-binding proteins (IGF-BPs) and at the same time, the availability of IGF-BPs may be regulated by the proteolytic activity of some metalloproteinases (MMPs). The aim of the present study was to compare the amounts of IGF-I and IGF-BPs in relation to the activity of MMP-9 in serum and knee synovial fluid from patients with Lyme arthritis (LA) and post-traumatic damage (PTD).

**Material and methods:** Serum and synovial fluids were taken from knee joints of patients with PTD and LA. ELISA (for IGF-I assay), polyacrylamine gel electrophoresis following Western immunoblotting (for IGF-I and IGF-BPs expression), and zymography (for metalloproteinases detection), were used.

**Results:** The concentration of IGF-I in serum and

synovial fluid from LA patients were significantly lowered in comparison to PTD patients. Interesting, the synovial fluid /serum ratio of IGF-I concentrations was also lower in LA patients. Low expression IGF-BP3 and high activity of MMP-9 were detected in the LA synovial fluid.

**Conclusions:** The high proteolytic activity of MMP-9 results in a cleavage of both IGF-I and IGF-BP3 causing a decrease in content of these substances in LA synovial fluid. In addition, the reduction in IGF and IGF-BP amounts may affect the repair processes in joint tissues of LA patients. The low concentration of IGF-I and IGF-BP3 slows down the repair processes in the joint tissues of LA patients.

**Key words:** Insulin-like Growth Factor-I, Insulin-like Growth Factor-Binding Protein, metalloproteinase, synovial fluid, Lyme arthritis, post-traumatic damage.