

## High Serum Level of Tnf-A Correlates with Chronic Low Back Pain but Not Acute Sciatica

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**INTRODUCTION:** Low back pain is the primary cause of disability in individuals younger than 50 years. Increasing evidence is available as to the importance of cytokines in acute and particular chronic pain. Cytokines can influence transduction, conduction, and transmission of the nociceptive signal, resulting in prolonged or permanent signalling to the brain's cognitive centres in the absence of a painful noxious or nonnoxious stimulus (Sommer 2001).

Several cytokines, including Interleukin 1 (IL-1), tumor necrosis factor (TNF), IL-6, and IL-10 are thought to influence nociception or pain. To date, there have been no studies of the production of inflammatory mediators in blood from patients with low back pain. We have therefore analysed levels of the proinflammatory mediators IL-1 $\beta$ , IL-6, TNF- $\alpha$  in sera from patients with sciatica and low back pain, and their possible relationship to pain dimensions.

**METHODS:** In this prospective longitudinal study with a follow-up of six months, the course of serum concentration of interleukin 1 beta (IL-1 $\beta$ ), interleukin 6 (IL-6) and Tumor Necrosis Factor  $\alpha$  (TNF- $\alpha$ ) was measured by Bio-Plex cytokine assay in 31 patients with acute sciatica and 41 patients with chronic low back pain. Blood samples were taken at ten fixed times during follow-up, and cytokine values were adjusted to possible influential factors and correlated to the course of pain and clinical function to evaluate the predictive role of cytokine regarding therapy outcome.

**RESULTS:** At admission of the study and 10 days later, the proportion of TNF- $\alpha$  positive subjects (above 2pg/ml) was significant elevated among patients with low back pain compared to patients with acute sciatica. Median (SD) of serum TNF- $\alpha$  concentrations were significant higher in patients with chronic low back pain (n=41) than in patients with

acute sciatica (n=31). In the whole period the pain of patients reduced from time to time. Elevated TNF- $\alpha$  serum levels are associated with a significantly improved pain in patients with chronic low back pain but not with acute sciatica. A close coherence exists between the cytokines IL-1 $\beta$ , IL-6 and TNF- $\alpha$  together in blood of patients as with acute sciatica as with chronic low back pain. Neither age, sex, BMI, nicotine and alcohol consumption are related to the serum levels of cytokines.

**DISCUSSION & CONCLUSIONS:** As far as we know, this is the first analysis of parameters predicting a major clinical connection of cytokines in blood and low back pain. Our findings indicate that elevated serum levels of the proinflammatory cytokine TNF- $\alpha$  are associated with a significantly improved pain in patients with chronic low back pain but not with acute sciatica. We concluded that Detection of high level of TNF- $\alpha$  might be a marker for more pain in patients with chronic low back pain. and TNF- $\alpha$  probably play an important role in the chronic process of low back pain.

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