

## **Tumor necrosis factor- $\alpha$ -308 A/G gene polymorphism in children with juvenile idiopathic arthritis: relation to disease activity, damage, and functional status**

### Abstract

The study aims to evaluate the clinical significance of serum levels of tumor necrosis factor alpha (TNF- $\alpha$ ) and -308 A/G promoter polymorphism in juvenile idiopathic arthritis (JIA) patients and find any association to the subsets, clinical and laboratory features, disease activity, and damage as well as functional disability. Forty-eight JIA children and 30 controls were included in the present study. Juvenile arthritis disease activity score in 27 joints (JADAS-27) was calculated, juvenile arthritis damage index (JADI) was assessed, and Childhood Health Assessment Questionnaire (CHAQ) measured the functional status. Serum TNF- $\alpha$  was assayed by ELISA and gene (-308) promoter polymorphism was determined by polymerase chain reaction. The 48 JIA children (mean age  $11.5 \pm 2.8$  years) were 13 systemic, 17 oligoarticular, and 18 polyarticular onset. The serum TNF- $\alpha$  was significantly higher in patients ( $90.4 \pm 6.3$  ng/ml) compared to control ( $3.5 \pm 2.6$  ng/ml) ( $p < 0.0001$ ) with a tendency to be higher in the polyarticular subtype. All controls had TNF- $\alpha$  -308 GG alleles. The frequency of GG genotype tended to be higher in systemic onset compared to oligoarticular and polyarticular subtypes. The serum TNF- $\alpha$  significantly correlated with JADAS-27 ( $r = 0.32$ ,  $p = 0.03$ ) and CHAQ ( $r = 0.37$ ,  $p = 0.01$ ) and negatively with the presence of GG alleles ( $r = -0.48$ ,  $p = 0.001$ ). The GG alleles were significantly negatively associated with C-reactive protein ( $r = -0.32$ ,  $p = 0.03$ ) with a tendency to negatively correlate with JADAS-27, CHAQ, and JADI-extrarticular ( $r = -0.28$ ,  $p = 0.06$ ;  $r = -0.25$ ,  $p = 0.09$  and  $r = -0.25$ ,  $p = 0.09$ , respectively). There is evidence of a possible influence of the -308 SNP promoter position on the production of TNF- $\alpha$ , the severity of JIA which may consequently influence the response to anti-TNF- $\alpha$  treatment.

Keywords 308 A/G gene polymorphism . CHAQ . JADAS-27 . JADI . JIA . TNF- $\alpha$