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The association between IL-6 and MMP-3 gene polymorphisms and adolescent idiopathic scoliosis: a case-control study

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Background

The nucleus pulposus of scoliotic discs respond to exogenous stimuli by secreting interleukin-6 (IL-6) and other inflammatory cytokines. The association between matrix metalloproteinases (MMPs) and disc degeneration has been reported by several investigators. A human MMP-3 promoter 5A/6A gene polymorphism regulates MMP-3 genes expression, while the G/C polymorphism of the promoter region of IL-6 gene influences levels and functional activity of the IL-6 protein.

Methods

We conducted a case-control study to investigate whether the 5A/6A polymorphism of the MMP-3 gene and the G/C polymorphism of the promoter region of IL-6 gene were associated with the susceptibility to develop AIS.

Results

The frequency of the 5A/5A genotype of MMP-3 gene polymorphism in patients with scoliosis was almost 3 times higher than in controls (30.2% vs. 11.2%, P 0.001). The frequency of the G/G genotype of IL-6 gene polymorphism in patients with scoliosis was almost 2 times higher than in controls (52.8% vs. 26.2%, P < 0.001). 5A/5A genotype of MMP-3 gene polymorphism and G/G genotype of IL-6 gene polymorphism are independently associated with a higher risk of scoliosis (odds ratio, respectively, 3.34 and 10.54).

Conclusion

This is the first study performed to evaluate the possibility that gene variants of IL-6 and MMPs may be associated with scoliosis. This study suggests that MMP-3 and IL-6 promoter polymorphisms constitute important factors in the genetic predisposition to scoliosis.

References

1. Takahashi M, Haro H, Wakabayashi Y, et al.: **The association of degeneration of the intervertebral disc with 5a/6a polymorphism in the promoter of the human matrix metalloproteinase-3 gene.** *J Bone Joint Surg Br* 2001, **83**:491-5.
2. Burke JG, Watson RVW, Conhyea D, et al.: **Human nucleus pulposus can respond to a pro-inflammatory stimulus.** *Spine* 2003, **28**:2685-93.
3. Nojonen-Hietala N, Virtanen I, Karttunen R, et al.: **Genetic variations in IL6 associate with intervertebral disc disease characterized by sciatica.** *Pain* 2005, **114**:186-94.