

## **The L-Type Amino Acid Transporter LAT1 Expression in Patients with Scoliosis**

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### **INTRODUCTION:**

Amino acid transporters are transmembrane proteins that mediate the transfer of amino acids. As one of amino acid transporters, LAT1 which is encoded by Slc7a5, mediates cellular uptake of the essential amino acids. Recently, the relation between LAT1 and skeletal formation in the development has been focused. However, little is known regarding the clinical features of LAT1 in the cartilage which might affect the development of skeletal deformity such as scoliosis. The aim of this study was to investigate the expression of L-type amino acid transporter 1 (LAT1) and solute carrier transporter 7a5 (Slc7a5) in patients with pediatric scoliosis and to compare with the relationship between LAT1 and Slc7a5 expression and the clinical features.

**METHODS:** We prospectively recruited 56 patients who underwent corrective spinal fusion for scoliosis. The patients comprised 40 girls and 16 boys with a mean age of 13.1 years at the time of surgery. There were 34 idiopathic scoliosis (IS), and 22 congenital scoliosis (CS) patients. During the surgery, an epiphyseal part of the spinous process at apical vertebra was harvested, then LAT1 and Slc7a5 expression in the cartilage was evaluated.

### **RESULTS:**

LAT1 expression was observed in 60.7% (34 out of 56) of the patients in the cartilage. LAT1 expression in IS patients was 76%, which were statistically higher compared to 36% in CS patients. When compared with LAT1 expression, there was no statistical difference among age, genders, BMI, Cobb angle, and Risser grade. The mean Slc7a5 expression in IS patients showed significantly higher than CS patients. There was no significant correlation between Slc7a5 expression and age, BMI, and Cobb angle.

### **DISCUSSION AND CONCLUSION:**

LAT1 and Slc7a5 expression in IS and CS patients showed significant differences. The different behavior between IS and CS might reflect the functional effects through cartilage formation in the developmental phase.