

Research Article Summary Behavior of Scoliosis during Growth in Children with OI

Scoliosis is a common spinal deformity seen in children who have OI. It causes the person's spine to become curved from side to side. Curves tend to increase over time. Progressive curves that endanger the child's function and health often require surgery. In February of this year, the **Journal of Bone and Joint Surgery** published an interesting study about scoliosis and the growing OI child. The study was conducted by Dr. Peter Smith, Dr. Kim Hammerberg and their team at the Shriners Hospital for Children in Chicago. The goal of the study was to establish the relationship on the progression of scoliosis between OI severity, the child's age and the child's history of treatment with bisphosphonate.

Records of 316 children with an OI diagnosis were reviewed during multiple clinic visits throughout growth over a thirty year period. OI severity was listed using the modified Sillence classification and there were sufficient numbers to evaluate Type I (Mild) Type IV (Moderate) and Type III (Severe) as distinct subgroups. They found that over-all 50% of the children were diagnosed with scoliosis, a curvature of the spine greater than ten degrees. This is much higher than the prevalence seen in the general population. In this study, the type of OI significantly affected how many children had scoliosis and how rapidly the curve got worse. The high rates of progression seen in children with OI Type III and Type IV contrasted with the milder course seen in children with OI Type I.

- 68% of those with OI Type III developed scoliosis with a progression rate of 6 degrees per year.
- 54% of those with OI Type IV developed scoliosis with a progression rate of 4 degrees per year.
- 39% of those with OI Type I developed scoliosis with a progression rate of 1 degree per year.

Early treatment with bisphosphonates, beginning before age 6, slowed down the rate of curve progression by 3.8% but only for children with OI Type III. This is considered a significant change. No evidence was found that bisphosphonate treatment changed curve behavior in other types of OI or when the treatment started at an older age.

This study did not look at three other factors that are known to affect the development and progression of scoliosis – ligament laxity, muscle weakness and vertebral fractures. Since ligament laxity and muscle weakness are not affected by bisphosphonate treatment understanding their role in curve progression will further clarify the behavior of scoliosis in the growing child.

Reference: Behavior of Scoliosis during Growth in Children with Osteogenesis Imperfecta. Journal of Bone and Joint Surgery. February 5, 2014.

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