

### **Adolescent Idiopathic Scoliosis: Categorization of Fracture Patterns among Blunt Trauma Patients Relative to a Normative Trauma Population**

**Introduction:** Adolescent idiopathic scoliosis (AIS) is the most common form of scoliosis. As of yet, the characterization of traumatic injuries in AIS patients has not been examined. It is

believed that AIS trauma patients are more likely to present with spinal fracture than the general population.

**Methods:** The KID database was queried for AIS patients  $\leq 20$  years, from 2003 to 2009. AIS patients admitted for acute trauma were isolated. Mechanisms of injury (MOI), fracture patterns, and surgical procedures were assessed. Trauma AIS patients were propensity score matched to a general trauma population of 323,729 patients, based on age, sex, and MOI. Fracture patterns were compared and logistic regression analysis predicted relative odds of fracture in AIS patients.

**Results:** Of 41,142 AIS patients, 437 suffered acute blunt trauma. Mean age was 16.3 years, female 61.6%, white 72.5%, Deyo score: 0.3684. Most prevalent MOIs were motor vehicle accidents (37.1%), pedestrian struck (22.9%), falls (18.3%) and assaults (7.6%). 20.1% of AIS trauma patients sustained 99 total vertebral fractures. Of those, 25 were cervical, 23 thoracic, 35 lumbar, and 16 sacral/coccygeal. AIS patients had significantly more vertebral fractures (99 vs 52) than the general population ( $p < 0.001$ ). Cervical and sacral/coccygeal fractures were similar among groups (4.9% vs 3.0%,  $p = 0.16$ ; and 3.7% vs 3.7%,  $p = 1.0$ ), while thoracic (5.3% vs 2.5%,  $p = 0.035$ ) and lumbar fractures (8.1% vs 2.8%,  $p < 0.001$ ) were different. AIS patients had increased odds of any fracture (OR: 2.1 [1.4-3.1]), thoracic (OR: 2.2 [1.0-4.5]) and lumbar fractures (OR: 3.1 [1.6-6.1]) (all,  $p \leq 0.039$ ).

**Discussion:** AIS trauma patients relative to a normative trauma population were more likely to present with a vertebral fracture; specifically, thoracic and lumbar fractures. Emergency physicians and orthopaedic/neurosurgeons should suspect these injuries in this patient population.