

Due to a greater elasticity and compressibility of the bone in general and especially the paediatric spine, trauma is less likely to result in a fracture in children than in adults. Thus, fractures of the thoracolumbar spine in children are rare and classification systems providing detailed treatment recommendations as already established in adults are still lacking in the paediatric population. We therefore aimed to evaluate the validity and reliability of the thoracolumbar injury classification and severity score system (TLICS) and the AOSpine injury score in paediatric patients presenting with a traumatic fracture of the thoracolumbar spine. Patients younger than 18 years presenting with a traumatic thoracolumbar fracture at a large academic trauma centre between 2010 and 2020 were included retrospectively. Demographic and clinical data were retrieved from electronic medical reports. The AOSpine injury score and TLICS were calculated using plain radiography, magnetic resonance imaging, and/or computed tomography by a spine surgeon with eleven years of experience, and a research fellow trained in musculoskeletal radiology with two years of experience. Disagreement was solved in a consensus meeting with an orthopaedic surgery resident with three years of experience. Descriptive summaries were calculated as the means with standard deviation. To determine interrater reliability, Cohen's Kappa was calculated. Contingency table analysis was performed to calculate the scores' accuracy in predicting the performed treatment. Sixty patients with 167 fractures were included. Demographic and clinical data are presented in Table 1. Surgical treatment was performed in 14 patients. The mean AOSpine injury score was 1.49 ± 2.0 , the mean TLICS was 1.32 ± 1.65 . Interrater reliability analysis revealed Kappa values of 0.868 for the TLICS and 0.860 for the AOSpine injury score ($p < 0.001$). Contingency table analysis showed a sensitivity of 1.00 and specificity of 0.94 for the AOSpine injury score and a sensitivity of 0.90 and specificity of 0.90 for the TLICS in predicting the performed treatment. Our results confirm that the TLICS is a valid classification system for determining treatment decisions in paediatric patients and show high interrater reliabilities for both classification systems but slightly higher accuracy of the AOSpine injury score compared to the TLICS. As the anatomy and biomechanics of children vary significantly, there still is a need for the development of a classification system taking into account the distinct characteristics of different paediatric age groups.

