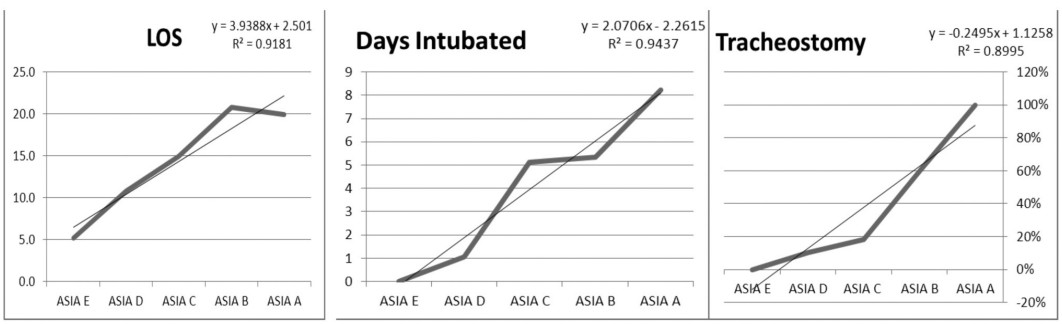
ASIA Impairment Scale Predicts the Need for Tracheostomy After Cervical Spine Injury

Benjamin R. Childs, BS; Timothy A. Moore, MD; John J. Como, MD, MPH;
Heather A. Vallier, MD;
MetroHealth Medical Center, Cleveland, Ohio, USA

Purpose: The objective of this study was to evaluate the ability of the American Spinal Injury Association (ASIA) impairment scale and neurologic level of injury to predict the need for mechanical ventilation as well as tracheostomy. We hypothesized that an increased ASIA impairment scale would be associated with greater need for mechanical ventilation regardless of injury level. We further hypothesized that the ASIA impairment scale in combination with level of cervical injury would help predict the need for tracheostomy.

Methods: 446 patients with fractures, dislocations, or ligamentous injury of the cervical spine were identified retrospectively from hospital records between January of 2007 and May of 2013. Charts were reviewed to determine demographics, ISS, Glasgow Coma Scale (GCS), presence and severity of chest injuries, length of hospital stay (LOS), ICU stay, mechanical ventilation time, and mortality. 54 patients had spinal cord injury, and had ASIA impairment scale and neurologic level recorded in the electronic record.

Results: 54 patients were included in the study. Of these, 9 patients were ASIA A (16.7%), 5 ASIA B (9.26%), 11 ASIA C (20.4%), 19 ASIA D (35.2%), and 10 ASIA E (18.5%). Increasing ASIA impairment correlated to higher ISS, but did not correlate to age or GCS. Greater ASIA impairment did correlate with longer LOS, days intubated, days on ventilation, and greater rate of tracheostomy. ASIA B or greater had a specificity of 95%, sensitivity of 73%, positive predictive value of 85%, and negative predictive value of 90% for predicting need for tracheostomy.



Conclusion: We investigated the ability of the ASIA impairment scale to predict tracheostomy in a general trauma setting, including other injuries. An ASIA impairment score of B or higher is both a specific and sensitive predictor of need for tracheostomy with relatively high positive and negative predictive value. Given the relatively low risk of tracheostomy and the potential benefits, an ASIA impairment score of B or higher would be a sensible criterion to include in a protocol to determine the need for tracheostomy.

See pages 99 - 147 for financial disclosure information.