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Flail chest injuries: a review of outcomes and treatment practices from the National Trauma Data Bank.

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BACKGROUND: Flail chest injuries are associated with severe pulmonary restriction, a requirement for intubation and mechanical ventilation, and high rates of morbidity and mortality. Our goals were to investigate the prevalence, current treatment practices, and outcomes of flail chest injuries in polytrauma patients.

METHODS: The National Trauma Data Bank was used for a retrospective analysis of the injury patterns, management, and clinical outcomes associated with flail chest injuries. Patients with a flail chest injury admitted from 2007 to 2009 were included in the analysis. Outcomes included the number of days on mechanical ventilation, days in the intensive care unit (ICU), days in the hospital, and rates of pneumonia, sepsis, tracheostomy, chest tube placement, and death.

RESULTS: Flail chest injury was identified in 3,467 patients; the mean age was 52.5 years, and 77% of the patients were male. Significant head injury was present in 15%, while 54% had lung contusions. Treatment practices included epidural catheters in 8% and surgical fixation of the chest wall in 0.7% of the patients. Mechanical ventilation was required in 59%, for a mean of 12.1 days. ICU admission was required in 82%, for a mean of 11.7 days. Chest tubes were used in 44%, and 21% required a tracheostomy. Complications included pneumonia in 21%, adult respiratory distress syndrome in 14%, sepsis in 7%, and death in 16%. Patients with concurrent severe head injury had higher rates of ventilator support and ICU stay and had worse outcomes in every category compared with those without a head injury.

CONCLUSION: Patients who have sustained a flail chest have significant morbidity and mortality. More than 99% of these patients were treated nonoperatively, and only a small proportion (8%) received aggressive pain management with epidural catheters. Given the high rates of morbidity and mortality in patients with a flail chest injury, alternate methods of treatment including more consistent use of epidural catheters for pain or surgical fixation need to be investigated with large randomized controlled trials.

LEVEL OF EVIDENCE: Epidemiologic/prognostic study, level IV.