Imapact of thoracic injury on traumatic brain injury outcome

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Introduction

Traumatic brain injury is the leading cause of morbidity and mortality among trauma groups, and pulmonary contusion is involves in 29% of TBI patients. Previous studies did not further distinguish the impact of different types of chest injuries on TBI prognosis. The aim of this study is to assessed the significance of thoracic injury on the 30-day mortality and outcome of traumatic brain injury (TBI).

Methods

TBI patients admitted to our department were retrospectively evaluated. We developed two prognostic models based on admission predictors with logistic regression analysis to assess the significance of thoracic injuries in determining the 30-day mortality and outcome. The internal validity of the models was evaluated with the bootstrap re-sampling technique. We also validated the models in an external series of 165 patients that collected from our center. Discriminative ability was evaluated with C statistic. Calibrative ability was

Results

Among 505 TBI patients admitted, 102 (20.2%) had thoracic injuries. Patients with a PCS = 6 had a 3.142 and 8.065 times higher odds of mortality and poor outcome compared with patients with a PCS <6, respectively. Any one-score increase of the TTS had a 1.193 times higher odds of a poor outcome (p = 0.017). The predictive model for mortality and 30-day functional outcome both had good accuracy (AUC: 0.875; 95% confidence interval [CI], 0.841-0.910 and AUC: 0.888; 95%CI, 0.860-0.916, respectively). Internal validation showed no over optimism in any of the two models' predictive C statistics (C statistic 0.872 for 30-day mortality and C statistic 0.884 for the 30-day neurological outcome). The external validation confirmed the discriminatory ability of these models (C statistic 0.949 (95%CI: 0.919-0.980) for 30-day mortality and C statistic 0.915 (95%CI: 0.868-0.963) for the 30-day neurological outcome). The calibration was also good for patients from the validation population (H-L test p>0.05).

Conclusions

Thoracic injury diagnosed by CT has a negative impact on the 30-day mortality and functional outcome of TBI patients. The extent of PC and the TTS are the predictors for TBI outcome.

Learning Objectives

Doctors should pay attention to chest injuries in patients suffered TBI.

References

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