

Assessing the Efficiency of Pre-Hospital Scoring System with Conventional Coagulation Tests Based Definition of Acute Traumatic Coagulopathy

Authors : Venencia Albert, Arulselvi Subramanian, Hara Prasad Pati, Asok K. Mukhophadhyay

Abstract : Acute traumatic coagulopathy is an endogenous dysregulation of the intrinsic coagulation system in response to the injury, associated with three-fold risk of poor outcome, and is more amenable to corrective interventions, subsequent to early identification and management. Multiple definitions for stratification of the patients' risk for early acute coagulopathy have been proposed, with considerable variations in the defining criteria, including several trauma-scoring systems based on prehospital data. We aimed to develop a clinically relevant definition for acute coagulopathy of trauma based on conventional coagulation assays and to assess its efficacy in comparison to recently established prehospital prediction models. **Methodology:** Retrospective data of all trauma patients (n = 490) presented to our level I trauma center, in 2014, was extracted. Receiver operating characteristic curve analysis was done to establish cut-offs for conventional coagulation assays for identification of patients with acute traumatic coagulopathy was done. Prospectively data of (n = 100) adult trauma patients was collected and cohort was stratified by the established definition and classified as "coagulopathic" or "non-coagulopathic" and correlated with the Prediction of acute coagulopathy of trauma score and Trauma-Induced Coagulopathy Clinical Score for identifying trauma coagulopathy and subsequent risk for mortality. **Results:** Data of 490 trauma patients (average age 31.85±9.04; 86.7% males) was extracted. 53.3% had head injury, 26.6% had fractures, 7.5% had chest and abdominal injury. Acute traumatic coagulopathy was defined as international normalized ratio ≥ 1.19; prothrombin time ≥ 15.5 s; activated partial thromboplastin time ≥ 29 s. Of the 100 adult trauma patients (average age 36.5±14.2; 94% males), 63% had early coagulopathy based on our conventional coagulation assay definition. Overall prediction of acute coagulopathy of trauma score was 118.7±58.5 and trauma-induced coagulopathy clinical score was 3(0-8). Both the scores were higher in coagulopathic than non-coagulopathic patients (prediction of acute coagulopathy of trauma score 123.2±8.3 vs. 110.9±6.8, p-value = 0.31; trauma-induced coagulopathy clinical score 4(3-8) vs. 3(0-8), p-value = 0.89), but not statistically significant. Overall mortality was 41%. Mortality rate was significantly higher in coagulopathic than non-coagulopathic patients (75.5% vs. 54.2%, p-value = 0.04). High prediction of acute coagulopathy of trauma score also significantly associated with mortality (134.2±9.95 vs. 107.8±6.82, p-value = 0.02), whereas trauma-induced coagulopathy clinical score did not vary between survivors and non-survivors. **Conclusion:** Early coagulopathy was seen in 63% of trauma patients, which was significantly associated with mortality. Acute traumatic coagulopathy defined by conventional coagulation assays (international normalized ratio ≥ 1.19; prothrombin time ≥ 15.5 s; activated partial thromboplastin time ≥ 29 s) demonstrated good ability to identify coagulopathy and subsequent mortality, in comparison to the prehospital parameter-based scoring systems. Prediction of acute coagulopathy of trauma score may be more suited for predicting mortality rather than early coagulopathy. In emergency trauma situations, where immediate corrective measures need to be taken, complex multivariable scoring algorithms may cause delay, whereas coagulation parameters and conventional coagulation tests will give highly specific results.

Keywords : trauma, coagulopathy, prediction, model

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