

The GERTality Score: A Feasible and Adequate Tool to Predict Mortality in Geriatric Trauma Patients

Julian Scherer, MMED (Ortho); Yannik Kalbas, MS; Franzisa Ziegenhain, MD; Valentin Neuhaus, MD; Rolf Lefering, PhD; Michel Teuben; Kai Sprengel, MD; Hans-Christoph Pape, MD; Kai Oliver Jensen, MD
University Hospital of Zurich, Zurich, Switzerland

Purpose: A large number of prediction models and subsequent outcome scores for trauma mortality have been developed over the last decades. However, feasible scoring systems for the severely injured geriatric patient are lacking. Therefore, the aim of this study was to develop and validate a scoring system for the prediction of mortality in severely injured geriatric trauma patients.

Methods: The German Trauma Registry (TR-DGU) was utilized and all geriatric individuals (≥ 65 years) admitted between 2008 and 2017 with an ISS ≥ 9 were included. Patient and trauma characteristics as well as diagnostics, therapy, and outcome data were gathered. Initially, data were dichotomized and thereafter the specific odds of all variables for mortality were calculated. Relevant variables were added to the novel GERTality scoring system. Subsequently, this score as a sole predictor for mortality was validated by conducting a receiver operating characteristic (ROC) curve analysis and comparison with the Geriatric Trauma Outcome Score and the RISC-II (Revised Injury Severity Classification) Score.

Results: A total of 58.055 trauma patients with a mean age of 77 years were included. Based on the univariable analysis, the following 5 variables were included in the GERTality-score: age ≥ 80 years, PRBC (packed red blood cells) transfusion requirements in the time from admission to ward, ASA (American Society of Anesthesiologists) score ≥ 3 , GCS (Glasgow Coma Scale) ≤ 13 , and AIS (Abbreviated Injury Scale) in any body region ≥ 4 . For every positive variable in an indexed patient, the score adds up 1 point. So, the maximum GERTality-score was 5. A mortality rate of 72.4% was calculated in patients with a maximum GERTality score. Mortality rates of 65.1% and 47.5%, respectively, were encountered in patients with a GERTality scores of 4 versus 3. The area under the curve (AUC) found by the ROC curve analysis of the novel GERTality score was 0.803, whereas the Geriatric Trauma Outcome Score had an AUC of 0.784 and the highly complex RISC-II score resulted in an AUC of 0.879.

Conclusion: The novel GERTality score is a simple and feasible scoring system that enables an adequate prediction of the probability of mortality in severely injured geriatric patients by using only 5 specific parameters. Additional studies on different data sets should be performed to further validate this new scoring system.