Novel risk score of mortality prediction for critical cardiogenic shock patients

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Background: Patients with critical cardiogenic shock have a high mortality rate. However, evidence for a specific scoring system for mortality prediction is obscure.

Purpose: This study aimed to identify independent predictors to build a reliable scoring system for survival prediction and risk identification in patients with cardiogenic shock.

Methods: This study enrolled critically ill patients with cardiogenic shock in the intensive care unit (ICU) between January 1, 2010, and December 31, 2021. A total of 1,607 patients were enrolled in this study. A novel scoring system for cardiogenic shock mortality prediction, the Kaohsiung Veterans General Hospital Cardiogenic Shock (KVHCS) score, was developed based on independent predictors. Further validation was performed using the Acute Physiology and Chronic Health Evaluation (APACHE) II score.

Results: The mean age of the patients was 67.6 ± 14 years, with male predominance (76%). Patients in the death subgroup were older (72.4 ± 12.8 vs. 66 ± 14 years, P < 0.001), had higher APACHE II (24.1 ± 9.9 vs. 14.6 ± 8.6, P < 0.001) scores, and had more comorbidities. A five-strata KVHCS score was constructed. Compared to the predictive ability of the APACHE II score (AUC = 0.75, P < 0.001) on ICU mortality, the KVHCS score (AUC = 0.87, P < 0.001) had a more powerful performance. It was also more reliable at predicting 30-day mortality (AUC = 0.81 vs. 0.73). Coronary artery disease (CAD) had the greatest contribution to mortality, whereas diabetes mellitus (DM) was a positive predictor of ICU discharge survival but had a negative impact on long-term outcomes.

Conclusions: For critical cardiogenic shock patients in the ICU, CAD was the most important factor negatively affecting ICU survival, whereas DM patients had better survival at ICU discharge but worse long-term outcome. The novel KVHCS score had better risk level prediction for mortality in cardiogenic shock patients than the traditional APACHE II score.