The ACEF score: a simple but powerful predictor of short-term mortality in patients with ST-elevation myocardial infarction

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Background: several clinical risk scores are available for the risk stratification of patients with ST-elevation myocardial infarction (STEMI), such as the CADILLAC, GRACE, PAMI, TIMI, and Zwolle, but all are complex to use and there is uncertainty on the best one. The age-creatinine-ejection fraction (ACEF) score, has been recently proven effective and proficient as a risk score in cardiac surgery despite its user-friendliness. We thus aimed to compare the performance of the ACEF score in comparison to the other available risk scores in patient with STEMI.

Methods: subjects with STEMI undergoing primary percutaneous coronary intervention at our Institution from 2001 to 2009 were enrolled. The primary end-point was in-hospital all-cause death, whereas long-term all-cause death, long-term cardiac death were appraised as secondary outcomes. ACEF, CADILLAC, GRACE, PAMI, TIMI, and Zwolle risk scores were compared with receiver-operating characteristics (ROC) curves with areas under the curve (AUC), and binary multivariable logistic regression analysis with odds ratios (OR), plus 95% confidence intervals.

Results: a total of 746 patients were included, followed for an average of 28 months. The best predictors of in-hospital all-cause death were the GRACE score (AUC=0.78 [0.72-0.85], adjusted OR=1.02 [1.01–1.03], p<0.001) and the ACEF score (AUC=0.76 [0.69-0.83], adjusted OR=1.64 [1.20-2.24], p=0.002). The GRACE score also proved the best prognostic tool for long-term all-cause death (AUC=0.81 [0.77-0.85], adjusted OR=1.02 [1.01-1.02], p<0.001), together with the CADILLAC score (AUC=0.81 [0.77-0.85], adjusted OR=1,20 [1.12-1.29], p<0.001). Finally, the best predictors of long-term all-cause cardiac death were the GRACE score (AUC=0.79 [0.74–0.84], adjusted OR=1.02 [1.01–1.03], p<0.001), the CADILLAC score (AUC=0.77 [0.71–0.83], adjusted OR=1.18 [1.10–1.26], p<0.001), and the TIMI score (AUC=0.74 [0.68–0.79], adjusted OR=0.86 [0.74–0.89], p=0.033).

Conclusions: the ACEF score, a risk model limited to only 3 clinical variables, has favorable predictive features compared with more complex risk scores in the prediction of early mortality after STEMI. Conversely, the GRACE score, despite its greater complexity, provides superior prognostication capability for long-term clinical outlook.