Abstract: P1698

Age shock index is a simple bedside clinical risk stratification tool in patients with non-ST-segment elevation myocardial infarction

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Topic(s):
Non-ST-Elevation Myocardial Infarction (NSTEMI)

Citation:
Introduction: Shock index (SI), (heart rate (HR) / systolic blood pressure (SBP)), has been reported to predict worse outcomes in different acute settings. Two derivatives, named modified SI (MSI), defined as HR / mean BP; and Age SI, defined as SI multiplied by age, were later developed, but only the former was tested for short-term outcomes in patients with myocardial infarction (MI). We hypothesize that Age SI may demonstrate higher prognostic accuracy than SI and MSI due to the added prognostic value of age in this population.

Purpose: Compare the prognostic performance of admission age SI, MSI and SI for predicting in-hospital mortality in patients with NSTEMI.

Methods: Retrospective cohort study of consecutive patients admitted to the Cardiology department of a tertiary care hospital with the diagnosis of NSTEMI between October 2010 and September 2018. Very high-risk patients in need of emergent treatment were excluded. Of the initial cohort of 2476 patients, we excluded 5 who presented cardiac arrest before or at hospital admission, 4 with cardiogenic shock, 95 with acute pulmonary oedema, 10 with SBP < 80 mmHg, 1 with HR < 40bpm and 1 with HR > 160bpm. The primary outcome was all-cause in-hospital mortality. The discriminatory capacity of Age SI, MSI, SI for the primary outcome was assed using the ROC-AUC and compared with the DeLong method, and the value with highest Youden-index was considered the optimal cut-off point. Calibration was assessed using the Hosmer-Lemeshow (HL) test and adjustment for confounding variables was performed using logistic regression analysis.

Results: 2359 patients were included [mean age 66±13 years; 1732 (73.4%) men], of whom 40 (1.7%) died during hospitalization. Discrimination by ROC-AUC was highest for Age SI (0.78 [95% CI 0.71-0.86]), compared to MSI (0.69 [95% CI 0.61-0.78]) and SI (0.69 [95% CI 0.61-0.78]), p < 0.01 for comparison. All indexes demonstrated adequate calibration (HL: Age SI 7.4; MSI 4.5; SI 6.4; p > 0.5). The optimal cut-off for Age SI was 40, which was present in 684 patients (29%) and had 75% sensitivity, 72% specificity, 4.5% positive and 99.5% negative predictive value (NPV) for in-hospital mortality (4.4% vs 0.6%, p<0.001). After adjusting for covariates, an Age SI higher than 40 was associated with increased in-hospital mortality (adjusted OR 3.2, 95% IC 1.06-9.55, p=0.039).

Conclusion: Age SI demonstrated better discriminatory capacity and equal calibration, compared to SI and MSI for in-hospital mortality. An age SI higher than 40 was associated with a 3-fold increased risk of in-hospital death. This cut-off demonstrated excellent negative predictive value (99.5%) and may allow very early risk assessment in patients with non-ST-segment elevation MI (NSTEMI), before laboratorial values are available for GRACE calculation. This may guide initial therapy and help select the most appropriate initial site of care.
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