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The biomarker mid-regional pro-adrenomedullin drawn upon admission for ST-elevation myocardial infarction is a strong predictor of 30-day mortality

Authors:
S Wiberg¹, C Hassager¹, JE Moeller², HB Ravn³, L Holmvang¹, LO Jensen², MG Lindholm¹, J Kjaergaard¹, JP Goetze⁴, R Frikke-Schmidt⁴, JH Thomsen¹, OK Moeller-Helgestad², M Frydland¹, ¹Rigshospitalet - Copenhagen University Hospital, Heart Centre, Department of Cardiology - Copenhagen - Denmark, ²Odense University Hospital, Department of Cardiology - Odense - Denmark, ³Rigshospitalet - Copenhagen University Hospital, Heart Centre, Department of Anaesthesia - Copenhagen - Denmark, ⁴Rigshospitalet - Copenhagen University Hospital, Centre of Diagnostic Investigations, Department of Clinical Chemistry - Copenhagen - Denmark,

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Background
Despite significant improvements in ST-segment elevation myocardial infarction (STEMI) treatment during the past decades, the mortality remains high in the subset of patients developing cardiogenic shock during admission. Biomarkers that rapidly could predict the risk of death in clinically stable patients admitted with STEMI would be of high clinical value. The biomarker mid-regional pro-adrenomedullin (MRproADM) has previously been associated with increased risk of cardiogenic shock in STEMI patients.

Purpose
To assess the associations and predictive value of MRproADM drawn upon admission versus 30-day mortality compared with the 'Thrombolysis In Myocardial Infarction' (TIMI) risk score in a large cohort of patients admitted with STEMI.

Methods
A total of 1700 consecutive patients with verified STEMI were included. We excluded patients with manifest cardiogenic shock upon admission as well as patients with out-of-hospital cardiac arrest, since these patients are known to have a high mortality. A blood sample was drawn upon admission and analyzed for MRproADM. Mortality was adjudicated after 30 days blinded for biomarker values. Cox proportional hazard models were applied to evaluate the hazard ratio (HR) MRproADM (transformed by logarithm of 2) adjusted for TIMI risk score. Further, receiver operating characteristics (ROC) curves were applied to assess the predictive value of MRproADM, the TIMI risk score and the combination of MRproADM and the TIMI risk score (Figure).

Results
A total of 95% of patients had a valid blood sample and were included in the analyses. The mean age was 63±13 years and 1251 (74%) were male. The overall 30-day mortality was 2.8 %. The median (25th–75th percentile) MRproADM value was 0.70 (0.58-0.89) nmol/L in patients surviving past 30 days compared to 1.32 (1.01-2.24) nmol/L in patients dying within the first 30 days from admission (p<0.0001). MRproADM was independently associated with time to death after adjustment for TIMI risk score (HR (95% CI) 3.1 (2.3-4.3), p<0.0001). The area under the ROC curve was 0.86 for MRproADM. In contrast, the area under the ROC curve was 0.76 for the TIMI risk score (Figure). Adding TIMI risk score to MRproADM did not increase the AUC (p=0.27).
Conclusions
The biomarker MRproADM drawn upon admission is independently associated with 30-day mortality in clinically stable patients admitted with STEMI after adjustment for TIMI risk score. Further, MRproADM is a strong predictor of 30 day mortality and seems superior to the TIMI risk score.