Long-term prognostic value of growth-differentiation factor 15 in acute myocardial infarction complicated by cardiogenic shock

Purpose
Growth-differentiation factor 15 (GDF-15), a stress-responsive member of the transforming growth factor beta cytokine superfamily, has proven prognostic impact in cardiovascular disease. In acute myocardial infarction (AMI) complicated by cardiogenic shock (CS) impact on short-term the impact of GDF-15 was shown recently, but a possible long-term prognostic impact beyond the acute phase has not been investigated yet.
Methods
In 190 patients with CS complicating AMI blood samples were collected during primary percutaneous coronary intervention (PCI). The blood was centrifuged immediately and the serum was frozen at -87° C. GDF-15 was measured with a standard ELISA-Kit. All-cause mortality at 1 year was used for long-term outcome assessment.
Results
Patients with positive 1 year survival had in median significant lower levels of GDF-15 (5002 [IQR 2297;9134] vs. 10618 [IQR 6406;14458] pg/ml; p<0.001). GDF-15 levels above 7452 pg/ml (best cut off by Youden-index) showed higher rates of death at 1 year (71.4 vs. 34.8 %, Chi² p<0.001; log-rank-testing [HR 2.61 {95%CI 1.77-3.85}; p<0.001]). A landmark analysis in 30 day survivors showed a persistent discriminating effect of GDF-15 (log-rank-test day 30 to 1 year: HR 4.92 [95%CI 2.15-11.21]; p<0.001). In a multivariable stepwise Cox-regression model including all baseline variables with an univariable association to 1 year mortality (p<0.1: GDF-15, age, serum creatinine and lactate, ejection fraction, sex, prior stroke, NT-ProBNP, presence of coronary 3-vessel disease, patent culprit vessel after PCI and mechanical ventilation ad admission) GDF-15, age, ejection fraction, serum lactate and a patent culprit vessel after PCI remained significant predictors of time to death (HR per 10 µg/L GDF-15 1.77 [95%CI 1.13-2.81], p=0.01). Adding GDF-15 to a model including all multivariable significant predictors resulted in a significant increase of the area under the curve for prediction of 1 year mortality (0.767 without vs. 0.817 with GDF-15, p=0.046).
Conclusions
GDF-15 levels at baseline are an independent predictor of long-term mortality in acute myocardial infarction complicated by CS.