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.