

# Predictive value of elevated Neutrophil Gelatinase-Associated lipocalin (NGAL) levels for Assessment of Cardio-Renal Interactions among ST-Segment Elevation Myocardial Infarction Patients

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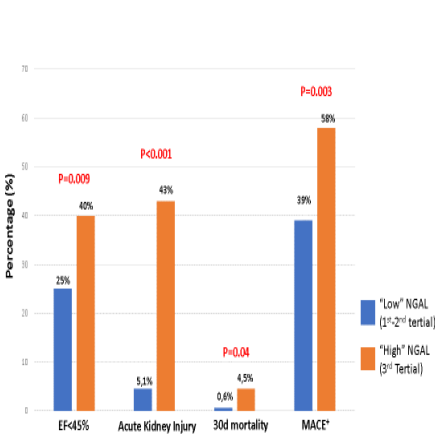
**Background:** Neutrophil gelatinase-associated lipocalin (NGAL) are stored in mature neutrophils and released by damaged renal tubular cells reflecting both inflammatory reactions and renal injury. Furthermore, NGAL was recently found to be associated with endothelial dysfunction and plaque instability. We therefore investigated the prognostic utility of elevated NGAL levels for renal and clinical outcomes among ST elevation myocardial infarction patients (STEMI) treated with primary coronary intervention (PCI).

**Methods:** We performed a prospective, observational, open label trial including STEMI patients after primary PCI admitted to the cardiac intensive care unit. Blood samples for plasma NGAL were drawn immediately after admission. High NGAL was defined as values within the 3<sup>rd</sup> tertial (>66 percentile). Patients were assessed for major in-hospital adverse clinical events (MACE). These included the occurrence of acute kidney injury (AKI), reduced left ventricular ejection fraction (LVEF), clinical heart failure findings, need for inotropic support and 30-day mortality.

**Results:** A total of 267 patients were included (mean age  $66 \pm 14$  years, 81% males). Patients with high NGAL values had higher admission CRP levels but similar white blood cell counts.

Short term adverse outcomes were consistently increased in the high NGAL group with more AKI (45% vs. 5%,  $p < 0.001$ ), lower mean LVEF ( $46 \pm 8\%$  vs  $44 \pm 9\%$ ,  $p = 0.04$ ), higher 30 day mortality (0.6% vs 4.5%,  $p = 0.04$ ), and higher incidence for the composite outcome of MACE (39% vs 58%,  $p = 0.003$ ). In a multivariate logistic regression model high NGAL emerged as a strong predictor for MACE independent of other inflammatory markers (OR 2.03, 95%CI 1.19 - 3.46,  $p = 0.009$ ).

**Conclusions:** Among STEMI patients undergoing primary PCI, elevated NGAL levels are associated with adverse renal and cardiovascular outcomes, independent of traditional inflammatory markers. Further studies are needed to assess the potentially unique role of NGAL in cardio-renal interactions.



\*Heart failure symptoms, need for inotropes or 30d mortality

