Serial measurements of Neutrophil Gelatinase-Associated lipocalin (NGAL) levels for Assessment of Contrast Induced Nephropathy among Chronic Kidney Disease Patients Undergoing Elective Coronary Angiography

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Background: Among Patients with chronic kidney disease (CKD), baseline neutrophil gelatinase-associated lipocalin (NGAL), a marker of tubular damage, may reflect the severity of renal impairment. There are no previous data on serial changes in serum NGAL levels in CKD patients before and after percutaneous coronary intervention (PCI). We performed serial serum NGAL level and evaluated their relation for the occurrence of contrast induced acute kidney injury (CI-AKI) following PCI**.**

Methods: We included 58 patients with CKD undergoing elective PCI. Plasma NGAL measurements were performed before (pre-NGAL) and 24 hours following PCI (post- NGAL). Patients were followed for the occurrence of CI-AKI and for the change in NGAL levels before and after PCI. Receiver operator characteristic (ROC) method was used to identify the optimal sensitivity and specificity for the observed pre-NGAL level compared with post-NGAL calculated for patients with CI-AKI.

Results: Overall CI-AKI incidence was 33%. Both pre-NGAL (172 vs. 119 ng/mL, $p < 0.001$) and post –NGAL ((181 vs. 121 ng/mL, $p < 0.001$) levels were significantly higher in patients with CI-AKI than in patients without CI-AKI. No significant changes were detected between pre and post-NGAL levels, both in patients withand without CI_AKI (figure 1). According to the ROC curve, pre-NGAL levels performed similarly to post-NGAL levels in the prediction of CI-AKI (AUC 0.753 vs. 0.745,figure 2), with the optimal cutoff value for Pre-NGAL to predict CI-AKI being 129 ng/mL (sensitivity of 73% and specificity of 72%, $p < 0.001$) compared with 141 ng/mL (sensitivity of 73% and specificity of 71%, $p < 0.001$) for post-NGAL levels.

Conclusions: Among CKD patients undergoing elective PCI, we detected no significant changes in serial NGAL levels. In these high risk patients baseline (Pre- NGAL) levels may be used with similar efficacy to post- NGAL levels to predict CI-AKI. Further studies on larger populations are required to validate the potential utility of NGAL measurements in CKD patients.

Figure 1: Comparison of pre and post NGAL levels in patients with vs. without CI-AKI

Figure 2- ROC curve for CI-AKI prediction for pre and post-NGAL serum levels