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Objective The aim of study was to evaluate the Neutrophil Gelatinase-Associated Lipocalin (NGAL) and cystatin C (CysC) as early biomarkers for prediction of contrast induced acute kidney injury (CIAKI).

Materials and methods The patients who were scheduled to undergo diagnostic cardiac angiography and percutaneous coronary intervention with moderate to severe chronic kidney disease (CKD) were considered to be eligible. Moderate or severe CKD was defined as an eGFR 30 to 90 ml/min/1.73 m^2, calculated with modified modification of diet in renal disease. First, the vein blood was obtained before and 2, 4, 8, 24 and 48 h after procedure to observe changing trend of two biomarkers with time and determine the time points when the NGAL and cystatin C level increasing to the peak. The plasma NGAL and CysC were measured with enzyme-linked immunosorbent assay kit (R and D System Inc., USA). CIAKI was defined as a relative increase in serum creatinine (SCr) from baseline of ≥25% or an absolute increase of ≥0.5 mg/dl (44 umol/l) up to day 3.

Results Total 311 patients were enrolled, among whom 39 patients (12.5%) developed CIAKI. Plasma NGAL increased at 2 h and reached peak at 4 h after procedure while plasma CysC increased at 2 h and reached peak at 24 h after procedure. The area under the ROC curve (AUC-ROC) was 0.662 (95% CI: 0.565–0.758, p=0.002) for NGAL with 51.4% of sensitivity and 80.6% of specificity. The AUC-ROC of CysC for CIAKI was 0.628 (95% CI: 0.539 to 0.716, p=0.016) with 57.1% of sensitivity and 60.2% of specificity. NGAL with relative increasing more than 25% had higher sensitivity (87.2%) and lower specificity (80.8%), while CysC with relative increasing more than 25% had 76.9% of sensitivity and 81.2% of specificity. Combined relative increasing of both biomarkers might get 90.1% of specificity, but only 51.2% of sensitivity.

Conclusion Plasma NGAL and CysC might predict CIAKI better and earlier. Combining relative increasing plasma NGAL at 4 h with relative increasing plasma CysC at 24 h after procedure might perform better for early diagnosis of CIAKI.

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COMBINED NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN WITH CYSTATIN C TO EARLY DIAGNOSE CONTRAST INDUCED ACUTE KIDNEY INJURY

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