Acute Kidney Injury Biomarkers after Sodium Phosphate Bowel Preparation in non-CKD patients

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Purpose : After oral sodium phosphate (OSP) bowel preparation, acute kidney injury (AKI) and chronic kidney disease occurred even in the patients with normal kidney function. Examination of more sensitive markers, such as neutrophil gelatinase-associated lipocalin (NGAL) and urinary kidney injury molecule-1 (KIM-1), may need for the prevention and early detection of AKI. We hypothesized that NGAL and urinary KIM-1 may increase in OSP bowel preparation causing AKI including subclinical kidney injury.

Methods : We prospectively enrolled 30 healthy volunteers (16-60 yrs old, eGFR more than 90 ml/min/1.73m^2) who were supposed to undergo screening colonoscopy. The volunteers have no urinary abnormalities and do not take any ACEi or ARB. We measured concentrations of serum creatinine, serum cystatin-C, serum NGAL, urinary NGAL, and urinary KIM-1 on baseline, colonoscopy study day, and following subsequent two days. KIM-1 was measured by sandwich ELISA (R&D, MN).

Results : No subjects showed significant increase of creatinine and cystatin-C during the study period. Serum NGAL was increased in the colonoscopy day, but statistically insignificant when compared to the baseline level (90.4±26.7 vs 83.1±20.7 ng/ml). And there were no significant changes in urinary NGAL/Cr. Baseline Urinary KIM-1/Cr values were in the range of 0-0.63 ng/mg. Subsequently examined urinary KIM-1/Cr in 3 out of 30 patients (10%) had levels above baseline range and the increased levels were 2.6-11 fold (1.06-1.38 ng/mg).

Conclusion : Increase of KIM-1 in 10% of non-CKD patients after OSP bowel preparation with no significant increase of NGAL in all tested. Usefulness of urinary KIM-1 in the detection of OSP induced subclinical kidney injury needs to be determined in early CKD patients, stage 1-2.

Key Words : NGAL, KIM-1, Sodium phosphate nephropathy