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Congenital Cardiology Solutions

NOVEL URINARY BIOMARKERS REMAIN ELEVATED YEARS AFTER ACUTE KIDNEY INJURY FOLLOWING CARDIAC SURGERY IN CHILDREN

Poster Contributions
Poster Sessions, Expo North
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Session Title: Congenital Cardiology Solutions: Surgical Outcomes
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Background: Novel urinary biomarkers predict acute kidney injury (AKI) after cardiopulmonary bypass (CPB-AKI). AKI increases risk for future chronic kidney disease (CKD) in adults. We aimed to determine if urinary biomarkers remained chronically elevated in patients (pts) with CPB-AKI (AKI+) vs. without AKI (AKI-).

Methods: We compared CKD clinical/laboratory markers (urine microalbumin/Cr, Schwartz eGFR and blood pressure) and novel urinary biomarkers (uNGAL, uIL-18, uKIM-1 & uL-FABP) in AKI+ (n=19) versus AKI- (n=12) pts 6.8+/- 0.8 yrs (mean) post-CPB. CPB-AKI was defined by the pRIFLE criteria (≥ 50% increase in serum creatinine (sCr) over baseline).

Results: Baseline characteristics between AKI + versus AKI - pts were similar (RACHS-1, CPB time, age at surgery) except for peak sCR (median 0.77 vs 0.48 mg/dL; p=0.02). At follow-up, both cohorts had similar age (7.9 +/- 1.5 vs 7.7 +/- 0.35 yrs). Clinical/laboratory CKD markers were normal in the majority of pts and did not differ between the groups. Urinary biomarker concentrations for AKI + versus AKI - pts are presented in the Table.

Conclusions: In this long term follow-up of children post CPB, we observed 1) persistently elevated uIL-18, uKIM-1 and uL-FABP in AKI + patients, 2) higher uIL-18, uKIM-1 and uL-FABP in AKI + versus AKI - pts and 3) no evidence of classic CKD signs. We suggest novel urinary biomarkers could serve as a more sensitive marker of chronic kidney injury in children who develop post-CPB AKI.

Biomarker	AKI - (n=12)*	AKI + (n=19)*	p-value
NGAL (ng/ml)	10.4 (10.2, 3.9-16.9)	11.9 (7.0, 8.5-15.2)	0.64
IL-18 (pg/ml)	23.6 (16.6, 13.0-34.1)	64.0 (49.4, 40.1-87.8)	0.01
KIM-1 (pg/ml)	247 (204, 117-377)	523 (367, 346-700)	0.03
L-FABP (ng/ml)	2.7 (1.0, 2.1-3.4)	8.0 (3.6, 6.1-9.8)	0.001

* All values mean (SD, 95%CI)