Introduction:
Perioperative Acute Kidney Injury (AKI) is associated with significant morbidity and mortality [1]. Certain urinary biochemical parameters seem to have a standardized behavior during AKI development and may act as surrogates of decreased glomerular filtration rate (GFR) aiding in early AKI diagnosis [2]. Aim of this prospective observational study was the evaluation of urinary biochemical parameters as early indicators of AKI in a cohort of major surgery patients.

Methods:
68 patients were studied. AKI was defined according to AKIN criteria within 48 hrs after surgery [3]. At pre-defined time points (preoperatively, recovery room [RR] and on postoperative days [POD] 1 to 3) simultaneous serum and urine samples were analyzed for urea, creatinine, Na, K, Cl, while fractional excretions of Na (FENa), Urea (FEUrea), K (FEK), urinary strong ion difference (SIDU) and estimated GFR (eGFR) were calculated.

Results:
16 patients (23.5%) developed AKI. While there was no difference in preoperative eGFR between AKI and non-AKI patients (75.3±16 vs 83.9±15.2ml/min/m2, p=0.09), RR eGFR was already lower in AKI patients (69.5±18.7 vs 85.7±15.6ml/min/m2, p=0.001). This was accompanied by significantly lower NaU (82.7±26.8 vs 108.1±41.9mEq/l, p=0.002) and ClU (94.7±32.9 vs 114.5±33.4mEq/l, p=0.041) values, as well as significantly higher FEK (62.5±41.5 vs 24.8±16.5%, p=0.002). FENa and FEUrea differed significantly between the two groups on POD 1, whereas SIDU did not differ.

Conclusion:
In a general surgery population low NaU and ClU values, as well as high FEK values were already evident immediately after surgery, probably representing GFR impairment preceding formal AKI diagnosis. Additional studies must confirm these findings and reevaluate these simple parameters as potential AKI monitoring tools.

References: