Analysis of kidney damage biomarkers in plasma and urine samples from patients with documented renal injury.

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The kidney is one of the primary sites of xenobiotic-induced toxicity, which underlines the need for reliable and sensitive biomarkers for renal injury. The FDA and EMEA have issued guidelines for 7 new urinary biomarkers of drug-induced kidney damage in rats, and a natural continuation to build on such efforts are studies performed in human patient material to advance the "rolling qualification". To this end, a screen for potential protein biomarkers in relation to kidney toxicity/damage was performed in a set of urine and plasma samples from patients with documented renal damage. The investigated patient groups included diabetic nephropathy, obstructive uropathy, analgesic abuse and glomerulonephritis along with age and gender matched control groups. Multiplexed immunoassays were applied in order to quantify the following protein analytes: Alpha-1 Microglobulin, KIM-1, Microalbumin, Beta-2-Microglobulin, Calbindin, Clusterin, Cystatin C, TreFoil Factor-3, CTGF, GST- alpha, VEGF, Calbindin, Osteopontin, Tamm-Horsfall Protein, Timp-1, NGAL. In addition, standard blood and urine chemistry were determined. Statistical analyses using both univariate and multivariate tools indicated discrepancies in protein levels when comparing case and control samples. Future analysis aiming to qualify these biomarkers will indicate the potential of these candidates as markers for renal toxicity in humans.