URIINARY CYSTATIN-C: A NEW AUTOMATED PARTICLE-ENHANCED IMMUNE TURBIDIMETRIC TEST FOR THE ROUTINE EVALUATION OF KIDNEY TUBULAR FUNCTION

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BACKGROUND
Cystatin-C is an inhibitor of cysteine proteases with a molecular mass of 13 kDa. Due to its physical properties it is freely filtrated through the glomeruli then reabsorbed and almost completely catabolized by the proximal tubular cells. It is a normal component of urinary proteins in very low concentration. Recent studies showed that elevated levels of urinary cystatin-C (u-CYSC) reliably indicates tubular dysfunction.

AIMS
Because commercial u-CYSC test is not available at present, we optimized and validated an automated serum immune turbidimetric test for urine measurements. Furthermore, our aim was to investigate u-CYSC concentrations in diseases which can be accompanied by acute or chronic kidney injury.

METHODS
A particle-enhanced immune turbidimetric assay for serum CYSC (DiaSys GmbH) was adapted for a Cobas 8000/c502 automated analyzer (Roche) to measure u-CYSC.

RESULTS
The detection limit was determined to be 0.017 mg/L u-CYSC. Reference range for u-CYSC/creatinine ratio was established to be 0.007 (0.004-0.015) mg/mmol [median (2.5-97.5 percentiles)]. Compared to the control group, u-CYSC/creatinine ratios showed approximately 44-fold elevation in sepsis-related acute kidney injury (p<0.001). The u-CYSC/creatinine values of the chronic hypertension patient group did not differ significantly from those of controls.

CONCLUSIONS
We adapted a highly sensitive, precise and accurate turbidimetric assay for CYSC determination in urine. Our fully automated method is ideal for routine lab testing and our findings confirm that u-CYSC levels sensitively reflect the tubular damage in acute kidney injury.