Pediatr Nephrol (2004) 19:1429
DOI 10.1007/s00467-004-1599-5

LETTER TO THE EDITORS

Arend Bökenkamp · Stefan Herget-Rosenthal

Urinary cystatin C as a marker of GFR? A word of caution

Published online: 21 October 2004

Sirs,
In a recent publication in *Pediatic Nephrology* Hellerstein et al. [1] proposed the urinary cystatin C/creatinine ratio as a marker of glomerular filtration rate (GFR). However appealing the idea of screening urine to detect probands with decreased GFR may be, some words of caution are warranted.

The patient population of Hellerstein et al. was comprised mostly of patients with tubulointerstitial damage from uropathies. Unfortunately, two groups that are critical for the evaluation of their technique were barely studied. These include patients with isolated tubular injury who have a high urinary cystatin C/creatinine ratio but *normal* GFR [2, 3] and patients with minimal change nephrotic syndrome. The authors present one single patient with IgA nephropathy with nephrotic-range proteinuria and a high urinary cystatin C/creatinine ratio but fail to state the GFR. Data both in rats [4] and in man [5] indicate that in nephrotic syndrome albumin competes with low molecular weight protein absorption in the proximal tubule [5], leading to low molecular weight proteinuria. Therefore the cystatin C/creatinine ratio may well be an indicator of *renal disease* but it does not reliably reflect *GFR* in situations where there is significant proteinuria of tubular or glomerular origin.

The authors assess the analytical performance of the urinary cystatin C/creatinine ratio using a GFR cut-off of 60 ml/min per 1.73 m^2. Although the non-invasiveness of their method is appealing for screening purposes, such a low threshold would miss children in the "creatinine-blind" range who should be the target group of screening programs for renal disease.

Thus detection of incipient renal impairment remains the preserve of *serum* cystatin C [6], which cannot be replaced by the less invasive urinary test proposed by the authors.

A. Bökenkamp
Department of Pediatric Nephrology,
Free University Medical Center,
Amsterdam, The Netherlands

S. Herget-Rosenthal
Division of Nephrology,
University Hospital,
Essen, Germany

A. Bökenkamp (✉)
Department of Pediatric Nephrology,
Vrije Universiteit Medisch Centrum,
De Boelelaan 1117, 1007 MB Amsterdam, The Netherlands
e-mail: bokenkamp@vumc.nl
Tel.: +31-20-4444444
Fax: +31-20-4440849

References

1. Hellerstein S, Berenbom M, Erwin P, Wilson N, DiMaggio S (2004) The ratio of urinary cystatin C to urinary creatinine for detecting decreased GFR. Pediatr Nephrol 19:521–525
2. Norden AG, Scheinman SJ, Deschodt-Lanckman MM, Lapsley M, Nortier JL, Thakker RV, Unwin RJ, Wrong O (2000) Tubular proteinuria defined by a study of Dent's (*CLCN5*mutation) and other tubular diseases. Kidney Int 37:240–249
3. Uchida K, Gotoh A (2002) Measurement of cystatin-C and creatinine in urine. Clin Chim Acta 323:121–128
4. Thielemans N, Lauwerys R, Bernard A (1994) Competition between albumin and low-molecular-weight proteins for renal tubular uptake in experimental nephropathies. Nephron 66:453–458
5. Tomlinson PA, Dalton RN, Hartley B, Haycock GB, Chantler C (1997) Low molecular weight protein excretion in glomerular disease: a comparative analysis. Pediatr Nephrol 11:285–290
6. Laterza OF, Price CP, Scott MG (2002) Cystatin C: an improved estimator of glomerular filtration rate? Clin Chem 48:699–707