Measurement of Proteinuria

R.H.R.		White ^a
C.M.		Taylor ^a
A.	Anne	Green ^b

Departments of ^aNephrology and ^bClinical Chemistry, The Children's Hospital, Birmingham, UK

R.H.R. White, Professor of Paediatric Nephrology, The Children's Hospital, Ladywood Middleway, Ladywood, Birmingham B16 BET (UK)

Dear Sir,

The recent paper by Chambers et al. [1] highlights the frequency with which gross errors occur in the measurement of urinary total protein concentration in routine hospital laboratories. They argued that the test should be replaced by measurement of albumin and other selected proteins. A variety of nephelometric, turbidimetric, dye-binding and biuret techniques were used and it would have been informative to analyse the results in terms of individual methods. Our experience of measuring total urinary protein concentration by a modification of the Coomassie blue method [2] has proved favourable. We found it highly sensitive at low urinary protein concentrations and reported within-batch coefficients of variation 2.9 and 0.94% at concentrations of 0.025 and 0.089 g/l, respectively [3]. While the constant relationship which we observed between albumin and total protein excretion in health might alter in disease and become of relevance to those making a special study of glomerular disorders, in clinical practice we have found the measurement of total protein by this method adequate for monitoring progress in our patients. Moreover, the reagents cost less than those of the albumin radioimmunoassay. We expressed our results as protein/creatinine ratios in early morning urine (EMU) samples, and found an extremely good linear correlation with the protein excretion rate in timed, overnight collections [3]. The method proved sufficiently sensitive to detect small but significant changes in proteinuria, consequent upon experimental modulation of dietary protein intake, in patients with reduced functioning renal mass due to reflux ne-phropathy [4]. Moreover, we demonstrated a highly significant correlation between the amount of proteinuria and the extent of segmental glomerulosclerosis in the same condition [5], and concluded that the detection of EMU 'microproteinuria' is a simple and reliable way of demonstrating glomerular hyperperfusion.

The collection of an EMU specimen is simple and eliminates the inaccuracies created by timing errors and loss of urine; it is therefore particularly valuable for very young children. It is unclear to us why most routine hospital laboratories continue to measure protein excretion in 24-hour collections, as they do not discriminate between postural and pathological proteinuria and cause considerable inconvenience to patients.

References

Chambers RE, Bullock DG, Whicker JT: Urinary total protein estimation – fact or fiction. Nephron 1989;53:33–36.

Bradford MM: A rapid and sensitive method for the quantitation of microgram quantities of protein using the principle of protein dye-binding. *Anal Biochem* 1976;72:248–254.

Elises JS, Griffiths PD, Hocking MD, et al: Simplified quantification of urinary protein excretion in children. *Clin Nephrol* 1988;30:225–229.

Elises JS, Taylor CM, Buchanan E, et al: Short term restriction of dietary protein lessens proteinuria in patients with reduced nephron mass (abstract). *Pediatr Nephrol* 1988;2:C133.

White RH R, Morita M, Yoshiara S, et al: Glomerular changes in reflux nephropathy (abstract). *Pediatr Nephrol* 1989;3:C61.