Quantitation of Proteinuria in Patients with IgA Nephropathy and Membranous Nephropathy in Early Morning and Spot Urine Specimens

L.L.		Wan
K.		Hiromura
Y.		Tsukada
S.		Yano
T.		Naruse

Third Department of Internal Medicine, Gunma University School of Medicine, Maebashi, Gunma, Japan

S. Yano, MD, Third Department of Internal Medicine, Gunma University School of Medicine, 3-39-22 Showa-cho, Maebashi, Gunma 371 (Japan)

600

^>

Dear Sir,

IgA nephropathy (IgA-N) and membranous nephropathy (MN-N) are common forms of chronic glomerulonephritis whose management relies on evaluation of urinary protein. Such measurements are usually done in the outpatient clinic on spot urine specimens, as the protein/creatinine ratio is reportedly well correlated with that in 24-hour urine specimens [1, 2]. We previously investigated the effects of posture on urinary protein excretion in patients with various renal diseases [3]. Urine was collected after 60 min spent in the supine position, following the collection of urine after standing for 60 min. We found that the increase in urinary protein excretion in patients with MN-N after standing significantly exceeded that in patients with IgA-N. We questioned whether there may also be a difference in urinary protein excretion between routine 'spot' urine and 'early morning' urine as collected from patients with IgA-N and MN-N at outpatient clinics. Our objective was to evaluate the urinary excretion of protein, albumin, IgG, and transferrin in early morning and spot urine specimens in patients with IgA-N and MN-N.

A total of 22 Japanese patients, 13 patients with IgA-N (10 males and 3 females, mean age 42.5 ± 13.5 years) and 9 patients with MN-N (4 males and 5 females, mean age 55.8 ± 7.8 years) were included in this study, in which the diagnosis was determined by renal biopsy. Any patient with a serum creatinine level of > 2.0 mg/dl was excluded from the study. Serum creatinine lev-

500

400

O

o

a.

300 ■

$P < 0.01$

281.9 ± 122.2

200

100

U

MN-N (n=9)

IgA-N (n=13)

Fig. 1. Difference in urinary protein excretion in patients with IgA-N (n = 13) and MN-N (n = 9) obtained in early morning and spot urine specimens. Percentage change in urinary protein excretion was calculated as: [protein (mg/mg cr) of 'spot' urine/protein (mg/mg cr) of 'early morning' urine] $\times$ 100. Lines represent mean values.

els ranged from 0.7 to 2.0 mg/dl (mean 1.2 ± 0.5) in patients with IgA-N, and from 0.5 to 1.8 mg/dl (mean 1.0 ± 0.4) in patients with MN-N. Creatinine levels did not differ significantly between the 2 groups. The early morning sample was obtained immediately when the patients got up at home, after hav-

KARGER

E-Mail karger@karger.ch Fax +41613061234

© 1996 S. KargerAG, Basel 0028-2766/96/0722-0369\$8.00/0

Table 1. Excretion of urinary proteins in IgA nephropathy and membranous nephropathy: early morning vs. spot urine specimens (mean $\pm$ SD)

ing voided just before going to bed at night. Thus, this sample represented the protein excretion in the supine position. A spot sample of urine was also taken from patients at the outpatient clinic on the same day. This sample represented the protein excretion in the upright position following mild exercise. Each sample was analyzed for protein, creatinine, albumin, transferrin, and IgG, as previously described.

Most patients showed an increase in protein excreted in the spot specimens vs. the early morning specimens. However, the percent change, i.e. [protein (mg/mg cr) of 'spot' urine/protein (mg/mg cr) in early morning urine] $\times$ 100, in patients with MN-N significantly exceeded that in patients with IgA-N

(fig. 1). The urinary excretion of albumin and IgG in the spot samples was significantly higher than that in early morning samples in patients with IgA-N and MN-N. However, the percent change in albumin in MN-N patients significantly exceeded that in IgA-N patients. Urinary excretion of transferrin tended to be increased in the spot samples in both groups, but not to a significant extent (table 1). The IgG/transferrin ratio was significantly higher in the spot sample vs. the early morning sample in patients with IgA-N, but not in MN-N patients (data not shown). A difference in the glomerular damage in IgA-N vs. MN-N may perhaps account for the differing excretion of protein in the spot and early morning urine specimens.

References

- Jay MG, Bruce SC, Richard AM, Serafino G: Use of single voided urine samples to estimate quantitative proteinuria. *N Engl J Med* 1983; 309:1543-1546.
- Schwab SJ, Christensen RL, Dougherty K, Klahr S: Quantitation of proteinuria by use of protein-to-creatinine ratios in single urine samples. *Arch Intern Med* 1987;147:943-944.
- Wan LL, Yano S, Hiromura K, Tsukada Y, Tomono S, Kawazu S: Effects of posture on creatinine

clearance and urinary protein excretion in patients with various renal diseases. *Clin Nephrol* 1995;43:312-317.

Obituary

NEPHRON regrets to note the passing away of Dr. P.R. Uldall, in June 1995. A fine nephrologist and a faithful reviewer of this journal, Dr. Uldall displayed an insight and wisdom much appreciated by the editors-in-chief.

370

Nephron 1996;72:369-370

Wan/Hiromura/Tsukada/Yano/Naruse