Normal Urinary Red Blood Cell Morphology in Segmental Necrotizing Glomerulonephritis

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Sir,

Urinary red blood cell morphology has been reported to be useful in discriminating renal from nonrenal causes of hematuria. In renal disease, dysmorphic blood cells are detected in urine, whereas in nonrenal hematuria the morphology is normal [1,2]. The estimated sensitivity and specificity of blood cell morphology in the differentiation of renal and nonrenal origin of hematuria have been estimated to range from 95 to 99% and 85 to 92%, respectively [2-5]. We report normal urinary red blood cell morphology in patients with segmental necrotizing glomerulonephritis compared with other types of glomerular disease.

In a 48-month interval, urinary red blood cell morphology was prospectively studied with light microscopy in three groups of patients: IgA glomerulonephritis (IgA); segmental necrotizing glomerulonephritis (SNG), and a miscellaneous group of patients with other glomerular disease (OTHER). No nephrolithiasis or urinary infections were detected in these patients, and echography revealed no morphologic abnormalities of the renal pelvis, urinary bladder and prostate that could account for hematuria. The percentage of dysmorphic red blood cells per field was calculated. Plasma creatinine was determined at the time of the urinary evaluation.

Results are shown in table 1 and figure 1. Age was similar in the IgA and OTHER groups, while patients with SNG were older. The histology of patients with SNG revealed > 40% crescents in 6 of 11 patients, and in 2 patients crescents were not observed. Severe renal failure was detected in most patients with SNG, the creatinine levels being significantly higher in this group compared with the 2 other groups ($p < 0.001$). Normal urinary blood

Table 1. Urinary red blood cell morphology (URBCM) in different types of glomerulonephritis: clinical and laboratory data

URBCM = Urinary red blood cells. * $p < 0.05$; ↔ $p < 0.01$; *** $p < 0.001$.

1 Includes: mesangial proliferative glomerulonephritis (4 patients); mesangiocapillary glomerulonephritis (2 patients); He-noch-Schönlein purpura (2 patients); endocapillary glomerulonephritis (2 patients); focal and segmental glomerulosclerosis (1 patient), and systemic lupus erythematosus (1 patient).

2 Cut-off point between normal vs. abnormal percentage of dysmorphic red blood cells < 20%.

cell morphology was seen in 9 of 11 patients with SNG and in only 2 of 23 in both IgA and OTHER groups ($p < 0.0001$). The mean percentage of dysmorphic red blood cells was significantly lower in the SNG group compared with the 2 other groups ($p < 0.001$). Our results show that eumorphic urinary red blood cells are not specific of nonrenal hematuria, as they can be detected in segmental necrotizing glomerulonephritis.

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observations have also suggested that successive changes in pH and osmolality could also alter red blood cell morphology during passage through the distal nephron [7].

60

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-0-

-0-

3/8 40

••

20

-0-

IgA SNG OTHER

Fig. 1. Percentage of urinary dysmorphic red blood cells in three groups of patients with glomerulonephritis: IgA; segmental necrotizing glomerulonephritis (SNG), and other types of glomerulonephritis (OTHER). Urinary red blood cell morphology is usually abnormal in hematuria of glomerular origin; however, in patients with SNG, urinary red blood cells are usually normal. Rupture of glomerular basement membrane in SNG would allow direct massive passage of red blood cells to Bowman's space, thus obviating mechanical interference of such cells with glomerular basement membrane. *** $p < 0.001$.

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