Clinical Significance of Urinary Epidermal Growth Factor Levels in Patients with Acute Renal Failure

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Dear Sir,

The origin and the significance of urinary human epidermal growth factor (hEGF) remain in hypothesis. We investigated urinary hEGF levels in 16 patients with acute renal failure (12 men and 4 women aged 18-77 years, mean 46.2 ± 4.6 SEM) and compared these with healthy controls (7 men and 5 women aged 24-73 years, mean 42.9 ± 6.0 SEM). Changes in urinary hEGF levels over the course of time were also studied in 9 patients who recovered from the acute phase. Urinary hEGF levels were determined by radioimmunoassay with a specific anti-hEGF antibody and ^{125}I -hEGF, and were corrected for creatinine (Cre) concentration. Plasma Cre concentration ranged from 3.3 to 13.7 mg/dl (5.09 ± 0.68 ; $n = 16$) in the acute phase and 0.6 to 1.9 mg/dl (1.09 ± 0.7 ; $n = 9$) in the recovery phase. The urinary hEGF levels in the acute phase were 0.98 ± 0.20 ng/mg Cre ($n = 16$) – a level significantly ($p < 0.01$) lower than the normal control (13.74 ± 1.18 ; $n = 12$) – and this subsequently increased significantly (6.10 ± 0.73 ng/mg Cre) during recovery ($n = 9$, $p < 0.01$; fig. 1). There was a significant correlation ($r = 0.712$, $p < 0.001$) between urinary hEGF and Cre clearance (ml/min) and an inverse correlation ($r = -0.406$, $p < 0.05$) between urinary hEGF levels and fractional excretion of sodium. There was no significant correlation between hEGF concentrations in serum and urine ($r = 0.230$, $p < 0.43$). The remarkable decreased level of urinary hEGF was already observed before urinary β_2 -microglobulin and N-acetyl- β -glucosaminidase increased. Thus, urinary hEGF levels

were significantly lower in patients with acute renal failure than in those with normal renal function, and increased toward normal after recovery from the acute phase. Such decreased urinary hEGF cannot be ascribed to decreased clearance resulting from impaired renal function, because serum hEGF levels are very low and only 10% of intravenously injected mouse EGF is excreted in the urine [1]. Furthermore, synthesis of prepro-EGF mRNA in the tubules of the kidney was reported in mice [2]. Therefore, we emphasize that the measurement of urinary hEGF is useful for diagnosing renal damage and recovery of renal tissue from severe tubular injury.

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Recovery phase

References

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