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Urinary renin and angiotensinogen for predicting anti-proteinuric effect of angiotensin receptor blocker

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Objectives: Although urinary angiotensinogen (AGT) and renin were reported to reflect intrarenal renin-angiotensin system activity which is known to be activated in proteinuric chronic kidney disease, the clinical value of urinary AGT and renin during anti-proteinuric treatment is not fully determined. The clinical value of urinary AGT or renin for predicting the anti-proteinuric effect of angiotensin receptor blocker (ARB) was investigated.

Methods: A multicenter, prospective non-controlled study was conducted in 205 patients with overt proteinuria [urinary protein/creatinine ratio (uPCR) \geq 1 mg/mgCr] with maximum follow-up period of 5 years. All patients were treated with valsartan for 24 weeks after a washout period. Urinary AGT/creatinine ratios (uAGT/Cr) at baseline and 24-weeks were measured with baseline renin/creatinine ratio (uR/Cr). The uPCR was followed up at 8-weeks and 24-weeks in all patients. A total of 56 patients were followed up for 5 years.

Results: Patients' age was 47.6 ± 12.5 years and 51.2% were male. Baseline uPCR and eGFR were 2.32 ± 1.43 mg/mgCr and 63.2 ± 28.8 ml/min/1.73m², respectively. Natural logarithms of (ln) uAGT/Cr and uR/Cr were significantly higher in 53 patients with significant reduction of proteinuria (decrease in uPCR \geq 1 mg/mgCr at 24-weeks). Ln(uAGT/Cr), ln(uR/Cr), change in ln(uAGT/Cr) [Δ ln(uAGT/Cr)], DM and baseline uPCR were associated with the degree of proteinuria decrement. In multivariable analysis, Δ ln (uAGT/Cr) and baseline uPCR were identified as independent predictors (OR 0.622, 95% CI 0.493-0.784, $P < 0.001$ and OR 1.907, 95% CI 1.410-2.579, $P < 0.001$, respectively) for proteinuria decrement. Among 56 patients followed up for 5 years, Δ ln(uAGT/Cr) at 24-weeks was an independent predictor for proteinuria decrement over 5 years (OR 0.448, 95% CI 0.268-0.751, $P = 0.002$).

Conclusions: Our study showed that change in urinary AGT excretion has the potential usefulness as a prognostic marker predicting a short-term as well as long-term anti-proteinuric effect of ARB.