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Significance of renal ultrasonography in predicting the renal prognosis in the diabetic patients

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Objectives: Renal disease is associated with diabetes mellitus (DM) has become the leading cause of chronic kidney disease (CKD). Renal ultrasonography is the only imaging investigation required in the work-up of renal disease. We conducted this study to identify the differences in renal ultrasonographic findings between diabetic and non-diabetic patients and to evaluate the relationship between the prognosis and renal ultrasonographic findings in patients with nephropathy.

Methods: A total 252 patients who undergone renal ultrasonography at Chungnam National University Hospital were included. Disease progression was defined as a ≥ (≥ 10% decline in estimated glomerular filtration rate (eGFR)/year or the development of end-stage renal disease. The renal length was measured as the greatest pole-to-pole distance in the sagittal plain. In the sagittal plane, the renal cortical thickness (from medullary pyramid to the capsule) and the renal parenchymal thickness (from the sinus fat to the renal capsule) was measured on the upper, middle and lower thirds of the kidney, and the average was calculated to avoid any bias due to the variability of the border. The renal scoring system was evaluated by sum the following items: echogenicity of renal parenchyma (0: normal, 1: slightly increased, 2: increased), morphology of cortical margin (0: normal, 1: irregular), (RK/Height (RH), CK/Kidney/Height (CKH), PK/Kidney/Height (PKH)) are set to 0 (above median) and 1 (below median).

Results: The diabetic patients had lower eGFR (65.3±19.1, 75.2±20.8, p=0.000) than the non-diabetic those. The diabetic patients had thicker renal parenchymal thickness/kidney/height than the non-diabetic-those in spite of lower eGFR (0.91±0.15, 0.86±0.14, p=0.006). Cox proportional analysis, scoring system, presence of DM, and age were independently associated with renal disease progression after adjusting for confounding variables (hazard ratio [HR]: 1.380 (1.024–1.859), p=0.034).

Conclusions: In conclusion, our results suggest that renal ultrasonography at the time of diagnosis provides useful prognostic information in patients independently of renal function.