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KNOW-CKD 연구에서 나타난 동맥경직도와 신장 기능 감소의 연관성

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Arterial Stiffness as a Risk Factor for Rapid Decline in Renal Function in KNOW-CKD Cohort

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Objective: Patients with chronic kidney disease (CKD) have increased arterial stiffness, which may reduce cushioning function of arteries and disrupt renal endothelial function. It could influence declining of renal function. Here, we explored association between arterial stiffness and declining of renal function, independent from blood pressure.

Methods: We analyzed 736 CKD patients with brachial-to-ankle pulse wave velocity (baPWV) at baseline from the Prospective KoreaN Cohort Study for Outcome in Patients With Chronic Kidney Disease (KNOW-CKD) study. Estimated glomerular filtration rate (eGFR) was calculated at baseline and at 2 years using the Modification of Diet in Renal Disease (MDRD) formula with an isotope dilution mass spectrometry (IDMS) traceable serum creatinine. We defined a rapid decline in renal function as eGFR slope of < -3 ml/min/1.73m^2 per year. baPWV was used as a marker of arterial stiffness. We used multivariable binary logistic regression to analyze risk factors for rapid decline in renal function.

Results: Patients were 52.9±12.1 years old and 58.8% were male. 264 (35.9%) patients exhibited rapid decline in renal function. Median baPWV in rapid decline group was 1,456 (interquartile range; 1,302-1,664 vs. non rapid decline group; 1,432; 1286-1,655) cm/sec. In a multivariable binary logistic regression adjusted with age, gender, mean arterial blood pressure, DM, baseline serum creatinine, hemoglobin, uric acid, albumin, random urine protein-to-creatinine ratio, log baPWV (OR, 12.8; 95% confidence interval, 1.2 to 134.4; p=0.033) was a significant risk factor for rapid decline in renal function. In subgroup of patients who measured initial heart-to-femoral PWV (n=414), log hfPWV (OR, 46.1; 95% confidence interval, 1.6 to 1337.7; P=0.026) after adjustment was also an independent risk factor for rapid decline in renal function.

Conclusion: Arterial stiffness is a risk factor for rapid decline in renal function, independently from systemic blood pressure. Regular measurement of and therapeutic effort to improve arterial stiffness is warranted for CKD patients.

Key Words: 동맥경직도, 만성신부전, 사구체 여과율
Pulse wave velocity, Chronic kidney disease, GFR