

Association of Pulse Wave Velocity and Pulse Pressure with Decline in Kidney Function

Chang Seong Kim, Ha Yeon Kim, Yong Un Kang
Joon Seok Choi, Eun Hui Bae, Seong Kwon Ma, Soo Wan Kim

Department of Internal Medicine, Chonnam National University Medical School, Gwangju, Korea

Introduction: The association of arterial stiffness and kidney function decline in patients with mild-to-moderate chronic kidney disease (CKD) is not well established. This study investigated whether pulse wave velocity (PWV) and pulse pressure (PP) are independently associated with glomerular filtration rate (GFR) and rapid kidney function decline in early CKD.

Methods: Carotid femoral PWV (cfPWV), brachial-ankle PWV (baPWV), and PP were measured in a cohort of 913 patients (mean age, 63 ± 10 years; baseline estimated GFR, 84 ± 18 ml/min/1.73m²). Estimated GFR was measured at baseline and at follow-up. The renal outcome examined was rapid kidney function decline (estimated GFR loss, >3 ml/min/1.73m² per year). The median follow-up duration was 3.2 years.

Results: Multivariable adjusted linear regression model indicated that arterial PWV (both cfPWV and baPWV) and PP increased as estimated GFR declined, but neither was associated with kidney function after adjustment for various covariates. Multivariable logistic regression analysis found that cfPWV and baPWV were not associated with rapid kidney function decline (odds ratio [OR]=1.39, 95% confidence interval [CI]=0.41-4.65; OR=2.51, 95% CI=0.66-9.46, respectively), but PP was (OR=1.22, 95% CI=1.01-1.48, $p=0.045$).

Conclusions: Arterial stiffness assessed using cfPWV and baPWV was not correlated with lower estimated GFR and rapid kidney function decline after adjustment for various confounders. Thus, PP is an independent risk factor for rapid kidney function decline in population with relatively preserved kidney function (estimated GFR ≥ 30 ml/min/1.73m²).

Key Words: Arterial stiffness, GFR