Low ankle brachial index is associated with cardiovascular events in patients with chronic kidney disease; result from the KNOW-CKD study

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Objectives: Vascular calcification of the media is an independent and strong predictor of cardiovascular risk in patients with chronic kidney disease (CKD). Ankle brachial index (ABI) is a useful tool for diagnosis of medial calcification as well as peripheral artery disease. However, few studies are reported its relation to the renal progression and risk of cardiovascular events in patients with CKD.

Methods: In this prospective longitudinal study, we enrolled 2115 patients from the KoreaN cohort study for Outcome in patients with CKD (KNOW-CKD). The patients were categorized into low ABI (≤ 0.9), borderline ABI (0.9–1.1), normal ABI (1.1–1.3), or high ABI (≥ 1.3). The relationship between ABI and cardiovascular events (myocardial infarction, stroke, cerebral hemorrhage, or congestive heart failure), renal progression (as ≥ 50% decline of estimated glomerular filtration rate (eGFR), doubling of serum creatinine, or start of dialysis) was analyzed using Cox regression.

Results: Renal progression and cardiovascular events were occurred 330 (15.6%) and 86 (4.3%) in patients, respectively, during the median follow-up of 26.9 months. Compared to patients with high ABI, patients with low ABI had a lower prevalence of renal progression (low ABI: 17.5% vs. high ABI: 24.7%), whereas had a higher risk of cardiovascular events (low ABI: 17.3% vs. high ABI: 7.2%). In Cox regression model, patients with low ABI were at higher risk of cardiovascular events even after adjustments (hazard ratio [HR], 4.41; 95% confidence interval [CI], 1.63–11.9; P = 0.003), but high ABI had no significant risk of cardiovascular events (HR, 1.18; 95% CI, 0.46–3.07; P = 0.731) than those with normal ABI. However, there was no significant association between patients with low or high ABI and a risk of renal progression after adjustment.

Conclusions: Low ABI (≤ 0.9) is related to higher risk of cardiovascular events in patients with CKD.