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Risk factors of arterial stiffness in chronic kidney disease depending on diabetes mellitus: Data analysis from the KoreaN Cohort Study for Outcomes in Patients with Chronic Kidney Disease (KNOW-CKD)

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Objectives: Pulse wave velocity (PWV) as a parameter of arterial stiffness is known to be related to degree of renal dysfunction. Also different factors are studied to be associated with PWV depending on presence of diabetes mellitus (DM).

Methods: Of 2,238 patients enrolled in the KoreaN cohort study for Outcomes in patients With Chronic Kidney Disease (KNOW-CKD), 1,656 patients were eligible for analysis using PWV and status of metabolic syndrome. By matching for age and sex, 412 patients were included in each group according to the presence of DM. We analyzed factors related to PWV in DM and non-DM group. Mean brachial-ankle PWV was used.

Results: Mean age was 59.1±9.1 years, and men accounted for 70%. Proportion of patients with hypertension was not different in both group. Metabolic syndrome was more prevalent in DM group (94.1%) than in non-DM group (56.1%). Estimated glomerular filtration rate (eGFR) was higher in non-DM group (48.4±26.2 ml/min/1.73m^2) than in DM group (35.3±20.9 ml/min/1.73m^2). PWV was significantly higher in DM group (1,800±381 cm/s) than in non-DM group (1,549±325 cm/s) (P<0.001). PWV increased as CKD stage goes up in non-DM group, while it did not show such linear relationship in DM group. The risk for increased PWV increased with higher systolic blood pressure (OR 1.06, 95% CI 1.03-1.08, P<0.001) and decreased with higher eGFR (OR 0.99, 95% CI 0.98-1.00, P=0.002) in non-DM group. Higher systolic blood pressure (OR 1.03, 95% CI 1.01-1.06, P<0.001) and lower age (OR 0.96, 95% CI 0.93-0.99, P<0.001) was associated with risk of increased PWV in DM group.

Conclusions: PWV was higher in patients with higher systolic blood pressure and lower eGFR in case of CKD without DM, and PWV was higher in patients with higher systolic blood pressure and younger age in case of CKD with DM.