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The association of Hyperkalemia with arterial stiffness in patients with peritoneal dialysis

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Objectives: The arterial stiffness is derived from endothelial dysfunction, which is affected by age, blood pressure, diabetes, and dyslipidemia. In healthy person, there are several reports that show a good effect of high potassium diet for vascular and endothelial function. But, in dialysis patients, the high potassium affects the adverse outcome. We evaluated the association of potassium with arterial stiffness through the pulse wave velocity (PWV) in peritoneal dialysis patients.

Methods: We evaluated 50 patients undergoing peritoneal dialysis. We measured the brachial-ankle pulse wave velocity (BaPWV) to assess the arterial stiffness in all patients. The mean value of BaPWV of right and left legs was analyzed in this study.

Results: The mean age of patients was 51 ± 12.8 years old and the proportion of men was 46%. The common cause of dialysis were hypertension (44%) and diabetes (30%). The 24-hours mean systolic blood pressure was 142.8 ± 21.27 mmHg. In laboratory values, the mean value of potassium was 5.57 ± 6.47 mEq/L. The glucose was 117.8 ± 40.7 mg/dl. Lipid profile (triglyceride, low-density lipoprotein) were 154.0 ± 162.8 and 95.7 ±39.3 mg/dl. The mean BaPWV of both leg was 1663.3 ± 372.72 m/s. In correlation and linear regression analysis, the potassium showed a positive relation with BaPWV (r=0.279, p=0.050). In linear regression analysis, after adjustment of age, sex, smoker, alcohol drinker, cardiovascular disease, 24-hours mean systolic blood pressure, other laboratory finding (glucose, lipid profile, etc) and drugs, the potassium showed significant positive association with BaPWV (β=0.376, p=0.011).

Conclusions: Hyperkalemia in peritoneal dialysis patients showed a positive association with BaPWV as significant as other risk factors. BaPWV is a strong indicator of arterial stiffness, thus the higher potassium in peritoneal dialysis patients could affect arterial stiffness.