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Association between vascular calcification and residual renal function in patients on hemodialysis with urination

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Objectives : Vascular calcification (VC) is common and may affect cardiac function in patients with end-stage renal disease (ESRD). Little is known about the effect of residual renal function (RRF) on VC in patients on hemodialysis (HD).

Methods : One hundred six patients with RRF on maintenance HD for 3 months were recruited between January 2014 and February 2015. We used residual renal urea clearance (KRU) to measure RRF. To assess VC severity, we conducted abdominal aortic calcification score (AACS) analysis, ambulatory blood pressure monitoring, and brachial-ankle pulse wave velocity. We also performed echocardiography to evaluate cardiac function.

Results : Mean patient-age, median dialysis duration, and proportion of non-diabetic patients on HD were 59.1 ± 11.0 years, 28.4 (10.9 – 49.2) months, and 43.4 %, respectively. The median KRU was 0.9 (0.3 –2.5) mL/min/1.73m2. AACS (4.0 [1.0 – 9.5] vs. 3.0 [0.0 – 7.5], P = 0.05) was significantly higher in patients with a KRU < 0.9 mL/min/1.73m2 than a KRU ≥ 0.9 mL/min/1.73m2. KRU affected AACS (ß = −0.280, P= 0.002) after factor adjustment. In non-diabetic patients with ESRD, KRU was significantly correlated with AACS (ß = −0.314, P = 0.037) after factor adjustment. The proportion of left ventricular diastolic dysfunction was significantly higher in patients with a KRU < 1.0 mL/min/1.73m2 than in those with a KRU > 1.0 mL/min/1.73m2 (636 % vs. 33.3%, P = 0.040).

Conclusions : AACS was independently associated with RRF deterioration. In non-diabetic patients on HD, left ventricular diastolic dysfunction was correlated with RRF.

Keywords : vessel, calcification, residual renal function