

Clinical Significance of Central Arterial stiffness and Aortic calcification in a Cross-Sectional Study of Hemodialysis Patients

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Backgrounds: Cardiovascular disease is leading cause of death in chronic kidney disease. It is hypothesized that non-traditional risk factors such as arterial stiffness (AS) and vascular calcification (VC) play role in cardiovascular events. The present study was aimed to investigate the relationship between regional AS and VC in hypertensive and hemodialysis (HD) patients and identify additional contributing factors.

Methods: We report cross-sectional data on 65 patients with hypertension and 61 HD patients. Patients had pulse wave velocity (PWV), abdominal computed tomography (CT) scans, and serum markers of mineral metabolism.

Results: Mean heart femoral (hf) PWV (9.72 ± 2.16 vs. 11.3 ± 3.20 m/s, $p < 0.01$), brachial ankle (ba) PWV (13.80 ± 2.95 vs. 17.76 ± 4.79 m/s, $p < 0.01$) were significantly increased in HD group than those of hypertensive group. Highest aortic VC score was 387.4 ± 295.2 hounsfield units (HU), calcification numbers were 2.69 ± 2.43 with 73.6% of subjects having some aortic VC present in HD group. In univariate linear regression analysis, hfPWV correlated positively with age ($r = 0.613$, $p < 0.01$), pulse pressure ($r = 0.540$, $p < 0.01$), highest aortic VC (HU) ($r = 0.483$, $p < 0.01$), gender ($r = 0.354$, $p < 0.05$) and diabetes ($r = 0.331$, $p < 0.05$). Aortic VC correlated positively with pulse pressure ($r = 0.483$, $p < 0.01$), age ($r = 0.392$, $p < 0.01$) and dialysis duration ($r = 0.389$, $p < 0.05$). In multivariate regression analysis, old age and diabetes, male, high pulse pressure and dialysis duration were significantly associated with PWV in order. Whereas high pulse pressure, dialysis duration, age were significant factor for aortic VC. In dialysis patients, arterial stiffness and vascular calcification in diabetics were to be more prevalent and advanced than that in non-diabetics.

Conclusion: There is a high prevalence of VC in HD patients, and it strongly correlated with central AS. Therefore, PWV may be useful for assessment of CV risk in end-stage renal disease.

Key Words: 심혈관질환, 혈관석회화, 투석

Cardiovascular disease, Vascular calcification, Dialysis