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Dialysis

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Association of coronary artery calcification and arterial micro-calcification of the vascular access in incident hemodialysis patients

Yeongbok Lee*, Young Ok Kim, Bo Mi Choi, Young Soo kim, Sun Ae yoon

Background: We have reported that arterial micro-calcification (AMiC) of vascular access has a negative impact on access patency and cardiovascular mortality in hemodialysis (HD) patients. Reasons behind increased cardiovascular mortality in AMiC are not fully understood, but it is believed that aortic stiffness is a major contributing factor. Whereas, coronary artery calcification (CAC) is quite common in HD patients and it is known as predictor of future cardiovascular events and all-cause mortality in HD patients. The aim of this study was to explore the relationship between AMiC and CAC in HD patients.

Methods: 119 HD patients who received vascular access operation were included in this study. The AMiC was diagnosed by pathologic examination of arterial specimen by von Kossa stain, which was acquired during the operation. All patients underwent a multi-detector computed tomography (MDCT) imaging procedure and coronary artery calcium score (CACS) was calculated. Patients were classified into two groups, according to the CACS, as high (≥ 100), in 67 patients, and low (<100), in 52 patients. We compared AMiC and several parameters between the patients with high and low CACS groups.

Results: Mean age was 64.3 ± 13.0 years and the male gender was 63.9% ($n=76$). The incidence of AMiC was 56.3% ($n=67$). The mean CACS was 430.4 ± 720.2 and distributed from zero to 3954.4. Patients with high CACS group were older (69.3 ± 9.7 vs. 57.8 ± 14.0 , $p<0.05$), and showed a significantly higher prevalence of diabetes mellitus (74.6% vs. 55.8%, $p<0.05$). High CACS group showed high incidence of AMiC compared to low CACS group (73.1% vs. 43.7%, $p<0.05$). By binary logistic regression, older age, diabetes mellitus and AMiC was independently associated with high CACS.

Conclusion: The present study suggests that AMiC is closely associated with CAC in incident HD patients.

Keywords: coronary artery calcification, hemodialysis, vascular calcification