

동정맥루 혈관 미세석회화가 동맥경직도 및 내피세포 기능부전에 미치는 영향

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The Impact of Arterial Micro-calcification on Aortic Stiffness and Endothelial Dysfunction in Patients with End-stage Renal Disease

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Purpose: We previously reported that arterial micro-calcification (AMC) at vascular access operation site is common and closely associated with early failure of vascular access in patients with end-stage renal disease (ESRD). Although vascular gross calcification by radiologic study is known as an independent risk factor for cardiovascular morbidity and mortality in ESRD patients, the role of AMC by histologic evaluation is not reported yet.

Methods: Sixty-five ESRD patients awaiting vascular access operation were included in this study. Before the operation, gross calcification of the aortic arch and the radial artery was measured with plain X-ray (chest and wrist X-ray). Aortic stiffness and flow mediated dilation were evaluated with brachial-ankle pulse wave velocity (baPWV) and flow mediated dilatation (FMD) of the brachial artery, respectively. Diagnosis of AMC was made by microscopic analysis with von kossa staining.

Results: Mean age of the patients was 60±12 years and patients with diabetes mellitus (DM) accounted 70.8%. The gross calcification was detected in 29 out of the 65 aortic arches (44.6%) and 5 out of the 27 radial arteries (18.5%). The arterial specimens were obtained from 47 radial arteries and 18 brachial arteries. The AMC was detected in 36 patients (55.4%). The AoAC score was higher in the positive AMC group (n=36) compared to the negative AMC group (n=29) (17.8±17.1% vs. 5.1±12.3%, p=0.001). The baPWV was also higher in the positive AMC group, compared to the negative AMC group (26.5±9.4 m/s vs. 19.8±6.6 m/s, p=0.006). But there was no difference in FMD between the two groups (5.4±2.6% vs 5.7±3.5%, p=0.764). The positive AMC group had higher incidence of DM (91.6% vs 44.8%, p=0.001), systolic blood pressure (156±23 mmHg vs. 143±25 mmHg, p=0.036) and pulse pressure (67±9 mmHg vs. 55±17 mmHg, p=0.014) than the negative AMC group.

Conclusion: This data showed that AMC at vascular access operation site was related to baPWV but not to FMD in ESRD patients. Therefore we suggest that AMC is associated with cardiovascular morbidity and mortality via aortic stiffness in ESRD patients.

Key Words: 동맥 미세석회화, 동맥경직도, 심혈관질환

Arterial microcalcification, PWV, Cardiovascular morbidity