BIOCHEMICAL AND CLINICAL CORRELATION OF INTRAPLQUE NEOVASCULARIZATION USING CONTRAST-ENHANCED ULTRASOUND OF THE CAROTID ARTERY

Background: Several biomarkers reflecting inflammatory or proteolytic activity have been known to represent plaque vulnerability. Moreover, a recent study confirmed that contrast-enhanced ultrasound (CEUS) can visualize intraplaque neovascularization (IPN) and demonstrate plaque vulnerability. In this study, we tried to demonstrate that IPN detected by CEUS was correlated with several well-known biomarkers and clinical outcome in patients with coronary artery disease (CAD).

Methods: Patients with stable CAD were screened by conventional carotid ultrasound and patients with carotid plaque thickness more than 2 mm were performed by CEUS for the presence of IPN. Plasma levels of biomarkers and clinical outcomes were evaluated.

Results: Among consecutive 89 patients fulfilled the inclusion criteria, 30 patients without IPN (group 1) and 59 patients with IPN (group 2) were analyzed. There were no significant difference in baseline characteristics except for mean age (62.9±10.1 yrs versus 68.4±9.6 yrs, p=0.015). On multivariate analysis, only MMP-9 (p=0.021, 95% CI 1.002-1.027) showed a significant association with IPN. But patients with IPN showed only trend for a history of cardiovascular disease (CVD) (44% versus 30%, p=0.19) and one-year cardiovascular events (CVE) (8.3% versus 3.3%, p=0.36) compared to group 1. Maximum plaque thickness (p= 0.04, 95% CI 1.230-6.322) showed a significant correlation with the clinical outcome including CVD or CVE.

Conclusions: MMP-9 correlated with IPN on CEUS. For clinical implication, however, large prospective studies are needed.