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RELATION BETWEEN PLASMA GLUCAGON-LIKE PEPTIDE-1 LEVELS AND TISSUE CHARACTERISTICS OF CORONARY PLAQUE IN PATIENTS WITH CORONARY ARTERY DISEASE

ACC Moderated Poster Contributions
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Background: Diabetes mellitus (DM) is well recognized to be a major risk factor for coronary artery disease (CAD). Incretin is a gut-derived peptide and one of the enhancers of insulin secretion. Previous studies have reported that a major incretin, glucagon-like peptide-1 (GLP-1), is decreased in patients with DM. GLP-1 analogue is widely used to treat DM in the clinical setting, and is expected to reduce the incidence of CAD. However, there is no evidence regarding the association between blood levels of GLP-1 and coronary plaque characteristics. We sought to assess whether plasma GLP-1 levels are associated with coronary plaque characteristics.

Methods: A total of 78 culprit coronary vessels in patients with CAD who underwent percutaneous coronary intervention (PCI) were examined by integrated backscatter intravascular ultrasound (IB-IVUS) before PCI, using a 40-MHz intravascular catheter. Patients with previous diagnosis of DM and HbA1c of more than 6.5% were excluded. We evaluated plaque components for all available frames (mean length of 68mm) in the target vessel prior to PCI by IB-IVUS analysis at 1-mm intervals. All patients underwent a 75-g oral glucose tolerance test (75-g OGTT) and plasma GLP-1 response was evaluated by the area under the GLP-1 concentration-time curve (AUC GLP-1) from 0 to 120 minutes. The patients were divided into 3 groups according to the tertile of AUC GLP-1 levels.

Results: Patients in the low tertile of AUC GLP-1 had a significantly greater percentage lipid area than did patients in the intermediate and high tertiles (low tertile vs. intermediate tertile vs. high tertile; 56.5 ± 10.7% vs. 49.2 ± 15.0% vs. 48.1 ± 11.3%, $p < 0.05$ by analysis of variance [ANOVA]) and a smaller percentage fibrosis area (33.7 ± 8.3% vs. 44.0 ± 12.7% vs. 44.6 ± 8.7%, $p < 0.05$ by ANOVA). Multiple regression analysis showed that the low tertile of AUC GLP-1 was associated with percentage lipid area independent of age, gender, DM, and other coronary risk factors ($p < 0.05$).

Conclusions: Low levels of plasma GLP-1 during 75-g OGTT is associated with an increased lipid content in patients with CAD, suggesting that plaque vulnerability is increased in this subgroup of patients.