POSTPRANDIAL GLUCAGON-LIKE PEPTIDE-1 LEVELS REFLECT IMPAIRED GLUCOSE TOLERANCE AND EXTENT OF CORONARY ATHEROSCLEROSIS IN NON-DIABETIC PATIENTS WITH CORONARY ARTERY DISEASE

ACC Poster Contributions
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Background: Previous studies have suggested that postprandial hyperglycemia contributes to atherogenesis, and impaired glucose tolerance (IGT) is considered an important risk factor for coronary artery disease (CAD). Glucagon-like peptide-1 (GLP-1) is a gut-derived incretin hormone stimulating insulin secretion, and incretin effect is known to be reduced in type 2 diabetes. However, the impact of incretin on IGT and coronary atherosclerosis in non-diabetic subjects has not been well clarified.

Methods: We evaluated plasma GLP-1 levels by immunoassay using blood samples obtained during 75 g oral glucose tolerance test (before and at 30, 60, 120 min after glucose ingestion) in 45 non-diabetic patients with angiographically detected CAD. Extent of coronary atherosclerosis was assessed by previously validated scoring system (extent score).

Results: Patients with IGT (n=28) had higher proportion of male (93 vs. 59 %, p=0.017) and multi-vessel disease (71 vs. 29 %, p=0.014) as well as higher extent score (29.5 vs. 21.0, p=0.010) than those with normal glucose tolerance (NGT). GLP-1 levels did not differ between IGT and NGT at baseline (2.5 vs. 2.5 pmol/L, p=0.906), 30 min (4.8 vs. 7.9 pmol/L, p=0.061) and 60 min after load (4.0 vs. 4.5 pmol/L, p=0.378). In contrast, 2-hour GLP-1 was significantly lower in IGT than in NGT (3.9 vs. 5.9 pmol/L, p=0.005), and 2-h GLP-1 correlated inversely with 2-h glucose levels (r=-0.36, p=0.018). Multivariate logistic regression identified 2-h GLP-1 as a determinant of IGT independent of age, sex, body mass index, and homeostasis model assessment of insulin resistance (odds ratio; 0.16, p=0.015). Moreover, patients with multi-vessel disease had lower 2-h GLP-1 than those with single vessel disease (3.8 vs. 6.0 pmol/L, p=0.003), and 2-h GLP-1 correlated inversely with extent score (r=-0.39, p=0.010).

Conclusions: Reduced GLP-1 response is associated with IGT independently of insulin resistance and also correlates with more extensive coronary atherosclerosis in non-diabetic CAD patients. Our findings suggest that therapeutic approaches for enhancing incretin action may ameliorate glucose intolerance and reduce the development of CAD in non-diabetic subjects.