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IMPACT OF DAILY GLUCOSE FLUCTUATION ON CORONARY PLAQUE VULNERABILITY IN PATIENTS PRETREATED WITH LIPID LOWERING THERAPY

Poster Contributions

Hall C

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Background: There has been growing evidence that the glucose fluctuation is an important contributing factor to the development of coronary artery disease (CAD) as residual risk beyond dyslipidemia.

Objective: This study sought to investigate the impact of daily glucose fluctuation on coronary plaque character in CAD patients pretreated with lipid lowering therapy.

Methods: In this prospective study, 60 consecutive CAD patients referred to percutaneous coronary intervention whose low density lipoprotein (LDL) cholesterol level < 120 mg/dl with statin or < 100 mg/dl without statin were enrolled. In addition to culprit lesions, non-culprit angiographically mild-to-moderate narrowing lesions were evaluated with virtual histology intravascular ultrasound (VH-IVUS), and the volume percentage of necrotic core within the plaque (%NC) and the presence of thin-cap fibroatheroma (TCFA) were evaluated. Daily glucose fluctuation was analyzed by continuous glucose monitoring system (CGMS), and the standard deviation of the 24-hour blood glucose level (glycemic SD) was calculated. The impact of glycemic SD as well as other coronary risk factors on %NC and the presence of TCFA were assessed.

Results: Among the study subjects, LDL cholesterol was 87.0 ± 18.2 mg/dl and Hemoglobin A1c was 6.4 ± 1.0 %. Oral glucose tolerance test revealed the proportion of diabetes and impaired glucose tolerance were 56.7% and 28.3%, respectively, and only 15% showed normal glucose tolerance. A total of 143 plaques were evaluated in 60 patients: 88 plaques in 34 diabetic patients, and plaques of culprit lesion were 32.2%. %NC by VH-IVUS was well correlated with the glycemic SD by CGMS ($r=0.511$, $P<0.001$). A multiple linear regression analysis showed that the glycemic SD had the most strong effect on the %NC (standardized coefficient $\beta=0.479$, $P<0.001$). Moreover, after multiple logistic regression analysis, the glycemic SD remained the only independent risk factor of the presence of TCFA (Odds Ratio 1.083; 95% CI 1.025-1.145, $P=0.005$).

Conclusion: The daily glucose fluctuation may have an impact on coronary plaque vulnerability in CAD patients pretreated with lipid lowering therapy.