RELATION BETWEEN HYPERINSULINEMIA AND TISSUE CHARACTERISTICS OF NON-CULPRIT PLAQUE IN NON-DIABETIC PATIENTS WITH ACUTE CORONARY SYNDROMES

ACC Poster Contributions
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Authors: Takayuki Mitsuhashi, Kiyoshi Hibi, Masami Kosuge, Sakano Tomokazu, Naohiro Komura, Ikuyoshi Kusama, Fumiyuki Otsuka, Mitsuaki Endo, Noriyuki Iwahashi, Jun Okuda, Kengo Tsukahara, Toshiaki Ebina, Satoshi Umemura, Kazuo Kimura, Yokohama City University Medical Center, Yokohama, Japan, Yokohama City Unvercity Graduate School of Medicine, Yokohama, Japan

Background: Hyperinsulinemia is associated with elevated risk of acute coronary events even before the onset of diabetes. However, the precise mechanism remains to be elucidated. The aim of this integrated backscatter intravascular ultrasound (IB-IVUS) study was to clarify the association between hyperinsulinemia and the tissue characteristics of coronary plaques in non-diabetic patients with acute coronary syndrome (ACS).

Methods: Non-culprit coronary lesions with mild to moderate stenosis in 82 non-diabetic patients with ACS were examined by IB-IVUS, using a 40-MHz intravascular catheter. IB-IVUS measurements were at 1-mm intervals for a 10-mm length of plaque, and average values of each plaque component were calculated. In addition, 42 available plaques in the left main coronary artery (LMCA) were also analyzed. All patients underwent a 75-g oral glucose tolerance test to calculate the area under the insulin-concentration-time curve (AUC insulin) from 0 to 120 minutes.

Results: Patients in the high tertile of AUC insulin had a significantly greater % lipid area and absolute lipid volume than did patients in the intermediate and low tertiles (tertile 3 vs. tertile 2 and tertile 1, 37.6 ± 16.6% vs. 25.8 ± 11.9% and 27.5 ± 14.7%, p < 0.01, and 29.9 ± 22.6mm3 vs. 15.3 ± 12.6mm3 and 17.7 ± 12.7mm3, p < 0.01, respectively) and a significantly smaller % fibrosis area (tertile 3 vs. tertile 2 and tertile 1, 55.0 ± 11.5% vs. 61.7 ± 9.4% and 60.7 ± 9.4%, p < 0.05). Multiple regression analysis showed that the high tertile of AUC insulin was independently associated with an increased % lipid area (p < 0.05). In analyzable plaques in the LMCA, patients in the high tertile of AUC insulin had a significantly greater % lipid area than those in the intermediate and low tertiles (tertile 3 vs. tertile 2 and tertile 1, 45.5 ± 15.9% vs. 36.4 ± 19.9% and 29.9 ± 12.1%, p < 0.05).

Conclusions: Hyperinsulinemia is associated with an increased lipid content of non-culprit intermediate lesions in non-diabetic patients with ACS, suggesting that plaque vulnerability is increased in this milieu. Our results may give additional insights into the management of non-diabetic patients with hyperinsulinemia.