Comparison of coronary atherosclerotic features in response to achieving LDL-C <55 mg/dl between non-diabetic and diabetic patients: insights from the REASSURE-NIRS registry

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Introduction: Current ESC guideline recommends achieving LDL-C <1.4 mmol/l in very high-risk subjects. Despite fabvourable anti-atherosclerotic effects of lowering LDL-C, its efficacy is diminished in type 2 diabetic patients. Whether response of coronary atheroma to on-treatment LDL-C <1.4 mmol/l differs in diabetic and non-diabetic subjects has not been elucidated yet.

Methods: The REASSURE-NIRS registry is an on-going multi-center registry to enroll CAD subjects receiving PCI under the guidance of near-infrared spectroscopy/intravascular ultrasound (NIRS/IVUS: DualProTM, Nipro, Tokyo, Japan) imaging. Culprit lesions in 557 CAD patients who already received a statin were evaluated by NIRS/IVUS. Maximum 4-mm-lipid-core burden-index (maxLCBI4mm) and plaque calcification grade at culprit sites were measured. Calcification grade at each 1-mm cross-sectional image was defined as follows: calcium arc 0° = 0, 0–90° = 1, 90–180° = 2, 180–270° = 3, 270–360° = 4. MaxLCBI4mm and the averaged calcification grade were compared in diabetic and non-diabetic subjects stratified according to on-treatment LDL-C level, respectively.

Result: The proportion of diabetic (n=293, HbA1c; 6.9±0.9%) and non-diabetic patients (n=264) with on-treatment LDL-C <1.4 mmol/l was 8.54 and 16.67%, respectivey (p=0.01). In non-diabetic patients, achieving LDL-C <1.4mmol/L was associated with a lower maxLCBI4mm, whereas, in diabetic patients, maxLCBI4mm was numerically smaller under achieving LDL-C <1.4 mmol/l, but this comparison did not meet statistical significance (Figure 1). Furthermore, a greater degree of calcification grade in non-diabetic patients was observed in association with on-treatment LDL-C level (Figure 2). However, plaque calcification at diabetic coronary atheroma was not necessarily induced under achieving stricter LDL-C goal. Subgroup analysis demonstrated that diabetic patients with body mass index ≥25 (odds ratio = 0.15; 95% CI: 0.18–1.19, p=0.04), estimated glomerular filtration rate <60 (mL/min/1.73m^2) (odds ratio = 0.31; 95% CI: 0.10–0.90, p=0.03) and non-insulin use (odds ratio = 0.36; 95% CI: 0.14–0.87, p=0.02) benefit from achieving LDL-C <1.4 mmol/l.

Conclusion: Achieving LDL-C <1.4 mmol/l was associated with more stabilized atheroma in non-diabetic patients with CAD, whereas these favourable effects were not observed in diabetic subjects. Our findings suggest the potential need to modify additional atherogenic risks for stabilizing diabetic coronary atheroma under achieving LDL-C <1.4 mmol/l.

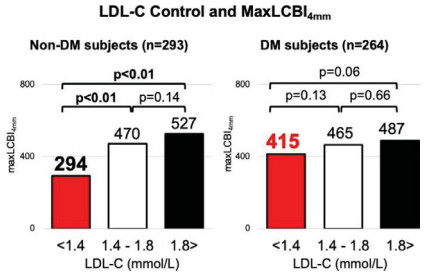

Figure 1

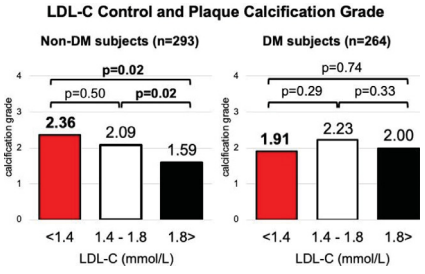

Figure 2