Lack of statin therapy is associated with plaque instability in non-culprit non-ischemic lesions of diabetic patients – data from the COMBINE OCT-FFR study

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Background: Effect of statin therapy on coronary plaque stabilisation and reducing adverse cardiovascular events is well known both in primary and secondary prevention. Nevertheless, there is a paucity of data presenting the impact of statins on plaque morphology as assessed by optical coherence tomography (OCT).

Purpose: The goal of this analysis was to evaluate the plaque morphology using OCT within non-culprit, non-ischaemic coronary lesions in diabetes mellitus (DM) patients with or without statin pre-treatment.

Methods: All patients of the COMBINE (FFR-OCT) trial underwent fractional flow reserve (FFR) measurement followed by OCT in FFR negative lesions. OCT recorded the presence of thin-cap fibroatheroma (TCFA), plaque rupture (PR), plaque erosion (PE) and calcified nodule (CN).

Results: From the 391 patients, 82 (21%) had no statin at baseline. OCT was performed in 463 lesions of which 96 lesions assessed in statin naive and 367 lesions in statin treated group. The median angiographic diameter stenosis was 50% and the median FFR value was 0.88 in both groups (p=0.953 and p=0.448, respectively). Myocardial infarction (MI) at presentation was 16.6% and did not differ between groups (p=0.380). Patients without statin pre-treatment were characterized by lower rate of known hypercholesterolemia (47.6% vs. 63.0%; p=0.011), male gender (52.4% vs. 65.7%; p=0.027), active smokers (8.5% vs. 22.3%; p=0.004) and previous MI (22.0% vs. 35.3%; p=0.022) as compared to patients with statin pre-treatment, respectively. The results of the qualitative OCT findings see in Table 1.

Conclusions: Non-ischemic lesions of DM patients without statin pre-treatment showed more vulnerable and instable plaque features like wider lipid arc, thinner fibrotic cap and a higher prevalence of lipid-rich plaque, TCFA and PR suggesting a stabilizing effect of statins on non-ischemic atherosclerotic lesions.

Table 1

	Without statin pre-treatment (n=96)	With statin pre-treatment (n=367)	All lesions (n=463)	p
Fibroatheroma	74 (77.1)	295 (80.4)	369 (79.7)	0.474
Calcified plaque	84 (87.5)	317 (86.4)	401 (86.6)	0.773
Calcium arc (°)	147 [89–231]	138 [81–234]	143 [83–234]	0.789
Lipid-rich plaque	77 (80.2)	242 (65.9)	319 (68.9)	0.007
Lipid arc (°)	226 [176–272]	180 [129–245]	193 [138–251]	<0.001
Cap thickness (μm)	93 [61–159]	118 [65–200]	112 [64–187]	0.008
Thin-cap fibroatheroma	32 (33.3)	63 (17.2)	95 (20.5)	<0.001
Plaque rupture	16 (16.7)	35 (9.5)	51 (11.0)	0.047

Values are n (%) or median [first quartile–third quartile].