

TCT-562

Impact of Serum LDL and Statin Therapy on Coronary Plaque Morphology: An OCT and IVUS Co-registered Study



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BACKGROUND We sought to investigate the association between serum LDL cholesterol, statin use, plaque vulnerability, and lipid composition using both optical coherence tomography (OCT) and intravascular ultrasound (IVUS).

METHODS We retrospectively analyzed 805 pts with CAD (38.9% acute coronary syndromes [ACS]) who underwent coronary intervention. IVUS plaque burden (plaque/vessel) was assessed at the minimum lumen area site; volume indices (mean angle × length) of lipids, macrophages, calcium, and fibrous cap thickness by OCT were measured for the entire lesion. Pts were divided into tertiles stratified by LDL and compared.

RESULTS The median pt age was 66 years with 82.0% men, 34.4% with diabetes, and 53.4% with no pre-admission statins. Median lesion length was 22.6 mm, and 30.5% had a thin-cap fibroatheroma. Macrophage and lipid volume indices and plaque burden were greatest in the high LDL tertile and lowest in the low LDL tertile; calcium volume index was the lowest and the fibrous cap was the thinnest in the high LDL tertile. Value of p for trend <0.05 in all plaque morphology parameters in different LDL group. In the multivariable linear regression model (Table, all p<0.05), after adjusting for clinical risk factors (age, sex, smoking, diabetes, renal insufficiency, ACS, and statin use), LDL was independently associated with the morphological findings. Statin use pre-admission was independently associated with fibrous cap thickness and lipid volume index.

Independent variable	LDL Tertile			Multivariate Linear Analysis Regression Coefficient	
	Low (78 mg/dL [66-86]) (n=265)	Intermediate (107 mg/dL [99-115]) (n=267)	High (142 mg/dL [130-157]) (n=273)	LDL	Statin use
Fibrous cap thickness (µm)	90 (60-130)	83 (60-120)	70 (60-120)	—	10.2 (1.1 to 19.3)
Macrophage volume index (degree*mm)	322 (141-557)	365 (149-583)	383 (199-666)	1.0 (0.2 to 1.7)	—
Lipid volume index (degree*mm)	1157 (496-1893)	1329 (649-2156)	1582 (959-2477)	5.3 (2.8 to 7.7)	-207 (-387 to -27)
Calcification volume index (degree*mm)	285 (30-838)	180 (41-724)	122 (0-482)	-2.5 (-4.5 to -0.6)	—
IVUS Plaque burden (%)	83.2 (77.6-87.8)	85.4 (79.9-89.1)	85.9 (81.7-89.1)	0.02 (0.005 to 0.035)	—

CONCLUSION OCT-assessed plaque vulnerability was associated with LDL levels irrespective of statin treatment.

CATEGORIES IMAGING: Intravascular

TCT-563

Early vascular responses to everolimus-eluting cobalt-chromium stent for the treatment of ST-elevation acute myocardial infarction: the results of the MECHANISM-AMI study 3-months OCT follow-up cohort



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BACKGROUND Recently, everolimus-eluting cobalt chromium stent (EES) is widely accepted as treatment for ST-segment elevation myocardial infarction (STEMI) patients, and some reports showed lower incidence of stent thrombosis than bare-metal stent especially in early phase after stenting. Though, the vessel healings during this period were still unclear.

METHODS The MECHANISM-AMI study is designed to reveal early vascular responses of EES for STEMI patients using optical coherence tomography (OCT). Patients were prospectively registered in either 2-week (2-W) or 3-month (3-Mo) scheduled OCT follow-up cohort. In addition to standard OCT parameters, incidence of intra-stent thrombus (IS-Th) and quantitative measures of %length of IS-Th (the numbers of cross-sections with IS-Th × 100 divided by total number of cross-sections within the stented segment) were assessed.

RESULTS A total of 105 patients were enrolled in this study, 44 patients in 2-W and 50 patients in 3-Mo were available for complete serial OCT analysis. Patients' and lesions' background were not different between the two cohorts. %uncovered strut significantly decreased from post-procedure to 2-W (63±20% vs 21±14%, P<0.05), and it was 8.6±9.4% at 3-Mo. %malapposed strut also improved from post-procedure to 2-W (7.3±9.0% vs 4.7±5.9%, P<0.05), and it was only 1.0±2.3% at 3-Mo. Furthermore, IS-Th were detected in 29 cases (65%) at 2-W and 12 cases (24%) at 3-Mo respectively, and %length of IS-Th at 3-Mo was significantly lower than at 2-W (1.5±4.3%, 4.7±9.5%; P<0.05, table).

	2-W cohort 44 case (46 stents)		3-Mo cohort 50 case (53 stents)	
	Post EES	2-W	Post EES	3-Mo
Stent area, (mm ²)		6.7±1.9		7.4±2.1
Lumen area, (mm ²)	6.5±1.8	6.7±1.9*	7.0±1.9	7.1±2.2
%uncovered strut, (%)	63±20	21±14*	62±19	8.6±9.4***
%malapposed strut, (%)	7.3±9.0	4.7±5.9*	6.5±7.0	1.0±2.3***
Incidence of IS-Th, n (%)	40 (91%)	29 (65%)	41 (82%)	12 (24%)**
%length of IS-Th, (%)	13±11	4.7±9.5*	11±12	1.5±4.3***

*; P<0.05 compared with Post EES of 2-W cohort. **; P<0.05 compared with Post EES of 3-Mo cohort. ***; P<0.05 compared between 2-W and 3-Mo after stenting.

CONCLUSION MECHANISM AMI study reveals the early vascular reactions at 2-W and 3-Mo after EES implantation in STEMI patients. Both dynamic resolution of IS-Th and the decrease of uncovered and malapposed strut were already observed at relatively early stage. These findings appear to be favorable aspects of EES use for STEMI patients.

CATEGORIES IMAGING: Intravascular

TCT-564

Effect of Intravascular Ultrasound-Guided vs. Angiography-Guided New-Generation Drug-Eluting Stent Implantation; Meta-analysis with Individual Patient-Level Data from 2,345 Randomized Patients



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