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Objective/Purpose: Previous data regarding lipid-lowering therapy at the time of presentation of STEMI has shown that 10-35% of patients are on some lipid-lowering medication. We sought to determine what percentage of our STEMI patients were on lipid-lowering, to see how often additional lipid-lowering therapy was recommended as well as whether other lipid disorders, such as FH or elevated Lp(a) or homocysteine levels were recognized or investigated.

Methods: Consecutive patients presenting with STEMI were canvased for entry lipid-lowering therapy (statin or others), as well as baseline LDL and HDL. For those entering on statin, we determined whether lipid therapy was advanced, or whether other lipid abnormalities such as elevated Lp(a) were present or even investigated.

Results: In 50 consecutive STEMI patients seen in one year, 16% were already on lipid-lowering therapy, almost exclusively statins, and typically atorvastatin. At least 30% should have been on lipid lowering agents based on LDL and risk level. Two patients were identified with baseline LDL meeting criteria for familial hypercholesterolemia. Baseline and follow-up after treatment LDL was 106.6 and 51.8 mg/dl respectively. For HDL, baseline was 39.5 and follow-up was 42.3 mg/dl. Of those on baseline lipid-lowering agents, additional lipid-lowering therapy was instituted only 2% of the time and Lp(a) level was drawn 1% of the time. Homocysteine levels or hypobetalipoproteinemia or other metabolic abnormalities were never assessed.

Conclusions: In this population of STEMI patients, aggressive additional lipid-lowering when patients are already on therapy should be instituted and other lipid abnormalities should be sought after.

Clinical Application of Biomarkers

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Effects of Icosapent Ethyl on Plasma Ceramides and Coronary Plaque Progression in EVAPORATE trial
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Lead Author’s Financial Disclosures: Nothing to disclose.

Study Funding: None.

Background/Synops: Despite the beneficial effects of statins on progression of coronary atherosclerosis, significant cardiovascular (CV) risk persists in patients with residual hypertriglyceridemia. REDUCE-IT demonstrated that Icosapent ethyl (IPE) added to statins significantly reduced adverse CV outcomes in these patients. The EVAPORATE trial showed a significant reduction in coronary plaque progression in the IPE arm, offering mechanistic insights to the CV benefits of IPE. Circulating ceramide (CER) levels and CER ratios are important predictors of coronary plaque instability, progression, and adverse CV risk.

Objective/Purpose: We sought to compare the effect of IPE vs placebo on ceramide scores and ratios in participants enrolled in EVAPORATE trial. We further assessed correlations between CER levels and changes in coronary plaque burden and characteristics.

Methods: EVAPORATE is a randomized, placebo-controlled trial, using CCTA to evaluate the effects of IPE as an adjunct to statins on coronary plaque progression in a cohort with elevated triglycerides, over 18 months. A total of 63 participants from the EVAPORATE trial were included. Changes in serum levels of CER species, ratios, and scores were compared between patients receiving IPE vs placebo. Spearman’s correlation was used to examine association of ceramide scores and changes in coronary plaque volumes.

Results: CER ratios and scores were similar between the groups at baseline. In the IPE group, the CER score was 4.27 (SD 3.02) at baseline and was 4.00 (SD 3.05) at follow-up (p=0.55). At 18 month follow-up, there was a significant increase in CER ratios, CER 16:0/24:0 and CER 18:0/24:0, in the placebo group (p=0.0018; p=0.0076, respectively), compared to no significant change in the IPE group (p=0.85; p=0.37, respectively). Changes in CER score did not correlate with changes in total plaque volumes in either group (IPE (r=0.326), placebo (r=-0.295) (p>0.05).

Conclusions: There were significant differences in the CER ratios in the IPE arm vs placebo arm in the EVAPORATE trial, as well as a trend to lowered CER score in the IPE group. Future studies are warranted to further characterize correlations of IPE and CER.

Clinical Application of Biomarkers

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Intracoronary Thrombus in a Patient with Elevated Lp(a) Levels and COVID-19
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Lead Author’s Financial Disclosures: Nothing to disclose.

Study Funding: None.
Background/Synopsis: Lp(a) is elevated in 20% of the population and is associated with increased risk for myocardial infarctions and strokes. In patients with COVID-19, Lp(a) is upregulated as a response to the systemic inflammatory infection which can potentially increase the risk for atherothrombotic events. The following case presents the first report of a patient with elevated Lp(a) levels and COVID-19 who presented with an acute MI and evidence for intracoronary thrombus.

Objective/Purpose: 49-year-old male with past medical history of thoracic aortic aneurysm recently diagnosed with COVID-19 presented to ED with chest pain. EKG showed ST-segment elevation in the anterior leads with a 12.7 troponin score. Patient underwent emergent cardiac catheterization that showed 90% ulcerated thrombotic lesion in the proximal LAD. The thrombus was demonstrated by both angiography and IVUS. Thrombectomy, angioplasty, and stenting were performed. There was embolization of thrombus to the distal LAD. Echocardiogram revealed LVEF 55% with apical hypokinesis. He was started on DAPT, statin, and rivaroxaban due to the high risk of recurrent coronary thrombosis. His Lp(a) was 200 nmol/L. (Normal < 75 nmol/L).

Methods: N/A.

Results: Cases of patients with COVID-19 and elevated Lp(a) presenting with acute MI and intracoronary thrombus have yet to be reported. Elevated Lp(a) level is thought to increase the risk of cardiovascular events and venous thromboembolism through anti-fibrinolytic and pro-atherosclerotic properties. Acute, transient elevations in Lp(a) secondary to IL-6 production have been observed in inflammatory states, such as COVID-19 infections. A cohort study of 146 COVID-19 patients in the Netherlands observed a mean increase in Lp(a) of 16.9mg/dL from baseline over a course of 21 days during hospitalization In a retrospective study of patients admitted with COVID-19, 5.6% of 531 experienced arterial thrombosis, 9 of which suffered myocardial infarction. In patients similar to ours with COVID-19 and elevated Lp(a), there may be elevated risk of similar events and providers should remain vigilant for potential complications. It is possible that acutely elevated Lp(a) levels contribute to arterial thrombotic events in the coronaries during COVID-19 infection.

Conclusions: In patients presenting with COVID-19 and acute myocardial infarction, we recommend that clinicians measure Lp(a) level and evaluate for intracoronary thrombi to correlate our findings.

Complex or Unusual Cases in Lipid Management

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Novel Use of Therapeutic Plasma Exchange and Evinacumab in a Patient with Homozygous Familial Hypercholesterolemia

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Lead Author’s Financial Disclosures: Nothing to disclose.

Study Funding: None.

Background/Synopsis: We present a 47-year-old woman with homozygous familial hypercholesterolemia (HoFH), recurrent ASCVD events, and multiple intolerances to therapy (including lipoprotein apheresis) who was treated successfully with a unique combination of therapeutic plasma exchange (TPE) and pharmacotherapy, including evinacumab. Her treatment with TPE required 1) pre-medication to prevent allergic reactions, 2) use of a specific TPE system selected to reduce risk of allergic reactions, and 3) medical flights bi-monthly across California to perform TPE at our institution. Following initiation of evinacumab, the patient achieved persistent low levels of LDL-C and subsequently discontinued TPE.

Objective/Purpose: To describe the novel use of TPE and evinacumab in HoFH when treatment options are limited.