

Association between degree of LDL-cholesterol decrease after a myocardial infarction and mortality - a nationwide cohort study

J. Schubert¹, B. Lindahl¹, H. Melhus¹, H. Renlund², M. Leosdottir³, A. Allahyari⁴, P. Ueda⁵, T. Jernberg⁴, E. Hagstrom¹

¹Uppsala University, Department of Medical Sciences, Uppsala, Sweden; ²Uppsala Clinical Research Center, Uppsala, Sweden; ³Skane University Hospital, Department of Cardiology, Lund, Sweden; ⁴Danderyd University Hospital, Department of Clinical Sciences, Stockholm, Sweden; ⁵Karolinska Institute, Clinical Epidemiology Division, Department of Medicine, Stockholm, Sweden

Background: In clinical trials, patients with myocardial infarction (MI) and elevated LDL-cholesterol (LDL-C) benefit the most from lipid lowering therapy, and more intensive LDL-C lowering therapy is associated with better prognosis.

Purpose: To investigate the association between degree of LDL-C lowering and prognosis in MI patients from a large real-world setting.

Methods: Patients admitted with an MI between 2006 and 2016 and registered in the Swedish MI-registry (SWEDEHEART) were followed until 2018. The difference in LDL-C between the MI hospitalization and a 6–10 week follow-up was measured. In multivariable Cox regression analysis adjusting for clinical risk factors (eg. age, diabetes, prior cardiovascular disease), the association between LDL-C change, mortality and recurrent MI was assessed using restricted cubic splines. Further, the patients were stratified according to quartile decrease in LDL-C from MI hospitalization to the follow-up.

Results: A total of 44,148 patients (median age: 64) had an LDL-C measured during the MI hospitalization and at follow-up. Of these, 9,905

(22.4%) had ongoing statin treatment prior to admission. The median LDL-C at the MI hospitalization was 2.96 (interquartile range 2.23, 3.74) mmol/L and the median decrease in LDL-C was 1.17 (0.37, 1.86) mmol/L. During a median follow-up of 3.9 years, 3,342 patients died and 3,210 had an MI. Patients with the highest quartile of LDL-C decrease (1.86 mmol/L) from index event to follow-up, had a lower risk of mortality, hazard ratio (HR) 0.59 (95% confidence interval [CI] 0.44–0.80) compared to those with the lowest quartile of LDL-C decrease (0.37 mmol/L) (figure). For MI, the corresponding HR was 0.83 (95% CI 0.68–1.02). Ongoing statin-use prior to admission did not alter the effect of LDL-C decrease and outcome in the analysis.

Conclusions: In this large nationwide cohort of MI patients, a gradually lower risk of death was observed in patients with larger decrease in LDL-C from index event to follow-up, regardless of statin use prior to admission. The same trend was observed for recurrent MI, although not reaching statistical significance. This confirms previous findings that efforts should be made to lower LDL-C after MI.

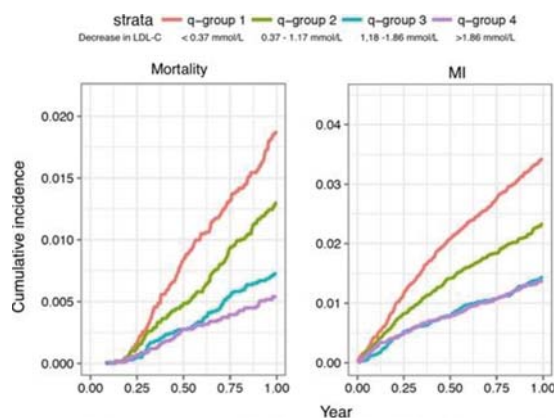


Figure: One year cumulative incidence of mortality and myocardial infarction (MI) by quartile of LDL-C decrease.