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Abstract

Background: Studies suggests that in the general population, hyperlipidemia may confer higher risk of developing chronic kidney disease (CKD). But, there is conflicting data as to whether statins can protect renal function or slow renal degradation. We sought to examine the impact of statins on the association of low-density lipoprotein cholesterol (LDL) and risk of incident CKD.

Methods: Our cohort included 1,439,756 US veterans without chronic kidney disease (CKD), but with LDL measured between 2004-2006, who were followed until 2014. Incident CKD was defined as over 3 estimated glomerular filtration rate (eGFR) measurements <60 mL/min/1.73m^2 at least 90 days apart. Patients with a statin prescription at the time of LDL measurement were identified. Cox models were used to estimate the associations between LDL with incident CKD. Model adjustments include demographics, comorbidities, smoking status, prescription of fibrate or niacin, body mass index, albumin, high-density lipoprotein cholesterol, and triglycerides.

Results: The cohort included 5% females, 16% African Americans, 26% diabetics, and 30% statin-users, with a mean age of 60±13 years. The median [IQR] of LDL and eGFR were 109 [88,133] mg/dL and 83 [72,94] mL/min/1.73m^2, respectively. A J-shaped association between LDL and incident CKD were observed in both those on statin and not on a statin after adjustment. Low LDL (<70 mg/dL) was associated with a higher risk of incident CKD compared to the reference (LDL 70-<100 mg/dL) regardless of statin use. High LDL ≥160 mg/dL was associated with the highest of risks of incident CKD (HR: 1.08, 95% CI: 1.04, 1.13, and HR: 1.10, 95% CI: 1.07, 1.12, for statin use and no statin use, respectively).

Conclusion: Both high and low LDL were associated with higher incident CKD risk independent of statin use in this US veteran cohort. Further studies are needed to understand how to manage cardiovascular disease risk by lowering LDL while simultaneously reducing risk of CKD.

Incident CKD

Hazard Ratio

On Statin
Not on Statin

Serum LDL (mg/dL)