

Diabetic retinopathy and low density lipids, a cohort study

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Abstract

Background— Diabetic retinopathy is the leading cause of blindness and visual disability in developed countries effecting about a quarter of patients worldwide. Major risk factors include hyperglycemia, diabetes duration and hypertension. Some previous studies suggest higher total serum cholesterol was associated with a higher prevalence of retinopathy although statin use has not been shown to affect the severity diabetic retinopathy. We examined the potential association between low density lipids and the development of retinopathy and whether the type of statin use effects this association.

Methods— We conducted a population based cohort study using the data base of Clalit Health Services central region. All new onset type 2 diabetes patients who were diagnosed between January 1 2001 and December 31 2015 aged between 40 and 75 years were included in the study. The primary end point was retinopathy as diagnosed by ophthalmologist consult. Time dependent COX regression models were used to calculate Hazard ratios for the association between LDL levels and the development of DR. Adjustments were made for age, statin use, statin type, race, and time since DM diagnosis and an array of medical conditions.

Results—31394 subjects were identified with new onset diabetes mellitus, mean age of 58.6. The total

follow up time was 214,551 patient years and 4819 patients developed retinopathy. No difference was seen in the risk of developing retinopathy according to LDL before diabetes diagnosis, however lower LDL levels at the end of follow up were associated with a reduced hazard of retinopathy below 100mg/dl HR 0.8 (CI 0.72-0.87) and below 70mg/dl HR 0.66 (CI 0.59-0.74). No association was found between different statin groups used to reduce cholesterol and the development of retinopathy.

Conclusions— Retinopathy seems to be related to LDL levels after diagnosis of DM whereas levels of LDL before diagnosis appear not to be associated. Those that achieve LDL of under 70mg/dl reduce risk for retinopathy more than levels of less than 100mg/dl. The statin group used to reduce LDL does not appear to be associated with incidence of retinopathy.

Keywords—Diabetes, retinopathy, low density lipids, statins

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