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Association between Plasma PCSK9 levels and Computed Topographic Coronary Artery Calcium

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Keywords

PCSK9, coronary artery calcium, atherosclerotic cardiovascular disease

Abstract

Background

Given its central role in low-density lipoprotein (LDL) metabolism, there is interest in exploring proprotein convertase subtisilin/kexin type 9 (PCSK9) as a potential circulating biomarker of atherosclerotic cardiovascular disease (ASCVD) risk. Computed tomography for coronary artery calcium (CAC) scoring provides an accurate assessment of subclinical coronary atherosclerotic plaque burden and can be used to refine cardiovascular risk estimates in individuals without symptoms of ASCVD. In this study, we assessed the correlation of cross-sectional measurements of plasma PCSK9 concentration and CAC score in individuals free of clinical ASCVD.

Methods

Patients were recruited at routine clinic visits with providers at the OHSU Center for Preventive Cardiology. Only patients who had previously undergone CAC scoring as part of standard of care were included. Total plasma PCSK9 levels were measured using a commercially available ELISA assay (R&D Systems). Descriptive statistics were used to describe continuous and categorical variables. Wilcoxon rank sum and fisher exact tests were used to test significant differences between variables (p-value<0.05), when appropriate. Unadjusted and adjusted multiple logistic regression models were utilized to determine odds ratios (OR) of plasma PCSK9 concentrations to predict CAC>0 versus CAC=0 scoring.

Results

Of the 189 patients included in this analysis, 106 (56.1%) were female and the mean age was 58.8 (standard deviation: 12.3) years. There were 138 (73%) patients with CAC>0 scoring and median overall CAC score was 75 (interquartile range [IQR]: 0-251). Median plasma PCSK9 level was 374.8 (IQR: 289.9-467) for those with CAC>0 versus 333.2 (IQR: 266.9-441.3) for those with CAC=0. No significant association was observed between plasma PCSK9 concentration and CAC score in either an unadjusted (OR=1.0015; p=0.1740)

or adjusted (for age, sex, body mass index, LDL-C, and statin therapy) model (OR=1.0004; p=0.8126).

Conclusion

Plasma PCSK9 concentration was not associated with subclinical CAC in an asymptomatic preventive cardiology clinic population.