Abstract: P3822

Risk prediction for ASCVD in primary prevention patients on statin therapy

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Topic(s):
Risk Factors and Prevention – Cardiovascular Risk Assessment

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Background: Statins are now widely used for the primary prevention of atherosclerotic cardiovascular disease (ASCVD). However, existing risk prediction models were developed primarily on patients not on statins. We developed a novel model to estimate the risk of ASCVD among contemporary patients taking statins.

Methods: Using combined data from 3 large NIH-sponsored cohort studies: Atherosclerosis Risk in Communities, Framingham Offspring Study, and Multi-ethnic Study of Atherosclerosis we examined adults aged 40-79 years without prior ASCVD who were on statin therapy at the baseline exam. A Cox proportional hazards model was used to identify factors associated with a 10-year risk of CV death, MI, or stroke. Age, sex, and race were forced into the model while other potential candidate predictors were retained if statistically significant at the 0.05 level. Interaction terms with age, sex, and race were retained if significant at the 0.01 level. The model was assessed with c-statistic and calibration plots of observed events versus model-based risks after cross-validation and contrasted with the Pooled Cohorts Equations (PCE) recommended by the current U.S. guidelines.

Results: Among 2333 primary prevention patients on statins at baseline, a total of 220 events occurred over a median 8.8 years of follow-up. Most risk factors retained in our final model overlapped with those included in the PCE (age, sex, race, systolic blood pressure [sBP], diabetes, smoking, high-density lipoprotein cholesterol, total cholesterol). Our model also included creatinine clearance, aspirin use, and the interaction between age and sBP. Optimism-corrected discrimination of the new model was marginally higher than PCE: 0.69 (95% CI 0.66-0.72) versus 0.68 (95% CI 0.65–0.72). Cross-validated calibration was superior on our contemporary sample, especially at the higher levels of risk (Figure), where PCE over-estimated risk.

Conclusion: Accurate estimation of 10-year ASCVD risk among patients currently on statins necessitates recalibration of the current PCE model or application of our algorithm developed specifically for this cohort. This might help avoid over-estimation of risk and reduce the need for unnecessary additional lipid-lowering therapy.
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