

Predicting Cardiovascular Risks in a Contemporary Population

The widely accepted pooled cohort equations overestimate 5-year risk in a cohort of Veterans Affairs patients, with implications for statin eligibility.

The pooled cohort equations (PCE) were developed to estimate the risk for an initial atherosclerotic cardiovascular disease (ASCVD) event. However, these equations were derived from data in longitudinal studies before widespread use of statin therapy. Investigators sought to test the PCE and two other cohort-derived risk prediction models (one that recalculated the equation based on the characteristics of the population and another that added baseline statin therapy) by examining national Veterans Affairs (VA) electronic health data on 1,672,336 veterans free of ASCVD at baseline (mean age, 58; 94% men; 83% white).

At baseline, 19% of the patients had a statin prescription. After an average follow-up of 4.6 years, 66,605 ASCVD events (coronary death, myocardial infarction, or stroke) and 31,878 ASCVD deaths occurred. The PCE overestimated 5-year risk across all groups. The cohort-derived risk models improved model performance, as measured by calibration (i.e., how closely a model's estimates of event rates match the observed rates). Baseline statin use was associated with a 7% relative risk reduction in ASCVD events and 25% relative risk reduction in ASCVD deaths.

COMMENT

Consistent with findings from a multitude of studies that have tested the performance of the PCE in contemporary cohorts, the PCE overestimates risk in VA patients using electronic health record data. Findings from the current study suggest that the overestimation of risk extends beyond background statin therapy and that large health systems may benefit from developing their own risk prediction models. The 2018 updated multisociety cholesterol guidelines (*NEJM JW Cardiol* Jan 2019 and *J Am Acad Cardiol* 2019; 73e285) note the limitations of current risk prediction models and recommend considering risk-enhancing factors to guide clinician-patient shared decision making about statins and other preventive therapies. — **Fatima Rodriguez, MD, MPH, FACC, FAHA**

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