

EDITORIAL COMMENT

Coronary Artery Calcium

An Equal Opportunity Predictor*



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Coronary artery calcium (CAC) has been extensively studied in population-based assessments in the United States (9 cohort studies including the MESA [Multi-Ethnic Study of Atherosclerosis] and the Framingham Heart Study) and Europe (Rotterdam Heart Study and Heinz Nixdorff Recall Study, among others) (1); however, less is known about the epidemiology of CAC in an Asian population. As reported in this issue of *JACC: Asia* by Wong et al (2), the SingHEART study was such an epidemiologic study. It evaluated the prevalence of coronary artery calcifications in the healthy population older than 30 years of age and looked at associations of age, sex, risk factors, and cardiovascular events (2). The study used the MESA risk calculator and noted many of the same observations seen in other cohorts. It is reassuring to see that many of the typical predictors of risk predicted CAC in this cohort, including increasing age, low-density lipoprotein cholesterol, systolic blood pressure, and glucose.

It is very encouraging that CAC performs so uniformly across different races and ethnicities, including across different Asian populations. Zheng Wong et al (3) also compared the results in this Singapore population with the results in the Asian (Chinese) population studied in MESA. The consistent predictive value of CAC and its associations with common cardiovascular risk factors make CAC determination an ideal test for assessing cardiovascular risk across all known groups. In MESA (and other cohorts), CAC afforded similar risk across all

different ethnic and racial subgroups, as well as by stratification by age and sex (4).

Most of the risk prediction models do not include specific information related to Asians. This gap leads to systematic overestimation of risk in Asians that may contribute to overtreatment with preventive therapies, with expected increases in medical costs and unnecessary side effects of medications. There is a need to balance risk with benefit by using more accurate risk prediction models, either through development of new tools, such as the MESA risk calculator, which allows for use in multiple ethnic or racial groups, or recalibration of known risk scoring systems.

Further limitations of current scoring systems are that they have not been largely validated in cohorts outside the United States and Europe. The SingHEART study examined the association of CAC scoring in a Singapore population, by evaluating the discriminative performance of CAC scoring and its incremental predictive utility in the overall cohort. These results are important because the SingHEART study demonstrates that in spite of the general low-risk nature, CAC remains a useful tool for cardiovascular disease risk prediction in this population. The current study thus extends the use of calcium scoring to this Asian population. These findings may help address the existing knowledge gaps for cardiovascular risk prediction in an asymptomatic Asian clinical population with little data-driven advice for risk prediction in this population.

According to current guidelines of the American College of Cardiology and the American Heart Association (5) and the European Society of Cardiology (6), the CAC score may be used in cardiovascular risk assessment in addition to traditional risk factors in persons at intermediate risk. The demonstration of the utility of CAC in this group is timely because it has definitive implications for clinical practice guidelines, given the superior risk discrimination and risk reclassification of CAC when compared with other known risk markers.

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