



Original Research

Association of Cardiovascular Health and Time Lived With Zero Coronary Artery Calcium

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Abstract

Background

Zero coronary artery calcium (CAC) is robustly associated with lower risk of cardiovascular disease (CVD). Factors associated with greater time lived with zero CAC are not well understood.

Objectives

This study aims to evaluate the association of cardiovascular health (CVH) and time lived with zero CAC.

Methods

In MESA (Multi-Ethnic Study of Atherosclerosis), participants who had zero CAC at baseline and were followed up to 10 years, restricted mean survival time since study entry lived with zero CAC was estimated by baseline CVH (high, intermediate, low), stratified by sex and age (45-64 years and 65-84 years).

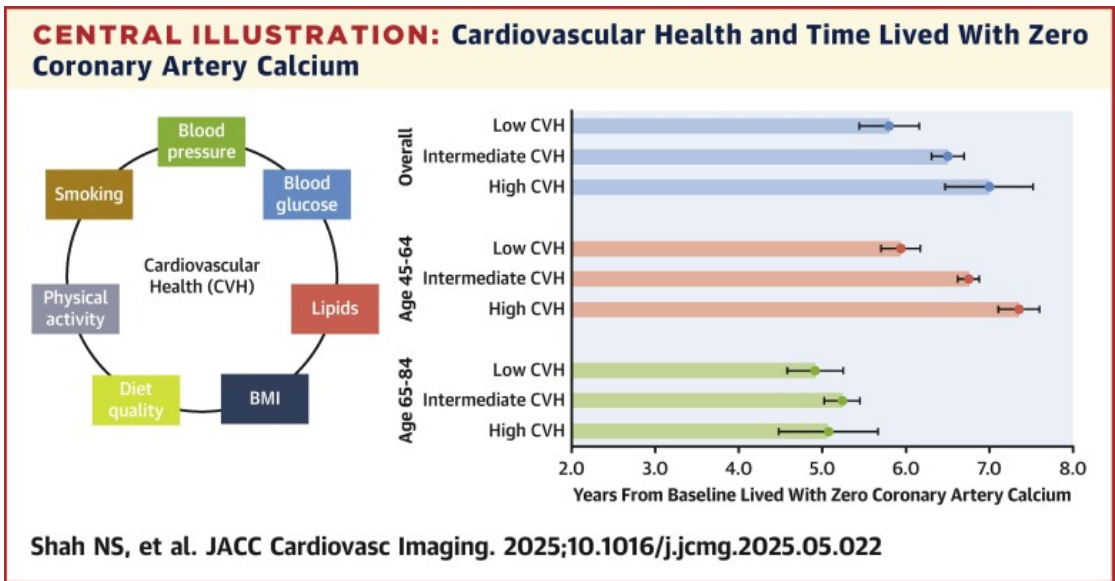
Results

Among 3,416 participants with zero CAC at baseline (63% female, age 58 ± 9 years at baseline, CVH score 8.8 ± 2.1), the years since study entry lived with zero CAC was 4.9 ± 3.5 years. Women with high vs low CVH lived on average 6.6 years (95% CI: 6.4-6.8 years) vs 5.6 years (95% CI: 5.3-5.8 years) with zero CAC ($P < 0.01$). Men with high vs low CVH lived 6.4 years (95% CI: 5.9-6.9 years) vs 5.5 years (95% CI: 5.1-5.9 years) with zero CAC ($P = 0.01$). Participants aged 45 to 64 years with high vs low CVH lived 7.4 years (95% CI: 7.1-7.6 years) vs 5.9 years (95% CI: 5.7-6.2 years) with zero CAC ($P < 0.01$). Participants aged 65 to 84 years at baseline with high vs low CVH lived a similar duration with zero CAC (5.1 years [95% CI: 4.5-5.7 years] vs 4.9 years [95% CI: 4.6-5.2 years]) with zero CAC ($P = 0.65$).

Conclusions

High CVH was associated with longer time lived with zero CAC. Maintaining high CVH early in midlife may reduce risk of CVD as measured by CAC onset.

Central Illustration



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Methods

MESA included self-identified Black, Chinese, Hispanic, and White adults aged 45-84 years without a history of CVD, enrolled between 2000-2002 from 5 sites in the United States. Detailed inclusion and exclusion criteria and data collection protocols, including for CAC CT, have previously been described.^{7,12,13} MESA visits 2, 3, 4, and 5 included participants with follow-up CT at a mean of 1.7 ± 0.3 years, 3.2 ± 0.4 years, 4.9 ± 0.5 years, and 9.7 ± 0.6 years, respectively, after the initial

Results

The characteristics of participants with zero CAC at baseline are shown in Table 1. There were 911 participants with low CVH (mean age: 59.1 ± 8.8 years, 65% female); 2,154 participants with intermediate CVH (mean age: 57.8 ± 9.2 years, 62% female); and 351 participants with high CVH (mean age: 56.2 ± 9.1 years, 63% female). The median follow-up time in the overall sample was 9.0 years (25th-75th percentile: 2.1-9.6 years), among those aged 45-64 years 9.1 years (Q1-Q3: 2.3-9.8 years), and

Discussion

In this multiethnic sample of adults with zero CAC at baseline, high CVH was associated with approximately 1 year of longer time lived with zero CAC, compared with low CVH. Adults aged 45-64 years with high CVH lived ~1.5 years longer with zero CAC, and adults with intermediate CVH lived ~1 year longer with zero CAC, relative to those with low CVH. Older adults had no difference in time lived with zero CAC on the basis of CVH status. In the secondary analysis, there were differences in time

Conclusions

In this analysis of adults in MESA without CAC at baseline, better CVH was associated with longer time lived with zero CAC. Optimizing CVH may result in prevention or postponement of incident CAC, which may delay incident ASCVD.

COMPETENCY IN MEDICAL KNOWLEDGE: Better cardiovascular health is related to longer time lived without coronary artery calcium. Optimizing cardiovascular health at younger ages may help patients prevent or delay onset of coronary artery calcium.

TRANSLATIONAL OUTLOOK:

Funding Support and Author Disclosures

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