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Original Investigation | November 10, 2015

Prevalence and Correlates of Myocardial Scar in a US Cohort

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ABSTRACT

[ABSTRACT](#) | [INTRODUCTION](#) | [METHODS](#) | [RESULTS](#) | [DISCUSSION](#) | [CONCLUSIONS](#) | [ARTICLE INFORMATION](#) | [REFERENCES](#)

Importance Myocardial scarring leads to cardiac dysfunction and poor prognosis. The prevalence of and factors associated with unrecognized myocardial infarction and scar have not been previously defined using contemporary methods in a multiethnic US population.

Objective To determine prevalence of and factors associated with myocardial scar in middle- and older-aged individuals in the United States.

Design, Setting, and Participants The Multi-Ethnic Study of Atherosclerosis (MESA) study is a population-based cohort in the United States. Participants were aged 45 through 84 years and free of clinical cardiovascular disease (CVD) at baseline in 2000-2002. In the 10th year examination (2010-2012), 1840 participants underwent cardiac magnetic resonance (CMR) imaging with gadolinium to detect myocardial scar. Cardiovascular disease risk factors and coronary artery calcium (CAC) scores were measured at baseline and year 10. Logistic regression models were used to estimate adjusted odds ratios (ORs) for myocardial scar.

Exposures Cardiovascular risk factors, CAC scores, left ventricle size and function, and carotid intima-media thickness.

Main Outcomes and Measures Myocardial scar detected by CMR imaging.

Results Of 1840 participants (mean [SD] age, 68 [9] years, 52% men), 146 (7.9%) had myocardial scars, of which 114 (78%) were undetected by electrocardiogram or by clinical adjudication. In adjusted models,

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age, male sex, body mass index, hypertension, and current smoking at baseline were associated with myocardial scar at year 10. The OR per 8.9-year increment was 1.61 (95% CI, 1.36-1.91; $P < .001$); for men vs women: OR, 5.76 (95% CI, 3.61-9.17; $P < .001$); per 4.8-SD body mass index: OR, 1.32 (95% CI, 1.09-1.61, $P = .005$); for hypertension: OR, 1.61 (95% CI, 1.12-2.30; $P = .009$); and for current vs never smokers: 2.00 (95% CI, 1.22-3.28; $P = .006$). Age-, sex-, and ethnicity-adjusted CAC scores at baseline were also associated with myocardial scar at year 10. Compared with a CAC score of 0, the OR for scores from 1 through 99 was 2.4 (95% CI, 1.5-3.9); from 100 through 399, 3.0 (95% CI, 1.7-5.1), and 400 or higher, 3.3 (95% CI, 1.7-6.1) ($P \leq .001$). The CAC score significantly added to the association of myocardial scar with age, sex, race/ethnicity, and traditional CVD risk factors (C statistic, 0.81 with CAC vs 0.79 without CAC, $P = .01$).

Conclusions and Relevance The prevalence of myocardial scars in a US community-based multiethnic cohort was 7.9%, of which 78% were unrecognized by electrocardiography or clinical evaluation. Further studies are needed to understand the clinical consequences of these undetected scars.

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