

MINNEAPOLIS HEART INSTITUTE®'S JOURNALSCAN

The Physician's Source for the Latest in Cardiovascular Care Essential to Primary Care Practice

CORONARY CALCIUM AS A PREDICTOR OF CORONARY EVENTS IN FOUR RACIAL OR ETHNIC GROUPS

In white populations, computed tomographic measurements of coronary-artery calcium predict coronary heart disease independently of traditional coronary risk factors. However, it is not known whether coronary-artery calcium predicts coronary heart disease in other racial or ethnic groups. This study collected data on risk factors and performed scanning for coronary calcium in a population-based sample of 6,722 men and women, of whom 38.6% were white, 27.6% were black, 21.9% were Hispanic and 11.9% were Chinese. The study subjects had no clinical cardiovascular disease at entry and were followed for a median of 3.8 years.

There were 162 coronary events, of which 89 were major events (myocardial infarction or death from coronary heart disease). In comparison with participants with no coronary calcium, the adjusted risk of a coronary event was increased by a factor of 7.73 among participants with coronary calcium scores between 101 and 300 and by a factor of 9.67 among participants with scores above 300 ($P < 0.001$ for both comparisons). Among the four racial and ethnic groups, a doubling of the calcium score increased the risk of a major coronary event by 15 to 35% and the risk of any coronary event by 18 to 39%. The areas under the receiver-operating-characteristic curves for the prediction of both major coronary events and any coronary event were higher when the calcium score was added to the standard risk factors.

The coronary calcium score is a strong predictor of incident coronary heart disease and provides predictive information beyond that provided by standard risk factors in four major racial and ethnic groups in the United States. No

major differences among racial and ethnic groups in the predictive value of calcium scores were detected.

Detrano R, Guerci AD, Carr JJ, Bild DE, Burke G, Folsom AR, et al. Coronary calcium as a predictor of coronary events in four racial or ethnic groups. N Engl J Med. 2008 Mar 27;358(13):1336-45..

Comment:

It is unequivocal that coronary artery calcification (CAC), as detected by CT scanning, represents coronary atherosclerosis. Both electron beam CT (EBCT) and multislice CT (MSCT) are now used to determine the extent of coronary calcification typically reported as the Agatston score or coronary artery calcium score (CCS). The particular relationship between CAC, cardiovascular risk factors and hard cardiovascular events has been the topic of intense interest for over a decade. Initial studies were flawed by limited patient numbers and poor definition of outcomes.

This Multi-Ethnic Study of Atherosclerosis, or MESA study, represents an important trial correlating CCS with subsequent hard cardiovascular events. It is the result of a long-term, prospective, NIH-funded, bias-free evaluation of CCS in multiple ethnicities and future cardiovascular events in a large cohort of men and women. The results showed that in comparison to those without coronary artery calcium, the adjusted risk of a coronary event (myocardial infarction or cardiovascular death) was 9.67 times higher in people with a calcium score greater than 300 over an average follow-up interval of 3.8 years. A doubling of the calcium score resulted in a 20% increase in the risk of a major cardiovascular event. This relationship held

regardless of ethnicity and, importantly, was additive to standard risk factors.

The Framingham risk score is inexpensive, easy to calculate but only modestly accurate. Framingham risk scores are reported as an estimated 10-year risk in percent per year. High risk has been defined as the risk equivalent to those with established CAD, approximately greater than 2% per year. Low risk, in general, is considered in those with less than 1% per year. It is the intermediate risk patient, or those with a Framingham risk score of between 1-2% per year, where additional tools, such as calcium scoring has been advocated. Indeed, the 2007 AHA Clinical Expert Consensus Document of Coronary Artery Calcification committee concluded to consider CAC measurement in intermediate risk patients such that these patients

may be re-classified as high risk and subsequent patient management may be modified.

The MESA study further solidifies the growing body of evidence that coronary calcification is an independent predictor of future cardiovascular disease. Future randomized studies in this area may clarify whether the increased risk associated with CAC can be reduced with preventive methods such as aspirin and statins and how CCS compares to other novel methods for cardiovascular risk assessment such as carotid medial thickness and newer serum markers.

— **T. Knickelbine, MD**, senior consulting cardiologist, Minneapolis Heart Institute.[®]

###

EDITOR-IN-CHIEF	EDITOR	CONTRIBUTING EDITOR
M. Nicholas Burke, MD	Kirk Livingston	T. Knickelbine, MD
<i>Minneapolis Heart Institute[®]'s JournalScan</i> is produced regularly by the Minneapolis Heart Institute. [®] <i>Journal Scan</i> provides expert, practical commentary on breaking cardiovascular research for primary care physicians.		
<p style="text-align: center;">Minneapolis Heart Institute[®] 920 East 28th Street, Suite 300 • Minneapolis, Minnesota 55407 • Telephone: 612-863-4899 View electronically at www.mplsheart.com/journalscan <i>The information in Journal Scan is for educational purposes only, and is not intended to be a replacement or substitution for professional medical care. Only a qualified health care provider can diagnose and treat a health problem or disease. The Minneapolis Heart Institute[®] will not be responsible for the misuse of the information in this newsletter.</i> © Copyright 2008 Minneapolis Heart Institute.[®] All Rights Reserved. Minneapolis Heart Institute[®] is a trademark of Minneapolis Heart Institute,[®] Inc.</p>		