

IREVIEWS

STATE-OF-THE-ART PAPERS

Noninvasive Cardiovascular Risk Assessment of the Asymptomatic Diabetic Patient

The Imaging Council of the American College of Cardiology

Matthew J. Budoff, MD, *Chair*,^a Paolo Raggi, MD,^b George A. Beller, MD,^c Daniel S. Berman, MD,^d Regina S. Druz, MD,^e Shaista Malik, MD, PhD,^f Vera H. Rigolin, MD,^g Wm. Guy Weigold, MD,^h Prem Soman, MD, PhD,ⁱ on behalf of the Imaging Council of the American College of Cardiology



JACC: CARDIOVASCULAR IMAGING CME

CME Editor: Ragavendra R. Baliga, MD

This article has been selected as this issue's CME activity, available online at <http://www.acc.org/jacc-journals-cme> by selecting the CME tab on the top navigation bar.

Accreditation and Designation Statement

The American College of Cardiology Foundation (ACCF) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The ACCF designates this Journal-based CME activity for a maximum of 1 AMA PRA Category 1 Credit(s)[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Method of Participation and Receipt of CME Certificate

To obtain credit for this CME activity, you must:

1. Be an ACC member or *JACC: Cardiovascular Imaging* subscriber.
2. Carefully read the CME-designated article available online and in this issue of the journal.
3. Answer the post-test questions. At least 2 out of the 3 questions provided must be answered correctly to obtain CME credit.
4. Complete a brief evaluation.
5. Claim your CME credit and receive your certificate electronically by following the instructions given at the conclusion of the activity.

CME Objective for This Article: After reading this article the reader should be able to: 1) give an overview of the present state-of-the-art of imaging in the context of the person with type II diabetes; 2) increase knowledge in the appropriate use of these tests for clinical decision making in asymptomatic patients; 3) review the possible value of coronary calcium, nuclear imaging and echocardiography in this context; and 4) understand the relationship between different imaging modalities in persons with diabetes and their ability to predict future occurrence of cardiovascular events.

CME Editor Disclosure: *JACC: Cardiovascular Imaging* CME Editor Ragavendra R. Baliga, MD, has reported that he has no relationships to disclose.

Author Disclosures: Dr. Budoff has received grant support from General Electric. Dr. Soman has received grant funding and consultant fees from Astellas. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Medium of Participation: Print (article only); online (article and quiz).

CME Term of Approval

Issue Date: February 2016
Expiration Date: January 31, 2017

From the ^aDepartment of Medicine, Los Angeles Biomedical Research Institute at Harbor-UCLA, Torrance, California; ^bMazankowski Alberta Heart Institute, Department of Medicine, University of Alberta, Edmonton, Alberta, Canada; ^cDepartment of Medicine, University of Virginia, Charlottesville, Virginia; ^dDepartments of Imaging and Medicine, Cedars-Sinai Medical Center and the Cedars-Sinai Heart Institute, Los Angeles, California; ^eDepartment of Cardiology, Hofstra North Shore-LIJ School of Medicine, Uniondale, New York; ^fDepartment of Medicine, University of California, Irvine, California; ^gDepartment of Medicine/Division of Cardiology, Northwestern University Feinberg School of Medicine, Chicago, Illinois; ^hCardiology Division, MedStar Heart & Vascular Institute, MedStar Washington Hospital Center, Washington, DC; and the ⁱDivision of Cardiology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania. Dr. Budoff has received grant support from General Electric. Dr. Soman has received grant funding and consultant fees from Astellas. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received October 5, 2015; accepted November 6, 2015.

Noninvasive Cardiovascular Risk Assessment of the Asymptomatic Diabetic Patient

The Imaging Council of the American College of Cardiology

ABSTRACT

Increased cardiovascular morbidity and mortality in patients with type 2 diabetes is well established; diabetes is associated with at least a 2-fold increased risk of coronary heart disease. Approximately two-thirds of deaths among persons with diabetes are related to cardiovascular disease. Previously, diabetes was regarded as a “coronary risk equivalent,” implying a high 10-year cardiovascular risk for every diabetes patient. Following the original study by Haffner et al., multiple studies from different cohorts provided varying conclusions on the validity of the concept of coronary risk equivalency in patients with diabetes. New guidelines have started to acknowledge the heterogeneity in risk and include different treatment recommendations for diabetic patients without other risk factors who are considered to be at lower risk. Furthermore, guidelines have suggested that further risk stratification in patients with diabetes is warranted before universal treatment. The Imaging Council of the American College of Cardiology systematically reviewed all modalities commonly used for risk stratification in persons with diabetes mellitus and summarized the data and recommendations. This document reviews the evidence regarding the use of noninvasive testing to stratify asymptomatic patients with diabetes with regard to coronary heart disease risk and develops an algorithm for screening based on available data. (J Am Coll Cardiol Img 2016;9:176-92) © 2016 by the American College of Cardiology Foundation.

Diabetes is increasing by epidemic proportions in the United States and throughout the world (1,2). Increased cardiovascular morbidity and mortality in patients with type 2 diabetes is well established; diabetes is associated with at least a 2-fold increased risk of coronary heart disease (CHD) and 2- to 4-fold increased risk of CHD and stroke mortality compared with patients without diabetes (3-5). Currently two-thirds of death among persons with diabetes is related to cardiovascular disease (CVD) (5). Furthermore, management strategies for diabetes have shifted from glucocentric to multifactorial, to identify and target patients’ cardiovascular risk factors.

Formerly, diabetes was regarded as a “coronary risk equivalent,” implying a 10-year cardiovascular risk of >20% for every diabetes patient (6). This was based on an observational Finnish study by Haffner et al. (6), which showed that people with diabetes without prior myocardial infarction (MI) had a similar risk of CHD to those with MI but without diabetes. Following the original study by Haffner et al. (6), multiple studies from different population cohorts provided varying conclusions on the validity of the concept of coronary risk equivalency in patients with diabetes. Although some large observational studies supported the concept of coronary risk equivalency (7-10), several others did not (11-14). In a systematic review and meta-analysis, Bulugahapitiya et al. (15)

included 13 studies involving 45,108 patients. The mean duration of follow-up was 13.4 years (range 5 to 25 years). Patients with diabetes without prior MI had a 43% lower risk of developing CHD compared with patients without diabetes with previous MI (summary odds ratio [OR]: 0.56; 95% confidence interval [CI]: 0.53 to 0.60). The results showed that patients with diabetes were at a lower risk of developing total CHD events compared with patients without diabetes with established CHD (15). New guidelines have started to acknowledge the heterogeneity in risk and include different treatment recommendations for diabetic patients without other risk factors who are considered to be at lower risk (16,17). Furthermore, guidelines have suggested that further risk stratification in patients with diabetes is warranted before universal treatment (18,19). An important clinical question remains: do patients with asymptomatic diabetes need routine screening for CHD, and if so, how? This document reviews the evidence regarding the use of noninvasive testing to stratify asymptomatic patients with diabetes with regard to CHD risk (Central Illustration).

1. ROLE OF EXERCISE STRESS TESTING

Exercise testing in patients with diabetes is attractive due to low cost, simplicity, and wide availability. Compared with nondiabetic patients, the goals of

Download English Version:

<https://daneshyari.com/en/article/2937626>

Download Persian Version:

<https://daneshyari.com/article/2937626>

[Daneshyari.com](https://daneshyari.com)