

Cardiovascular Disease and Diabetes

Preface

Jackie L. Boucher, MS, RD, CDE, and
David G. Hurrell, MD, FACC, Guest
Editors

The International Diabetes Federation estimates that diabetes accounts for ~ 6% of total global mortality, with 50% of diabetes-associated deaths being attributed to cardiovascular disease (CVD).¹ Individuals with diabetes have twice the incident myocardial infarction (MI) rate as the general population, and survival rates are lower among individuals with diabetes once they have an adverse cardiovascular event.² Women with diabetes and CVD, regardless of menopausal status, have a four- to sixfold increase in the risk of developing CVD, whereas men with diabetes have a two- to threefold increased risk of CVD compared to women and men without diabetes.³ Women with diabetes also have poorer prognosis after an MI, have higher risk of death from CVD than men, and typically receive less aggressive treatment to achieve treatment goals.³

Because individuals with diabetes are at higher risk for CVD events than individuals without diabetes and are at risk for future events if they have already had one, most national guidelines consider CVD in their recommendations for people with diabetes.² Comprehensive guidelines, improved diagnosis, and effective treatments have definitely helped decrease mortality from CVD during the past few decades, but there is still more clinicians can do to help prevent it, especially among individuals with diabetes.

Today, most CVD prevention efforts for individuals with diabetes focus on treating blood pressure, lowering LDL cholesterol, increasing HDL cholesterol, encouraging tobacco cessation and physical activity, and providing medical nutrition therapy. There is strong evidence to support risk factor reduction in these

areas and evidence that progress has been made. However, there are still significant improvements needed to achieve both primary and secondary prevention of CVD. The numbers of individuals who attain various recommended targets for risk factor reduction are grim. Using data from the cross-sectional National Health and Nutrition Examination Survey 2001–2002, researchers estimated the proportion of individuals not at goal for blood pressure, lipids, and hemoglobin A_{1c} (A1C). Overall, 50.2% were not at goal for A1C, 64.6% did not achieve LDL cholesterol goals, 52.3% did not hit HDL cholesterol targets, and 53% failed to attain target blood pressure levels.⁴ Typically, when individuals have multiple risk factors for CVD, they are less likely to have their risk factors effectively managed.⁵ In fact, in the study by Malik et al.,⁴ the number of individuals with diabetes at goal for all three risk factors, including A1C, LDL, and blood pressure, was very low, with only 5.3% of men and 12.7% of women with diabetes achieving this desirable endpoint.

The purpose of this From Research to Practice section is to increase your awareness about, understanding of, and active treatment initiatives for CVD and diabetes. Our hope is the information presented will expand your knowledge in this area, help you more proactively identify individuals who may benefit from further diagnostics or treatments, and refer individuals as needed for additional care. Recommendations for diabetes and CVD are consistent between the American Diabetes Association and the American Heart Association,² and the topics covered in this section are those that should be integrated into content areas covered as part of

diabetes self-management education programs.⁶

The section begins with an article by Betsy B. Dokken, PhD, NP, CDE, on the pathophysiology of the link between diabetes and CVD. The author describes the complex and multifactorial etiology of CVD in diabetes, focusing on defects in both macrovasculature and microvasculature in addition to cellular and molecular mechanisms. As clinicians, we should understand the underlying mechanisms so we can treat patients appropriately, hopefully early in the disease process, and help them understand their disease progression.

Because CVD is the leading cause of morbidity and mortality in patients with diabetes, careful questioning about exertional symptoms in every patient and screening in high-risk asymptomatic patients is crucial. Given the increased risk of CVD in women and their poor outcomes post-MI, timely and accurate diagnosis can lead to appropriate preventive and therapeutic interventions and lower mortality rates.⁷ In our second article, Eve Roelker, MS, ANP-BC, CCRN, emphasizes the importance of proper screening and diagnosis of coronary artery disease in individuals with diabetes. Her article reviews what clinicians should consider in their assessment of patients, selection of appropriate diagnostic tools, and development of treatment plans.

Diabetes is a risk factor for developing peripheral arterial disease (PAD). Patients with both PAD and diabetes are at higher risk than PAD patients without diabetes for the progression of their PAD, as well as developing manifestations of coronary heart disease.⁸ The next article by Lyn M. Steffen, PhD, MPH, RD, et al., addresses PAD. Awareness of PAD among both pro-

fessionals and consumers is low; as a result, it is important for clinicians to familiarize themselves with the risk factors, symptoms, diagnostic methods, and treatment recommendations for this condition.

In our fourth article, by Curtis Triplitt, PharmD, CDE, and Carlos A. Alvarez, PharmD, MSc, BCPS, the focus shifts to best practices for using therapeutic medications to treat lipids and blood pressure and effective use of antiplatelet therapy. Given the low number of individuals reported to be at goal for A1C, blood pressure, and lipids, it is essential that we understand these treatment medications and use them as part of an aggressive treatment plan to manage CVD risk factors.

And finally, Raquel Franzini Pereira, MS, RD, LD, and Marion J. Franz, MS, RD, LD, CDE, finish our research section with an article on the key lifestyle modifications—nutrition, physical activity, and tobacco cessation—required to help individuals with diabetes both prevent and treat CVD. Medical nutrition therapy has been demonstrated to lower A1C, blood pressure, and lipids. Key lifestyle behaviors include tobacco cessation, physical activity, and healthy eating. These three healthy behaviors, used alone or in conjunction with medication therapy, are important to achieving the desired treatment goals. In this article, evidence-based recommendations for all three key behaviors are discussed. Practitioners should use this information to individualize and prioritize treatment goals to help patients achieve the best possible outcomes.

References

¹International Diabetes Federation: Diabetes prevalence [article online]. Available from <http://www.idf.org/home/index>.

²cfm?node=264. Accessed 1 August 2008

²Buse JB, Ginsberg HN, Bakris GL, Clark NG, Costa F, Eckel R, Fonseca V, Gerstein HC, Grundy S, Nesto RW, Pignone MP, Plutzky J, Porte D, Redberg R, Stitzel KF, Stone NJ: Primary prevention of cardiovascular diseases in people with diabetes mellitus: a scientific statement from the American Heart Association and the American Diabetes Association. *Circulation* 115:114–126, 2007

³Legato MJ, Gelzer A, Goland R, Ebner SA, Rajan S, Villagra V, Kosowski M: Gender-specific care of the patient with diabetes: review and recommendations. *Gen Med* 3:131–158, 2006

⁴Malik S, Lopez V, Chen R, Wu W, Wong ND: Undertreatment of cardiovascular risk factors among persons with diabetes in the United States. *Diabetes Res Clin Pract* 77:126–133, 2007

⁵Gu Q, Burt VL, Paulose-Ram R, Yoon S, Gillum RF: High blood pressure and cardiovascular disease mortality risk among U.S. adults: the third National Health and Nutrition Examination Survey mortality follow-up study. *Ann Epidemiol* 18:302–309, 2008

⁶Funnell MM, Brown TL, Childs BP, Haas LB, Hoseney GM: National standards for diabetes self-management education. *Diabetes Care* 31:S97–S104, 2008

⁷Mieres JH, Shaw LJ, Arai A, Budoff MJ, Flamm SD, Hundley G, Marwick TH, Mosca L, Patel AR, Quinones MA, Redberg RF, Taubert KA, Taylor AJ, Thomas GS, Wenger NK: Role of noninvasive testing in the clinical evaluation of women with suspected coronary artery disease: consensus statement from the Cardiac Imaging Committee, Council on Clinical Cardiology, and the Cardiovascular Imaging and Intervention Committee, Council on Cardiovascular Radiology and Intervention, American Heart Association. *Circulation* 111:682–696, 2005

⁸Marso S, Hiatt WR: Peripheral arterial disease in patients with diabetes. *J Am Coll Cardiol* 47: 921–929, 2006