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THE PRESENT AND FUTURE

STATE-OF-THE-ART REVIEW

Peripheral Artery Disease

Evolving Role of Exercise, Medical Therapy, and Endovascular Options

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CME Objective for This Article: At the end of this activity the reader should be able to: 1) evaluate medical treatment options for patients with peripheral artery disease so as to decrease the likelihood of experiencing a myocardial infarction, stroke, and cardiovascular death; 2) for your patients with claudication, counsel on lifestyle modifications to improve their quality of life; and 3) diagnose patients with critical limb ischemia so that they may be referred for revascularization to prevent amputation.

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Listen to this manuscript's audio summary by *JACC* Editor-in-Chief Dr. Valentin Fuster.

Peripheral Artery Disease

Evolving Role of Exercise, Medical Therapy, and Endovascular Options

ABSTRACT

The prevalence of peripheral artery disease (PAD) continues to increase worldwide. It is important to identify patients with PAD because of the increased risk of myocardial infarction, stroke, and cardiovascular death and impaired quality of life because of a profound limitation in exercise performance and the potential to develop critical limb ischemia. Despite effective therapies to lower the cardiovascular risk and prevent progression to critical limb ischemia, patients with PAD continue to be under-recognized and undertreated. The management of PAD patients should include an exercise program, guideline-based medical therapy to lower the cardiovascular risk, and, when revascularization is indicated, an "endovascular first" approach. The indications and strategic choices for endovascular revascularization will vary depending on the clinical severity of the PAD and the anatomic distribution of the disease. In this review, we discuss an evidence-based approach to the management of patients with PAD. (J Am Coll Cardiol 2016;67:1338–57)

Peripheral artery disease (PAD) refers to atherosclerosis involving the aorta, iliac, and lower-extremity arteries and is associated with significant morbidity and mortality (1,2). Since the last iteration of the guidelines focused on PAD (2–4), published data have emerged that may alter the standard of care for this high-risk patient group. This review will delve in great detail into the management of PAD patients, highlighting the roles of exercise, optimal medical management, and endovascular therapy. Surgical revascularization will not be discussed because current expert consensus documents recommend an "endovascular first" approach for the majority of PAD patients requiring revascularization (2,3).

Despite initiatives to improve on the identification and management of PAD (2,5), the number of people affected and disease morbidity continues to rise. As of 2010, more than 200 million people worldwide are living with PAD, which represents a 28.7% increased prevalence in low- and middle-income countries and a 13.1% increase in high-income countries over a 10-year period (6,7). Prevalence studies in the United States estimate that 5.9% of Americans over 40 years of age have PAD (8). When specific high-risk populations are evaluated, estimates of PAD prevalence are as high as 30% (9). The prevalence and severity of PAD is increased in African Americans and Hispanics (10). A recent retrospective cohort study evaluating nearly 12 million insured American adults reported mean annual incidence rates of PAD and critical limb ischemia (CLI) of 2.35% and 0.35%, respectively (11).

The risk factors for PAD mirror those of cerebrovascular and coronary atherosclerosis, including a positive family history, diabetes mellitus, smoking, chronic kidney disease, hypertension, and hyperlipidemia (5,9,10,12,13). Smoking and diabetes are particularly virulent and are associated with worse outcomes, independent of other risk factors (14).

Identification of patients with PAD is important because there is a 3- to 4-fold increased risk of cardiovascular events, even in the setting of asymptomatic disease (15). At 5 years, approximately 1 of 5 patients with PAD will experience a nonfatal cardiovascular event, and 15% to 20% will die (most of cardiovascular causes) (8,16).

Most patients with PAD fall into 1 of 3 groups: classic claudication (10% to 30%), atypical leg pain (20% to 40%), or asymptomatic (nearly 50%). Formal testing to assess functional capacity and endurance shows significant impairment in patients with PAD, even if asymptomatic. Although the majority of patients report leg symptoms other than classic claudication, greater functional decline is associated with greater severity of disease, lower baseline ankle-brachial index (ABI), and increased numbers of cardiovascular events (17–20). In patients with CLI, outcomes are dire: at 1 year, 10% will experience a fatal cardiovascular event, and 25% will undergo limb amputation (2).

Patient-reported symptoms underestimate PAD prevalence, and the physical examination is not a reliable tool for the identification of disease. Diagnosis and prevention of adverse outcomes may