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MEETING REPORT

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Canadian Guidelines for the Management of Peripheral Arterial Disease (PAD)

Introduction

Peripheral Arterial Disease (PAD) is an extremely important public health issue affecting a significant portion of the Canadian population. It is a condition characterized by progressive narrowing of the arteries in the lower extremities. Patients with PAD may be asymptomatic or symptomatic. The prevalence of asymptomatic disease is high and, as with symptomatic disease, is associated with up to a six-fold increased risk of cardiovascular morbidity and mortality. In contrast to the relatively benign progression of local disease, overall mortality is significant, approximately 50%. At 10 years, the survival rate of asymptomatic patients is approximately 50% and, for severe symptomatic patients, approximately 25%.

Symptoms range from intermittent claudication to critical limb ischemia. Intermittent claudication is the most common manifestation. It is typically characterized by a history of leg pain on exercise that is relieved with rest. Patients can present with more progressive symptoms such as critical limb ischemia, leading to ulcers and gangrene, necessitating surgical interventions such as angioplasty, stenting, endarterectomy, bypass or amputation. The need for amputation is higher in patients with renal dysfunction and/or diabetes.

The PAD Consensus Document presented at the 2005 Canadian Cardiovascular Society Congress was devised by a primary writing panel, which is regionally broad-ranging, and composed of cardiovascular specialists, cardiologists, internists, and surgeons from coast to coast.

The deleterious nature of PAD is compounded by its status as an under-diagnosed and under-treated disease. Recent data has elaborated on the magnitude of the burden of PAD and its under-treatment; however, there is a paucity of Canadian epidemiological data. It is estimated that 27 million people in Europe and North America have the disease and, in Canada, it likely affects approximately 4% of the population over the age of forty.

The PAD Consensus Document presented at the 2005 Canadian Cardiovascular Society Congress was devised by a primary writing panel, which is regionally broad-ranging, and composed of cardiovascular specialists, cardiologists, internists, and surgeons from coast to coast. The secondary review panel also encompasses a broad range of specialists caring for the patient with peripheral arterial disease. The intent of this document is to be complementary to larger European (TASK) and US documents (AHA/ACC), with a very practical focus of disseminating and implementing knowledge and best practices to our patients. Of course, the CCS consensus process is dynamic, and we hope to expand the focus of this document as it is updated in years ahead. The following is a brief synopsis of the content of the document.

Pathophysiology

Atherosclerosis is a generalized disease that affects large- and medium-sized arteries. Atherosclerotic plaques are prone to disruption, thereby triggering the formation of an overlying thrombosis. The term atherothrombosis has been introduced to describe thrombosis complicating atherosclerosis. PAD is a distinct atherothrombotic syndrome that is associated with an elevated risk of cardiovascular and cerebrovascular events including death, myocardial infarction and stroke.

Risk Factors

The two risk factors that correlate most with the development and progression of PAD are cigarette smoking and diabetes. PAD is seen in smokers a decade earlier than non-smokers, and smokers have up to a 5.6-fold increase in the development of PAD compared to non-smokers. In addition, continued smoking in patients with symptomatic PAD is associated with an 11-fold increase in limb loss as compared to persons who discontinue smoking or non-smokers. Similar risk is seen in patients with diabetes, with rates of intermittent claudication increasing by 3.5-fold in men with glycosuria compared to non-diabetic men. Women with glycosuria have a highly elevated 860% increased risk, compared to women without glycosuria.

Data from the Framingham and other studies also indicate a strong and convincing relationship between hypertension and PAD. The Framingham study reported that hypertensive men had a 2.5-fold, and women a 3.9-fold, age-adjusted increased risk for PAD compared to controls without hypertension, a finding that has been confirmed in other studies.

Screening and Diagnosis

Due to the increased risk of morbidity and mortality with PAD, screening by history and physical examination should be part of the health evaluation of men >40 years of age, and women who are post-menopausal, or >50 years of age, as well as of patients with a recognized cardiovascular risk factor. Although PAD is currently under-diagnosed, there is a growing body of evidence that supports its diagnosis through non-invasive procedures, which are effective diagnostic and risk assessment tools. Many questionnaires have been developed to help define intermittent claudication and to establish prevalence. The non-invasive ankle brachial index (ABI) test has been widely used in epidemiological studies to demonstrate hemodynamic impairment in claudicant patients, but also to help detect PAD in the high population of PAD patients who do not present with claudication. An ABI is considered normal between 0.9-1.3 in most studies. An ABI <0.9 is diagnostic of PAD, and an ABI >1.3 reflects non-compressible calcified vessels.

Therapeutic Strategies

Steps taken to identify and modify risk factors are central to managing PAD patients. Both pharmacological and non-pharmacological approaches should be administered simultaneously. Two important non-pharmacological approaches to lifestyle have been shown effective in reversing symptomatic PAD — smoking cessation and regular exercise. Medical therapies that have been evaluated for the prevention of cardiovascular events in the PAD population can generally be grouped into three categories: thrombosis-directed therapies, cholesterol lowering therapies, and blood pressure lowering therapies. In recent years, a number of large randomized controlled trials have helped clarify the role of these strategies in patients with PAD, and this information is summarized within the Consensus document. In addition, the role of tight glucose control and the special properties of individual classes of pharmacologic agents, including ACE inhibitors and statins, are highlighted. Given the high baseline risk of PAD patients and the effectiveness of these interventions, a combination of multiple drug therapies, in conjunction with aggressive lifestyle changes (smoking cessation and regular walking) should be emphasized for all patients with PAD. ▣

Peripheral Arterial Disease Consensus Document Grade 1A Recommendations

Risk Factors

- All individuals with symptomatic or asymptomatic PAD should be assessed for all modifiable risk factors.
- Identified risk factors should be managed appropriately in order to reduce the risk of adverse cardiovascular events, and the progression of PAD.
- Individuals with PAD are recommended to quit smoking and have regular walking programs as non-pharmacological approaches to reducing overall cardiovascular risk, and improving PAD symptoms.

Management of Atherosclerotic Renal Artery Stenosis

- BP targets should be 130/80 mm Hg in the absence of renal insufficiency or significant proteinuria.
- If serum creatinine is >140 µmol/L, or if there is >1 gm/day of proteinuria, BP target should be 125/75 mm Hg.
- ACE inhibitor therapy should be first-line, with the addition of a diuretic if required.

PAD Screening and Diagnostic Techniques

- Taking a directed history for PAD symptoms (using validated questionnaire).
- Performing directed examination, focusing on physical findings that have been proven useful in detecting PAD (as defined by an ABI <0.9).
- Ordering an ABI to help diagnose arterial claudication in patients suspected of claudication.
- Ordering an ABI to diagnose PAD in asymptomatic patients with arterial bruits or diminished pulses.
- Considering magnetic resonance angiography (MRA) or computed tomography angiography (CTA) (where facilities exist) rather than DSA, in patients with incapacitating claudication.

Aortic Aneurysm Screening and Follow-Up Recommendations

- All men aged 65-74 should be screened

Initial Size	Recommendation	Grade
≤3.0 cm	Repeat ultrasound follow-up in 3-5 years	1A
3.1-3.4 cm	Repeat ultrasound in 3 years	1A
3.5-3.9 cm	Repeat ultrasound in 2 years	1A
4.0-4.4 cm	Repeat ultrasound in 1 year	1A
≥4.5 cm	Referral to vascular surgeon and repeat ultrasound every 3-6 months	1A
If >1 cm growth in 1 year	Referral to vascular surgeon	1A

Evidence Supporting Medical Therapies to Reduce Cardiovascular Events in PAD

Class of Agents	Grade
Statins	1A
ACE inhibitors	1A
Oral hypoglycemics or insulin	2B
Antiplatelet agents	1A

Percutaneous Endovascular Interventions for PAD

Iliac artery interventions

- Provisional iliac stenting (either balloon-expandable or self-expanding) should be performed following suboptimal PTA results

Non-Medical Management of Chronic Limb Ischemia

- Patients with critical limb ischemia should be considered for revascularization procedures.
- Infrainguinal bypasses to the tibial vessels should be performed with autogenous conduits as they offer superior patency to synthetic conduits.
- Lifelong atherosclerotic related risk factor modification and medical therapy is recommended following lower extremity revascularization.

Recommended Approach to Preoperative Assessment for Non-Cardiac Vascular Surgery

- The approach to the preoperative evaluation should be appropriate to the situation (elective versus emergent surgery) and should be tempered by the patient's overall health status.
- Preoperative coronary revascularization does not reduce risk in patients with stable cardiac symptoms and thus should only be considered in patients who would warrant revascularization for medical reasons independent of the proposed operation.
- Non-invasive testing is recommended only for selected patients scheduled for elective vascular surgery.
- In patients who can ambulate, the exercise stress test is the non-invasive test of choice. In patients who are unable to exercise, the choice of non-exercise non-invasive test should be dictated by availability, local expertise, and consideration of contraindications.

Abdominal Aortic Arterial Disease

Ruptured abdominal aortic arteries are the 10th leading cause of death in men over the age of 55 in the US. The prevalence of abdominal aortic aneurysms (AAAs) (≥ 3 cm) is 3-10% for patients over the age of 50. Screening of asymptomatic men over 65 has been proven in randomized trials, with higher yields in those with a smoking history. Referral to a vascular specialist should occur when the aorta reaches 4.5 cm. Aneurysm repair thresholds differ between men and women and new minimally invasive lower risk options for aneurysm treatment exist.

The role of the cardiac specialist has been less defined in the PAD arena than in the patient with coronary disease (CAD).

Atherosclerotic Renal Artery Stenosis

Patients with PAD are at high risk of renal artery stenosis, and represent a patient group requiring particular attention. Screening and diagnostic techniques include history and physical examination, as well as non-invasive imaging techniques of the renal vasculature. The gold standard for the diagnosis of renal arterial disease remains renal arteriography. Less invasive diagnostic modalities are available, but the greatest pitfall of these less invasive tests, with the possible exception of MRA, is their low sensitivity (high rate of falsely negative tests that fail to detect a significant lesion).

Percutaneous Endovascular Interventions (PEI)

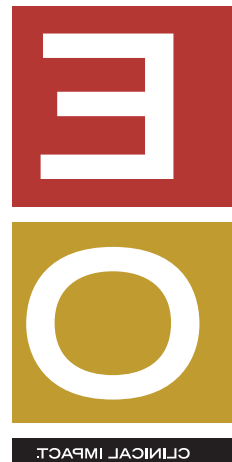
The indications for PEI are more liberal than surgical indications for PAD, predominantly due to their substantially less invasiveness, low peri-procedural complications, and shorter recovery time. Currently accepted indications for PEI include: severe claudication that interferes with work or lifestyle despite pharmacologic and exercise therapies, chronic critical limb ischemia (rest pain, non-healing ulcer, or gangrene), and emergency treatment of acute limb ischemia. The field of percutaneous endovascular intervention of PAD has made dramatic strides over the past four decades.

Perioperative Risk Assessments

General internists and cardiologists are frequently asked to perform preoperative assessments on patients who are scheduled to undergo major vascular surgery. The purpose of these assessments should not be to “clear” someone for surgery, but rather to evaluate the severity and stability of a surgical candidate’s medical conditions and, where necessary and possible, to optimize their management before surgery. The preoperative assessment should be seen as a venue for the provision of risk estimates to the surgeon, patient, and anesthesiologist, which can be used to inform decision-making about the proposed surgery.

Conclusion

The role of the cardiac specialist has been less defined in the PAD arena than in the patient with coronary artery disease (CAD). Unlike the CAD patient — who ideally receives comprehensive care from primary care physicians, specialists, surgeons, and established secondary prevention clinics — there is no such care strategy for the PAD patient. The PAD patient is often seen by the primary care health provider and, when symptomatic, is sent to vascular surgeons for evaluation and possible revascularization. Until recently, little attention has focused on the evaluation and treatment of the disease process itself. The delivery of care to the PAD patient is not widely publicized. Although not explicitly discussed within the Consensus document, one of the goals of this consensus process is to stimulate discussion and foster debate as to the most appropriate models for health care delivery in the PAD patient, with the goal of ensuring better treatment, to ultimately reduce both morbidity and mortality. ■



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