Peer-reviewed
Cardiovascular Disease

Nonsurgical Management of Chronic Exertional Angina in Older Adults

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The increasing average age of natural survival and effective therapies for many previously fatal illnesses have increased the older adult population. Thus, there is a concomitant increase in long-term treatment requirements for many conditions, including chronic angina pectoris. Advances in nonsurgical interventions include angioplasty and stent technology. The medical treatment of angina should be individualized to the patient and usually involves multiple-drug regimens. Mainstays of therapy include acetylsalicylic acid and nitroglycerin 0.4 mg spray with combinations of long-acting nitrates, beta-blockers, calcium channel blockers, and the ancillary use of angiotensin-converting enzyme inhibitors and statins. Risk reduction involves controlling modifiable factors, including smoking, weight control, hypertension, and hyperlipidemia; this will reduce disease progression and cardiac event occurrences. Older adults should be monitored for drug interactions and sensitivity to medication in the presence of associated medical problems and other therapies. Cardiac rehabilitation programs are a useful addition to comprehensive medical treatments for chronic stable angina.

Key words: *angina, antianginal drug therapy, risk reduction, cardiac rehabilitation, percutaneous coronary intervention, PCI*

Introduction

Cardiovascular disease remains the commonest disease in the industrialized nations of the Western world. The condition has both acute and chronic manifestations. In a significant proportion of affected individuals, angina strikes suddenly without warning. In an even larger number of people, manifestations of angina are responsible for long-term symptoms and disability.[1–3]

The average age of natural survival and the effective therapies available for many previously fatal illnesses have resulted in an increasing number of active, aging older adults, often with significant medical illnesses being treated on a long-term basis. As a result, there has been an intense focus of research and resources on therapies and strategies for diagnosis, treatment, and risk reduction in many medical conditions, not the least of which have been cardiovascular diseases. The past decade has seen major advances in available treatment options, most notably in the areas of medical, surgical, and interventional technology, prescribed to reduce the risk of both disease presentation and secondary recurrence of existing documented atherosclerotic coronary artery disease.

Aggressive treatments in the middle decades of life for conditions including acute myocardial infarction, congestive heart failure, and noncardiac conditions such as diabetes, cancers, and others have also shifted survival statistics of the cardiac disease population more than most, given the prevalence of the disease. Accordingly, a growth in older adult populations with established and documented heart disease has occurred,[2,3] and the ever-present high risk of atherosclerotic disease in advancing age has increased the numbers of older adults presenting with symptomatic heart disease. The presence of concomitant medical diagnoses may result in more patients who are not candidates for aggressive interventional therapies or open heart surgery for treatment of their symptoms. Therefore, medical therapies including drugs and other ancillary nonsurgical approaches have gained popularity in recent years.[4]

Angiography and Interventional Technology

It is important to recognize that the advances in angiography, percutaneous coronary intervention (PCI) with angioplasty, and stent technology have allowed for these procedures to be evermore commonly recommended for older adults. The rise in popularity of these procedures lies in their relatively low risk of morbidity and mortality and the short hospital stay involved. However, angioplasty in general is recognized as a riskier procedure for older individuals than for middle-aged people with similar anatomical lesions. Angioplasty becomes an important option when chronic stable angina progresses to more frequent or unstable angina due to metabolic factors (e.g., anemia) or intolerance to one or more of the common medical therapies used in the treatment of angina pectoris. While some patients are reluctant to consider intervention, the recommendation for PCI for older adults and for those with significant comorbidities is now more common. This increase in popularity is precisely due to the advantageous risk-benefit ratio when compared with long-term medical therapies and the fact that it is an option when open heart surgical procedures are contraindicated, not

Table 1: Common Antianginal Drug Therapies*

Nitrates	Beta-Blockers	Calcium Channel Blockers	ASA	Statin Cholesterol-Lowering Drugs
NTG 0.4 mg spray SL	Atenolol 50–100 mg o.d.	Nifedipine 10–30 mg t.i.d. or q.i.d.	ECASA 81 mg o.d.	Atorvastatin 10–80 mg o.d.
NTG 0.3, 0.6 mg pills SL p.r.n.	Nadolol 40–80 mg o.d.	XL 20–60 mg o.d.		
Nitroglycerin patches 0.2, 0.4, 0.6, 0.8 mg on 12–14 h/d	Bisoprolol 5–20 mg o.d.	Diltiazem 30–90 mg t.i.d. or q.i.d. XC, CD 60–360 mg o.d.	ECASA 325 mg o.d.	Rosuvastatin 5–20 mg o.d.
Isosorbide dinitrate 10–60 mg, 2–3 times/d	Metoprolol 50–100 mg b.i.d.–q.i.d.	Verapamil 80–120 mg t.i.d. or q.i.d.		Simvastatin 10–40 mg o.d.
	Acebutolol 200–600 mg b.i.d.	SR 180–240 mg o.d.		Pravastatin 20–40 mg o.d.
		Amlodipine 2.5–10 mg o.d. Felodipine 5–20 mg o.d.		

ASA = acetylsalicylic acid; ECASA = enteric-coated ASA; NTG = nitroglycerin.
* Each category of drug therapy contains examples of commonly prescribed medications in Canada; this is not meant to portray a complete or preferred list of available agents.

practical given their scope, or not desired by the patient or family.[5,6]

The symptoms of angina occur as a result of myocardial ischemia caused by an imbalance between myocardial oxygen requirements and oxygen supply. Increased oxygen requirements are caused by tachycardia, left ventricular wall stress, and contractility.[7] Older adults often have an associated comorbidity for which the treatment or the condition results in anemia, marked weight gain, occult thyrotoxicosis, fever, infections, hypoxia, chronic pain, deconditioning, or a metabolic or electrolyte imbalance. Certain drug therapies or other factors can also increase the risk of angina and should be optimized as much as possible in the initial noncardiac medical therapy of individuals with angina.

Medical Therapy with Antianginal Drugs

The most effective method of controlling angina with medication is to individualize treatment to a particular patient based upon general body weight, associated conditions such as hypertension or diabetes, and sensitivity to medications, alone or in combination. It is often effective to use two or more drugs to obtain optimal prevention of exertional, stress-induced, and resting angina. Some medications can also be titrated to seasonal variations of symptoms.

The basic constants of therapy include acetylsalicylic acid 81 mg and nitroglycerin 0.4 mg spray as needed, along with one or more of the following: a beta-blocker, a calcium channel blocker, or long-acting oral or transdermal nitrate patches (Table 1). The use of evidence-based medicine is important in making therapy recommendations; however, evidence-based medicine for the treatment of cardiac conditions in older adults is not as often implemented as it is for younger people.

The beta-blocking agents are considered a cornerstone of therapy for angina. They are also effective as antihypertensive and antiarrhythmic agents and have been proven to reduce mortality and reinfarction in patients with postmyocardial infarction. They reduce the frequency of angina and raise the angina threshold. They can be used as single daily dose monotherapy or in twice-daily dosing to increase the peak-trough effect of higher levels in patients with more frequent symptoms. Caution should be exercised in the use of these drugs by older adults in general because of their bradycardic and antihypertensive associated effects. Additionally, beta blockers should be avoided in those with slow heart rates or a pre-existing heart block. Individuals who are dependent on insulin and people with diabetes, asthma, or chronic obstructive pulmonary disease with suboptimal control of these conditions may respond adversely to beta-blockade.[8,9]

The calcium channel blockers have three distinct classes of commonly used preparations that variably affect blood pressure and heart rate and have documented effective antianginal effects in all subgroups. They act to inhibit calcium ion movement through slow channels by noncompetitive blockade of voltage sensitive L-type calcium channels, resulting in effects upon conduction system tissue and relaxation of vascular smooth muscle.

The phenylalkylamine drugs (e.g., Verapamil) are both strongly negatively

inotropic and chronotropic and can interfere with atrioventricular (AV) conduction. This makes them useful for patients with hypertension and tachyarrhythmias but contraindicated for people with bradycardia, heart failure, or hypotension. They are also well known to cause significant constipation, often an issue of serious consideration for older adults.

The dihydropyridine drugs (e.g., Nifedipine) have no significant node blocking or bradycardic effects and are mainly vasodilatory, thus acting as good antihypertensive and angina-alleviating agents.[9] The main adverse effects can be reflex tachycardia or, more commonly, peripheral dependent edema or flushing. These drugs are mostly available as single daily dose monotherapy. The second-generation preparations, including Amlodipine, are more recently popular for angina and hypertension control and show benefit in older adults.

The modified benzothiazepine drugs (e.g., Diltiazem) provide a combination of the above groups' properties with a mix of mild AV nodal blocking effects and vasodilatory activity. They provide very effective anginal, hypertension, and heart rate control. These drugs have a wide dosing range and are available in graduated strengths. The drugs are effective when used both in the dose strength and frequency titration alone or in combination to provide long-term effective angina control in older adults.[1]

The use of oral long-acting nitrates requires multiple daily dosing due to the short half-life of the commonly used preparations such as Isosorbide. Nitroglycerin patches applied for 12-hour cycles are more effective nonoral techniques of additional angina control. When considering these therapies in older adults, the issues of headache, nitrate tolerance, intolerance, and skin rash are particularly relevant.

Significant evidence exists demonstrating that cardioprotection from ischemic events has been influenced beneficially by the long-term use of angiotensin-converting enzyme inhibitors.[10] Statin therapy for hyperlipidemia or established coronary artery disease is proven to reduce disease progression and subsequent cardiac events.[11] Most cardiologists advocate the use of these therapies in the absence of contraindications to complete a regimen for long-term antianginal protection.

Cardiac Rehabilitation and Risk Reduction Therapy

The benefits of cardiac rehabilitation programs with mild graduated exercise and educational classes to optimize risk-reduction strategies have been proven to benefit most patients with cardiac disease.[12] There is some evidence that exercise can produce favourable morphological angiographic changes in obstructive lesions among those with chronic stable angina.[13] Older adults are limited from this additional modality of therapy only by their individual frailty or inactivity. Smoking cessation, weight reduction, maintaining a healthy diet, counselling therapy for depression and anxiety related to cardiac disease, and education regarding medication administration are equally relevant to older adults.[14] Some people with associated mobility issues including stroke, arthritis, obesity, or respiratory or malignant disease may not be able to participate sufficiently, but may enjoy the group therapy benefit associated with the treatment of these and many other diseases. An opportunity to participate should certainly be offered to all patients.

Clinical Pearls

Presentation of angina in older patients may manifest as arthritic, gastrointestinal, or otherwise atypical and vague complaints.

Multiple drug interactions may occur in older patients being treated for associated comorbidities. Before initiating any new drug therapy, the physician must ensure no adverse interaction will occur.

Nonpharmacological Therapies

Some older adults do not respond to multiple medical therapies or wish to pursue nondrug therapies for their angina. If they are refractory to drug therapy, enhanced external counterpulsation is a noninvasive treatment that has been shown to have a limited benefit in reduction of symptoms after a course of therapy, but the duration of benefit is uncertain. Some studies have shown a long duration of beneficial effect.[15,16] The use of vitamin therapy in high doses and other nonconventional therapies such as chelation cannot be recommended and are not appropriate treatments, particularly for older adults.

Conclusion

In summary, the treatment of chronic exertional angina among older adults should encompass as many of the usual modalities of complete cardiac secondary prevention care as possible. Such care includes risk reduction counselling and treatment, adequate but not excessive medication,

Key Points

- The prevalence of atherosclerotic coronary artery disease is very high in the older adult population.
- Angina medication should be tailored to consider associated medical conditions commonly found in older patients.
- The role of angioplasty is increasingly utilized among the older adults and frail cardiac patients.
- Beta-blockers should be used with caution in older patients.
- Exercise and cardiac rehab programs are very valuable in the older patient group.

step-care additions and adjustments of drug therapy to account for the frailty of advancing age, and recognition and treatment of associated medical illnesses. Physicians must take care to carefully monitor more fragile older adults and adjust therapy as needed to reduce the risk of drug interactions and iatrogenic events. Patient encouragement and motivation are very important. Almost all patients should be able to reach a level of therapy that prevents frequent or unstable angina episodes and allows for a good quality of life without ischemic cardiac disease becoming a limiting illness in older adults as they advance into their senior years.

No competing financial interests declared.

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