Clinical Cardiology Reserch and Reports

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Current Perspectives of Angina Pectoris Symptoms and Treatment

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Received Date: June 03, 2023; **Accepted Date:** June 24, 2023; **Published Date:** July 08, 2023

Citation: Silva M, Mancini B, Camici G*, Lennon N, Stone F, Current Perspectives of Angina Pectoris Symptoms and Treatment, V2(1).

Abstract

Angina is the most common symptom of ischemic heart disease, which is the major cause of morbidity and mortality worldwide. Approximately 9 million patients in the USA have symptoms of angina, though its treatment is challenging.

Keywords: coronary arteries; coronary vasospasm; chest pain; cardiac ischemia; chronic stable angina

Introduction

Angina, or chest pain, is the most common symptom of ischemic heart disease, a major cause of morbidity and mortality worldwide. Chest pain can be due to non-cardiac and cardiac causes, and thorough history and physical is critical in differentiating these causes and identifying patients experiencing acute coronary syndrome. Angina is one of the signs of acute coronary syndrome (ACS) and can further subdivide into stable and unstable angina. Stable angina defines as the occurrence of symptoms with exertion only. Unstable angina or symptoms occurring at rest requires more prompt evaluation and management.

Cardiovascular disease is the leading cause of death worldwide and ischemic heart disease is responsible for approximately half of these deaths. Among its clinical manifestations, acute coronary syndromes typically need urgency or emergency management, while chronic coronary syndromes can be usually managed with an outpatient approach for both diagnosis and treatment, in absence of identified high-risk features. Patients with stable angina pectoris have a 3 to 4% annual incidence of myocardial infarction and death and the principal therapies available (lifestyle modifications, medications, percutaneous coronary intervention, and coronary artery bypass grafting) have the primary aim of reducing the risk of death, myocardial infarction and stroke and improve quality of life by reducing symptoms.

Pathophysiology of Angina Pectoris

Angina pectoris is caused by episodes of myocardial ischemia provoked by an imbalance in myocardial oxygen supply-demand, which may be due either to an increase in oxygen demand (depending on wall tension, i.e., intraventricular pressure, left ventricular radius—and volume—and wall thickness; heart rate and myocardial contractility) or a decrease in oxygen supply (reduction in coronary blood flow, anaemia and other causes reducing oxygen-carrying capacity of the blood).

Therefore, drugs that reduce the progression of atherosclerosis and prevent plaque remodelling are recommended in coronary artery disease (CAD) patients to reduce the risk of myocardial infarction (MI) and antianginal drugs may have prognostic benefits in certain populations.

Lifestyle Modifications

Healthy lifestyle behaviour should be encouraged in all patients, in particular regular exercise, healthy (i.e., Mediterranean) diet pattern, intentional weight loss and smoking cessation.

Cigarette smoking is responsible for 50% of deaths in smokers and a lifetime smoker has on average a 10-year life loss. Smoking cessation improves the prognosis in patients with chronic coronary syndromes with a 36% reduction in mortality risk in quitters.

A Mediterranean diet, rich in fruit, vegetables, fibre, polyunsaturated fats, and legumes, with limited intake of red meat, processed foods, saturated fats and dairy is recommended in the European guidelines.

Percutaneous Coronary Intervention and Coronary Artery Bypass Graft

Revascularization in stable ischemic heart disease has two main indications: to improve symptoms and to improve survival. In fact, in patients undergoing CABG for stable ischemic heart disease, survival benefits were observed only in the case of left main disease, triple vessel disease or ischemic cardiomyopathy. The STICH trial randomized over 1200 patients with ischemic left ventricular dysfunction (LVEF < 35%) to receive medical therapy alone or CABG and medical therapy and showed the superiority of revascularization and medical therapy at 10-year follow-up for all-cause mortality, while the primary endpoint was not met at 5-year follow-up.

Gender differences and angina presentation

The WISE (Women's Ischemia Syndrome Evaluation) study highlighted that over 2/3 of women with angina had no obstructive CAD and the majority of these had functional impairments in the coronary microcirculation associated with significant impairments in health-related quality of life. Indeed, women have more non-obstructive CAD and functional IHD which are frequently overlooked and hence undertreated.

Invasive coronary angiography and physiological assessment

UK NICE guidelines suggest that invasive coronary angiography is a third-line investigation for angina when the results of non-invasive functional imaging are inconclusive. Patients with typical symptoms, particularly those in older age groups with higher probability of non-diagnostic CTCA scans, often proceed directly to invasive coronary angiography. During cardiac catheterisation, assuming that epicardial CAD is responsible for their symptoms, visual assessment for severe angiographic stenosis (>90%) is sufficient to establish significance and treatment plan for these patients. Two common pitfalls for visual interpretation of angiograms were recently highlighted by two coronary physiology pioneers Gould and Johnson. Using their quantitative myocardial perfusion database of over 5900 patients showing that occult coronary diffuse obstructive coronary disease or flush ostial stenosis may be both be overlooked on angiography and mislabelled as microvascular angina with suboptimal treatment.

Rationale and benefit of invasive coronary function testing in INOCA

We contend that a complete diagnostic evaluation of the coronary circulation should assess structural and functional pathology. The British Heart Foundation CorMicA trial provides evidence about the opportunity to provide a specific diagnosis to patients with angina using an interventional diagnostic procedure (IDP) when obstructive CAD is excluded by invasive coronary angiography. Consenting patients were randomised 1:1 to the intervention group (stratified medical therapy, IDP disclosed) or the control group (standard care, IDP sham procedure, results not disclosed). The diagnostic intervention included pressure guidewire-based assessment of FFR, CFR and IMR during adenosine induced hyperaemia (140 µg/kg/min).

Conclusion

Typical angina affects over 10 million people in the United States. The presentation can vary from chest pressure to fatigue to shortness of breath to nausea. If this ultimately leads to myocardial infarction or unstable angina, the cardiology team is imperative in treatment; however, there are often many providers that will see this individual before that evolution. It is important to utilize an interprofessional team to best suit each patient. The primary care provider will play a large role in primary and secondary prevention, likely for many years prior to the development of symptoms.

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