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Understanding the Silent Killer of the Heart

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DESCRIPTION

Coronary artery disease, also known as ischemic heart disease, stands as the leading cause of morbidity and mortality worldwide, posing a significant public health challenge. Characterized by the narrowing or blockage of coronary arteries that supply oxygenated blood to the heart muscle, deprives the heart of essential nutrients, leading to myocardial ischemia, infarction, and potentially life-threatening complications. Despite advancements in diagnosis and treatment continues to exact a heavy toll on individuals and healthcare systems, emphasizing the importance of understanding its pathophysiology, risk factors, and management strategies. The pathogenesis is multifactorial, involving complex interactions between genetic predisposition, lifestyle factors, and systemic diseases. Central to its development is the process of atherosclerosis, wherein cholesterol-rich plaques accumulate within the arterial walls, causing luminal narrowing and compromising blood flow. Clinical manifestations vary depending on the degree of coronary artery stenosis and the presence of myocardial ischemia or infarction. Stable angina, characterized by episodic chest discomfort or pressure precipitated by exertion or emotional stress, reflects reversible myocardial ischemia secondary to coronary artery narrowing. Unstable angina, a medical emergency, denotes crescendo angina or new-onset angina at rest, suggestive of acute plaque rupture and impending myocardial infarction. Myocardial infarction, resulting from acute thrombotic occlusion of a coronary artery, presents with persistent chest pain, diaphoresis, dyspnea changes indicative of myocardial injury. In some cases, may manifest as silent ischemia, occurring without overt symptoms but still predisposing individuals to adverse cardiovascular outcomes, emphasizing the importance of vigilant risk factor assessment and aggressive risk reduction measures. Diagnosis relies on a combination of clinical evaluation, non-invasive testing, and invasive coronary angiography. Electrocardiography aids in the detection of ischemic changes, including ST-segment depression or elevation, T-wave inversion, or pathological Q-waves suggestive of prior myocardial infarction. Exercise stress testing, myocardial perfusion imaging, and coronary computed tomography angiography provide additional diagnostic information regarding the presence, severity, and extent of coronary artery disease. Invasive coronary angiography remains the gold standard for diagnosing allowing for direct visualization of coronary artery anatomy and the performance of percutaneous coronary interventions such as angioplasty and stent placement to restore blood flow and alleviate ischemic symptoms. Lifestyle modifications, including smoking cessation, adoption of a heart-healthy diet, regular physical activity, weight management, and stress reduction techniques, form the cornerstone management, addressing modifiable risk factors and promoting overall cardiovascular health. Pharmacological interventions, such as antiplatelet agents, statins, beta-blockers, angiotensin-converting enzyme inhibitors, and nitro-glycerine, target specific pathways involved in atherosclerosis progression, myocardial ischemia, and plaque stabilization, reducing the risk of recurrent cardiovascular events. In select cases, revascularization procedures, including coronary artery bypass grafting may be indicated to restore coronary blood flow and alleviate angina refractory to medical therapy, improving quality of life and long-term prognosis. In conclusion, coronary artery disease represents a major global health burden, driven by atherosclerosis, modifiable risk factors, and lifestyle habits. Understanding the pathophysiology, clinical manifestations, and management principles of is essential for healthcare providers to deliver effective preventive strategies and therapeutic interventions. By addressing modifiable risk factors, promoting healthy lifestyle behaviors, and implementing evidence-based therapies, clinicians can mitigate the burden and improve long-term cardiovascular outcomes for individuals at risk.

CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.