ATHEROSCLEROSIS IN YOUNG ADULTS: RISK FACTORS AND CLINICAL FEATURES

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Abstract

Atherosclerosis, traditionally considered a disease of older individuals, is increasingly recognized in young adults due to changes in lifestyle, dietary habits, and the rising prevalence of metabolic disorders. Early development of atherosclerotic lesions significantly increases the risk of premature cardiovascular events. This article examines the major risk factors and clinical manifestations of atherosclerosis in young adults, emphasizing the importance of early detection and preventive strategies. The findings suggest that modifiable lifestyle factors, metabolic abnormalities, and genetic predisposition play crucial roles in the early onset of the disease.

Keywords: atherosclerosis, young adults, cardiovascular risk factors, metabolic syndrome, early detection.

Introduction

Atherosclerosis is a chronic inflammatory disease characterized by lipid accumulation, endothelial dysfunction, and plaque formation within arterial walls. Although it is commonly associated with advanced age, pathological studies have demonstrated that atherosclerotic changes may begin in adolescence or early adulthood.

The increasing prevalence of obesity, sedentary lifestyle, smoking, and poor dietary patterns has led to a growing incidence of early-onset atherosclerosis. Cardiovascular diseases remain the leading cause of mortality worldwide, and the early development of atherosclerosis significantly contributes to this burden. Understanding the specific risk factors and clinical features in young adults is essential for timely prevention and intervention.

Objective

The objective of this study is to analyze the major risk factors contributing to atherosclerosis in young adults and to describe its clinical manifestations and diagnostic characteristics in this age group.

Methods

This study is based on an analytical review of current scientific literature focusing on early-onset atherosclerosis. Epidemiological data, clinical observations, and laboratory findings related to young adults aged 18–40 years were examined. Risk factors including smoking, dyslipidemia, obesity, hypertension, diabetes mellitus, genetic predisposition, and lifestyle habits were analyzed. Clinical and subclinical manifestations were evaluated using available research evidence from imaging studies and laboratory assessments.

Results

The findings indicate that modifiable risk factors play a dominant role in the development of atherosclerosis in young adults. Smoking was identified as one of the strongest contributors to endothelial dysfunction and early plaque formation. Dyslipidemia, particularly elevated low-

density lipoprotein cholesterol and reduced high-density lipoprotein cholesterol, was strongly associated with subclinical atherosclerotic changes.

Obesity and metabolic syndrome significantly increased the risk of early vascular damage. Insulin resistance and chronic low-grade inflammation were found to accelerate plaque development. Hypertension, even in borderline ranges, contributed to arterial stiffness and endothelial injury.

Clinical manifestations in young adults are often subtle or absent. Many individuals remain asymptomatic until a cardiovascular event occurs. However, subclinical findings such as increased carotid intima-media thickness, coronary artery calcification, and reduced arterial elasticity have been detected in this population. In some cases, young patients may present with premature coronary artery disease, myocardial infarction, or ischemic stroke.

Discussion

Atherosclerosis in young adults represents a growing public health concern. Unlike older patients, where aging is a major contributing factor, early-onset atherosclerosis is primarily driven by lifestyle and metabolic abnormalities. The presence of multiple risk factors significantly increases the likelihood of early plaque formation.

Early detection through screening of lipid profiles, blood pressure monitoring, and imaging techniques can help identify high-risk individuals. Lifestyle modification, including smoking cessation, healthy diet, regular physical activity, and weight control, plays a critical role in prevention.

Genetic predisposition also contributes to disease development, particularly in cases of familial hypercholesterolemia. Therefore, family history assessment is essential in young patients presenting with dyslipidemia or premature cardiovascular symptoms.

Conclusion

Atherosclerosis in young adults is increasingly prevalent and largely influenced by modifiable risk factors. Smoking, dyslipidemia, obesity, metabolic syndrome, and hypertension are key contributors to early vascular damage. Clinical manifestations may remain silent until advanced stages, making early screening and prevention crucial.

Comprehensive risk assessment and lifestyle interventions are essential to reduce the burden of premature cardiovascular disease. Further research is needed to develop targeted preventive strategies and improve early diagnostic approaches in young populations.

Atherosclerosis in young adults represents an increasingly significant medical and public health challenge. Although traditionally associated with aging, current evidence clearly demonstrates that atherosclerotic processes often begin early in life and may progress silently for years before clinical symptoms appear. The growing prevalence of unhealthy lifestyle patterns, including smoking, physical inactivity, high-calorie diets, and chronic stress, has contributed substantially to the earlier onset of vascular pathology.

The findings of this study emphasize that modifiable risk factors play a central role in the development of early atherosclerosis. Dyslipidemia, obesity, metabolic syndrome, insulin resistance, and hypertension significantly accelerate endothelial dysfunction and plaque formation. In many cases, multiple risk factors coexist, producing a synergistic effect that markedly increases cardiovascular risk even before the age of 40. Genetic predisposition,

particularly familial hypercholesterolemia, further amplifies the likelihood of premature cardiovascular events.

One of the major concerns is that atherosclerosis in young adults is frequently asymptomatic. Subclinical vascular changes, such as increased carotid intima-media thickness and early coronary calcification, may remain undetected without targeted screening. As a result, the first clinical manifestation may be an acute cardiovascular event, including myocardial infarction or ischemic stroke, which can have devastating consequences at a relatively young age.

Early identification of high-risk individuals through lipid profiling, blood pressure monitoring, metabolic assessment, and appropriate imaging techniques is essential. Preventive strategies should prioritize aggressive lifestyle modification, including smoking cessation, weight control, balanced nutrition, and regular physical activity. In selected high-risk individuals, pharmacological intervention may also be warranted to prevent disease progression.

In conclusion, atherosclerosis in young adults is a preventable yet increasingly prevalent condition. Comprehensive risk assessment, early screening, and proactive preventive measures are critical to reducing premature cardiovascular morbidity and mortality. Strengthening public health initiatives and promoting cardiovascular awareness among young populations are vital steps toward controlling the future burden of atherosclerotic disease.

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