

Hyperlipidemia and Peripheral Arterial Disease: Focus on Iliac Artery Stenosis

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DESCRIPTION

The association between elevated lipid levels and iliac artery stenosis is an important topic in cardiovascular and vascular medicine, as it highlights the role of dyslipidemia in the development of peripheral arterial disease. Elevated lipid levels, commonly referred to as hyperlipidemia, involve increased concentrations of total cholesterol, Low-Density Lipoprotein (LDL) cholesterol, triglycerides, or reduced High-Density Lipoprotein (HDL) cholesterol in the blood. These abnormalities contribute significantly to atherosclerosis, a progressive condition characterized by the buildup of fatty plaques within arterial walls. The iliac arteries, which are major blood vessels supplying blood to the pelvis and lower limbs, are particularly vulnerable to atherosclerotic changes due to their size, blood flow dynamics and exposure to systemic risk factors.

Iliac artery stenosis occurs when atherosclerotic plaque narrows the arterial lumen, reducing blood flow and potentially leading to symptoms such as claudication, leg pain during walking, reduced exercise tolerance and, in severe cases, critical limb ischemia. Elevated lipid levels play a central role in the initiation and progression of this process. Excess LDL cholesterol penetrates the endothelial lining of the iliac arteries and undergoes oxidative modification, triggering an inflammatory response that attracts macrophages and promotes foam cell formation. Over time, these foam cells accumulate and contribute to the formation of atherosclerotic plaques, which gradually harden and narrow the arterial lumen. Triglyceride-rich lipoproteins also contribute to endothelial dysfunction and inflammation, further accelerating plaque development. In contrast, HDL cholesterol has a protective role by facilitating reverse cholesterol transport and reducing inflammation; therefore, low HDL levels are associated with an increased risk of iliac artery stenosis.

The progression of stenosis is influenced not only by lipid levels but also by the duration of exposure to hyperlipidemia, meaning that individuals with long-standing untreated dyslipidemia are at higher risk of developing significant iliac artery disease. Clinical

studies have consistently demonstrated a strong correlation between elevated cholesterol levels and the presence of peripheral arterial disease, including iliac artery involvement. Patients with hyperlipidemia often present with multi-level arterial disease, indicating that lipid abnormalities affect the vascular system systemically rather than in isolation. The presence of iliac artery stenosis in hyperlipidemic individuals is also frequently associated with other cardiovascular conditions such as coronary artery disease and cerebrovascular disease, reflecting a shared atherosclerotic mechanism. Early detection of elevated lipid levels is therefore essential in preventing iliac artery stenosis and its complications.

Diagnostic evaluation typically includes lipid profile testing combined with imaging studies such as Doppler ultrasound, computed tomography angiography, or magnetic resonance angiography to assess the severity of arterial narrowing. Management strategies focus primarily on lipid control through lifestyle modification and pharmacological therapy. Dietary changes aimed at reducing saturated fat and cholesterol intake, regular physical activity, weight management and smoking cessation are foundational measures that can significantly improve lipid profiles and vascular health. Pharmacological treatments, particularly statins, play a major role in lowering LDL cholesterol, stabilizing atherosclerotic plaques and reducing inflammation within the arterial wall.

CONCLUSION

Evidence suggests that effective lipid-lowering therapy not only slows the progression of iliac artery stenosis but may also reduce the risk of symptoms and the need for invasive interventions such as angioplasty or surgical revascularization. In conclusion, elevated lipid levels are strongly associated with the development and progression of iliac artery stenosis through their central role in atherosclerosis. Understanding this relationship emphasizes the importance of early screening, consistent lipid management and comprehensive cardiovascular risk reduction strategies to prevent iliac artery disease and improve long-term vascular outcomes.

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