Hyperlipoproteinemia (Type V Dyslipidemia)

Hyperlipoproteinemia (Type V Dyslipidemia) is characterized by increased cholesterol, VLDL, chylomicrons, and triglycerides. Patients have an increased risk of cardiovascular disease. Xanthomas and acute pancreatitis can be present. Treatments include lifestyle changes, statins, and fibrates.



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Pathophysiology

Increased Cholesterol

Up-arrow Cholesterol-burger

Cholesterol is always high in type V hyperlipoproteinemia. However, LDL is usually low.

Increased VLDL

Up-arrow Veiled-lady-bug-devil

This disease is characterized by increased VLDL. An increase in VLDL can distinguish between type V and type I dyslipidemia. Type I is known to have a normal or moderately increased VLDL.

Increased Chylomicrons

Up-arrow Kite-mic

Chylomicrons are increased in this disease as well. Chylomicrons are hard to see in the plasma of normal / moderate hypertriglyceridemia patients after a 12-hour fast. Chylomicrons can begin to be seen when serum triglycerides rise above 1000-2000 mg/dL, and symptoms commonly occur when triglycerides are 2000 mg/dL and above.

Increased Triglycerides

Up-arrow Triceratops

Increased triglycerides can also be a feature of this disease. Hypertriglyceridemia can occur due to impaired clearing of cholesterol remnants, impairment of lipoprotein lipase activity, or pathologic abnormality of hepatic VLDL and intestinal chylomicron synthesis.

Increased Risk of Cardiovascular Disease

Up-arrow Risk Heart Diseased

Patients have an increased risk of developing ASCVD (atherosclerotic cardiovascular disease) due to the increase in cholesterol in the blood. This risk increases more if the patient has diabetes, hypertension, or is a smoker.

Clinical Features

Xanthomas

Zen-master

Eruptive skin xanthomas are small, erythematous-yellow nodular papules mostly seen on the buttocks, trunk, and extensor surfaces. This clinical feature is associated with chylomicronemia and occurs due to lipid deposition in the skin.

Acute Pancreatitis

Acute-angle Pancreas-on-fire

Triglyceride levels are often above 1000 mg/dL, increasing the risk of acute pancreatitis. Patients with triglyceride levels above 500 mg/dL should be treated to prevent acute pancreatitis.

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Diagnosis

Lipid Panel

Lip Panel

A lipid panel is helpful in diagnosis as it will return values for all the lipoproteins as well as cholesterol and triglycerides. Another test is post-heparin lipolytic activity. Type V dyslipidemia is characterized by elevated post-heparin lipolytic activity qualitatively. In contrast, type I presents with absent or decreased post-heparin lipolytic activity. Lipoprotein lipase is bound with heparan sulfate moieties on the vascular endothelium. By administering heparin, lipoprotein lipase will be free from its binding to heparan sulfate. This allows LPL activity measurement.

Management

Lifestyle Changes

Throwing away Unhealthy food, Cigarette, and Exercising on stairs

Lifestyle modification should be the initial step in treating the patient. This includes smoking cessation, reduced alcohol consumption, other dietary changes, exercise, and weight reduction.

Statins

Statue

Statins are also helpful in reducing cholesterol in hyperlipoproteinemia patients. They work by inhibiting the conversion of HMG-CoA to mevalonate, which is a part of cholesterol synthesis. These drugs are also known as HMG-CoA reductase inhibitors.

Fibrates

Fly-Brats

Fibrates act by breaking down triglycerides with lipoprotein lipase activation through PPAR-alpha. Nicotinic acid supplementation can also be a choice for patients who are refractory to conventional treatment. Other medications that can be useful are fish oil supplements and niacin. Fish oil supplements help to reduce VLDL and triglyceride levels.

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