

Hypercholesterolemia: An Overview

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PERSPECTIVE

Hypercholesterolemia, often known as high cholesterol, is characterised by excessive cholesterol levels in the blood. It's a combination of hyperlipidemia (high lipid levels in the blood), hyperlipoproteinemia (high lipoprotein levels in the blood), and dyslipidemia (low lipid levels in the blood) (any abnormalities of lipid and lipoprotein levels in the blood). Diet, obesity, inherited (genetic) disorders (such as LDL receptor mutations in familial hypercholesterolemia), or the presence of other diseases such as type 2 diabetes and an underactive thyroid can all cause elevated levels of non-HDL cholesterol and LDL in the blood. Cholesterol is one of three major kinds of lipids used by all animal cells to build their membranes, and it is produced by all animal cells. Phytosterols (similar to cholesterol) are produced by plant cells, albeit in modest amounts. It's also a building block for steroid hormones and bile acids. Because cholesterol is water insoluble, it is carried in the blood plasma by protein particles (lipoproteins). Very low density lipoprotein (VLDL), intermediate density lipoprotein (IDL), low density lipoprotein (LDL), and high density lipoprotein (HDL) are the four types of lipoproteins (HDL). Although all lipoproteins contain cholesterol, high levels of lipoproteins other than HDL (also known as non-HDL cholesterol), notably LDL cholesterol, are linked to an increased risk of atherosclerosis and coronary heart disease. Higher HDL cholesterol levels, on the other hand, are protective. To lower total blood cholesterol and LDL in adults, it is recommended that they avoid trans-fats and replace saturated fats in their diets with polyunsaturated fats. Diet is typically insufficient to accomplish the desired decrease of LDL in persons with very high cholesterol (e.g., familial hypercholesterolemia), and lipid-reducing drugs are usually required. Other therapies, such as LDL apheresis or surgery (for more severe forms of familial hypercholesterolemia), may be used if necessary. In the United States, over 34 million persons have high blood cholesterol.

Symptoms and signs

Although hypercholesterolemia is asymptomatic in and of itself, a long-term increase in serum cholesterol can lead to atherosclerosis (hardening of arteries). Elevated serum cholesterol contributes to the production of atheromatous plaques in the arteries over decades. This can cause the arteries involved to constrict over time. Smaller plaques, on the other hand, may rupture and form a clot, obstructing blood flow. A heart attack can occur when a coronary

artery is suddenly blocked. A stroke is caused by a blockage in a cerebral artery. If the stenosis or occlusion develops gradually, blood supply to the tissues and organs will gradually deteriorate until organ function is compromised.

Tissue ischemia (restricted blood supply) may emerge as distinct symptoms at this time. Momentary ischemia of the brain (also known as a transient ischemic attack) can cause temporary vision loss, dizziness, and impairment of balance, trouble speaking, weakness, or numbness or tingling on one side of the body. Ischemia of the eye can cause transitory sight loss in one eye, while insufficient blood supply to the heart might induce chest pain. Insufficient blood supply to the legs can cause calf discomfort when walking, and insufficient blood supply to the intestines can cause belly pain after digesting a meal. Hypercholesterolemia can cause a variety of health symptoms. Familial hypercholesterolemia (Type IIa hyperlipoproteinemia), for example, has been linked to xanthelasma palpebrarum (yellowish patches beneath the skin around the eyelids), arcus senilis (white or grey discoloration of the peripheral cornea), and xanthomata (deposition of yellowish cholesterol-rich material) of the tendons, particularly the fingers. Xanthomata of the palms, knees, and elbows has been linked to type III hyperlipidemia. The most common cause of hypercholesterolemia is a mix of environmental and hereditary factors. Weight, diet, and stress are all environmental influences. Loneliness is a danger factor as well.

Diagnosis

In the United States and certain other nations, cholesterol is measured in milligrammes per deciliter (mg/dL) of blood. Millimoles per litre of blood (mmol/L) is the unit of measurement in the United Kingdom, most European countries, and Canada. Total cholesterol should not exceed 5 mmol/L, and low-density lipoprotein cholesterol (LDL) should not exceed 3 mmol/L, according to the UK National Health Service. Total cholesterol should not exceed 4 mmol/L, and LDL should not exceed 2 mmol/L in persons at high risk of cardiovascular disease. There is no absolute cutoff between normal and abnormal cholesterol levels, thus values must be interpreted in light of other health conditions and risk factors. Total cholesterol levels above 200 mg/dL raise the risk of cardiovascular disease, particularly coronary heart disease. LDL and non-HDL cholesterol levels both indicate future coronary heart disease; however, which predictor is superior is debatable. Although small dense LDL testing is not

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recommended for risk prediction, high levels of small dense LDL may be particularly harmful. Due to the high cost of doing so, LDL and VLDL levels were rarely measured directly in the past. Lipoprotein electrophoresis and the Fredrickson classification were once used to classify hypercholesterolemia. Newer approaches, such

as "lipoprotein subclass analysis," have improved our understanding of the relationship between atherosclerosis progression and clinical outcomes. If hypercholesterolemia is inherited (familial hypercholesterolemia), a family history of premature, early-onset atherosclerosis is more likely to be discovered.