

cholesterol

Cholesterol is made in the liver from saturated fats in food. It is a waxy substance that is found throughout the body. It is essential for the production of the sex hormones, as well as the repair of cell membranes.

To move around the body, cholesterol joins up with special proteins to form 'lipoproteins' which are carried in the blood. There are two kinds of lipoproteins; low density lipoproteins (LDL), which carry cholesterol from the liver to the cells and high density lipoproteins (HDL), which return excess cholesterol to the liver. You may often hear cholesterol described as 'good' and 'bad'. HDL, or 'good' cholesterol clears cholesterol from the arteries to the liver, where it is removed from the body. LDL or 'bad' cholesterol is associated with hardening of the arteries (atherosclerosis). This can lead to angina, heart attack and stroke.

Fatty substances in the blood like LDL and HDL cholesterol are often grouped together with triglycerides and called blood lipids. Triglycerides are one of the basic building blocks from which fats are formed. Lipid abnormalities were seen among HIV-positive people prior to the introduction of HAART. People with AIDS often had raised LDL cholesterol and declining HDL cholesterol. People on protease inhibitor therapy have been shown to have higher levels of total cholesterol compared to people not on protease inhibitors.

Measuring cholesterol

Cholesterol can be measured in two ways; blood drawn from a vein is tested in a laboratory or a finger-prick blood sample is tested on a desktop analyser. Blood fats are measured in units called millimoles per litre of blood, shortened to mmol/l. Like with HIV viral load, levels are subject to variation, both from day to day and throughout the day. A single test will rarely provide enough information to guide decisions about intervention; a series will be required to give a clearer picture. Eating makes a marked difference to blood lipids so it is best to measure them after an overnight fast. The average blood cholesterol level in the general population in the UK is 5.8mmol/l. The optimal level is considered to be less than 5.2mmol/l.

Diet

It may be possible to lower cholesterol levels by between 5% and 10% by adjusting your diet. Increase your intake of starchy foods like bread, pasta, rice and cereals. Try to reduce fat intake and replace saturated fats with unsaturated fats. For example, eat less butter and hard cheese. Increase your intake of polyunsaturated fats. These help to lower LDL cholesterol, but they also lower HDL

cholesterol. Examples are cornflower oil, sunflower oil and some margarines. Increase your intake of monounsaturated fats like olive oil or avocado. These lower LDL cholesterol but do not lower HDL cholesterol. To help prevent blood clotting and reduce triglyceride levels, increase your intake of a kind of polyunsaturated fat called omega-3 fats. These are found in oily fish like mackerel, herring, salmon and sardines.

Exercise

Regular daily activity such as swimming, cycling or brisk walking can increase levels of HDL cholesterol. It has not been shown to decrease levels of LDL cholesterol.

Medication

Drug therapy for elevated cholesterol levels usually only begins if dietary changes and exercise have failed to have a significant effect. Cholesterol-lowering drugs have been tested and licensed based on the results of clinical trials in HIV-negative people. They have been shown to reduce LDL cholesterol by more than 20%. Statins are the main class of drug, but are not appropriate for people with liver disease or for pregnant or breastfeeding women. Pravastatin appears to be the safest statin for use with a protease inhibitor. Other drugs used to treat raised cholesterol levels are called bile acid binding drugs, and fibrates. Bile acid binding drugs come in powder formulation and require mixing with water or fruit juice. They need to be taken with a meal. Since these drugs are not absorbed into the body, they can be used by pregnant women. Fibrates are tablets which lower triglycerides and have a lesser effect on cholesterol.

Heart disease risk

The risk of a heart attack is increased if you smoke, have high blood pressure or diabetes, and if you have a heart condition. Age and sex also play a part; risk of coronary heart disease in men occurs ten years earlier than in women. A doctor will assess your risk of heart attack by looking at your cholesterol level and take your additional risk factors into account. Stopping smoking reduces your risk of heart attack, and other diseases.

Protease inhibitors

Some studies have shown thickening of and damage to the arteries among people taking protease inhibitors. It has been suggested that people taking protease inhibitors may be at an increased risk of developing heart disease, though these drugs have not been in use for long enough periods as yet to know what the risk over the longer-term will be. However, it is clear that the additional risk factors described above play an important role.

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