Canadian AIDS Treatment Information Exchange
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FactSHEET

NUTRIENTS TO MANAGE HIGH LIPID LEVELS

Summary

High levels of lipids (cholesterol and triglycerides) are now commonly seen in some people with HIV/AIDS (PHAs) taking highly active antiretroviral therapy, especially in those taking protease inhibitors (PIs). Making positive changes to your life, such as improving your diet, doing regular exercise and taking some nutritional supplements, can have a significant impact on elevated lipid levels.

What is it?

Higher-than-normal levels of certain fatty substances or lipids, such as cholesterol and triglycerides, is called hyperlipidemia. This condition is dangerous to one's health because it places people at high risk for cardiovascular diseases such as atherosclerosis (hardening of the arteries), heart attacks and stroke. As well, these greatly increased levels of fats can become damaged or oxidized. Once lipids have undergone such damage they can weaken the immune system.

Symptoms

Hyperlipidemia often has no obvious symptoms. Sometimes, in prolonged or severe hyperlipidemia, yellow-coloured nodules appear on the skin around the eyes, elbows or other areas of the body. These are called xanthomas or xanthelasmas.

Blood Tests

Blood tests, called a lipid profile, can reveal if you have high levels of lipids. A lipid profile measures the levels of different lipids in your blood, including HDL (the "good" cholesterol), LDL (the "bad" cholesterol), total cholesterol and triglycerides.

A programme to reduce high lipid levels

Based on your doctor's assessment, you may need to start taking lipid-lowering drugs, such as Zocor (simvastatin) and Lipitor (artovastatin). If your doctor decides that your condition does not require immediate treatment with prescription lipid-lowering drugs, here are some suggestions you may find helpful.

Food and Exercise

Diet, exercise and stress management may all help to lower blood lipid levels. A diet that is overall low in fat (less than 30% of calories from fat) is essential. An emphasis should be placed on consuming mainly

unsaturated fats from vegetable sources, particularly extra virgin olive oil. Fat from animal sources should be minimized, and hydrogenated fat, found in margarine and processed foods, should be avoided. Increasing fibre intake through the consumption of fruit, vegetables, whole grains and legumes has been shown to lower cholesterol. Eating refined sugar should be limited, as high sugar intake leads to elevation of triglycerides and cholesterol. Following these dietary guidelines along with regular cardiovascular exercise will often decrease lipid levels by 10% to 30%. Management of stress by exercising, practicing yoga and doing meditation can also lower elevated lipid levels and high blood pressure.

Nutritional Supplements

To help manage high levels of lipids in the blood, some PHAs may choose to take nutritional supplements in addition to using lipid-lowering drugs. Choosing the right nutritional supplement should be done with the help of a health care professional, such as a licensed naturopath or medical doctor.

Antiretroviral drugs such as PIs, NNRTIs and nucleoside analogues may cause your body to have an increased need for several nutrients, including L-carnitine and copper, both of which are essential in the metabolism of lipids. PHAs with hyperlipidemia as a result of taking antiretrovirals should consider supplementing with these nutrients first.

Carnitine

Carnitine is an amino acid that helps move fat to places in a cell where it can be “burnt” to release energy. A deficiency of carnitine can cause high lipid levels in the blood, liver dysfunction and problems maintaining steady blood sugar. Supplementation of carnitine may help reduce total cholesterol and triglycerides and increase HDL cholesterol. Carnitine is available in capsule form and, like other amino acids, should not be taken with meals. However, taking it with a little fruit juice will improve absorption. For more information on other uses of carnitine, see the CATIE Supplement Sheet on L-acetylcarnitine and L-carnitine. The manufacturer of carnitine, Sigma-Tau, suggests that doses between 1 gram and 3 grams be taken daily.

Copper

Both copper deficiency and copper excess are associated with elevated cholesterol and triglycerides. Slight copper deficiency may be common in the general population because the standard North American diet may not provide the recommended daily intake of this mineral. Although antiretrovirals may cause the body to lose copper, PHAs taking these medications should not assume they are copper-deficient and should have copper levels assessed before supplementing. To find out about copper levels in the body, tests can measure the amount of this metal in your blood as well as inside red blood cells and by hair analysis. It is important to note that high levels of copper in the blood is a common finding in patients with hyperlipidemia. This may be because the amount of copper in blood samples may not be a reliable indicator of the amount of copper stored in organs such as the liver. Levels of copper inside red blood cells are likely a better indication of copper status.

Remember that zinc interferes with copper absorption, so these minerals should not be taken together. Also, high intake of zinc supplements can lead to copper deficiency, so PHAs taking supplements of zinc to help their immune system should consider also taking a small supplement of copper. See the CATIE Supplement Sheet on zinc and copper for more information. Most PHAs who supplement their intake of copper take between 2 mg and 4 mg per day.

Niacin

Niacin, vitamin B_3, has been shown to lower total cholesterol, LDL and triglycerides, while raising HDL in HIV negative as well as HIV positive people.

Unfortunately, the high doses of niacin that are needed to affect lipid levels can have a well-known and unpleasant side effect of skin flushing, which occurs 20 to 30 minutes after ingestion. For this reason, there are "slow-release" forms of niacin available. However, these formulations have been shown to be toxic to the liver and should be avoided. Niacinamide, another form of vitamin B_3, does not cause flushing but it is not effective for lowering lipid levels. Currently, the safest form of niacin is inositol hexaniacinate, which is better tolerated in terms of flushing, although it is considerably more expensive. For those who experience skin flushing with niacin ingestion, it is important to remember that this is often a temporary effect that diminishes after the first few doses. Individuals should try to maintain the recommended dose rather than reduce it, which could actually prolong the flushing reaction.

As part of a protocol for reducing high levels of lipids, some PHAs start with 100 mg of niacin three times a day with meals, then increase by 100 mg three times daily each week to a maximum of 1,000 mg three times daily if necessary to achieve adequate results. Regardless of the form of niacin being used, regular monitoring of the liver by means of blood tests, every three months, is useful.

It is important to note that niacin might interact with prescription lipid-lowering drugs. Those who wish to take niacin and are already taking prescription lipid-lowering drugs should do so under the supervision of a health care professional.

Vitamin B_5

Pantethine, the active form of pantothenic acid or vitamin B_5, may also be helpful in helping to manage higher-than-normal levels of lipids in the blood. Pantethine has been shown to significantly reduce triglycerides, total cholesterol and LDL cholesterol. Only pantethine, and not pantothenic acid, is useful for lowering lipids. A standard dose of pantethine is 900 mg per day in divided doses (300 mg three times daily) with meals. It may take as long as four months before this dose has an effect on lipid levels.

Omega-3 Fatty Acids

Omega-3 fatty acids are nutrients that are well known to lower cholesterol and triglycerides. These are found in flaxseed oil and in the oil of deep cold-water fish such as salmon, cod, mackerel, tuna, halibut, herring and sardines. Although fish oils are available as a supplement in capsule form, this form may contain high levels of rancid fat that can actually raise levels of lipids in the blood. It may therefore be more useful to simply eat at least three servings of cold-water fish each week. Flaxseed oil is also an excellent source of omega-3 fatty acids. It is available in liquid or capsule form. Usually one teaspoon three times daily or an equivalent amount in capsule form is the dose used by PHAs. Be sure to store flaxseed oil in the refrigerator.

Chromium

Chromium is a trace element essential to the metabolism of lipids, glucose and insulin regulation. Chromium supplementation has been shown to lower serum triglycerides, LDL and total cholesterol, while raising HDL. This nutrient may be particularly beneficial in people with high lipid levels related to high levels of sugar in the blood. This is because chromium is known to help the body maintain steady levels of blood sugar. Chromium has been shown to be especially useful when used in conjunction with niacin; PHAs taking chromium can reduce their dose of niacin. Chromium picolinate is considered to be the most useful form of chromium. Some PHAs take a dose 200 microgrammes (mcg) of chromium daily.

Vitamin E

Antioxidants play a crucial role in the management of hyperlipidemia. The antioxidant vitamin E offers significant protection against the oxidation of LDL cholesterol and may even increase levels of "good" cholesterol (HDL cholesterol) in the blood. This means that although vitamin E may not directly reduce lipid levels, it may help prevent complications associated with hyperlipidemia by preventing the oxidation of fats in the blood. Most PHAs

take between 400 IU to 800 IU of vitamin E daily. Warning: PHAs who take the anti-HIV drug amprenavir (Agenerase) should **not** take supplements of vitamin E, as amprenavir contains a great deal of this vitamin.

Other Antioxidants

The use of other antioxidants, such as mixed carotinoids — alpha-carotene, beta-carotene, lycopene, vitamin C and selenium — can help prevent fat in your body from turning rancid or being oxidized. This is important, as oxidized fats are considered to greatly increase the risk of atherosclerosis. A combination of antioxidants may provide better protection than any single nutrient. Antioxidant combination supplements are commonly available and may be useful for anyone with hyperlipidemia. A suggested antioxidant protocol for PHAs at high risk of cardiovascular disease may include the following:

- vitamin C — 1 gram to 3 grams daily
- mixed carotinoids — equivalent to about 25,000 IU of vitamin A activity
- selenium — 200 mcg daily

PHAs at high risk for cardiovascular disease should always consult with their doctor to find the best way to deal with high lipid levels.

Credits

Author: Sean R. Hosein, Katie E. Rhéaume

Updated: March 2001

Design: Renata Lipovitch

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Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV-related illness and the treatments in question.

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Contact CATIE

by telephone
1.800.263.1638
416.203.7122

by fax
416.203.8284

by e-mail
info@catie.ca

on the Web
http://www.catie.ca

by mail
505-555 Richmond Street West
Box 1104
Toronto, Ontario
M5V 3B1
Canada

Funding has been provided by Health Canada, under the Canadian Strategy on HIV/AIDS.