



VITAMIN B COMPLEX

What is it?

Vitamin B complexes include vitamin B₁ (thiamine), vitamin B₂ (riboflavin), vitamin B₆ (pyridoxine), vitamin B₁₂ (cobalamin), niacin, pantothenic acid, biotin and folate. The functions of these vitamins are interrelated and they are usually in a single formulation (pill, capsule). They play essential roles in energy metabolism and in the proper functioning of nerves and the immune system. Due to concerns about vitamin B₁₂ absorption, a separate CATIE supplement sheet has been devoted to this particular supplement.

What do people with HIV use this supplement for?

1. To correct deficiencies

Deficiencies in vitamins B₁, B₆, and B₁₂ have all been observed in people living with HIV (PHAs) including those who have no symptoms of infection. The anti-HIV drug AZT may reduce folate levels in some people. Although deficiencies in vitamin B₂ have not been reported, PHAs taking vitamin B₂ supplements have had increased survival times in two studies. Vitamin B₁ supplements have also been shown to increase survival time.

A study involving 2,100 African PHAs showed significant benefits of B-complex supplementation. Although no direct testing was done, it is likely that these subjects were deficient in B-complex vitamins before they began taking supplements. Few of the people in the study had access to antiretroviral drugs.

Subjects taking a multivitamin developed AIDS in 72 weeks, compared to 32 weeks without this treatment. When a B-complex supplement was taken, the time preceding the development of AIDS was extended to 152 weeks. People with AIDS also survived longer when taking B vitamins.

2. To support the immune system

Vitamin B₆ is probably the most important B vitamin in terms of immune support. Results from the few studies of vitamin B₆ levels in PHAs conducted suggest that immune cell function is impaired when a deficiency in vitamin B₆ is present. It is possible that white blood cells are less able to respond to infection when vitamin B₆ levels are low. Natural killer cell activity may also be decreased. Two early studies suggested that CD4+ and CD8+ cell counts were lower in people with reduced vitamin B₆ levels, although this result has not been consistent in all studies. A 1991 study involving only 12 PHAs showed a dramatic CD4+ cell increase of 121 cells after six months of vitamin B₆ supplementation (20 to 25 mg per day). This result has not, however, been duplicated since. HIV-negative people with vitamin B₆ deficiencies experience shrinkage of lymphatic tissues, and a decrease in lymphocyte numbers and function.

3. To lower cholesterol and protect against heart disease

Many people living with HIV have elevated cholesterol levels. People have used niacin to treat high cholesterol since the 1950s.



In one study, the effect of niacin doses ranging from 3 to 4.5 grams were compared to 40 to 80 mg per day of the anti-cholesterol drug lovastatin. Niacin decreased LDL cholesterol (often called “bad” cholesterol) substantially, although not as effectively as lovastatin. Niacin also produced a greater increase in HDL cholesterol (“good” cholesterol). Doses of niacin as high as those used in this study should not be taken without the careful supervision of a physician. It is possible, however, that more modest doses may still improve the efficiency of fat metabolism.

A high cholesterol level, particularly LDL cholesterol, is a major risk factor for heart attack and stroke. As well, the risk of heart disease has become an increasing concern for PHAs. B complex vitamins, particularly B₆, B₁₂ and folate may help reduce the risk of cardiovascular disease. In a recent study of young HIV-negative men, vitamin B₆ supplements reduced cholesterol and triglyceride levels and the formation of blood clots. Another study showed that B₆ supplements reduced blood pressure. Vitamin B₆ deficiencies have also been associated with hardening of the arteries.

4. To cope with depression and stress

Two studies including HIV-positive gay men have shown that depression, fatigue and other forms of psychological distress are associated with low levels of vitamin B₆. One of these studies looked at the nutritional status of 88 gay men over an 18-month period. It showed that when a man’s intake of vitamin B₆ was restored to adequate levels, his psychological distress decreased. Vitamin B₆, B₁ and folate deficiencies have also been associated with depression in HIV-negative people.

5. To prevent lactic acidosis caused by anti-HIV drugs

The anti-HIV drugs AZT, 3TC, ddI, ddC, abacavir and d4T are called nucleoside reverse transcriptase inhibitors (NRTI). They help to slow down HIV reproduction by interfering

with one of the virus’s enzymes called reverse transcriptase. Over time, these drugs may damage the mitochondria inside a PHA’s cells. Mitochondria are the energy producing centres of a cell. Several B vitamins play a role in the processing of energy in mitochondria. Given this connection, it is possible that the combination of B vitamin deficiency and the use of NRTIs leads to mitochondrial dysfunction and damage.

One serious consequence of mitochondrial damage is lactic acidosis. Although rare, this is a severe side effect that can lead to muscle weakness, liver damage and death. A few case reports tell of PHAs who recovered from lactic acidosis when given vitamin B₂. Vitamin B₁ has also been successful in treating lactic acidosis in HIV-negative people requiring feeding tubes. In theory, the regular intake of B vitamins may help prevent lactic acidosis.

6. To treat peripheral neuropathy

Although vitamin B₁₂ is most commonly associated with the treatment of peripheral neuropathy, supplements of other B vitamins may also improve this condition. In her book *Positively Well*, Lark Lands reports that biotin and thiamine supplements have helped improve symptoms of neuropathy. Other “unofficial” B vitamins such as choline and inositol, which are often included in B vitamin supplements, may also help to treat neuropathy. According to Lark Lands, these vitamins have improved symptoms of neuropathy in many of her HIV-positive patients. She recommends supplementation with all of the B vitamins, as taking only one of this group can lead to deficiencies in others.

Available forms and usage

Modest amounts of B-complex vitamins are included in a standard multivitamin. For PHAs, doses of at least 25 mg per day of B vitamins are often suggested. Such doses are available in B25 vitamins, which typically contain 25 mg each of vitamins B₁, B₂, B₆, B₁₂ and niacin and varying amounts of the other B-complex



vitamins. Some PHAs prefer to use B50 vitamins which contain 50 mg of these vitamins. B vitamins are safe at these doses because excess amounts are usually quickly eliminated in the urine. For this reason, very high dose vitamin B products, such as B75 and B100 combinations may increase the cost while providing little additional benefit.

Cautions and concerns

B vitamins generally have few toxicities. Niacin can cause flushing and burning in the hands and feet at doses above 300 mg per day. High doses of vitamin B₆ (more than 150 mg per day) may cause peripheral neuropathy with long-term use. The most common “side effect” of B vitamins is bright yellow urine, a sign that the body is eliminating excess amounts of vitamin that it cannot absorb.

Credits

Author: Lori Lyons

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Design: Renata Lipovitch

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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



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