Tocotrienol Supercharged Vitamin E Contains Natural Mixed Tocopherols

Tocotrienols Reduce Three Major Risk Factors of Atherosclerosis
Atherosclerosis and its complications...heart attack...are the major causes of death in the United States and have reached epidemic proportions throughout the western world. This degenerative condition of the arteries is characterized by accumulation of lipids (mainly cholesterol) within the artery. Although any artery may be affected, the aorta, coronary and cerebral vascular system are most frequently involved. A number of dietary and lifestyle factors have been associated with increased risk for atherosclerosis. Three commonly sited risk factors may be modified with supplements of tocotrienols, a recently researched form of vitamin E,

- Elevated Cholesterol
- Oxidized LDL Cholesterol
- Abnormal Platelet Aggregation

Numerous studies have indicated that lowering LDL and total cholesterol levels decreases the risk of death from heart disease. Elevated cholesterol, specifically LDL (low density lipoprotein), is a clearly defined risk factor for the development of atherosclerosis. More specifically, oxidized LDL cholesterol is clearly implicated as the primary culprit. While vitamin E in the tocopherol form has been associated with reduced risk of heart attack, it has shown no significant effect on cholesterol levels. In contrast, the tocotrienols have demonstrated significant cholesterol-lowering effects in both animals and humans. In clinical trials, approximately 75% of patients with high cholesterol levels respond to the cholesterol-lowering effects of tocotrienols. Researchers believe that, in those who do not respond, elevated cholesterol levels are likely to be due to errors in cholesterol transport or degradation. The most dramatic cholesterol reduction is seen when tocotrienol supplements are combined with dietary changes (high fiber, low fat diet). In a 12-week, double-blind trial, those who responded to tocotrienol treatment, saw reductions of approximately 23% in total cholesterol and 32% in LDL using dietary modification plus tocotrienol supplements. Tocotrienols alone yielded a 16% decrease in total cholesterol and a 21% decrease in LDL.

In an 18-month study of 50 patients with cerebrovascular disease, the authors reported apparent regression of the disease in 7 patients in the tocotrienol group as demonstrated by ultrasonography. The disease progressed in only 2 of the 25 tocotrienol patients. None of the placebo group showed regression and 10 showed progression.

Dietary changes alone can reduce both cholesterol and the incidence of atherosclerosis; however, the degree of reduction is proportional to the degree of dietary change. Due to the difficulty of changing eating habits, dietary changes alone are inadequate for most people.

Tocotrienols vs. Cholesterol Drugs
HMG-CoA reductase is the rate-limiting enzyme involved in cholesterol production. It exerts its action at the corresponding receptor site. Tocotrienols appear to increase the natural rate of HMG-CoA reductase degradation, which in turn decreases cholesterol production. A 50% decrease in reductase can be seen within two hours. No adverse side effects have been associated with tocotrienols.

The “statin” drugs and over-the-counter yeast extracts decrease cholesterol production by competi-
Tocotrienols’ Unsaturated Side Chain Provides Higher Antioxidant Activity than Tocopherols

Vitamin E as d-alpha-tocopherol, the form commonly found in supplements, protects LDL from oxidation. In a study of more than 1,000 people, vitamin E reduced the risk of nonfatal heart attack by 77%. This protective effect is attributed primarily to its antioxidant properties. (6) Non-esterified vitamin E has higher antioxidant activity than esterified forms (tocopheryl acetate, succinate, etc.)

There are eight different forms of vitamin E. The four tocopherols (alpha-, beta-, gamma- and delta-tocopherol) share a saturated phytol side chain. The four analogous tocotrienols have a triple-unsaturated side chain. The unsaturated bonds on the side chain give the tocotrienols greater antioxidant activity and a different biologic action. When those bonds become saturated, the molecule becomes a tocopherol. Reports from laboratory studies indicate a 40-60 times higher antioxidant activity against lipid peroxidation in rat liver microsomal membranes with d-alpha-tocotrienol than with d-alpha-tocopherol and 6.5 times more protection of cytochrome P-450 against oxidative damage. (3) Cytochrome P-450 is present in most tissues and serves as an oxygenating catalyst in a variety of reactions. Alpha-tocopherol is most often used in supplements and is the standard for measurement of vitamin E. Tocopherols are the dominant form of vitamin E in corn (86%) and wheat germ (72%). Rice bran, on the other hand, contains 66% of its vitamin E as tocotrienols. (1)

Natural Anti-Thrombin Properties

Abnormal coagulation of platelets is also an important factor in the development of atherosclerosis. When platelets aggregate they release compounds that cause migration and proliferation of smooth muscle cells into the innermost layer of the artery. (2) Aspirin has been recommended to atherosclerosis patients because of its ability to inhibit production of thromboxane A2, a potent factor in coagulation and clot formation. However, aspirin is associated with a number of negative side effects including gastrointestinal bleeding and it has not been shown to positively influence any of the other risk factors for atherosclerosis.

Both tocopherols and tocotrienols, as well as other natural substances such as sesame seed oil, inhibit platelet aggregation without the negative side effects associated with aspirin. Vitamin E provides antioxidant protection and tocotrienols may lower cholesterol as well. As anti-thrombic agents tocotrienols have been shown to decrease platelet aggregation by 15% to 30%. Thromboxane A2 is difficult to measure because of its extremely short half-life. Its metabolite, thromboxane B2, is generally accepted as an indicator of thromboxane A2 production. Tocotrienols are reported to cause a 31% decrease in thromboxane B2. (1,4)

Multiple studies report a significant relationship between tocotrienols and cancer. In laboratory studies, tocotrienols significantly inhibited the growth of cancer in cultures. Although it has not been shown to cure or kill cancer cells, it may halt or slow the progression of cancer. (1,3)

Symptoms of Atherosclerosis

Atherosclerosis is usually associated with high blood pressure, weak pulse and wide pulse pressure. Symptoms, depending upon the arteries involved and degree of obstruction, may include angina, leg cramps, gradual mental deterioration, weakness or dizziness...or there may be no symptoms. (2) For many a heart attack or stroke is the first symptom...or at least the first symptom they notice. Symptoms may appear so gradually that they go unnoticed or they may be attributed to the normal aging process.

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References
1. Wilkinson, R., Tocotrienols and the Modification of Coronary Heart Disease Risk Factors, Yakim WA.