Atherosclerosis and Vitamin E

Vitamin E is a potent antioxidant which prevents lipid peroxidative tissue damage. It appears to regulate endothelial cell proliferation and repair while protecting the cells against oxidative injury.1

In a large study involving 24 countries, dietary vitamin E intake was strongly inversely correlated with the risk of death from coronary heart disease. Sunflower seed oil was the major source of alpha-tocopherol. This oil has 7 times the vitamin E content of soybean oil, the main oil consumed in most countries studied with higher rates of coronary artery disease.2 Moreover, vitamin E intake has been found to be inversely related to carotid arterial wall thickness.3

Plasma vitamin E levels have shown similar inverse correlations. For example, in a study of middle-aged men from 16 European countries, there was a strong inverse correlation between age-specific mortality from ischemic heart disease and lipid-standardized vitamin E levels.4

Cholesterol-standardized vitamin E levels within atherosclerotic plaques are significantly lower than in normal arterial wall, while lipid oxidation products are significantly higher; in fact, the severity of coronary atherosclerotic lesions have been found to be inversely related to vitamin E levels in arterial tissue.5

Supplementation

Numerous studies have examined the effects of vitamin E supplementation on coronary heart disease and acute myocardial infarction. Vitamin E supplementation of at least 100 IU daily slowed the progression of coronary artery atherosclerosis in men with previous coronary bypass surgery.6 In a double-blind study, supplementation of 800 IU per day significantly reduced the risk of cardiovascular death and non-fatal MI for over 2,000 patients with coronary atherosclerosis when reassessed after a mean of 510 days.8

When the use of vitamin supplements was related to the incidence of ischemic heart disease, vitamin E was more consistently and strongly associated with a lower incidence of the disease than any other vitamin.9 Also, in a 4-year prospective study of almost 40,000 male health professionals who were initially free of diagnosed coronary heart disease, diabetes and hypercholesterolemia, men who took at least 100 IU of vitamin E daily for at least 2 years had a multivariate relative risk of coronary disease of only two-thirds of those who did not take the supplements.10 For high-risk patients, however, more recent double-blind studies failed to find evidence of the vitamin's efficacy in preventing cardiovascular events.11

Under controlled conditions, vitamin E supplementation prior to cardiac bypass surgery has improved the outcome13 and prevented the usual increase in free radicals during surgery.14 Furthermore, supplementation may reduce the risk of restenosis following percutaneous transluminal coronary angioplasty15 as well as the risk of thrombosis following heart transplantation.16

While vitamin E has not been noted for lowering elevated LDL cholesterol levels, supplementation has raised HDL cholesterol levels in some studies,17 but not in others,18 perhaps because only certain people are responders.19 It is also the nutrient that has been shown most consistently to prevent LDL oxidation.20 This effect appears to be dose-related with a threshold of about 400 IU daily,20 although 1,200 IU daily is significantly more effective.21 There is also evidence from double-blind studies that vitamin E may reduce platelet adhesiveness22 and aggregation.23

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Much more information on the role of nutritional factors in illness can be found in Foundations of Nutritional Medicine, one of Dr. Werbach's internationally acclaimed Sourcebooks of Clinical Research. A free brochure describing all of his books is available from Third Line Press, 4751 Viviana Drive, Tarzana, California 91356 USA; 800-916-0076; 818-996-0076 Fax: 818-774-1575; E-mail: tlp@third-line.com; Internet: http://www.third-line.com.