

VYING FOR VITAMINS

Initially, experimental data suggested vitamins were good antioxidants and could protect against heart disease and cancer. Although vitamins currently represent a multibillion-dollar industry, recent research demonstrates they have no cardiovascular (CV) protective benefit.

The Cleveland Clinic

The Cleveland Clinic performed a meta-analysis of randomized, controlled trials (RCTs) to assess the effect of vitamin E and β -carotene on long-term CV mortality and morbidity.¹ The Clinic analyzed seven RCTs of vitamin E treatment and eight RCTs of β -carotene treatment; all trials included \geq 1,000 patients. The dose range for vitamin E was between 50 IU and 800 IU, and between 15 mg and 50 mg for β -carotene. Followup ranged from 1.4 to 12.0 years. The vitamin E trials involved a total of 81,788 patients, and the β -carotene trials involved 138,113 patients in the all-cause mortality analyses.

Vitamin E did not provide benefit in mortality compared with control treatment (11.3% vs. 11.1%, odds ratio (OR) = 1.02 [95% confidence interval (CI) = 0.98-1.06] P=0.42), nor did it significantly decrease risk of CV death (6.0% vs. 6.0%, P=0.86) or cerebrovascular accident (3.6% vs. 3.5%, P=0.31). Moreover, β -carotene led to a small, but significant

increase in all-cause mortality (7.4% vs. 7.0%, OR=1.07 [CI=1.02-1.11] P=0.003) and a slight increase in CV death (3.4% vs. 3.1%, OR=1.1 [CI=1.03-1.17] P=0.003).

The meta-analysis in RCTs demonstrated no benefit of vitamin E. It also showed a possible harm associated with β -carotene, especially among smokers, where the vitamin may interact with tobacco and lead to lung cancer.

Heart Protection Study (HPS)

HPS demonstrated that simvastatin, 40 mg/day, decreased CV events by \geq 25%.² Combination antioxidants (including vitamin E, 600 IU/day, vitamin C, 250 mg/day, and β -carotene, 20 mg/day) had no impact on total or CV mortality and morbidity. Mortality associated with vitamins was 14.1%, and 13.5% with placebo. These results in combination therapy of different antioxidants failed to show any benefits.

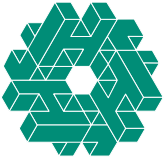
Heart Outcomes Prevention Evaluation (HOPE)

HOPE, a 4.5-year-long study, randomized 9,541 patients aged \geq 55 years, with either CV disease or diabetes, and another cardiac risk factor.³ HOPE evaluated ramipril and vitamin E at 400 IU/day. The primary outcome of myocardial infarction, stroke, or CV events was 16% in patients randomized to natural vitamin E, versus 15.4% in those randomized to placebo. Vitamin E demonstrated no benefit in heart disease protection.

About the author ...

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Heart Outcomes Prevention Evaluation—The Ongoing Outcomes (HOPE-TOO)


HOPE-TOO, a continuation of the HOPE study, looked at the effects of vitamin E in the prevention of CV disease in a high-risk population.⁴ Among all HOPE patients, 11.8% of patients in the vitamin E arm had a fatal or nonfatal cancer versus 12.4% of patients on placebo. Results were non-significant. Vitamin E had no effect in the CV outcome measurement, except for an unexpected 13% increase in heart failure seen in individuals taking vitamin E. The results were significant ($P=0.04$). One disturbing finding that has not been revealed to the general public is that vitamin E may actually provoke and cause congestive heart failure.

Physician's perspective

Vitamins have no proven CV protective benefit, and may actually even be harmful. In fact, RCTs have shown that β -carotene may be potentially carcinogenic in smokers.

It is unclear whether or not more long-term data will yield different results. While different antioxidant cocktails and treatment durations greater than five years may generate different results, the findings thus far are disappointing and consistently negative.

The recent long-term followup of HOPE-TOO suggests that over seven years of vitamin E therapy provides no cardiac protection, and may cause an increase in heart failure in high-risk patients prone to future CV disease.

Nonetheless, while most vitamin therapy does not protect the heart or brain, vitamin D and calcium do protect the bones! 

References

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