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REPORT

How Vitamin E Prevents Heart Attacks and Why We Should Take It

By Saul Kent

On May 20, 1993, two papers showing that vitamin E reduces the risk of coronary heart disease were published in the *New England Journal Of Medicine* by scientists at the Harvard School of Public Health.

The results of these studies, which were publicized widely throughout the United States, convinced many people who had been skeptical of the ability of vitamins to prevent heart disease and other lethal diseases, to start taking dietary supplements. For members of The Life Extension Foundation, however, the Harvard studies merely confirmed what they had been reading about for years. They also validated the work of Canadian doctors Evan and Wilfred Shute, whose pioneering clinical research with vitamin E in the 1940s, 50s and 60s provided a solid scientific foundation for future studies.

The reasons for all the hoopla over the Harvard studies was the fact that the scientists studied (prospectively) a vast number of subjects (39,910 male health professionals and 87,245 female nurses) for a lengthy period of time (4 years for the men and up to 8 years for the women), and that they found a major reduction in the risk of heart disease (40%-to-50%) in subjects who took vitamin E supplements (at least 100 IUs a day) for at least two years. The fact that the scientists were at an eminent university (Harvard) and had published in a prestigious journal (The New England Journal Of Medicine) added to the public impact of the studies.

A commentary on these studies in the same issue of the New England Journal by Daniel Steinberg, M.D., Ph.D. of the University of California at San Diego offered the typically cautious advice of alleged "authorities" about what public health policy should be regarding supplemental vitamin E (and other nutrients).

WHY NOT ADVISE PEOPLE TO TAKE ANTIOXIDANT VITAMINS?

Dr. Steinberg raises the question of whether "we" (the "authorities") should advise people to take supplemental antioxidant vitamins. He concedes that natural antioxidants such as vitamin E, vitamin C, and beta-carotene are "generally considered not to be toxic": which he says raises the question "Why not?" He then proceeds to give what he considers to be "good reasons why not." Here are his reasons:

"First, I think we must not make exceptions to the rule that recommendations to our patients must be backed by proof of a clear benefit to be conferred . . . My own conviction is that proof must include at least some valid clinical intervention trials demonstrating the magnitude of the benefit to be obtained in humans.

"A second reason for rejecting the 'Why not?' argument is that we do not have data showing the long-term (and presumably lifetime) intake of very large doses of natural antioxidants will not be toxic . . . Having inadequate data on the benefit to be expected, we should hesitate to accept any potential risk.

"Finally, before we lend our imprimatur to the widespread use of a still unproved treatment, one that requires the patient only to pop a few pills, we should ask how many patients will slack off on their adherence to better established, but somewhat more onerous, preventive measures such as a cholesterol-lowering diet, regular exercise, and smoking cessation.

"Meanwhile, I think we must play by the rules and insist on large, long-term, double-blind clinical trials. Until they are done, let's hold the vitamin E."

THE "HEAD IN THE SAND" APPROACH

Dr. Steinberg's third reason for not recommending supplemental vitamin E is the typical "head in the sand" approach, which has been parroted by the "authorities" for decades. His statement that "we" should not endorse "the widespread use of a still unproved treatment" ignores the fact that millions of people are already taking vitamin E (and many other vitamins) on their own and have been for decades! His "concern" that people will "slack off on other more onerous preventive measures" if they are advised to take vitamins ignores the fact that most people who take high-dose vitamins do so as part of a healthful lifestyle, while

those who do not take vitamins usually have other unhealthy habits as well! Dr. Steinberg's remark that we should not recommend a potentially lifesaving therapy because people might kill themselves in other ways is the most absurd argument proposed by the "authorities"!

Dr. Steinberg's second concern about the possible "toxicity" of long-term intake of supplemental vitamin E also ignores decades of high dosage vitamin E usage by millions of people without any significant indication of toxicity. The notion that supplemental vitamins may be "dangerous" is one of the greatest hoaxes ever perpetrated by the "authorities". In fact, vitamins are extraordinarily safe. THE TRUTH IS THAT NO ONE DIES FROM TAKING VITAMINS, WHILE HUNDREDS OF THOUSANDS OF AMERICANS DIE EVERY YEAR FROM FDA-APPROVED DRUGS!

THE FOLLY OF RELYING ON THE "AUTHORITIES"

It's a shame that so many "authorities" feel they must wait for the positive results of large scale clinical trials before they can recommend vitamin supplements. These scientists and physicians mislead people by insisting that it's appropriate to wait for "definitive proof" that supplemental vitamins can prevent diseases. Such advice is not only wrong, it's potentially life threatening for the following reasons:

1. There have been thousands of studies on the effects of vitamins on disease processes, the vast majority of which provide evidence that vitamins may help to prevent heart disease, stroke, cancer, and other lethal diseases. None of these studies comes close to providing "definitive proof" that vitamins prevent diseases in themselves...most are only suggestive. It is the accumulative weight of the evidence that is impressive, not any of the studies alone! When you consider that defendants are convicted of murder and sentenced to death because of the accumulative weight of many pieces of evidence, it is remarkable that the "authorities" refuse to recommend supplemental vitamins!
2. Because of the great expense of large-scale clinical studies to evaluate the ability of vitamins to prevent diseases, it usually takes decades and millions of dollars to conduct such studies. With most vitamins (and other nutrients), in fact, such large-scale studies have yet to be conducted and may never be conducted.
3. Large-scale studies often suffer from serious (sometimes fatal) flaws in their design, which can mask or prevent the discovery of the true benefits of supplemental vitamins. This is especially true of controlled clinical trials, which force every subject to take the exact same dose of the vitamin(s) under study. The problem is that a uniform dose is unlikely to be an optimal dose for most subjects and may be completely ineffective in subjects requiring higher doses. Controlled clinical studies also keep subjects from receiving the multiple supplemental nutrients they need for optimal health benefits.
4. The final reason to take supplemental vitamins before the "authorities" advise you to do so is because we are all growing old and dying. As we grow older, our risk of dying of a heart attack goes up geometrically. The risk of a 50-year old man dying of a heart attack is 200 times greater than a 20-year-old man, the risk of an 80-year-old man dying of a heart attack is 2,000 times greater than a 20-year-old man. The message is simple . If you wait for the "authorities" to tell you when to take vitamins such as Coenzyme Q10, vitamin B-6, vitamin B-12, folic acid, and magnesium, which prevent heart attacks you may very well be dead of a heart attack before you start taking these vitamins!

THE VALUE OF BIOCHEMICAL STUDIES

Biochemical studies of the effects of vitamins on disease processes are rarely reported on by the media and aren't usually cited as evidence in favor of taking vitamins. Yet such evidence can be better and more compelling than the almost invariably flawed results of controlled clinical studies. Biochemical studies provide highly persuasive evidence of the mechanisms of actions involved in taking vitamins.

When you know how vitamins help to keep you healthy and alive, it will be very hard for the "authorities" to convince you to wait for "more evidence" before taking these vitamins!

In this edition of Life Extension Update, we've provided you with solid evidence that supplementation with vitamin B-6, vitamin B-12 and folic acid helps to prevent heart attacks by reducing your body's levels of homocysteine, a toxic substance that promotes the development of the atherosclerotic plaques in arteries that are the major underlying cause of heart attacks and strokes. What follows is evidence of how vitamin E helps to prevent the formation of these life-threatening plaques.

HOW DIETARY CHOLESTEROL CONTRIBUTES TO HEART DISEASE

It's been known for decades that the regular consumption of foods high in fat and cholesterol is associated with an increased risk of atherosclerosis, and that higher-than-normal blood levels of cholesterol increases your risk of coronary heart disease.

About 25 years ago, it became clear that there are several types of cholesterol in our bloodstream (in the form of lipoproteins),

and that one form of cholesterol (high-density lipoproteins [HDL]) is good for your heart and your entire cardiovascular system. It is now accepted by cardiologists that your HDL/LDL (low-density lipoprotein) ratio is a better predictor of your risk of heart disease than simply measuring your total cholesterol.

THE OXIDATION OF LDL CHOLESTEROL

The first sentence of the abstract of the Harvard vitamin E study (in men) reads as follows:

"The oxidative modification of low-density lipoproteins increases their introduction into the arterial intima, an essential step in atherogenesis."

There have been many studies demonstrating that oxidized LDL cholesterol plays a critical role in the formation of arterial atherosclerotic plaques. Oxidized LDL can be found in atherosclerotic lesions. It accelerates the progression of these lesions by enhancing monocyte adhesion and macrophage foam cell generation, which induces the migration (to the lesion) of smooth muscle cells. Oxidized LDL also contributes to plaque formation by triggering thrombosis (blood clots that lodge in the lesions); and by impairing vasodilation of arteries to increase the shear stress of bloodflow within your arteries. All these factors contribute to atherosclerosis, which, in turn, significantly increases your risk of a fatal heart attack or stroke.

It is believed that the oxidation of LDL cholesterol generally occurs within the arterial cell wall, where it is sequestered from circulating antioxidants and comes into contact with iron and copper ions, which help to generate lipid oxidizing hydroperoxides and other free radical species.

INHIBITING THE OXIDATION OF LDL

Recent studies have shown that antioxidant vitamins such as vitamin C and vitamin E can inhibit the oxidation of LDL cholesterol and, as a result, increasing numbers of scientists are becoming convinced that this is the primary mechanism by which these vitamins protect us against heart attacks and strokes.

In one study, dietary vitamin E was found to decrease the susceptibility of LDL isolated from hypercholesterolemic men to oxidative modification. In another study, LDL taken from a single subject after dietary vitamin E supplementation was protected against oxidation when compared to LDL taken from subjects who had not received vitamin E. In a third study, supplementation with vitamin C and vitamin E reduced the enhanced oxidation of LDL caused by heavy cigarette smoking.

These findings are supported by in vitro studies, which show that both vitamin C and vitamin E inhibit oxidation in LDL taken from a wide variety of subjects. The antiatherogenic value of these antioxidant vitamins is further demonstrated by the inverse relationship between plasma levels of these vitamins and risk of death from heart disease.

Measures Of LDL Oxidation

A recent in vitro study by Vincent A. Rifici, Ph.D and A.K. Khachadurian, M.D. in the Journal of the American College of Nutrition, produced strong evidence that vitamin E is a highly potent inhibitor of LDL oxidation. Twelve healthy female and male subjects, age 22-49, who were non-smokers and were not taking any drugs or vitamin supplements, had samples of LDL cholesterol removed for testing after being given vitamin C alone followed by a period without any supplementation, which was then followed by supplementation with vitamin E. The subjects were given 250 mg of vitamin C 4 times a day, and then 800 IU of vitamin E once a day.

The amount of lipid peroxides formed in the samples (a measure of LDL oxidation) was determined by measuring Thiobarbituric Acid Reactive Substances (TBARS) immediately after incubation of the LDL in the culture medium. Two additional measures of LDL oxidation used in one subject were the appearance of conjugated dienes and the loss of reactive amino groups in the apolipoproteins found in the LDLs.

STRONG INHIBITORY EFFECT OF LDL OXIDATION BY VITAMIN E

The results of the study showed that supplementation with both vitamin C and vitamin E inhibited the oxidation of LDL cholesterol, but that vitamin E was especially effective in doing so. The inhibitory effect of vitamin C was 15%, while vitamin E inhibited LDL oxidation by 52% (the combined inhibitory effect of both vitamins was 63%). The scientists concluded that:

"Dietary supplementation with antioxidant vitamins C and E increases the resistance of lipoproteins to in vitro oxidation.... The onset of the propagation phase of lipid peroxidation was delayed up to 6 hours in the vitamin supplemented lipoprotein... as documented by decreased TBARS production. We have also shown that vitamin supplementation inhibits LDL oxidation according to other measures of the process....Our results indicate that dietary supplementation with antioxidant vitamins may be effective in retarding oxidation of LDL in vivo as well. "

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