

TOWNSEND LETTER

for Doctors & Patients

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Study Maligning Vitamin C Flawed

Editor:

This letter is in response to the article entitled, *Research Finds an Ill Effect of Vitamin C*, published by the Associated Press recently. This article portrays vitamin C as a potentially harmful substance. Since many physicians advocate the use of high doses of vitamin C for the treatment of people with cancer, I feel it is my duty to discuss certain aspects of the article in order to allay any uncertainties regarding the issue.

The basic finding of the study is that vitamin C, when in the presence of certain metals, can enhance a naturally occurring reaction that turns normal blood fats into potentially harmful blood fats called lipid hydroperoxides. These peroxides, if not neutralized, can be further converted into toxic substances called genotoxins. The term genotoxin describes a substance that has the ability to cause harmful effects on the DNA, or genes, in all cells. As the "control center" of cells DNA contains and distributes the information our cells need to function properly. The article extrapolates that the DNA damage caused by genotoxins in healthy cells would result in the "control center" acting improperly, leading to the formation of a cancerous cell. No one knows the true cause of cancer, but what is known is that cancer cells have abnormal DNA. In addition, the lead researcher of the original scientific investigation (Ian Blair, telephone interview) stated that all experiments had been performed in test tubes and not in actual people; therefore, the notion that vitamin C has deleterious consequences causing normal human cells in the body to become cancerous is merely an extrapolation.

As previously discussed, blood fats are known to be converted into peroxides that can be further converted into genotoxins. However, normal cells have an enzyme called catalase giving them the ability to quench the potentially harmful peroxide. Catalase is a special enzyme in all normal cells which functions to convert peroxides into water and oxygen — two substances that are beneficial to the health of those cells. In fact, a normal cell can synthesize as much catalase as needed. One fundamental difference between normal cells and cancer cells is that cancer cells almost entirely lack catalase. Thus, the cancer cells lack the ability to quench the potentially harmful peroxides resulting in the formation of genotoxins, ultimately causing cancer cell damage.

It is this very mechanism that the use of high-dose intravenous vitamin C exploits. In fact, the mechanism by which vitamin C induces peroxide formation in not only healthy cells, but also cancer cells, was discovered by Benade et al. as early as 1969. In 1991, Riordan et al. began studying the effects of high-dose vitamin C on cancer cells and found that, when exposed to such doses, cancer cells will die. Furthermore, normal cells will not die when subjected to similar doses of vitamin C. Thus, it can be concluded that taking high-doses of vitamin C would be beneficial to someone with cancer. Two other points of interest discussed in the article are that: 1) the reaction described in the study was accelerated by the presence of certain metals. This has been known since 1977 when Brain et al. published a study in a prestigious medical journal showing that the killing effect on melanoma cells could be enhanced by the presence of such metals; and 2) the formation of genotoxins, in terms of its effect on normal cells, is dependent on already existing lipid hydroperoxides. The normal formation of these peroxides is influenced mainly by various lifestyle issues, including types of fats used in the diet as well as the conditions inside the body. What we find is that people undergoing high-dose vitamin C treatment, or even people taking vitamin C as a supplement, often have healthier lifestyles and diet and tend to visit doctors more often. Thus the preexistence of the harmful blood fats may not be as big an issue as the authors believe it to be.

As for many people; the use of vitamin C for people with cancer was popularized by Linus Pauling, PhD, who himself used to take 10-15 grams of vitamin C daily. Dr. Pauling died in 1994 at the age of 93. In 1979 and 1985 researchers attempted to prove that the use of vitamin C for people with cancer had no effect on their disease. However, there were certain inherent flaws with these studies and their design. Also, many physicians purport that the use of vitamin C during conventional therapy (radiation or chemotherapy) will cause the conventional therapy to be less effective. Yet there are no studies that actually prove this to be true. On the contrary, there are many published studies that reinforce the clinical evidence gained from all the years of using vitamin C for people with cancer, both in conjunction with conventional therapy and without. Dr. Blair also stated that, "There is a paucity of scientific evidence that [vitamin C] is really good for you." There is a distinct difference between scientific evidence and clinical evidence. The former is evidence gathered from doing a test in a test tube on cells that may not even be of human origin; the latter is evidence gathered from actually treating patients. So when Balz Frei, a professor at the Linus Pauling Institute at Oregon State University cautioned that "the results [from the study under discussion] come from a test tube study, which involves chemicals in glass lab dishes, and that the same action may not occur in living animals," Dr. Frei was pointing to the fact that, in this case, it may be improper to create an extrapolation from the scientific to the clinical setting.

I believe that vitamin C is an important crusader in the battle against cancer, as it is an effective weapon with several methods of action. Compare the chemotherapeutic effects of vitamin C against standard chemotherapies used in conventional medicine, such as Taxol or 5-FU. While conventional drugs bear a host of ghastly side effects such as severe anemia, profound impairment of the immune system, loss of hair, nausea, vomiting, dizziness, dermatitis, fatigue and malaise, and even secondary cancers, high-dose intravenous vitamin C treatment is virtually free of such effects. In fact the treatment usually has associated side benefits such as improvement in immune function and well being, as well as improved resistance to infections and the potential for enhanced resistance to the spread of the cancer.

I hope you find this letter informative and helpful in the quest to better understand the great utility of vitamin C for people with cancer. Of course, I could inflate this letter with facts and figures on the benefits of vitamin C, but that is not the point — rather, my intention is to allow a better understanding of the perception of vitamin C both in the media and the clinic; and to yield a "behind the scenes" look at how to read a study and how a study reads.

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