Vitamin C and Cancer Treatment

One of the most common questions we get involves the use of supplements during cancer treatment. Patients are told by their doctors that they shouldn't use antioxidants because they may make the treatment ineffective. Patients become concerned about continuing their normal supplements because they contain antioxidants; they also want to know what else they could do to help themselves heal.

Let's be very clear: dietary supplements do not cure cancer. However, they may help during cancer treatment.

When Did All This Begin?

"It's possible that taking large amounts of vitamin C could interfere with the effects of chemotherapy or even radiation therapy." That quote is from Dr. David Golde, a cancer researcher at Memorial Sloan-Kettering Cancer Center, and was included in a 1999 press release. Since then, the use of antioxidants, especially vitamin C, has been discouraged by oncologists and physicians who treat cancer. The question is why did he make that statement? Moreover, is it accurate and a cause for concern?

The Science

In a series of elegant experiments, Dr. Golde and his colleagues identified the mechanism by which vitamin C can be transported into cancer cells. While the biochemistry is complex, the essence is that vitamin C is transported into cells via glucose-transporter mechanisms. Why is that significant? Because cancer cells appear to have more glucose transporters than normal cells do, and that allows them to use glucose (sugar) as energy to grow. If vitamin C is present in high quantities, the same mechanism will increase the uptake of vitamin C into the cell.

The question is why do cancer cells want vitamin C? The theory is that the cancer will use the vitamin C to protect itself against the body's normal defense mechanisms, which are trying to destroy the tumor.

In another series of experiments, Dr. Golde and colleagues demonstrated that:

- Vitamin C will inhibit cancer cell death by neutralizing free radicals inside cancer cells
- Vitamin C will prevent cancer cell death by hindering the destruction of cellular DNA in cancer cells
- Vitamin C will inhibit cancer cell death by constraining a specific pathway known for cell death in blood cells and specific types of cancer cell

While this seems to be overwhelming evidence against using vitamin C during cancer treatment, there two important caveats:

First, these were all test-tube studies, and no matter how carefully they were conducted, they have severe limitations for applicability to a whole organism. The body has many complex mechanisms that may neutralize the effects in individual cells

Second, and maybe even more important, none of the experiments used radiation or chemotherapy to see what roles vitamin C plays during cancer treatment. Vitamin C ’s effects during treatment may be exactly the opposite of its effects on untreated cancer cells.

The Recommendation

Based on the aforementioned research, Dr. Gabriella M. D’Andrea, also of the Memorial Sloan-Kettering Cancer Center, published recommendations that vitamin C and other antioxidants not be used by patients during cancer treatment. The concern is that antioxidants will reduce the efficacy of the treatment, whether chemotherapy or radiation. However, no additional data supporting that concern is presented.

The logic is understandable. If vitamin C protects normal cells during treatment, it stands to reason that it will protect cancer cells and reduce the effectiveness of treatment. The problem is that there’s no evidence to back that up in any of these test-tube studies.

Tests on Cancer Patients

On the other hand, there’s evidence in a human trial that supplementation with antioxidants does not interfere with treatment. In a recent study, researchers gave high doses of vitamin C, vitamin E, and beta-carotene to patients undergoing treatment for Stage III and IV lung cancer. When compared to patients who received placebos, there were no differences in survivability--taking high doses of antioxidants did not increase the death rate by interfering with chemotherapy. In fact, a closer look at the data reveals that patients using the antioxidants survived at a higher rate than those using a placebo, but the results did not achieve statistical significance. We’ll be watching closely to see if these results are repeated in other studies; then patients and their doctors can decide whether the very slim chance that antioxidants will help is worth the effort and expense of taking them.

Other clinical trials are often cited to demonstrate the lack of benefits of supplementation during cancer treatment. The lack of benefits is limited by what questions were asked, and often, the wrong questions are asked. Obviously, scientists want to know if people will live longer if they use supplements. That’s a valid question, but not the only one. No studies have compared how people feel while undergoing treatment when they use supplements versus when they don’t. Even if there’s no difference in survival rates, if people feel better and have more energy to carry on their lives during treatment, that’s a legitimate benefit. But it’s not a hard endpoint and is rarely considered.

Bottom Line

In statistics, there's an often-ignored conclusion called Reserve Judgment that's used when there are not enough data to claim statistical significance, but when the tested item or procedure doesn't appear to be non-significant. When it comes to taking vitamin C alone, it may be in the area called Reserve Judgment.

How does that help you if you're facing cancer treatment? Do what your treatment team recommends. If your doctors read the science and conclude it's best to avoid vitamin C, do it. If they read it and say there's enough evidence to use it, do so.

But don't think that there's nothing you can do when it comes to supplementing during cancer treatment. Life is about balance, and your nutritional approach should be balanced as well. Supplements that use whole-plant concentrates provide the balance of vitamins, minerals, and phytonutrients that are found in foods; these supplements may help keep your body strong during treatment when your appetite fades and healthy eating takes a hit. Supplements that contain green tea, alpha-lipoic acid, grapeseed extract, and shitake- and reishi-mushroom extracts have the phytonutrients that research has shown to be beneficial in reducing the risk of getting cancer. There's every reason to believe they're a good alternative to megadosing with any single vitamin during cancer treatment.