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To Take or Not to Take

BY LENA HUANG

Role of antioxidants called into question -- again.

Scientists have long investigated the connection between antioxidants and cancer, and now a new study reported in the *Journal of the National Cancer Institute* concludes that cancer patients undergoing radiation or chemotherapy should avoid routine use of antioxidant supplements.

With about 60 percent of cancer patients reporting that they take some type of vitamin supplement, according to the American Cancer Society, the relationship between antioxidants and cancer begs for clarity.

The debate is complex because a variety of antioxidants exists, not only in food and in supplements but also manufactured by the body. Combine that with the number of cancer therapies, cancer stages, tumor types, and other variables, and it is no wonder there are varying opinions on the topic.

For the *JNCI* study, researchers combed through two decades of clinical trials that had concurrent administration of antioxidant supplements with chemotherapy or radiation. They found three randomized studies focused on radiation and 16 on chemotherapy. While some of these studies showed antioxidant benefits, such as a reduction in side effects, others showed a decrease in survival rates of cancer patients.

With these varying assumptions, Brian D. Lawenda, MD, lead investigator of the study, said his team based their conclusion on the physician's dictum of "first, do no harm," that in the absence of beneficial evidence, doctors should advise against the use of high-dose supplemental antioxidants during radiation and chemotherapy until further studies are done.

Antioxidants are substances that block oxidation and affect many processes. One role they have is protecting cells from free radical damage. Free radicals (highly reactive molecules produced during normal metabolism and by environmental toxins) damage DNA, a reaction that may cause certain genes (the parts of DNA that encode proteins) to develop mutations, which can initiate new cancer cells or promote the growth of existing ones.

Many chemotherapy agents and radiation therapies work by inducing free radicals that damage cancer cell DNA and proteins. And while this can harm normal cells, it causes even more damage to rapidly growing cancer cells. So taking large doses of antioxidant supplements may interfere with these therapies by reducing their anticancer activity, according to Lawenda's study.

However, Lawenda, who is also the clinical director of radiation oncology at Naval Medical Center San Diego, adds that patients should not interpret this conclusion to mean they should remove foods with antioxidants from their diets. “Importantly, the potential adverse consequences of antioxidant supplements may be related to the high doses in which they are administered—intakes which cannot be easily achieved by any diet rich in these plant foods.”

Some commonly known natural antioxidants are vitamin C, which is found in citrus fruits and blueberries, and beta-carotene, which is found in carrots and other orange foods. These antioxidants and others have been studied in large-scale clinical trials since the 1980s with some showing promise and others revealing increases in cancer rates.

More recent research derived from cell culture and animal studies suggests antioxidants may slow or prevent cancer. “There are numerous reports that chemopreventive agents derived from natural sources—fruits, vegetables, spices—have antioxidant activity and are beneficial,” says Bharat B. Aggarwal, PhD, professor of experimental therapeutics at M.D. Anderson Cancer Center in Houston.

Aggarwal has studied numerous agents in fruits and vegetables, such as curcumin (a spice), lycopene (found in tomatoes), and resveratrol (found in grapes), that target specific molecular actions that can have preventive effects on cancer and other diseases.

Until further studies on specific antioxidants and cancer outcomes are done, Lawenda recommends patients get a natural mix of antioxidants through food sources as specified through the federal government’s dietary guidelines (www.health.gov/dietaryguidelines).

“We recommend that patients continue to meet the established dietary requirements [set by the government] for the essential vitamins C and E and the intake of carotenoids, flavonoids, and related antioxidant phytochemicals,” Lawenda says.