The antioxidant controversy and cancer

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Many oncologists, if not most, generally advise their patients to stop taking antioxidants during chemotherapy and radiotherapy. They believe that these therapy modalities depend partly on free radical effects and therefore antioxidants would be counterproductive. In this article I wish to address this issue, and whether this advice is based on any reasonable science or is just a point of view.[1]

Both antioxidants and free radicals are present in the body and clearly there needs to be a fine balance between them. It is generally assumed that excessive amounts of free radicals are one of the underlying causes of many diseases, including cancer. A deficiency of antioxidants can therefore have serious effects on health. An antioxidant deficiency is not uncommon in individuals who eat junk food, over-processed foods or cooked foods, and a diet low in vegetables and fruit. The constant use of oxygen in the body generates large amounts of free radicals, and the more ill a person is the more free radicals are generated, and hence increasing amounts of antioxidants are required.

Radiotherapy and chemotherapy generate more free radicals in a patient that may already be antioxidant deficient. The nutritional status of cancer patients, especially when the antioxidant intake is inadequate, may be a determinant of oxidative damage caused by free radicals in different organs.

In the risk vs benefit scenario is the consideration of whether the oncologist wants the patient to be antioxidant deficient in order to improve the free radical effect on the cancer (and healthy tissue) from chemotherapy and radiotherapy, or to have the support of antioxidants (and its protective effects) while the person is having chemotherapy and radiotherapy.

Dr Galloway points out that it is "important to keep comorbid conditions in mind for the sake of the entire patient and not just focus on cancer, because the patient can do extremely well as far as the cancer is concerned but subsequently die of coronary artery disease or stroke."[2] There is also evidence that the antioxidant status of the patient remains depressed for some months after treatment of the cancer.[3]

Two recent surveys support the use of antioxidants with chemo- and radiotherapy. Block et al[4] surveyed 845 peer reviewed articles and identified 19 clinical trials that met strict criteria. They reported that none of the trials reported evidence of significant decreased efficacy during chemotherapy. Many of the studies showed that antioxidants increased tumour response to chemotherapy and caused less toxicity than in the controls.

Simone et al surveyed peer reviewed literature from 1996 to 2003 and identified 280 articles for the study.[5] They concluded that the majority of patients who took antioxidants had improved survival. In a Finnish clinical trial on small-cell lung cancer, in which the patients used antioxidants, the authors had the following comment "... antioxidant treatment, in combination with chemotherapy and irradiation, prolonged the survival time of patients with small cell cancer, compared to most published combination treatment regimens alone. We also noticed that the patients receiving antioxidants were able to tolerate chemotherapy and radiation treatment well. Surviving patients started antioxidant treatment in general earlier than those who succumbed."[6]

What about the negative studies that tend to be highlighted by oncologists? Most of these studies concerned the use of antioxidants to prevent cancer. Bjelakovic et al did a systemic review and meta-analysis of antioxidant supplements for the prevention of gastrointestinal cancer.[7] He excluded over 400 trials that had no deaths. Dr Bernadine Healy, former director of the NIH, called this trial flawed. The selection process excluded many of the most positive studies that showed that mortality was significantly reduced by supplements.

Bairati et al reported on four or five studies on the use of antioxidants to prevent secondary cancer in head and neck patients. Their early studies showed adverse effects but their most recent studies showed that these negative effects were only seen in patients who continued to smoke during chemotherapy, and that when the antioxidants where derived from food then there were in fact fewer acute adverse effects and a decrease in local recurrence.[8–11] Only one recent study showed that the used of antioxidants vitamin C, E and folate did not reduce the risk of lung cancer.[12]

Commentary

Integrative doctors seldom use single nutrients as they are generally used in clinical studies. A study by Meyer and Bairati also suggested that it is better to consume food-based antioxidants rather than synthetic single vitamins.[10] Furthermore, there is evidence that some antioxidants when consumed alone at high doses can act as both an antioxidant and pro-oxidant. This does not seem to occur when combined with other antioxidants.

The recommendation is therefore to ensure that cancer patients are stocked up with antioxidants and other nutrients before receiving cancer treatment in order to ensure their best health possible before undergoing chemotherapy, radiotherapy and/or surgery.

The weight of the literature supports the use of antioxidants during treatment and this can be continued at maintenance doses during, and for many months after, the treatment.

My favourite anti-oxidants for cancer patients include vitamin C, melatonin, grape seed extract, Curcumin, selenium, green tea, lycopene and Coenzyme Q10. As will be noted, some of these are plant based antioxidants, and are less likely to cause problems when given long term.

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