Efficacy and Interaction of Antioxidant Supplements as Adjuvant Therapy in Cancer Treatment: A Systematic Review

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Probably no topic in integrative oncology causes more concern or confusion than the use of antioxidants in the care of those undergoing cancer therapies. In this paper 49 reports matching the inclusion criteria were included. I have personally researched, written and spoken about this for many years and have published one large scale review regarding ascorbate and oncologic agents [1]. In my own research reviews and clinical integrative oncology practice over two decades it has been my experience that when the data available are reviewed the seemingly extreme concerns about the topic are overstated or at least very unlikely to be as stated. In the abstract the authors set up this same issue:

"Oxidative stress is a key component in carcinogenesis. Although radiation produces reactive oxygen species, some anticancer agents such as alkylating agents, platinum and antitumor antibiotics exert cytotoxicity by generating free radicals. Nonenzymatic exogenous antioxidants such as vitamins, minerals, and polyphenols can quench ROS activity. However, whether antioxidants alter antitumor effects during radiotherapy and some types of chemotherapy remains unclear."

This is "author speak" for presenting the idea of the "elephant in the room" yet keeping most readers engaged. I have spoken to physicians on each end of the spectrum on this topic ("it's a bad idea" or "this is a stupid conversation") and most seemed to be drawn into this paper regardless of their view. So, what data and outcomes were reviewed?

One metric assessed was chemotherapy side effect reduction using antioxidants and the paper states "a significant relief in chemotherapy induced toxicities was reported in many trials using various antioxidant supplements."

Another critical area is the radiotherapy – antioxidant issue. In the paper the authors report in regard to radiotoxicity that "19 radiotoxicity prevention trials were investigated, which specifically aimed to reduce toxicities affecting the mucosa, skin, salivary glands, and taste. Four of 19 trials reported no significant differences in toxicity between groups. Antioxidant supplements such as vitamin E,

multivitamin combination, polyphenol and zinc were effective in preventing radiation-induced toxicities in the skin, mucosa, and salivary glands."

I find that this paper provided an honest look into this contentious subject as it outlined the known data as well as the biases intrinsic in all clinicians and researchers. I recall being faculty at an oncology symposium where in a grand rounds (given not long after I had presented data showing a high safety and potentially therapeutic index in combining radiotherapy and ascorbate) the radiation oncologist being asked about the same topic. Their response was "we think it is a bad idea. Maybe there is no actual negative data but we just think it is a bad idea".

I have wrestled with these issues for over twenty years in clinical practice and oncology research. I believe that we do need to be vigilant and look for the best outcome in patient care, which includes not interfering with any therapy that has the potential to help. In my own practice, teaching, writing and consulting with oncologists and integrative medical professionals I do attempt to use a data and clinical experience driven matrix which is my method for providing an ethical basis for recommending any therapy, especially oncologic. In the conclusions the authors state that sentiment as "Thus, it is important that clinicians make an integrated decision, taking into account the following: (1) the antioxidant dosage and types, (2) the background and state of the patient, and (3) type of cancer and antitumor therapy."

In assessing the best collaborative therapy during oncology care the professional does need to give thought to the mentioned criteria of patient vitality, stage of therapy, supplement selection and dosing. It has been my experience that when appropriately matching the natural therapy and the individual patient needs the patient will generally experience a lower frequency of negative effects from oncologic therapies as well as improved quality of life.

The final conclusion statements ring true based on many years of experience and now are echoed more and more in the published data: "Although there are many opinions about risks or benefits of antioxidant supplementation, we could mostly conclude that the harm caused by antioxidant supplementation remains unclear for patients during cancer therapy, except for smokers undergoing radiotherapy."

Reference cited:

1. Anderson PS. Ascorbate and Oncologic Therapies. 2013 downloaded from: https://www.academia.edu/10024397/Ascorbate_and_Oncologic_Therapies_-_Research_Review