

MicroNutrients

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8479349/>

Embracing cancer immunotherapy with vital micronutrients 2021

CONTROVERSY OVER USE OF MICRONUTRIENTS IN CANCER THERAPY

Since most **micronutrients may also act as antioxidants**, some physicians are concerned about possible inhibitory effects on chemotherapy killing actions[30]. On the contrary, there are reliable studies on the beneficial effects of antioxidants and micronutrients for patients during radiation therapy[31,32] and chemotherapy[33,34]. A recent extensive review comprising of 174 peer-reviewed articles and 93 clinical trials with a total of 18208 cancer patients showed that antioxidants have superior potentials in reducing chemotherapy-induced toxicity[35]. The conclusion was that antioxidant supplementation during oncology treatments enhanced chemotherapeutic efficacy and even prolonged patient survival. Moreover, in other studies, when antioxidants were given concurrently with chemotherapy, no interference occurred. Rather, they enhanced the chemotherapeutic effects, and even protected normal tissues and increased patient survivals and therapeutic responses[36,37].

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Recent studies have shown that **combinations of micronutrients exert pleiotropic effects in controlling tumor growth and metastasis** by modulating the tumor microenvironment, enhancing gut microbiota immune functions, and providing adjunct nutritional support to micronutrient deficient cancer patients. A higher than recommended dietary allowance micronutrient dose is proposed to reduce the toxic free radicals generated as a result of immunotherapy and tumor metabolism. This is not only helpful for managing treatment side effects but also enhancing treatment efficacy.