

Calorie or Carbohydrate Restriction? The Ketogenic Diet as Another Option for Supportive Cancer Treatment

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Disclosures of potential conflicts of interest may be found at the end of this article.

In their recent article, “Nutrient Restriction and Radiation Therapy for Cancer Treatment: When Less is More” [1], Colin E. Champ and colleagues provide a good number of arguments why calorie restriction (CR), either through overall dietary reduction or through intermittent fasting, may be a potent supportive intervention for patients undergoing standard radiotherapy and/or chemotherapy. I strongly agree with the authors that CR targets so many important cancer survival pathway transducers at the same time that it should definitely be tested in clinical trials. However, I want to point out two main concerns about CR and possible strategies to address them.

First, as also mentioned by Champ et al., CR might be a problem for patients who already have cachexia or those at high risk for cachexia. Although the authors suggested intermittent fasting as a better option than overall dietary reduction in these cases, I would propose considering the ketogenic diet (KD) as an alternative to CR. KDs and CR behave as siblings in the sense that both decrease serum insulin levels, increase the production of ketone bodies, and partly target the same signaling pathways through the restriction of carbohydrates [2]. Cachexia is a state of chronic inflammation, which alters whole-body metabolism such that glucose use of normal tissues is attenuated, and their reliance on fat as a fuel increases [2]. It follows that the high fat intake associated with a KD

might benefit patients with cachexia by providing sufficient energy for peripheral tissues and at the same time interfering with important cancer survival pathways. Initial results from epilepsy research indicate, however, that the effects of a KD and CR are not completely similar [3], and it would be very interesting to compare both interventions for cancer treatment in future clinical trials.

A second point of concern could be the reduced intake of micronutrients and secondary plant substances when less food is consumed. It is of utmost importance, therefore, to put great emphasis on food quality. This could pose an additional problem when combining CR with a KD as proposed by some authors [4], because the latter limits food choices quite seriously. However, KDs could be designed to consist of high-quality foods and would ideally be combined with anticancer nutraceuticals like omega-3 fatty acids, curcumin, or green tea polyphenols.

These issues highlight the need for a wider interdisciplinary approach that includes dietitians or nutrition-trained physicians. These issues should not, however, be an obstacle to implementing CR with or without a KD, as a supportive therapy for patients with cancer.

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