

Targeting metabolism with a ketogenic diet during the treatment of glioblastoma multiforme.

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Abstract

Retrospective data suggests that low serum glucose levels during the treatment of glioblastoma multiforme (GBM) may improve clinical outcomes. As such, many patients are implementing a **ketogenic** diet (KD) in order to decrease serum glucose flux while simultaneously elevating circulating ketones during radiation therapy and chemotherapy for the treatment of GBM. With IRB approval, a retrospective review of patients with high-grade glioma treated with concurrent chemoradiotherapy and adjuvant chemotherapy was carried out from August 2010 to April 2013. Serum glucose and ketone levels, dexamethasone dose, and toxicity of patients undergoing a KD during treatment were also assessed. Blood glucose levels were compared between patients on an unspecified/standard diet and a KD. Toxicity was assessed by Common Terminology Criteria for Adverse Events version 4. In total, 53 patients were analyzed. Six underwent a KD during treatment. The diet was well tolerated with no grade III toxicity and one episode of grade II fatigue. No episodes of symptomatic hypoglycemia were experienced. Four patients are alive at a median follow-up of 14 months. The mean blood glucose of patients on a standard diet was 122 versus 84 mg/dl for those on a KD. Based on this retrospective study, a KD appears safe and well tolerated during the standard treatment of GBM. Dietary restriction of carbohydrates through a KD reduces serum glucose levels significantly, even in conjunction with high dose steroids, which may affect the response to standard treatment and prognosis. Larger prospective trials to confirm this relationship are warranted.

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