

EATING YOUR WAY TO SEIZURE CONTROL

Efficacy of the Atkins Diet as Therapy for Intractable Epilepsy

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The ketogenic diet is effective for treating seizures in children with epilepsy. The Atkins diet also can induce a ketotic state, but has fewer protein and caloric restrictions, and has been used safely by millions of people worldwide for weight reduction. Six patients, aged 7 to 52 years, were started on the Atkins diet for the treatment of intractable focal and multifocal epilepsy. Five patients maintained moderate to large ketosis for periods of 6 weeks to 24 months; three patients had seizure reduction and were able to reduce antiepileptic medications. This provides preliminary evidence that the Atkins diet may have a role as therapy for patients with medically resistant epilepsy.

COMMENTARY

The Atkins diet has become very familiar to the general public. The media are replete with infomercials and anecdotal reports of its success in helping people lose weight. Whole sections of grocery stores are devoted to special Atkins diet products. Thousands of Americans are singing the praises of the Atkins diet for weight loss. But a treatment for epilepsy—how did that idea come about?

The premise of the Atkins diet is that carbohydrates are severely limited (maximum of 10 g/day, at least initially), to induce a state of ketosis, which suppresses appetite. The Atkins diet may facilitate weight loss by a number of mechanisms, including ketosis, fat mobilization, and moderate calorie restriction (1). The Atkins diet resembles another diet used to control intractable epilepsy—the ketogenic diet (KD). The two diets are similar in shifting the reliance of the body (and brain) from carbohydrate to fat as the major energy source. The main difference lies in the amount of protein allowed—the KD restricts protein, whereas the Atkins diet allows abundant protein. In addition, the KD ordinarily restricts total calorie intake to about

75% of the recommended daily allowance, whereas the Atkins diet has little or no caloric limitation. In addition, unlike the KD, no need exists for a fast or hospital admission before starting the Atkins diet.

Now, from the mecca of the KD, Johns Hopkins Hospital, comes this brief report of Atkins diet efficacy for intractable epilepsy. They describe a small series of six patients with intractable epilepsy who were started on the Atkins diet and maintained on it from 3 to 20 months. All are medically refractory patients who had shown an interest in starting a KD but decided to give the Atkins diet a try first (E. Kossoff, M.D., personal communication). They included three children (aged 7–12 years), an 18-year-old teenager, and two adults (aged 42 and 52 years). The patients had been treated with several AEDs (2 to 18!). Their seizure types included absence, complex partial, generalized tonic–clonic, and multiple seizure types in the same patient.

All of the children and the adolescent were able to achieve “large” ketones in their urine; in neither of the two adults did large urine ketones develop. The results were quite remarkable—two children and the teenager had greater than 90% seizure reduction! The one child who did not achieve urinary ketosis and neither adult had significantly improved seizure control on the Atkins diet. None of the patients had significant side effects, hypercholesterolemia, or excessive weight loss. All three of the successfully treated patients were able to taper their standard anticonvulsants, and at this writing, they remain under good seizure control on the Atkins diet (E. Kossoff, M.D., personal communication).

This is a preliminary, small open trial that was uncontrolled and unblinded. Nevertheless, the study raises the possibility that the Atkins diet is beneficial for children with medically refractory epilepsy. Many of the children who withdraw from the ketogenic diet do so because of either poor tolerability or the family’s inability to maintain the rigorous dietary regimen (2). Therefore a dietary regimen that increases palatability through less-restrictive protein and calorie requirements could enhance patient compliance. In the study of Kossoff et al., for one child who achieved seizure remission on the Atkins diet, the KD had previously failed. Another child was scheduled for the KD but achieved seizure control during the pre-KD phase of carbohydrate restriction (i.e., the Atkins diet) and never needed to go on the KD. Similar to

the age-related efficacy of the KD, the Atkins diet seems to have worked better in children. Although the Atkins diet was less encouraging in adults with epilepsy, larger-scale studies are necessary.

The KD suppresses seizures for unknown reasons (3). Ketosis, a common feature of these two diets, may provide clues to the KD mechanism of action (4,5). Alternatively, evidence exists that calorie restriction suppresses seizures independent of ketosis (6,7). Details of calorie intake are not provided in Kossoff's report, and many people who go on the Atkins diet do not decrease their total calorie intake significantly. Therefore the relative roles of ketosis and calorie restriction must be elucidated. Nevertheless, these intriguing findings suggest that the less restrictive Atkins diet might provide a more palatable and tolerable option to the KD for children with medically refractory epilepsy. It must be emphasized that, when used for epilepsy control, the Atkins diet and the KD are medical therapies, not fad diets. Neither diet should be undertaken without the supervision of a dietician and neurologist.

by Carl E. Stafstrom, M.D., Ph.D.

References

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