The ketogenic diet: a work in progress

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Our Commentaries from the Primary Care Neurology Society (P-CNS) provide a primary care perspective on the neurology articles in Progress. Here, Dr Karen Lanyon considers ‘Food for thought – the ketogenic diet for epilepsy’ (see page 6).

Despite the launch of 16 new antiepileptic drugs (AEDs) since the 1980s, 30 per cent of patients with epilepsy continue to have seizures. Mark Greener’s article ‘Food for thought – the ketogenic diet for epilepsy’ is a timely reminder that additional treatments need to be considered for some patients.

Seizures are symptoms of many different conditions and AEDs may help to suppress seizures in up to two-thirds of patients. Each medication has a specific mode of action but does not cure the epilepsy.

Mark Greener recalls that as far back as the beginning of the last century physicians on both sides of the Atlantic were trialling starvation as a treatment for patients with seizures. Prior to advent of AEDs, the ketogenic diet (KD) was used in children and adults suffering with all types of epilepsy but since the introduction of phenytoin in 1938, its use has been mainly in children with multiple seizure types, refractory to multiple AEDs. As a result, the diet has often been restricted to use in children fed via gastrostomy tubes.

There have been very few studies looking at the effectiveness of the KD in adults. A 2011 review found published data on dietary treatments from more than 1300 children under 12 years old, but from only 178 adults and 92 adolescents. Adult patients seem to experience similar side-effects to those encountered in children although non-compliance may be higher in adolescents and adults. The main reason for discontinuation in these studies was lack of efficacy.

Mark Greener describes the resurgence in popularity of the KD over the last 15 years. He highlights the broad effectiveness of dietary restriction, suggesting this does not specifically target the seizures but rather augments endogenous mechanisms in the brain that in turn suppress seizure activity. The KD has been shown to reduce seizures in up to 50 per cent of patients and may also improve neurological and cognitive functions, although there are few studies looking at quality of life. There are no studies directly comparing the KD with AEDs, but using the KD does not have the cumulative sedating effects of multiple AEDs and may allow medication to be reduced.

The classical KD can be unpalatable and tolerability has long been considered an issue. Thirty per cent of patients were quoted as experiencing gastrointestinal side-effects in a recent Cochrane review.2 The article discusses variations of the KD that have been tried, such as the modified Atkins diet and low glycaemic index diet, to try to improve adherence to the regimen, as well as studies using medium-chain triglycerides as opposed to saturated long-chain triglycerides. Adherence to these restrictive regimens requires careful dietary advice and this service is patchy and often unavailable, particularly for adult patients.

Studies have shown that patients can acquire benefits from the KD within a few days of its introduction. This may mean that if there is no apparent improvement in seizure frequency or even a worsening, patients do not need to be subjected to a long duration of treatment. In one study, those who achieved more than 75 per cent seizure reduction responded during the first month of treatment, and in a few subjects with daily seizures, the benefit was reached within four days.3

Mark Greener’s article explores the many theories being investigated to explain the mechanisms behind the KD. He also looks in detail at the successful use of the KD in patients with severe status epilepticus and reminds us that this treatment should be considered in refractory seizures that persist for at least 24 hours despite anaesthetics.

Further work is required, however, if we are to determine the optimal timing of diet administration, which type of diet, and at what stage in the natural history of epilepsy it should be tried. More detailed studies are required to investigate the long-term effects of the KD and dietary expertise needs to be expanded if this treatment is to be offered to more patients.

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References