spontaneous diuresis and renal function. Treatment duration ranged between 16 and 155 h, with a median of 27 h. We did not detect any complications associated with the technique, such as infection or catheter malfunction (Table 1).

In this sample of patients, we found that CFPD with a dual catheter system for RRT was easy to implement, efficient, and safe due to the absence of associated complications.

References


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Ketogenic diet as a therapeutic option in refractory epilepsy*

Dieta cetogénica como opción terapéutica en la epilepsia refractaria

Dear Editor:

Refractory epilepsy (RE) is defined as epilepsy with poor seizure control despite treatment with anticonvulsant medication. It accounts for 25%–30% of epilepsy cases, and poses a significant therapeutic challenge from a medical perspective.1–6 One of the effective therapeutic alternatives for RE is the ketogenic diet (KD).1–6 The KD consists of a diet rich in fat and low in protein and carbohydrate aimed at increasing the levels of ketone bodies.1–6 Several theories have been proposed to explain its mechanism of action, none of them conclusive.1–3,6

Despite the popularity the diet has achieved in the past twenty years, there is still no consensus on how the KD must be managed to achieve maximum efficacy

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Characteristics of the patients under study.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient (number)</td>
<td>Genetic cause</td>
</tr>
<tr>
<td>1</td>
<td>Dravet syndrome</td>
</tr>
<tr>
<td>2</td>
<td>Dravet syndrome</td>
</tr>
<tr>
<td>3</td>
<td>Rett syndrome</td>
</tr>
<tr>
<td>4</td>
<td>SCNZA encephalopathy</td>
</tr>
<tr>
<td>5</td>
<td>Dup 15q13.3 multifocal encephalopathy</td>
</tr>
<tr>
<td>Patient (number)</td>
<td>Structural cause</td>
</tr>
<tr>
<td>6</td>
<td>Thalamic infarction</td>
</tr>
<tr>
<td>7</td>
<td>Extensive malformation of the cortex in both hemispheres</td>
</tr>
</tbody>
</table>

♂, male; ♀, female; ACTH, adrenocorticotropic hormone; Dup, duplication; AED, antiepileptic drug.

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with minimum side effects and to make its use more widespread.²

The aim of our study was to assess the clinical efficacy, tolerability, degree of parental satisfaction and side effects of patients with RE treated with the KD.

We conducted a descriptive retrospective analysis of epileptic patients treated with a KD in our hospital in the past three years.

We evaluated the efficacy of the KD based on the percent reduction in the frequency of seizures (>75%, 74%–50%, <50%, and no response). We considered that patients had a good response when they experienced a seizure reduction of 50% or more compared to baseline.

We assessed parental satisfaction by means of a survey, asking their level of satisfaction (poor, fair, good, excellent).

We included a total of seven patients (six male and one female).

The onset of epilepsy occurred before age 6 months in all patients except patients 5 and 6, who had onsets at around 4 years of age.

The aetiology was genetic in five patients: two had Dravet syndrome (patients 1 and 2), one had Rett syndrome (patient 3), one a SCN2A mutation (patient 4) and one a 15q13.3 microduplication (patient 5). Two patients had lesonal epilepsy, caused by a perinatal thalamic infarction in one (patient 6) and extensive malformation of cortical development involving both hemispheres in the other (patient 7).

All patients had received appropriate treatment with several antiepileptic drugs (AEDs) and shown no response prior to the introduction of the KD (3–5 AEDs [43%], 6–8 AEDs [43%] and >9 AEDs [14%]; Table 1).

The patients that showed the best response, with a 75% or greater reduction in seizure frequency, suffered from various genetic anomalies (two had Dravet syndrome, one a mutation in the SCN2A gene, and one a 15q13.3 microduplication). The patients that had the worst outcomes, remaining seizure-free for less than one week, suffered from Rett syndrome and bilateral thalamic infarction.

Patients who had a past history of status epilepticus (28.56%) did not experience it again after the introduction of the diet. Status epilepticus was also not documented in patients that had not experienced it before.

The overall degree of satisfaction of the families was good. The reason for discontinuing the diet was family choice in two patients and progressive ineffectiveness despite an initial good response in the others.

The most frequently observed side effects were vomiting (42.85%) and insomnia. However, four patients (three of whom with a 3:1 diet ratio) did not experience any adverse effects (Table 2).

The KD is effective for treatment of refractory epilepsy, although its effects are only temporary in most patients; out of the seven patients presented here, only one continues with the ketogenic diet, and the effectiveness was temporary after an initial reduction of 50% in more than 70% of patients.¹⁴ Patients with genetic mutations benefited most from the diet, especially patients with Dravet syndrome, who achieved a reduction in seizures of 75% or greater.¹⁴

Patients in whom the KD was introduced earlier and after trying fewer AEDs responded better than patients in whom the diet was introduced several years after the onset of

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### Table 1: Summary of study outcomes.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Diet ratio</th>
<th>ECG</th>
<th>Status epilepticus</th>
<th>Reduction in number of seizures</th>
<th>Time</th>
<th>Side effects</th>
<th>Duration of TX (months)</th>
<th>Reason for discontinue</th>
<th>General satisfaction</th>
<th>Reason for satisfaction</th>
<th>EEG, electroencephalogram; TX, treatment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>No changes</td>
<td>1 month</td>
<td>No</td>
<td>Very satisfied</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>No changes</td>
<td>1 month</td>
<td>No</td>
<td>Satisfied</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>No changes</td>
<td>1 week</td>
<td>None</td>
<td>Subsequently ineffective</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>None</td>
<td>3 months</td>
<td>None</td>
<td>Subsequently ineffective</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>Not performed</td>
<td>2</td>
<td>None</td>
<td>Subsequently ineffective</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>No changes</td>
<td>3 months</td>
<td>None</td>
<td>Subsequently ineffective</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3:1</td>
<td>No</td>
<td>No changes</td>
<td>&gt;75%</td>
<td>1</td>
<td>No changes</td>
<td>3 months</td>
<td>None</td>
<td>Subsequently ineffective</td>
<td>Vomiting, irritability</td>
<td></td>
</tr>
</tbody>
</table>

- Patients numbered consistently with the previous table.
- Initial effectiveness with recurrence/worsening of seizures over time.
epilepsy and after trying multiple antiepileptic drugs (>6 AEDs).

The side effects were similar to those described in
the literature, with vomiting being the most frequent
complication. None of the side effects led to discontinua-
tion of the diet. We found fewer side effects in associ-
ation with the 3:1 diet ratio.

Although this is a retrospective study with a small sample,
we can conclude that the KD is efficacious for the treat-
ment of RE. However, more randomised studies are needed
to improve its implementation and prevent complications.

Acknowledgments

We want to thank our patients, who motivate us day after
day. For their smiles.

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Gaucher disease: Enzyme replacement treatment
initiated at pediatric age;
20-year experience

Enfermedad de gaucher: tratamiento
enzimático sustitutivo iniciado en la edad
pediátrica. Experiencia de 20 años

Dear Editor:

Gaucher disease (GD) is caused by deficiency of the enzyme
acid beta-glucosidase (GBA). The currently accepted clas-
sification is: type 1 (non-neuropathic) (GD-1), type 2 (acute
neuropathic) (GD-2) and type 3 (chronic neuropathic).
Since 1994, enzyme replacement treatment (ERT) has been avail-
able in Spain. Due to the limited long-term safety and
efficacy experience with ERT, it was of interest to describe
the experience in a tertiary pediatric hospital in which, this
treatment started being used as soon as it was available.

The evolution of 7 patients with GD (5 GD-1 and 2
GD-2) treated within the past 20 years in Hospital Infantil
La Fe (Valencia) was retrospectively described. The diagnosis
was confirmed by glucocerebrosidase activity in leukocytes (GAL) and by mutations in the GBA gene.

At diagnosis, and yearly thereafter, weight, height, BMI,
hepatomegaly–splenomegaly degree, hemogram, hemosta-
sis, chitotriosidase, chemokine ligand 18 (CCL18) and spine
densitometry were assessed. Abdominal magnetic resonance
imaging (MRI) was performed to assess liver and spleen vol-
umes, calculating the multiples of their normal volumes (MNV). In patients with bone involvement, MRI of long bones
was performed. ERT was administered by IV infusion for 2 h,
every 2 weeks at a 60 UI/kg dose in patients with GD-1.

Table 1 shows evolution of the 5 patients with GD-1. Age
at diagnosis ranged between 22 months and 11 years. In
every case, bone marrow aspiration showed Gaucher
cells. Genetic analysis showed that 3 of the patients car-
ried the mutation N370S in heterozygosis and 2 the mutation
L444P. Every patient showed hepatosplenomegaly and ane-
mia. The initial hepatomegaly was 1.9–3.5 times MNV, and
splenomegaly was 9–65 times MNV. One patient presented
with lesions of bone infarction and two had Erlenmeyerk-flask
shaped femurs. GAL ranged from 0.26–2.87 nM/mg prot.h
(lower than 8% of control GAL in every case). Patients 1 and
2 received treatment with alglucerase from 1995 to 1998
and with imiglucerase thereafter. Every patient improved
his/her weight and height, hemoglobin and platelets count.
ERT reduced the hepatic volume up to 3 times and that of
the spleen 4–15 times. These improvements occurred mainly
during the first 12–24 months of treatment. The patients did
not need blood transfusions. In 2009, due to the 6-month
shortage of imiglucerase, 2 patients started taking miglu-
sat. Both patients showed an increase in chitotriosidase and
CCL18; both biomarkers returned to normal values when ERT
was reintroduced at previous doses. These patients did not
show hematologic or bone involvement and no modification

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