



Registered Charity Number: 1108016

## **DRUG INTERACTIONS WITH THE KETOGENIC DIET**

Some of the most common questions that we get at Matthews Friends are regarding the interaction between a certain drug and the ketogenic diet with our children. In this section of our website we will aim to give you some information both medical and anecdotal from the experiences of parents that have been talking to us over the years – we will make it clear which part is Medical and which part is anecdotal.

As with everything please **DO NOT MAKE ANY ALTERATIONS TO YOUR CHILDRENS DIET OR DRUG TREATMENT WITHOUT SEEKING MEDICAL GUIDANCE FROM YOUR DOCTOR.**

### **CHAPTER 1: SODIUM VALPROATE (EPILIM/DEPAKOTE)**

#### **MEDICAL SECTION:**

1. Metabolites from Sodium Valproate are known to sometimes cause a 'false positive' result on testing urine for ketones.

This is stated in the British National Formulary (the pharmacists bible) under cautions relating to Sodium Valproate.

Mortensen PB (1984) recognised this in an article, Dicarboxylic acids and the lipid metabolism.

2. Toxicity

A study by Ballaban K, et al (1984) Complications of the Ketogenic diet;

Amazingly out of 52 children in this study, 10%, 5 children suffered serious complications on the diet.3 of which appeared to be related to Valproate toxicity, these children improved after withdrawal of Valproate, the author suggested that the ketogenic diet may increase valproate toxicity and that children treated with valproate may therefore be at greater risk of complications.

3. Carnitine

Science review:

Lheureux P, et al (2005) Carnitine in the treatment of Valproic acid- induced toxicity- what is the evidence?

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1297603>

'Risk factors include age under 24 months (especially those with organic brain disease), developmental delay, coincident congenital metabolic disorders, previous liver dysfunction, or severe epilepsy treated with polytherapy or ketogenic diets'

**PLEASE ALSO SEE FAQ'S ANSWERED BY OUR MEDICAL PROFESSIONALS.**

## **PARENTAL SECTION**

**If you think any of the topics below could be happening with your child then DISCUSS WITH YOUR NEUROLOGIST AND DIETITIAN.**

### **1. Increased Toxicity/side effects of the Drug**

It appears quite common for some children who were started on the diet AND their full dose of Epilim to do quite well in the beginning and then after 2 to 3 months (in some cases just a few weeks) suddenly go downhill and seizures to creep up or get worse and also for apparent side effects of the medication to increase. Reports have included groggy, unstable, excessive drooling, 'zombie like' children. The diet is then looked on as 'not working' and the child taken off and possibly more medication put in.

**BE AWARE** that it has been shown time and time again from our parents that what was actually needed was their child's Valproate to be lowered. It seems like the body can respond to the diet in the beginning very well but eventually the mix of the two causes what appears to be increased side effects/toxicity even when the blood levels appear to be satisfactory.

We fully appreciate that there is no medical evidence to support this at the time of writing – but we are asking our medical professionals to look into this for us and we would ask that you also raise this with your team as something to look for with their own patients.

### **2. Effects of Weaning Off Epilim**

This is always a minefield for both the family AND the dietitian because weaning of Valproate means fine tuning the diet. Certainly we have not found a single case on MF where children have been weaned off Valproate WITHOUT needing the diet to be fine tuned and adjustments made. The most common things reported are as follows:

**MORE CALORIES** needed because the metabolism starts speeding up and the body chews through the calories a lot quicker. Reports have been made that the children have more energy too and are more active – hence the need for more calories.

**EMOTIONAL INSTABILITY** – these reports have come up time and time again with our parents. As the levels of this drug get lower in our children and they become more awake, alive, active and all the other lovely things that you can witness, emotions that were suppressed before can start coming flooding back and this can be terrifying for the children as they have no idea how to handle this especially if they have been on the drug for a long

time. It does pass, but everything for that child can appear louder, bigger, closer and a whole lot more scary.

We have received reports of children doing the following:

Spontaneous crying and sobbing for no reason.  
Hysterical laughter for no reason (not gelastic seizures)  
Screaming and Shouting (over and above the normal!)  
Fear if someone comes near them.  
Covering their ears as if normal noise is too loud for them.  
Startled at the slightest noise.  
Anxious  
Things 'tasting different' and food likes/dislikes changing

This is a time that parents need to be extremely patient with their children – it can be very trying at times and also very upsetting for you to have to watch your child adjust to their 'new' surroundings but it does pass and gradually your child should be able to adjust and not have such sweeping emotional moods.

An example reported...

*"We found here that Daniel could only ever tolerate very low doses of SV - he was very prone to toxicity on it, especially once he started keto. Any dose higher than 18 mgs per kg per day saw a worsening of seizures, and even that low dose had to be spread 3-4 times during a 24 hr period as blood level tests showed he had very extreme peaks and troughs - it was an ongoing struggle to keep his blood levels even enough to prevent toxicity seizures as the doses peaked, and interdose withdrawal seizures as they dropped."*

*Susan Mum to Daniel*

### **3. Look out for Ulcers**

This one should really be looked at whether your child is on diet or not. Epilim can cause mouth ulcers which can be really painful. This in turn could make your child not want to eat as it is sore to do so. IF the side effects of the epilim appear to increase when on the diet then it stands to reason that ulcers could appear or become worse. Check for these – especially if you have a child that cannot tell you themselves. Pain can cause stress, stress can cause an increase in seizures, so we need to check everything.

- CHAPTER 3: LAMOTRIGINE
- CHAPTER 4: BENZODIAZOPINES -  
Clobazam, Nitrazepam, Clonazepam, Diazepam, Midazolam.
- CHAPTER 5: PHENYTOIN
- CHAPTER 6: ETHOSUXOMIDE
- CHAPTER 7: RUFINAMIDE
- CHAPTER 8: PHENOBARBITONE
- CHAPTER 9: VIGABITRINE