

USANA Technical Bulletin

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Epilepsy

Description

- Epilepsy is characterized by recurrent, sudden attacks of disordered cerebral function. These are brief attacks of altered consciousness, motor activity, or sensory phenomena. Convulsive seizures are the most common form of attacks, but any recurrent seizure pattern is considered epilepsy.¹

Causes

- It is not always possible to determine the cause of seizures.
- Brain injury to the child at birth or during pregnancy due to injury, infection or systemic illness in the mother.
- Lead or alcohol poisoning.
- Childhood diseases such as meningitis, viral encephalitis, mumps, and measles.
- Head trauma, brain tumors, or stroke.
- Alteration of blood values – hypo/hyperglycemia (high or low blood sugar), vitamin deficiency, or dehydration.

Types

- Idiopathic epilepsy includes seizures of unknown origin. Symptomatic epilepsy originates from known disease, accidents, or conditions.
- Seizures are divided into seven classifications – tonic-clonic, complex-Partial, Simple-Partial, Absence, Atypical Absence, Atonic, and Status Epilepticus. These classifications are used as guidelines to determine the severity of a person's seizure disorder.
- Some types of seizures (Petit Mal) may be outgrown with time.¹

At Risk

- There is evidence that some forms of epilepsy are inherited while other forms have various and often unknown origins.

Prevention and Management

- Drugs and laser surgery are often prescribed by physicians.
- The ketogenic diet is high in fat and low in carbohydrate and protein, which results in ketosis. In addition, fluids are limited, which helps contribute to the diet's success. This

ketotic state exerts an anti-epileptic effect, though its precise mechanism of action is not completely understood. This diet seems to be most effective for children.

- Patients on the ketogenic diet should be on nutritional supplements formulated with the help of their physician.
- Epileptic patients often have lower than normal levels of folic acid in their blood. Those taking certain anti-seizure drugs have even lower levels. Those patients with lower levels may be helped by folic acid supplementation.²
- Vitamin D may be recommended for children with epilepsy receiving anti-epilepsy drugs over 24 months.³
- Selenium depletion is often present in the brain of epilepsy patients and may be an important triggering factor for the origin of intractable seizures.⁴
- Carnitine treatment may benefit high-risk, symptomatic patients and those with free carnitine deficiency.⁵

Sources of Additional Information

- <http://www.swlink.net/~mayhall/>
- <http://www-leland.stanford.edu/group/ketodiet>

Abstracts

Coulter DL. Carnitine deficiency in epilepsy: Risk factors and treatment. *J Child Neurol* 1995 Nov;10 Suppl 2:S32-9. Numerous studies have shown that plasma carnitine levels are significantly lower in patients taking valproate than in controls. Free carnitine deficiency is not uncommon in these patients and also occurs in newborns with seizures and in patients taking other anticonvulsant drugs. Carnitine deficiency in epilepsy results from a variety of etiologic factors including underlying metabolic diseases, nutritional inadequacy, and specific drug effects. The relationship between carnitine deficiency and valproate-induced hepatotoxicity is unclear. Carnitine treatment does not always prevent the emergence of serious hepatotoxicity, but it does alleviate valproate-induced hyperammonemia. These studies suggest that specific risk factors for carnitine deficiency can be identified. Preliminary data suggest that carnitine treatment may benefit high-risk, symptomatic patients and those with free carnitine deficiency. Carnitine treatment is not likely to benefit low-risk, asymptomatic patients and those with normal carnitine levels.

References

- ¹ Taber's Cyclopedic Medical Dictionary. 16th ed. Philadelphia:F.A. Davis Company; 1985 p 608.
- ² Froscher W. Folate deficiency, anticonvulsant drugs, and psychiatric morbidity. *Clin Neuropharmacol* 1995 Apr;18(2):165-82.
- ³ Chung S. Effects of anti-epileptic drug therapy on bone mineral density in ambulatory epileptic children. *Brain Dev* 1994 Sep-Oct;16(5):382-5.
- ⁴ Ramackers VT. Selenium deficiency triggering intractable seizures. *Neuropediatrics* 1994 Aug;25(4):217-23.
- ⁵ Coulter DL. Carnitine deficiency in epilepsy: Risk factors and treatment. *J Child Neurol* 1995 Nov 10; Suppl 2:S32-9.