WHAT IS JUVENILE MYOCLONIC EPILEPSY (JME)?
JME is the most common primary generalized epilepsy syndrome in adolescence and comprises between 4%-10% of all epilepsies. In primary generalized epilepsies, the seizure activity starts over the entire brain at the onset. These epilepsies are genetic, although no one in the family may have epilepsy.

JME has its onset is usually between 8 -20 years of age. 3 types of seizures may occur:

- Generalized Tonic-Clonic (grand mal or convulsions) often occur upon awakening
- Myoclonic jerks: involuntary jerks of arms, legs or vocalizations that may result in dropping or tossing objects
- Absence seizures: blank staring seizures previously called Petit-Mal seizures.

The myoclonic jerks are the most characteristic feature of the syndrome and mainly affect the shoulders and arms on both sides and usually occur in the morning. There may be complaints of nervousness or clumsiness in the morning. The person remains awake and aware during myoclonic seizures which are very brief (sudden jerks). 90% of persons have generalized clonic-tonic-clonic seizures (grand mal) which often times occur upon awakening. One-third also have absence seizures that are very brief (2-4 seconds) blank staring spells.

Persons who have JME have normal or above average intellectual ability and normal neurologic functioning. The onset of JME is very seldom less that 8 years old or more than 20 years of age. Common factors which may cause seizures to occur are sleep deprivation (not getting enough sleep), alcohol intake and fatigue.

WHAT CAUSES SEIZURES?
All seizures are accompanied by an electrical problem in the brain due to a genetic-based “lower threshold” for brain cells to “fire” and develop a seizure.

WHAT IS THE PROGNOSIS? WILL MY CHILD OUTGROW THESE SEIZURES?
Spontaneous recovery is rare. Most people (>90%) with JME will have recurrence of seizures within 2 years of stopping AEDs. Most patients need treatment for life.

WHAT EVALUATION IS NECESSARY?
Usually only a history of the seizure disorder, physical and neurological examination and EEG are all that are necessary for an evaluation of a person with JME. JME is not related to brain tumors, abnormal blood vessels or any other structural lesion of the brain; and therefore CT or MRI scanning is not necessary.

IS THIS KIND OF EPILEPSY HEREDITARY? WILL MY CHILD PASS IT ON?
Heredity does play a role in the occurrence of Juvenile Myoclonic epilepsy. A family history of epilepsy, especially myoclonic seizures, “awakening” grand mal, and absence seizures is found in 17% of patients with JME. There is a risk for a person with JME passing on a type of epilepsy to a child. It has been localized to chromosome 6. If your child is concerned about heredity when he is ready to have children, he can talk with a geneticist.
WHAT IS THE BEST TREATMENT FOR THESE SEIZURES?

Treatment decisions are individually determined based on many issues including ability to swallow pills, cost, personal preference and risk-benefit determination. Anti-Epileptic Drugs (AEDs) can decrease the seizure frequency and even stop seizures in some people. The medication does not “cure” epilepsy, but response to the medication is usually very good.

<table>
<thead>
<tr>
<th>Seizures</th>
<th>Absence</th>
<th>GTC</th>
<th>Myoclonic</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zarontin® Ethosuximide</td>
<td>+++</td>
<td>No effect</td>
<td>++</td>
<td>Some GI symptoms: stomach discomfort</td>
</tr>
<tr>
<td>Depakote® Depakene ® (liquid) Valproic Acid Divalproex</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>GI symptoms, weight gain common, pregnancy concerns, tremor, hair loss</td>
</tr>
<tr>
<td>Lamictal® Lamotrigine</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>Could worsen Myoclonic seizures</td>
</tr>
<tr>
<td>Keppra® levetiracetam</td>
<td>++</td>
<td>++</td>
<td>++++</td>
<td>Relatively very safe; some agitation</td>
</tr>
<tr>
<td>Zonegran® Zonisamide</td>
<td>++</td>
<td>++</td>
<td>?</td>
<td>“zones” out some people Rare rash, kidney stones</td>
</tr>
<tr>
<td>Topamax® Topiramate</td>
<td>+/++</td>
<td>++</td>
<td>?</td>
<td>Slow thinking at high doses, some tingling of fingers, alters taste of sodas, reversible glaucoma, kidney stones, heat intolerance</td>
</tr>
</tbody>
</table>

IS THE MEDICINE ADDICTIVE?

No! There is no evidence that people taking medicine for epilepsy have a higher incidence of drug abuse than the general population. Anticonvulsants should always be withdrawn slowly though to avoid “withdrawal seizures.”
ARE THERE NON-MEDICATION TREATMENTS AVAILABLE?
Alternative treatments include a special, very strict high-fat low carbohydrate diet called the Ketogenic Diet. There are no known herbs or dietary supplements, biofeedback, chiropractics or acupuncture that helps with epilepsy. Vagus Nerve Stimulator (VNS) may be tried in very refractory cases.

ARE THERE ANY ACTIVITIES THAT SHOULD BE AVOIDED BECAUSE OF SEIZURES?
In general, children are encouraged to engage normally in childhood activities. There are some activities that can promote seizures in persons with JME which includes staying up very late at night (not getting enough sleep, sleep deprivation), alcohol or drug use or excessive quantities of coffee and tea which may lead to insomnia and result in sleep deprivation. Only some people may be sensitive to flashing or flickering lights (such as strobe lights or flickering light when driving past trees) and should be avoided. Most video games do not promote seizures but if they do, the seizures should occur during the activity, not minutes later. Certainly, anyone with seizures should avoid potential injuries. Seizures during certain activities are more likely to promote injuries include driving motorized vehicles (4 wheelers, golf carts, go carts, cars), horse and bike riding (potential falls can cause serious injuries), cooking or being near open flames and being in or near water: Showers are preferred over baths (someone should be watching during bath or while in hot tubs or swimming). A “buddy system” (a person watching the patient) and wearing a life vest is recommended when swimming in larger bodies of water that is not clear (ponds, rivers, lakes). Driving is feasible if the patient has been seizure-free on medications for a certain amount of time (in Oklahoma it is 6 months), takes his/her medicine regularly and reports his/her epilepsy to the Department of Public Safety (which issues a Medical Evaluation Form to be filled out by your neurologist on a regular basis). If the patient is driving and has a seizure (even if not while driving) the patient is obligated to report the seizure to the Department of Public Safety and his/her neurologist.

SHOULD I TELL PEOPLE ABOUT MY CHILD’S EPILEPSY?
Be sure to talk with your child about the seizures, explaining that he or she must take the prescribed medicine regularly. Explain that the seizures are related to his genes and not because of something he or she did. If he or she has questions you cannot answer, be sure to discuss these issues with your neurologist during appointments. It is up to you and your child with whom you share medical information. Certainly, sharing with people with whom your child spends a lot of time is a good idea. Having good friends and their families and teachers know what to do in case of a seizure will be helpful. It is best not to treat the diagnosis of epilepsy as a secret or something bad. This would give your child the message that the disorder is too terrible to talk about.

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