

Stopping seizure medications in children: When is it safe?

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Parents of a child with epilepsy want to understand why their child has seizures. We are better able to answer this question as our understanding of the causes of epilepsy and tools to detect brain abnormalities improve. Equally important to many parents are questions about the best way to treat seizures. Concerns about recurrent seizures often compete with anxieties and uncertainties about potential negative effects of antiepileptic medications on general health, learning, and behavior.

Many types of epilepsy that begin in childhood go away on their own. The child may “outgrow” the epilepsy and not require lifelong therapy. For a child whose seizures are well controlled on antiepileptic medication, it is often difficult to know if the good seizure control is due to the medication, or whether the epilepsy has gone into remission and medications are no longer necessary. In this issue of *Neurology* researchers report the results of a study that addresses this difficult question.¹ This study evaluates when is it safe to stop antiepileptic medications if a child becomes seizure-free after taking the medication for 1 year or less. More information about epilepsy and seizures can be found on the next page.

How was the study done?

For 4 years, the researchers followed 154 children who had various types of epilepsy. To be in the study, children were required to have complete control of seizures with medication after taking the medication for 1 year or less. These children were randomly (like the flip of a coin) divided into two groups. One group stopped medication after 6 months and the other after 1 year of being seizure-free. Neurologists often advise waiting until seizures are controlled for 2 or more years before trying to stop medication. Therefore, in this study, the medications were stopped earlier than usual.

What did the study find?

The researchers found that overall, about half of the children who underwent early withdrawal of medications remained seizure free for at least 2 additional years. This outcome was the same whether the medication was stopped after 6 months or 1 year of seizure control. Most children who had return of seizures after stopping medication regained control after restarting medication. About a quarter continued to have seizures after restarting medication. Two children experienced especially prolonged seizures that were hard to control.

The researchers do not recommend early medication withdrawal for all children with early seizure control. They did recognize some factors that might help identify which children are the best candidates for early withdrawal. These factors are listed in the table.

Were children with every type of seizure included in this study?

No, they were not. Simple febrile seizures, a very common seizure type in young children, occur only with high fever. Children with this seizure type were not included in this study. These children usually do not have seizures when their temperature is normal and most often are not treated with daily antiepileptic medications.

How could this and future studies be improved?

We know that epilepsy has many causes. It is a broad term that includes many different seizure types or “syndromes.” Knowledge of the exact epilepsy syndrome tells us a great deal about the type and length of treatment needed. Some epilepsy syndromes are fairly reliably “outgrown” at certain ages, while others are known to require lifelong therapy. Future studies that look at specific epilepsy syndromes are more likely to give good information to

Table Factors that may predict successful early withdrawal of antiepileptic medication in children

Seizures beginning before the age of 6 years
Certain seizure and epilepsy types (for example, absence seizures)
Seizures without problems such as weakness or numbness in one side of the body right after a seizure
A normal electroencephalography (EEG or “brain wave”) test

help individual patients make decisions. This study combined children who had all different kinds of seizures. Also, children with brief seizures were lumped together with those who had a single prolonged seizure. This might not be a good idea since these groups may be different in important ways.

What do we still need to learn?

We still need to better understand the potential risks of continuing and the risks of withdrawing antiepileptic medications in children with controlled epilepsy. Medications may cause subtle effects on learning and behavior at important stages of development that we don’t fully appreciate. Some medications may be unlikely to have these effects and are safer to use. Others perhaps should be avoided or discontinued early. On the other hand, what are the risks of early withdrawal, beyond the risks of physical injury from a recurrent seizure? How harmful are recurrent seizures for the brain? Recurrent seizures may put the child at risk for developing seizures that are harder to control in the future. Are some of the antiepileptic drugs able to protect the brain from this process? If so, which ones?

The finding that many children with early seizure control remain seizure free for years after early withdrawal of antiepileptic medication is encouraging, and should stimulate more work in this important area.

What is a seizure?

A seizure is a disruption in the normal electrical activity of the brain. Normally the brain is very active, passing electrical messages back and forth between nerve cells. When a person has a seizure, there is abnormal firing of nerve cells and the messages become jumbled in part or all of the brain.

A seizure may cause a variety of different symptoms, such as twitching or shaking in an arm, leg, one side of the face, or the whole body; repetitive movements or gestures; confusion; feelings of fear or other emotions; hallucinations (odd smells, tastes, sounds, or seeing things that are not there); loss of consciousness; and convulsions.

What causes seizures?

Anyone may have a seizure in certain conditions. Common causes are fever (in young children) (see febrile seizures, below), head trauma (during birth or any time later), infection of the brain or nervous system (e.g., meningitis), brain tumors, very low blood sugar, stroke (a brain attack), lack of oxygen to the brain, and poisoning (e.g., alcohol and various drugs).

What are febrile seizures?

Febrile seizures are generally benign and occur in children from ages 3 months to 5 years, with average age at onset of 18 to 22 months. They occur in the setting of a febrile illness, usually as the fever is rising fast. They are associated with common childhood infections such as ear infections, tonsillitis, upper airway infections, and gastrointestinal infections. Most are associated with viral illnesses.

Febrile seizures are more common in boys. They also tend to run in families. About one-third of children who have a first febrile sei-

zure will have a second one, almost always within 2 years. The earlier the onset of febrile seizures, the greater chance that they will recur. However, less than 5% of children with febrile seizures go on to develop epilepsy.

Although febrile seizures are usually benign, it is critical that the child be evaluated immediately to identify the cause of the fever and treat conditions such as meningitis or intoxication.

What is epilepsy?

Epilepsy is an episodic recurrence of seizures that are not due to fever, active infection, drug effects, or other triggering causes. It may be caused by a variety of conditions that injure a part or all of the brain, such as problems in development of the brain that occurs before birth, inherited disorders of the brain or nervous system, brain trauma, brain tumors, stroke, infections, and poisoning. About 70% of cases have no known cause.

Each year there are 125,000 new cases of epilepsy. About 2.5 million people in the United States have some form of epilepsy.

How is epilepsy diagnosed?

Medical history: the doctor will need to know as much as possible about what happened during, immediately before, and after the seizure. How often seizures occur, whether there are any warning signs, and whether the patient remembers anything about the seizure are all important. Someone who has witnessed the seizures can provide valuable information that the patient may not know.

Electroencephalography (EEG) is a simple and painless study that records the brain's electrical activity picked up by tiny wires taped to

the head. Specific brain wave patterns may be noted during or between seizures in patients with epilepsy and may help with diagnosis.

Imaging studies to look at the brain may be helpful in locating tumors, scars, or other abnormalities that may be causing seizures. MRI (magnetic resonance imaging) and CT (computed tomography) scans create pictures of the inside of the brain.

How is epilepsy treated?

Drugs called anticonvulsants are used most commonly to treat seizures. There are a number of different medications that can be used, alone or in combination. These drugs are effective in 60 to 80% of cases. Close supervision by a doctor is essential to watch for side effects and obtain the best seizure control.

People with epilepsy can help control seizures by avoiding alcohol and caffeine, avoiding unusual stress, getting enough sleep, taking their medications as prescribed, and working closely with their doctor. A special diet may be helpful in controlling certain types of seizures in children but requires very close medical supervision. Surgery may be very helpful when medication fails and the area of the brain where the seizure occurs is known.

For more information

American Academy of Neurology Foundation
www.thebrainmatters.org

Epilepsy Foundation of America
www.efa.org

Reference

1. Geerts AT, Niermeijer JMF, Peters ACB, et al. Four-year outcome after early withdrawal of antiepileptic drugs in childhood epilepsy. *Neurology* 2005;64:2136-2138.

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