

Lennox-Gastaut syndrome

Description

Lennox-Gastaut syndrome is a severe condition characterized by repeated seizures (epilepsy) that begin early in life. Affected individuals have multiple types of seizures, developmental delays, and particular patterns of brain activity measured by a test called an electroencephalogram (EEG). An EEG shows a slow spike-and-wave pattern during wakefulness and generalized paroxysmal fast activity during sleep.

In people with Lennox-Gastaut syndrome, epilepsy begins in early childhood, usually between ages 3 and 5. The most common seizure type is tonic seizures, which cause the muscles to stiffen (contract) uncontrollably. These seizures typically occur during sleep; they may also occur during wakefulness. Also common are atonic seizures, which are caused by a sudden loss of muscle tone. Tonic and atonic seizures can cause sudden falls that can result in serious or life-threatening injuries. Additionally, many affected individuals have atypical absence seizures, which cause a very brief partial or complete loss of consciousness. Other types of seizures have been reported less frequently in people with Lennox-Gastaut syndrome. Seizures associated with Lennox-Gastaut syndrome often do not respond well to therapy with anti-epileptic medications.

Although each seizure episode associated with Lennox-Gastaut syndrome is usually brief, more than two-thirds of affected individuals experience prolonged periods of seizure activity (known as status epilepticus) or episodes of many seizures that occur in a cluster.

About one-third of people with Lennox-Gastaut syndrome have normal intellectual development before seizures begin. The remainder have intellectual disability or learning problems even before seizures arise. Intellectual problems may worsen over time, particularly if seizures are very frequent or severe. Some affected children develop additional neurological abnormalities and behavioral problems. Many are also slow to develop motor skills such as sitting and crawling. As a result of their seizures and intellectual disability, most people with Lennox-Gastaut syndrome require help with daily activities. However, a small percentage of affected adults can live independently.

People with Lennox-Gastaut syndrome have a higher risk of death than their peers of the same age. Although the increased risk is not fully understood, it is partly due to poorly controlled seizures, pneumonia resulting from inhaling saliva (aspiration pneumonia) during a seizure, and injuries from falls. In addition, individuals with Lennox-

Gastaut syndrome are at risk of sudden unexpected death in epilepsy (SUDEP), which describes sudden death with no known cause in someone with epilepsy; it is not the direct result of a seizure.

Frequency

Lennox-Gastaut syndrome affects an estimated 1 to 2 per million people worldwide. This condition accounts for 3 to 4 percent of cases of epilepsy in children and 1 to 2 percent of cases in adults. For unknown reasons, it appears to be more common in males than in females.

Causes

Lennox-Gastaut syndrome can have many different causes. The disorder likely has a genetic component, although the specific genetic factors are not well understood.

Most cases of Lennox-Gastaut syndrome develop from an existing neurological abnormality. These cases maybe be caused by brain injuries that occur before or during birth, problems with blood flow in the developing brain, brain infections, or other disorders affecting the nervous system. The condition can also arise from brain malformations such as forms of cortical dysplasia, which are abnormalities in the outer surface of the brain (cerebral cortex). Many people with Lennox-Gastaut syndrome have a history of epilepsy beginning in infancy (infantile spasms) or a related condition called West syndrome before developing the features of Lennox-Gastaut syndrome. It is not clear why these neurological abnormalities evolve into Lennox-Gastaut syndrome.

In addition, variants (also called mutations) in several genes have been associated with Lennox-Gastaut syndrome, each in a small number of affected individuals. These genes are involved in the function of nerve cells in the brain, but it is unclear how changes in them contribute to the development of Lennox-Gastaut syndrome. The condition can also occur as part of a genetic disorder, such as tuberous sclerosis complex.

[Learn more about the genes associated with Lennox-Gastaut syndrome](#)

- CHD2
- FOXP1
- SCN1A
- SCN8A
- STXBP1

Additional Information from NCBI Gene:

- ALG13
- DNM1
- GABRB3

Inheritance

Most cases of Lennox-Gastaut syndrome are sporadic, which means they occur in people with no history of the disorder in their family. When Lennox-Gastaut syndrome is associated with a genetic change, the variant is usually not inherited but occurs as a random (de novo) event during the formation of reproductive cells (eggs or sperm) in an affected person's parent or during early embryonic development. However, 3 to 30 percent of people with this condition have a family history of some type of epilepsy, indicating that inherited genetic factors may play a role in some cases of Lennox-Gastaut syndrome.

Other Names for This Condition

- LGS

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Macrocephaly and epileptic encephalopathy (<https://www.ncbi.nlm.nih.gov/gtr/conditions/C3807541/>)

Genetic and Rare Diseases Information Center

- Lennox-Gastaut syndrome (<https://rarediseases.info.nih.gov/diseases/9912/index>)

Patient Support and Advocacy Resources

- National Organization for Rare Disorders (NORD) (<https://rarediseases.org/>)

Clinical Trials

- ClinicalTrials.gov ([https://clinicaltrials.gov/search?cond=%22Lennox-Gastaut syndrome%22](https://clinicaltrials.gov/search?cond=%22Lennox-Gastaut%20syndrome%22))

Catalog of Genes and Diseases from OMIM

- MACROCEPHALY AND EPILEPTIC ENCEPHALOPATHY (<https://omim.org/entry/606369>)

Scientific Articles on PubMed

- PubMed (<https://pubmed.ncbi.nlm.nih.gov/?term=%28Epilepsy%5BMAJR%5D%29+AND+%28lennox-gastaut+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+>

AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D)

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