GABA-transaminase deficiency

Description

GABA-transaminase deficiency is a brain disease (encephalopathy) that begins in infancy. Babies with this disorder have recurrent seizures (epilepsy), uncontrolled limb movements (choreoathetosis), exaggerated reflexes (hyperreflexia), weak muscle tone (hypotonia), and excessive sleepiness (hypersomnolence). Affected babies may grow faster in length than usual (accelerated linear growth), even though they have feeding problems and may not gain weight as quickly as expected (failure to thrive).

Children with GABA-transaminase deficiency have profoundly impaired development. Most do not achieve normal developmental milestones of infancy such as following others' movement with their eyes or sitting unassisted. Individuals with this disorder usually do not survive past the first 2 years of life, but some live longer into childhood.

Frequency

GABA-transaminase deficiency is a very rare disorder. Only a small number of affected individuals have been described in the medical literature.

Causes

GABA-transaminase deficiency is caused by mutations in the *ABAT* gene, which provides instructions for making the GABA-transaminase enzyme. This enzyme helps break down a brain chemical (neurotransmitter) called GABA when it is not needed. GABA normally helps slow down (inhibit) brain cell activity when necessary, to prevent the brain from being overloaded with too many signals. For this reason, GABA is called an inhibitory neurotransmitter.

Mutations in the *ABAT* gene lead to a shortage (deficiency) of functional GABA-transaminase enzyme. As a result, GABA is not properly broken down, so this neurotransmitter and another molecule called beta-alanine accumulate abnormally in brain cells. This accumulation alters the balance between the brain's neurotransmitters, leading to the neurological problems characteristic of GABA-transaminase deficiency. Excess GABA also leads to abnormal release of a protein that is necessary for growth of the body's bones and tissues (growth hormone), resulting in the accelerated linear growth that sometimes occurs in this disorder.

Learn more about the gene associated with GABA-transaminase deficiency

- ABAT

Inheritance

This condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- 4 alpha aminobutyrate transaminase deficiency
- ABAT deficiency
- GABA transaminase deficiency
- GABA transferase deficiency
- GABA-T deficiency
- Gamma aminobutyrate transaminase deficiency
- Gamma aminobutyric acid transaminase deficiency
- Gamma-aminobutyrate transaminase deficiency
- Gamma-aminobutyric acid transaminase deficiency

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Gamma-aminobutyric acid transaminase deficiency (https://www.ncbi.nlm.nih.gov/gtr/conditions/C0342708/)

Genetic and Rare Diseases Information Center

- Gamma-aminobutyric acid transaminase deficiency (https://rarediseases.info.nih.gov/diseases/194/index)

Patient Support and Advocacy Resources

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

Catalog of Genes and Diseases from OMIM

- GABA-TRANSAMINASE DEFICIENCY; GABATD (https://omim.org/entry/613163)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28%28GABA-transaminase+deficiency%5BTIAB%5D%29+OR+%28ABAT+deficiency%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D)

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