VLDLR-associated cerebellar hypoplasia

Description

VLDLR-associated cerebellar hypoplasia is an inherited condition that affects the development of the brain. People with this condition have an unusually small and underdeveloped cerebellum, which is the part of the brain that coordinates movement. This brain malformation leads to problems with balance and coordination (ataxia) that become apparent in infancy and remain stable over time. Children with *VLDLR*-associated cerebellar hypoplasia may learn to walk later in childhood, usually after the age of 6, although some are never able to walk independently. In one Turkish family, affected people walk on their hands and feet (quadrupedal locomotion).

Additional features of *VLDLR*-associated cerebellar hypoplasia include moderate to profound intellectual disability, impaired speech (dysarthria) or a lack of speech, and eyes that do not look in the same direction (strabismus). Some affected individuals have also had flat feet (pes planus), seizures, and short stature. Studies suggest that *VLDLR*-associated cerebellar hypoplasia does not significantly affect a person's life expectancy.

Frequency

VLDLR-associated cerebellar hypoplasia is rare; its prevalence is unknown. The condition was first described in the Hutterite population in Canada and the United States. This condition has also been reported in families from Iran and Turkey.

Causes

As its name suggests, *VLDLR*-associated cerebellar hypoplasia results from mutations in the *VLDLR* gene. This gene provides instructions for making a protein called a very low density lipoprotein (VLDL) receptor. Starting before birth, this protein plays a critical role in guiding the movement of developing nerve cells to their appropriate locations in the brain. Mutations in the *VLDLR* gene prevent cells from producing any functional VLDL receptor protein. Without this protein, developing nerve cells cannot reach the parts of the brain where they are needed. The resulting problems with brain development lead to ataxia and the other major features of this condition.

Learn more about the gene associated with VLDLR-associated cerebellar hypoplasia

- VLDLR

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

- Autosomal recessive cerebellar ataxia with mental retardation
- Autosomal recessive cerebellar hypoplasia with cerebral gyral simplification
- Cerebellar disorder, nonprogressive, with mental retardation
- Cerebellar hypoplasia and mental retardation with or without quadrupedal locomotion
- Cerebellar hypoplasia, VLDLR-associated
- CHMRQ1
- DES-VLDLR
- Dysequilibrium syndrome-VLDLR
- VLDLR-CH
- VLDLRCH

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Dysequilibrium syndrome (https://www.ncbi.nlm.nih.gov/gtr/conditions/C0394006/)

Patient Support and Advocacy Resources

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

Clinical Trials

- ClinicalTrials.gov (https://clinicaltrials.gov/search?cond=%22VLDLR-associated cerebellar hypoplasia%22)

Catalog of Genes and Diseases from OMIM

- CEREBELLAR ATAXIA, IMPAIRED INTELLECTUAL DEVELOPMENT, AND DYSEQUILIBRIUM SYNDROME 1; CAMRQ1 (https://omim.org/entry/224050)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28%28cerebellar+hypoplasia+%5Btiab%5D+AND+VLDLR+%5Btiab%5D%29+OR+%28dysequilibrium+syndrome+%5Btiab%5D+AND+VLDLR+%5Btiab%5D%29+OR+%28cerebellar+hypoplasia+%5Btiab%5D+AND+very+low+density+lipoprotein+receptor+%5Btiab%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D)

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