Spastic paraplegia type 4

Description

Spastic paraplegia type 4 (also known as SPG4) is the most common of a group of genetic disorders known as hereditary spastic paraplegias. These disorders are characterized by progressive muscle stiffness (spasticity) in the legs and difficulty walking. Hereditary spastic paraplegias are divided into two types: pure and complex. The pure types generally involve only spasticity of the lower limbs and walking difficulties. The complex types involve more widespread problems with the nervous system; the structure or functioning of the brain; and the nerves connecting the brain and spinal cord to muscles and sensory cells that detect sensations such as touch, pain, heat, and sound (the peripheral nervous system). In complex forms, there can also be features outside of the nervous system. Spastic paraplegia type 4 is usually a pure hereditary spastic paraplegia, although a few complex cases have been reported.

Like all hereditary spastic paraplegias, spastic paraplegia type 4 involves spasticity of the leg muscles and muscle weakness. People with this condition can also experience exaggerated reflexes (hyperreflexia), ankle spasms, high-arched feet (pes cavus), and reduced bladder control. Spastic paraplegia type 4 generally affects nerve and muscle function in the lower half of the body only.

Frequency

The prevalence of spastic paraplegia type 4 is estimated to be 2 to 6 in 100,000 people worldwide.

Causes

Mutations in the *SPAST* gene cause spastic paraplegia type 4. The *SPAST* gene provides instructions for producing a protein called spastin. Spastin is found throughout the body, particularly in certain nerve cells (neurons). The spastin protein plays a role in the function of microtubules, which are rigid, hollow fibers that make up the cell's structural framework (the cytoskeleton). Microtubules are also involved in transporting cell components and facilitating cell division. Spastin likely helps restrict microtubule length and disassemble microtubule structures when they are no longer needed. Mutations in spastin impair the microtubules' ability to transport cell compartments (organelles), especially in nerve cells; researchers believe this contributes to the major signs and symptoms of spastic paraplegia type 4.

Learn more about the gene associated with Spastic paraplegia type 4

- SPAST

Inheritance

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

In most cases, an affected person inherits the mutation from one affected parent. The remaining cases may result from new mutations in the gene. These cases occur in people with no history of the disorder in their family.

Other Names for This Condition

- Spastic paraplegia 4
- SPG4

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Hereditary spastic paraplegia 4 (https://www.ncbi.nlm.nih.gov/gtr/conditions/C1866855/)
- Genetic Testing Registry: Hereditary spastic paraplegia (https://www.ncbi.nlm.nih.gov/gtr/conditions/C0037773/)

Genetic and Rare Diseases Information Center

- Hereditary spastic paraplegia (https://rarediseases.info.nih.gov/diseases/6637/index)

Patient Support and Advocacy Resources

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

Clinical Trials

- ClinicalTrials.gov (https://clinicaltrials.gov/search?cond=%22Spastic paraplegia type 4%22)

Catalog of Genes and Diseases from OMIM

- SPASTIC PARAPLEGIA 4, AUTOSOMAL DOMINANT; SPG4 (https://omim.org/entry/182601)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28SPG4%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D)

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