Warsaw breakage syndrome

Description

Warsaw breakage syndrome is a condition that can cause multiple abnormalities. People with Warsaw breakage syndrome have intellectual disability that varies from mild to severe. They also have impaired growth from birth leading to short stature and a small head size (microcephaly). Affected individuals have distinctive facial features that may include a small forehead, a short nose, a small lower jaw, a flat area between the nose and mouth (philtrum), and prominent cheeks. Other common features include hearing loss caused by nerve damage in the inner ear (sensorineural hearing loss) and heart malformations.

Frequency

Warsaw breakage syndrome is a rare condition; at least four cases have been described in the medical literature.

Causes

Mutations in the *DDX11* gene cause Warsaw breakage syndrome. The *DDX11* gene provides instructions for making an enzyme called ChlR1. This enzyme functions as a helicase. Helicases are enzymes that attach (bind) to DNA and temporarily unwind the two spiral strands (double helix) of the DNA molecule. This unwinding is necessary for copying (replicating) DNA in preparation for cell division, and for repairing damaged DNA and any errors that are made when DNA is copied. In addition, after DNA is copied, ChlR1 plays a role in ensuring proper separation of each chromosome during cell division. By helping repair errors in DNA and ensuring proper DNA replication, the ChlR1 enzyme is involved in maintaining the stability of a cell's genetic information.

DDX11 gene mutations severely reduce or completely eliminate ChlR1 enzyme activity. As a result, the enzyme cannot bind to DNA and cannot unwind the DNA strands to help with DNA replication and repair. A lack of functional ChlR1 impairs cell division and leads to an accumulation of DNA damage. This DNA damage can appear as breaks in the DNA, giving the condition its name. It is unclear how these problems in DNA maintenance lead to the specific abnormalities characteristic of Warsaw breakage syndrome.

Learn more about the gene associated with Warsaw breakage syndrome

- DDX11

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

- WABS

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Warsaw breakage syndrome (https://www.ncbi.nlm.nih.gov/gtr/conditions/C3150658/)

Genetic and Rare Diseases Information Center

- Warsaw breakage syndrome (https://rarediseases.info.nih.gov/diseases/13708/index)

Patient Support and Advocacy Resources

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

Catalog of Genes and Diseases from OMIM

- WARSAW BREAKAGE SYNDROME; WABS (https://omim.org/entry/613398)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28warsaw+breakage+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D)

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