Single Gene Disorders - Autosomal Recessive Inheritance

https://medlineplus.gov/genetics/condition/perrault-syndrome/

You Are Here:

Home

→

Genetics

→

Genetic Conditions

→

Perrault syndrome

Perrault syndrome

Description

Perrault syndrome is a rare condition that causes different patterns of signs and symptoms in affected males and females. A key feature of this condition is hearing loss, which occurs in both males and females. Affected females also have abnormalities of the ovaries. Neurological problems occur in some affected males and females.In Perrault syndrome, the problems with hearing are caused by changes in the inner ear, which is known as sensorineural hearing loss. The impairment usually affects both ears and can be present at birth or begin in early childhood. Unless hearing is completely impaired at birth, the hearing problems worsen over time.Females with Perrault syndrome have abnormal or missing ovaries (ovarian dysgenesis), although their external genitalia are normal. Severely affected girls do not begin menstruation by age 16 (primary amenorrhea), and most never have a menstrual period. Less severely affected women have an early loss of ovarian function (primary ovarian insufficiency); their menstrual periods begin in adolescence, but they become less frequent and eventually stop before age 40. Women with Perrault syndrome may have difficulty conceiving or be unable to have biological children (infertile).Neurological problems in

individuals with Perrault syndrome can include intellectual disability, difficulty with balance and coordinating movements (ataxia), and loss of sensation and weakness in the limbs (peripheral neuropathy). However, not everyone with this condition has neurological problems.

Frequency

Perrault syndrome is a rare disorder; fewer than 100 affected individuals have been described in the medical literature. It is likely that the condition is underdiagnosed, because males without an affected sister will likely be misdiagnosed as having isolated (nonsyndromic) hearing loss rather than Perrault syndrome.

Causes

Perrault syndrome has several genetic causes. TWNK, CLPP, HARS2, LARS2, or HSD17B4 gene mutations have been found in a small number of affected individuals. The proteins produced from several of these genes, including TWNK, CLPP, HARS2, and LARS2, function in cell structures called mitochondria, which convert the energy from food into a form that cells can use. Although the effect of these gene mutations on mitochondrial function is unknown, researchers speculate that disruption of mitochondrial energy production could underlie the signs and symptoms of Perrault syndrome.The protein produced from the HSD17B4 gene is active in cell structures called peroxisomes, which contain a variety of enzymes that break down many different substances in cells. It is not known how mutations in this gene affect peroxisome function or lead to hearing loss in affected males and females and ovarian abnormalities in females with Perrault syndrome.It is likely that other genes that have not been identified are also involved in this condition.

Learn more about the genes associated with Perrault syndrome

CLPP

HARS2

HSD17B4

LARS2

TWNK

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 do not show signs and symptoms of the condition.

Other Names for This Condition

Gonadal dysgenesis with auditory dysfunction, autosomal recessive inheritance Gonadal dysgenesis with sensorineural deafness, autosomal recessive inheritance Gonadal dysgenesis, XX

type, with deafness Ovarian dysgenesis with sensorineural deafness

Additional Information & Resources

Genetic Testing Information

Genetic Testing Registry: Perrault syndrome

Genetic Testing Registry: Perrault syndrome 2

Genetic Testing Registry: Perrault syndrome 4

Genetic Testing Registry: Perrault syndrome 5

Genetic and Rare Diseases Information Center

Perrault syndrome

Patient Support and Advocacy Resources

National Organization for Rare Disorders (NORD)

Catalog of Genes and Diseases from OMIM

PERRAULT SYNDROME 1; PRLTS1

PERRAULT SYNDROME 4; PRLTS4

PERRAULT SYNDROME 5; PRLTS5

PERRAULT SYNDROME 3; PRLTS3

PERRAULT SYNDROME 2; PRLTS2

Scientific Articles on PubMed

PubMed

References

Jenkinson EM, Rehman AU, Walsh T, Clayton-Smith J, Lee K, Morell RJ, Drummond MC, Khan SN, Naeem MA, Rauf B, Billington N, Schultz JM, Urquhart JE, Lee MK, Berry A, Hanley NA, Mehta S, Cilliers D, Clayton PE, Kingston H, Smith MJ, Warner TT; University of Washington Center for Mendelian Genomics; Black GC, Trump D, Davis JR, Ahmad W, Leal SM, Riazuddin S, King MC, Friedman TB, Newman WG. Perrault syndrome is caused by recessive mutations in CLPP, encoding a mitochondrial ATP-dependent chambered protease. Am J Hum Genet. 2013 Apr 4;92(4):605-13. doi: 10.1016/j.ajhg.2013.02.013. Epub 2013 Mar 28. Citation on PubMed or Free article on PubMed Central

Morino H, Pierce SB, Matsuda Y, Walsh T, Ohsawa R, Newby M, Hiraki-Kamon K, Kuramochi M, Lee MK, Klevit RE, Martin A, Maruyama H, King MC, Kawakami H. Mutations in Twinkle primase-helicase cause Perrault syndrome with neurologic features. Neurology. 2014 Nov 25;83(22):2054-61. doi: 10.1212/WNL.0000000000001036. Epub 2014 Oct 29. Citation on PubMed or Free article on PubMed Central

Newman WG, Friedman TB, Conway GS, Demain LAM. Perrault Syndrome. 2014 Sep 25 [updated 2018 Sep 6]. In: Adam MP, Feldman J, Mirzaa GM, Pagon RA, Wallace SE, Bean LJH, Gripp KW, Amemiya A, editors. GeneReviews(R) [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2024. Available from http://www.ncbi.nlm.nih.gov/books/NBK242617/

Citation on PubMed

Pierce SB, Chisholm KM, Lynch ED, Lee MK, Walsh T, Opitz JM, Li W, Klevit RE,

King MC. Mutations in mitochondrial histidyl tRNA synthetase HARS2 cause ovarian dysgenesis and sensorineural hearing loss of Perrault syndrome. Proc Natl Acad Sci U S A. 2011 Apr 19;108(16):6543-8. doi: 10.1073/pnas.1103471108. Epub 2011 Apr 4. Citation on PubMed or Free article on PubMed Central

Pierce SB, Gersak K, Michaelson-Cohen R, Walsh T, Lee MK, Malach D, Klevit RE, King MC, Levy-Lahad E. Mutations in LARS2, encoding mitochondrial leucyl-tRNA synthetase, lead to premature ovarian failure and hearing loss in Perrault syndrome. Am J Hum Genet. 2013 Apr 4;92(4):614-20. doi: 10.1016/j.ajhg.2013.03.007. Epub 2013 Mar 28. Citation on PubMed or Free article on PubMed Central

Pierce SB, Walsh T, Chisholm KM, Lee MK, Thornton AM, Fiumara A, Opitz JM, Levy-Lahad E, Klevit RE, King MC. Mutations in the DBP-deficiency protein HSD17B4 cause ovarian dysgenesis, hearing loss, and ataxia of Perrault Syndrome. Am J Hum Genet. 2010 Aug 13;87(2):282-8. doi: 10.1016/j.ajhg.2010.07.007. Epub 2010 Jul 30. Citation on PubMed or Free article on PubMed Central

Related Health Topics

Genetic Disorders

Hearing Disorders and Deafness

Ovarian Disorders

MEDICAL ENCYCLOPEDIA

Absent menstrual periods - primary

Absent menstrual periods - secondary

Genetics

Sensorineural deafness

Understanding Genetics

What is the prognosis of a genetic condition?

How can gene variants affect health and development?

What does it mean if a disorder seems to run in my family?

What are the different ways a genetic condition can be inherited?

How are genetic conditions treated or managed?

Disclaimers