Pallister-Hall syndrome

Pallister-Hall syndrome is a disorder that affects the development of many parts of the body. Most people with this condition have extra fingers and/or toes (polydactyly), and the skin between some fingers or toes may be fused (cutaneous syndactyly). An abnormal growth in the brain called a hypothalamic hamartoma is characteristic of this disorder. In many cases, these growths do not cause any health problems; however, some hypothalamic hamartomas lead to seizures or hormone abnormalities that can be life-threatening in infancy. Other features of Pallister-Hall syndrome include a malformation of the airway called a bifid epiglottis, an obstruction of the anal opening (imperforate anus), and kidney abnormalities. Although the signs and symptoms of this disorder vary from mild to severe, only a small percentage of affected people have serious complications.

Frequency

This condition is very rare; its prevalence is unknown.

Causes

Mutations in the GLI3 gene cause Pallister-Hall syndrome. This gene provides instructions for making a protein that controls gene expression, which is a process that regulates whether genes are turned on or off in particular cells. By interacting with certain genes at specific times during development, the GLI3 protein plays a role in the normal shaping (patterning) of many organs and tissues before birth.

Mutations that cause Pallister-Hall syndrome typically lead to the production of an abnormally short version of the GLI3 protein. Unlike the normal GLI3 protein, which can turn target genes on or off, the short protein can only turn off (repress) target genes. Researchers are working to determine how this change in the protein’s function affects early development. It is uncertain how GLI3 mutations can cause polydactyly, hypothalamic hamartoma, and the other features of Pallister-Hall syndrome.

Inheritance Pattern

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 some cases, an affected person inherits a mutation in the GLI3 gene from one affected parent. Other cases result from new mutations in the gene and occur in people with no history of the disorder in their family.
Other Names for This Condition
- Hall-Pallister syndrome
- PHS

Diagnosis & Management

Genetic Testing Information
- What is genetic testing?
  /primer/testing/genetictesting
- Genetic Testing Registry: Pallister-Hall syndrome

Research Studies from ClinicalTrials.gov
- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22Pallister-Hall+syndrome%22

Other Diagnosis and Management Resources
- GeneReview: Pallister-Hall Syndrome
  https://www.ncbi.nlm.nih.gov/books/NBK1465
- MedlinePlus Encyclopedia: Epiglottis (Image)
  https://medlineplus.gov/ency/imagepages/19595.htm
- MedlinePlus Encyclopedia: Imperforate Anus
  https://medlineplus.gov/ency/article/001147.htm
- MedlinePlus Encyclopedia: Polydactyly
  https://medlineplus.gov/ency/article/003176.htm

Additional Information & Resources

Health Information from MedlinePlus
- Encyclopedia: Epiglottis (Image)
  https://medlineplus.gov/ency/imagepages/19595.htm
- Encyclopedia: Imperforate Anus
  https://medlineplus.gov/ency/article/001147.htm
- Encyclopedia: Polydactyly
  https://medlineplus.gov/ency/article/003176.htm
- Health Topic: Brain Malformations
  https://medlineplus.gov/brainmalformations.html
• Health Topic: Hand Injuries and Disorders
   https://medlineplus.gov/handinjuriesanddisorders.html

• Health Topic: Toe Injuries and Disorders
   https://medlineplus.gov/toeinjuriesanddisorders.html

Genetic and Rare Diseases Information Center
• Pallister-Hall syndrome

Educational Resources
• MalaCards: pallister-hall syndrome
   https://www.malacards.org/card/pallister_hall_syndrome

• Orphanet: Pallister-Hall syndrome
   https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=672

Patient Support and Advocacy Resources
• Hope for Hypothalamic Hamartomas
   http://www.hopeforhh.org/

• National Organization for Rare Disorders
   https://rarediseases.org/rare-diseases/pallister-hall-syndrome/

• Resource list from the University of Kansas Medical Center
   http://www.kumc.edu/gec/support/palshall.html

Clinical Information from GeneReviews
• Pallister-Hall Syndrome
   https://www.ncbi.nlm.nih.gov/books/NBK1465

Scientific Articles on PubMed
• PubMed
   https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28pallister-hall+syndrome%29+OR+%28hall-pallister+syndrome%29+AND+english%29%5Btiab%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM
• PALLISTER-HALL SYNDROME
   http://omim.org/entry/146510
Sources for This Summary

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/8914745

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/20301638

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15660767

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15739154
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1199298/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/20672375
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2947617/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/9054938

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16531732

Reprinted from Genetics Home Reference: 

Reviewed: November 2016
Published: January 2, 2019