Published on *My46* (https://www.my46.org) 01/20/2022

My46 Trait Profile

Pendred syndrome

Other Names: Enlarged vestibular aqueduct and goiter

Pendred syndrome is characterized by congenital hearing loss and an enlarged thyroid. It is caused by mutations in the SLC26A4 gene that makes the pendrin protein.

Characteristics of Pendred syndrome

Pendred syndrome is a genetic condition that is characterized by hearing loss and an enlarged thyroid, called goiter. Hearing loss in this syndrome is usually congenital (i.e. present at birth) or occurs prior to the onset of speech (prelingual). Pendred syndrome is thought to account for approximately 7.5% of all forms of congenital hearing loss. The hearing loss in Pendred syndrome is typically classified as severe-to-profound, and can be progressive or worsen over time. Hearing loss in Pendred syndrome is sensorineural, meaning it is caused by problems within the inner ear. Most individuals (approximately 80%) with Pendred syndrome have an abnormality of the inner ear called enlarged vestibular aqueduct (EVA). The vestibular aqueduct is a small, bony tube that extends between the inner ear and the brain. EVA can result in hearing loss as well as problems with balance. Goiter typically develops in late childhood or early adulthood. The goiter seen in individuals with Pendred syndrome typically does not affect the function of the thyroid (i.e., euthyroid goiter). However, a smaller number of affected individuals can develop thyroid function abnormalities. The symptoms of Pendred syndrome are variable, meaning that the age that symptoms present as well as their severity and rate of progression can be different between affected family members.

Diagnosis/Testing

Approximately 50% of individuals with Pendred syndrome have a change or mutation in a gene called SLC26A4. This gene makes a protein called pendrin, which is found in many organ systems, including the inner ear and the thyroid gland. It plays an important role in the production of thyroid hormone. However, its role in the inner ear is not well-understood. Mutations in other genes such as FOXI1 and KCNJ10 are also thought to cause Pendred syndrome, but are considerably less common.

Management/Surveillance

Management of Pendred syndrome includes regular hearing evaluations (ABR emission testing, audiometry), and thyroid evaluation monitoring for goiter. This includes periodic palpation of the thyroid gland, thyroid function testing, and ultrasound of the thyroid. Audiology, otolaryngology (ENT), and endocrinology specialists are often involved in the care of an individual with Pendred syndrome. Some specialists recommend that individuals with Pendred syndrome avoid contact sports and weightlifting because of reports that increased intracranial pressure (pressure inside the skull) and/or head trauma can result in progression of hearing loss.

Mode of inheritance

Pendred syndrome is inherited in an autosomal recessive pattern. This means that an individual has to inherit two SLC26A4 mutations (i.e., one from each parent) to be affected with Pendred syndrome. If both parents are carriers of a SLC26A4 mutation, they have a 1 in 4 (25%) chance with each pregnancy of having a child with Pendred syndrome.

Risk to family members

Parents of a child with Pendred syndrome are carriers of Pendred syndrome. If a sibling of a child with Pendred syndrome is unaffected, he/she has a 2 in 3 (66%) chance of being a carrier of Pendred syndrome.

Special considerations

None

Resources

National Association of the Deaf
http://www.nad.org
Genetics Home Reference: Pendred syndrome
http://ghr.nlm.nih.gov/condition/pendred-syndrome
NIDCD: Pendred syndrome
http://www.nidcd.nih.gov/health/hearing/pages/pendred.aspx

References

Alasti F, Van Camp G, Smith RJH. (Updated 20 December 2012). Pendred Syndrome/DFNB4. In: GeneReviews at GeneTests Medical Genetics Information Resource (database online). Copyright, University of Washington, Seattle. 1997-2013. Available at http://www.ncbi.nlm.nih.gov/books/NBK1467/. Accessed [11/26/2013].

Berrettini, S. et al. (2005)."Large vestibular aqueduct syndrome: audiological, radiological, clinical, and genetic features." American Journal of Otolaryngology 26(6): 363-371.

Reardon, W. et al. (1999)."Prevalence, age of onset, and natural history of thyroid disease in Pendred syndrome." Journal of Medical Genetics 36(8): 595-598.

Created: 11/2013 **Created by:** Katherine Rutledge Nelson, MS, CGC

Updated: mm/yyyy **Edited by:** Seema Jamal, MSc, LCGC