Wagner syndrome

Description

Wagner syndrome is a hereditary disorder that causes progressive vision loss. The eye problems that lead to vision loss typically begin in childhood, although the vision impairment might not be immediately apparent.

In people with Wagner syndrome, the light-sensitive tissue that lines the back of the eye (the retina) becomes thin and may separate from the back of the eye (retinal detachment). The blood vessels within the retina (known as the choroid) may also be abnormal. The retina and the choroid progressively break down (degenerate). Some people with Wagner syndrome have blurred vision because of ectopic fovea, an abnormality in which the part of the retina responsible for sharp central vision is out of place. Additionally, the thick, clear gel that fills the eyeball (the vitreous) becomes watery and thin. People with Wagner syndrome develop a clouding of the lens of the eye (cataract). Affected individuals may also experience nearsightedness (myopia), progressive night blindness, or a narrowing of their field of vision.

Vision impairment in people with Wagner syndrome can vary from near normal vision to complete loss of vision in both eyes.

Frequency

Wagner syndrome is a rare disorder, although its exact prevalence is unknown. Approximately 300 affected individuals have been described worldwide; about half of these individuals are from the Netherlands.

Causes

Mutations in the *VCAN* gene cause Wagner syndrome. The *VCAN* gene provides instructions for making a protein called versican. Versican is found in the extracellular matrix, which is the intricate lattice of proteins and other molecules that forms in the spaces between cells. Versican interacts with many of these proteins and molecules to facilitate the assembly of the extracellular matrix and ensure its stability. Within the eye, versican interacts with other proteins to maintain the structure and gel-like consistency of the vitreous.

VCAN gene mutations that cause Wagner syndrome lead to insufficient levels of versican in the vitreous. Without enough versican to interact with the many proteins of

the vitreous, the structure becomes unstable. This lack of stability in the vitreous affects other areas of the eye and contributes to the vision problems that occur in people with Wagner syndrome. It is unknown why *VCAN* gene mutations seem solely to affect vision.

Learn more about the gene associated with Wagner syndrome

- VCAN

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.

Other Names for This Condition

- Hyaloideoretinal degeneration of Wagner
- VCAN-related vitreoretinopathy
- Wagner disease
- Wagner vitreoretinal degeneration
- Wagner vitreoretinopathy

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Wagner syndrome (https://www.ncbi.nlm.nih.gov/gtr/conditions/C1840452/)

Genetic and Rare Diseases Information Center

- Wagner disease (https://rarediseases.info.nih.gov/diseases/7871/index)

Patient Support and Advocacy Resources

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

Catalog of Genes and Diseases from OMIM

- WAGNER VITREORETINOPATHY; WGVRP (https://omim.org/entry/143200)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28%28wagner+syndrome%5BTIAB%5D%29+OR+%28wagner+disease%5BTIAB%5D%29+NOT+%28Stickler%5BTI%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D)

References

- Kloeckener-Gruissem B, Amstutz C. VCAN-Related Vitreoretinopathy.2009 Feb 3 [updated 2016 Jan 7]. 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. Availablefrom http://www.ncbi.nlm.nih.gov/books/NBK3821/ Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/20301747)
- Kloeckener-Gruissem B, Bartholdi D, Abdou MT, Zimmermann DR, Berger W. Identification of the genetic defect in the original Wagner syndrome family. MolVis. 2006 Apr 17;12:350-5. Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/16636652)
- Meredith SP, Richards AJ, Flanagan DW, Scott JD, Poulson AV, Snead MP.Clinical characterisation and molecular analysis of Wagner syndrome. Br JOphthalmol. 2007 May;91(5):655-9. doi: 10.1136/bjo.2006.104406. Epub 2006 Oct 11. Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/17035272) or Free article on PubMed Central (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1954774/)
- Miyamoto T, Inoue H, Sakamoto Y, Kudo E, Naito T, Mikawa T, Mikawa Y, IsashikiY, Osabe D, Shinohara S, Shiota H, Itakura M. Identification of a novel splicesite mutation of the CSPG2 gene in a Japanese family with Wagner syndrome. InvestOphthalmol Vis Sci. 2005 Aug;46(8):2726-35. doi: 10.1167/iovs.05-0057. Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/16043844)
- Mukhopadhyay A, Nikopoulos K, Maugeri A, de Brouwer AP, van Nouhuys CE, BoonCJ, Perveen R, Zegers HA, Wittebol-Post D, van den Biesen PR, van derVelde-Visser SD, Brunner HG, Black GC, Hoyng CB, Cremers FP. Erosivevitreoretinopathy and wagner disease are caused by intronic mutations inCSPG2/Versican that result in an imbalance of splice variants. Invest OphthalmolVis Sci. 2006 Aug;47(8):3565-72. doi: 10.1167/iovs.06-0141. Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/16877430)
- Ronan SM, Tran-Viet KN, Burner EL, Metlapally R, Toth CA, Young TL. Mutationalhot spot potential of a novel base pair mutation of the CSPG2 gene in a familywith Wagner syndrome. Arch Ophthalmol. 2009 Nov;127(11):1511-9. doi:10.1001/archophthalmol.2009.273. Citation on PubMed (https://pubmed.ncbi.nlm.nih.gov/19901218) or Free article on PubMed Central (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3514888/)

Last updated July 1, 2014