Retinal arterial macroaneurysm with supravalvular pulmonic stenosis

Description

Retinal arterial macroaneurysm with supravalvular pulmonic stenosis (RAMSVPS) is a disorder that affects blood vessels in the eyes and heart. The condition generally becomes apparent in infancy or childhood.

RAMSVPS damages the arteries in the light-sensitive tissue at the back of the eye (the retina). These arteries gradually develop multiple small bulges called beading. Eventually, larger bulges in the blood vessel walls (macroaneurysms) occur. These macroaneurysms can tear (rupture), leading to bleeding that can spread into other areas of the eye and cause vision loss.

People with RAMSVPS also have a heart condition called supravalvular pulmonic stenosis. Pulmonic stenosis is a narrowing that affects the pulmonic valve between the heart and the lungs. The term "supravalvular" means that the narrowing occurs just above the valve, in a blood vessel called the pulmonary artery. Supravalvular pulmonic stenosis impairs blood flow into the lungs, where blood normally picks up oxygen for distribution to cells and tissues throughout the body. As a result, less oxygen is carried through the bloodstream, leading to signs and symptoms that include shortness of breath; a rapid heartbeat; fatigue; and swelling in the face, feet, or abdomen.

Frequency

RAMSVPS is a rare disorder. Only a small number of affected individuals and families, all from Saudi Arabia, have been described in the medical literature.

Causes

RAMSVPS is caused by a mutation in the *IGFBP7* gene. This gene provides instructions for making a protein called insulin-like growth factor-binding protein 7 (IGFBP7). The IGFBP7 protein is active in the lining of blood vessels (the vascular endothelium). It is thought to help stop a pathway called BRAF signaling, which is involved in directing cell growth.

The *IGFBP7* gene mutation that causes RAMSVPS results in an abnormally short IGFBP7 protein that does not function properly. Without normally functioning IGFBP7

protein to control BRAF signaling, this signaling is increased. It is unknown how this increase is related to the specific blood vessel abnormalities that occur in RAMSVPS, or why these abnormalities are confined to the eyes and the pulmonary artery. Researchers suggest that differences in normal levels of IGFBP7 protein in various parts of the body or the presence of other proteins with a similar function in different tissues may account for the specific signs and symptoms of this disorder.

Learn more about the gene associated with Retinal arterial macroaneurysm with supravalvular pulmonic stenosis

- IGFBP7

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

- Familial retinal arterial macroaneurysm
- FRAM
- RAMSVPS

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Familial retinal arterial macroaneurysm (https://www.ncbi.nlm.nih.gov/gtr/conditions/C3280205/)

Genetic and Rare Diseases Information Center

- Familial retinal arterial macroaneurysm (https://rarediseases.info.nih.gov/diseases/12779/index)

Patient Support and Advocacy Resources

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

Catalog of Genes and Diseases from OMIM

- RETINAL ARTERIAL MACROANEURYSM WITH SUPRAVALVULAR PULMONIC STENOSIS; RAMSVPS (https://omim.org/entry/614224)

Scientific Articles on PubMed

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

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