Inheritest® CARRIER SCREEN

Propionic acidemia

What is propionic acidemia?

Propionic acidemia is an inherited disease characterized by vomiting, lethargy, developmental delays, and hypotonia. Individuals with propionic acidemia have abnormalities in an enzyme, propionyl-CoA carboxylase, which breaks down proteins and certain types of fats and cholesterol. Symptoms associated with propionic acidemia are due to a toxic build-up of these substances and their metabolites in the body, primarily affecting the brain and nervous system.[1]

What are the symptoms of propionic acidemia and what treatment is available?

Propionic acidemia is a disease that varies in severity and age at onset, even within families. Symptoms of propionic acidemia usually begin within a few days after birth and may include: [1]

- Lethargy (lack of energy) and/or irritability
- Hypotonia (low muscle tone)
- Poor feeding/lack of appetite
- Vomiting

If untreated, symptoms may worsen to include seizures, stroke, coma, or death. Some individuals may not experience onset until childhood or later in life when symptoms are often triggered by fasting or illness, while others are found to be affected only after a family member is diagnosed. [1,2]

Regardless of age at onset, some individuals have long-term effects that may include: [1,2,3]

- Poor growth
- Pancreatitis (inflammation of the pancreas)
- Spasticity (abnormally tight muscles)
- Frequent infections
- Developmental delays and/or intellectual disability
- Vision problems
- Arrhythmia (abnormal heart rhythm) or cardiomyopathy (thickened heart muscle)
- Osteoporosis (low bone density)

There is no cure for propionic acidemia. Treatment may include a low protein diet with nutrition supplements, antibiotics, and avoidance of fasting. An individual with symptoms beginning in infancy who does not receive treatment typically does not live past the first year of life. [2]

Propionic acidemia is included on all newborn screening panels in the United States.[2]

How is propionic acidemia inherited?

Propionic acidemia is an autosomal recessive disease caused by mutations in two different genes, *PCCA* or *PCCB*.[1] An individual who inherits one copy of a mutation in either of these genes is a carrier and is not expected to have related health problems. An individual who inherits two mutations in the same gene, one from each parent, is expected to be affected with propionic acidemia. For example, a child with two *PCCA* mutations is expected to be affected, and a child with one *PCCA* mutation and one *PCCB* mutation is a carrier.

If both members of a couple are carriers of a mutation in the same gene, the risk for an affected child is 25% in each pregnancy; therefore, it is especially important that the reproductive partner of a carrier be offered testing.

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Who is at risk for propionic acidemia?

Propionic acidemia can occur in individuals of all races and ethnicities. It appears to be more common in Japan, Saudi Arabia, the Inuit population of Greenland, and some Amish communities.[1,4] The worldwide incidence is approximately 1 in 50,000.[4] In Japan the incidence is estimated to be 1 in 17,400,[4] with a calculated carrier frequency of 1 in 65.

Having a relative who is a carrier or who is affected can increase an individual's risk of being a carrier. Consultation with a genetics health professional may be helpful in determining carrier risk and appropriate testing.

What does a positive test result mean?

If a gene mutation is identified, an individual should speak to a physician or genetics health professional about the implications of the result and appropriate testing for the reproductive partner and at-risk family members.

What does a negative test result mean?

A negative result reduces, but does not eliminate, the possibility that an individual carries a gene mutation. The likelihood of being a carrier is also influenced by family history, medical symptoms, and other relevant test results.

Where can I get more information?

Propionic Acidemia Foundation: www.pafoundation.com

Organic Acidemia Network: www.oaanews.org

Children Living with Inherited Metabolic Disorders (CLIMB): www.climb.org.uk

References

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