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What is Joubert Syndrome 2?
Joubert syndrome 2 (JBTS2) is an inherited disease characterized by brain malformations, developmental delay, low muscle tone, and breathing abnormalities.[1] Signs and symptoms of JBTS2 are thought to be caused by the abnormal functioning of cilia, which are hair-like structures found on the surface of all cells of the body.[2] JBTS2 is also known as cerebello-oculo-renal syndrome 2 (CORS2).[2,3]

What are the Symptoms of Joubert Syndrome 2 and What Treatment is Available?
Individuals with JBTS2 have variable symptoms, including:[4]

- Brain malformations
- Mild to severe delayed development and intellectual disability
- Hypotonia (low muscle tone) in infancy, followed by ataxia (difficulty coordinating movements)
- Abnormal eye movements
- Abnormal breathing patterns

Other symptoms of JBTS2 may include:[4]

- Polydactyly (extra fingers and/or toes)
- Oral hamartomas (skin tags in the mouth)
- Abnormal kidney function

There is no cure for JBTS2 and treatment includes supportive care for symptoms.[4]

How is Joubert Syndrome 2 Inherited?
JBTS2 is an autosomal recessive disease suggested to be caused by mutations in the *TMEM216* gene.[1] An individual who inherits one copy of a *TMEM216* gene mutation is a "carrier" and is not expected to have related health problems. An individual who inherits two copies of the c.218G>T (p.R73L) mutation one from each parent, is expected to be affected with JBTS2. Integrated Genetics includes the c.218G>T (p.R73L) mutation in its Inheritest profile. Other mutation combinations in the *TMEM216* gene may result in either JBTS2 or another disease known as Meckel syndrome.[3,5]

If both members of a couple are carriers, 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.

Who is at Risk for Joubert Syndrome 2?
Joubert syndrome 2 can occur in individuals of any ethnicity; however, it is most common in individuals of Ashkenazi (Eastern European) Jewish ancestry. In the Ashkenazi Jewish population, the carrier frequency has been found to be 1/92[1] and the incidence of JBTS2 is calculated to be approximately 1 in 33,800.

Having a relative who is a carrier or is affected can also 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 genetic health professional about the implications of the result and appropriate testing for the reproductive partner and at-risk family members.

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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?
- Joubert Syndrome & Related Disorders Foundation: http://www.joubertfoundation.com/RealJoubert.asp
- NIH Office of Rare Diseases Research - Genetic and Rare Diseases (GARD) Information Center www.rarediseases.info.nih.gov/GARD/

References

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