Inheritest®
CARRIER SCREEN

Hereditary fructose intolerance

What is hereditary fructose intolerance?

Hereditary fructose intolerance is an inherited disease characterized by nausea, abdominal pain, diarrhea, vomiting, low blood sugar, and liver and kidney damage. Individuals with hereditary fructose intolerance have defects in the enzyme aldolase B, which is responsible for breaking down fructose (a sugar found primarily in fruit) into a form used by the body for energy.[1]

What are the symptoms of hereditary fructose intolerance and what treatment is available?

Symptoms of hereditary fructose intolerance begin when fructose or sucrose (table sugar) is introduced in the diet. Infant formulas, baby foods, and juices may contain sugars that can cause symptoms.[2]

Symptoms usually include [1,2]:

- Lethargy (lack of energy)
- Vomiting
- Diarrhea
- Abdominal pain
- Hypoglycemia (low blood sugar)
- Poor growth
- Seizures, possibly leading to coma (after ingesting large amounts of sugar)

If an affected individual is not treated, other symptoms may develop, including slow, stunted growth and liver and/or kidney damage[1]

There is no cure for hereditary fructose intolerance. Treatment includes strict avoidance of foods containing fructose, sucrose, and sorbitol (which contains fructose). Fructose or sucrose can often be found in sweet-tasting foods, but may also be found in unexpected products, such as medicines.[2] Avoidance of fasting, especially during illness, is advised.[3] Affected individuals tend to develop a natural aversion to sweet foods and may remain undiagnosed, but these individuals may develop symptoms if sugars are consumed. [2]

How is hereditary fructose intolerance inherited?

Hereditary fructose intolerance is an autosomal recessive disease caused by mutations in the *ALDOB* gene.[1] An individual who inherits one copy of an *ALDOB* gene mutation is a carrier and is not expected to have related health problems. An individual who inherits two *ALDOB* gene mutations, one from each parent, is expected to be affected with hereditary fructose intolerance.

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.

Who is at risk for hereditary fructose intolerance?

Hereditary fructose intolerance can occur in individuals of all races and ethnicities.[4] It is estimated to affect 1 in 20,000 individuals, with an approximate carrier frequency of 1/71.[1]

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?

Genetic and Rare Diseases (GARD) Information Center:
https://www.rarediseases.info.nih.gov/GARD/Condition/6622/Hereditary_fructose_intolerance.aspx

References

1. Hereditary fructose intolerance. Genetics Home Reference. Available at http://ghr.nlm.nih.gov/condition/hereditary-fructose-intolerance. Accessed: Mar 2, 2012.
2. Ali M *et al*. Hereditary fructose intolerance. *J Med Genet.* 1998; 35:353-365.
3. Hereditary fructose intolerance. *OMIM.* Available at: http://www.omim.org/entry/229600?search=fructose&highlight=fructose. Accessed: Mar 2, 2012.
4. Coffee EM *et al*. Increased prevalence of mutant null alleles that cause hereditary fructose intolerance in the American population. *J Inherit Metab. Dis.* 2010; 33:33-42.