



What is Ethylmalonic Encephalopathy?

Ethylmalonic encephalopathy (EE) is an inherited disease characterized by abnormalities of the nervous system, gastrointestinal tract, and blood vessels.¹ It involves defects in the enzyme *ETHE1*, which is thought to play an important role in energy production. Symptoms associated with EE are due to reduced energy production in cells and a toxic build-up of metabolites in the body.²

What are the symptoms of Ethylmalonic Encephalopathy and what treatment is available?

Signs of EE are usually apparent at birth or within the first few months of life and become progressively worse.

Symptoms may include^{2,3}:

- Developmental delay
- Hypotonia (low muscle tone)
- Abnormal movements of arms and legs
- Seizures
- Petechiae (skin rash)
- Easy bruising
- Acrocyanosis (blue discoloration of the hands and feet due to low oxygen levels in the blood)
- Chronic diarrhea

There is no cure for ethylmalonic encephalopathy. Treatment includes supportive care for symptoms. Individuals with ethylmalonic encephalopathy usually do not live past ten years of age.⁴

A few states include EE on newborn screening panels.⁵

How is Ethylmalonic Encephalopathy inherited?

Ethylmalonic encephalopathy is an autosomal recessive disease caused by mutations in the *ETHE1* gene.¹ An individual who inherits one copy of an *ETHE1* gene mutation is a “carrier” and is not expected to have related health problems. An individual who inherits two mutations in the *ETHE1* gene, one from each parent, is expected to be affected with ethylmalonic encephalopathy.

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 Ethylmalonic Encephalopathy?

Ethylmalonic encephalopathy has been reported most commonly in individuals of Mediterranean or Arab ancestry. The carrier frequency is unknown.²

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.





CARRIER SCREEN

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?

- Children Living with Inherited Metabolic Diseases (CLIMB) (UK)
<http://www.climb.org.uk/IMD/Echo/EthylmalonicAciduriaEncephalopathy.pdf>
- Genetics Home Reference: <http://ghr.nlm.nih.gov/condition/ethylmalonic-encephalopathy>.

References

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