

MITO PROFILE

LEIGH'S DISEASE INFORMATION

PROVIDED BY THE UNITED MITOCHONDRIAL DISEASE FOUNDATION

LEIGH'S DISEASE or Subacute Necrotizing Encephalomyelopathy (also called Leigh Disease, Leigh Syndrome)

Leigh's Disease is a progressive neurometabolic disorder with a general onset in infancy or childhood, often after a viral infection, but can also occur in teens and adults. It is characterized on MRI by visible necrotizing (dead or dying tissue) lesions on the brain, particularly in the midbrain and brainstem.

The child often appears normal at birth but typically begins displaying symptoms within a few months to two years of age, although the timing may be much earlier or later. Initial symptoms can include the loss of basic skills such as sucking, head control, walking and talking. These may be accompanied by other problems such as irritability, loss of appetite, vomiting and seizures. There may be periods of sharp decline or temporary restoration of some functions. Eventually, the child may also have heart, kidney, vision, and breathing complications.

There is more than one defect that causes Leigh's Disease. According to Dr. David Thorburn, at least 26 defects have been identified. These include a pyruvate dehydrogenase (PDHC) deficiency, and respiratory chain enzyme defects - Complexes I, II, IV, and V. Depending on the defect, the mode of inheritance may be X-linked dominant (defect on the X chromosome and disease usually occurs in males only), autosomal recessive (inherited from genes from both mother and father), and maternal (from mother only). There may also be spontaneous cases which are not inherited at all.

One estimate of the incidence of Leigh's disease (*Leigh Syndrome: Clinical Features and Biochemical and DNA Abnormalities* by Dr. David Thorburn, PhD of Melbourne, Australia) is one in 77,000 births or one per 40,000 births for Leigh and Leigh-like disease (a milder version of the syndrome, often not proven by imaging or autopsy). However, this may be an underestimate since mitochondrial diseases tend to be under-diagnosed and misdiagnosed.

There is no cure for Leigh's Disease. Treatments generally involve variations of vitamin and supplement therapies, often in a "cocktail" combination, and are only partially effective. Various resource sites include the possible usage of: thiamine, coenzyme Q10, riboflavin, biotin, creatine, succinate, and idebenone. Experimental drugs, such as dichloroacetate (DCA) are also being tried in some

clinics. In some cases, a special diet may be ordered and must be monitored by a dietitian knowledgeable in metabolic disorders.

The prognosis for Leigh's Disease is poor. Depending on the defect, individuals typically live anywhere from a few years to the mid-teens. Those diagnosed with Leigh-like syndrome or who did not display symptoms until adulthood tend to live longer.

RESOURCES FOR LEIGH'S DISEASE INFORMATION

Leigh's Center for Children at the University of California, San Diego
<http://biochemgen.ucsd.edu/mmdc/>

NINDS Leigh's Disease Information Page
National Institute of Neurological Disorders and Stroke (NINDS)
<http://www.ninds.nih.gov/disorders/leighsdisease/leighsdisease.htm>

Mitochondrial DNA-Associated Leigh Syndrome and NARP
By David R Thorburn and Shamima Rahman
<http://www.geneclinics.org/servlet/access?id=8888891&key=sNsIGLrZ0dDDP&fcn=y&fw=XOqf&filename=/profiles/narp/index.html>

Leigh Syndrome: Clinical Features and Biochemical and DNA Abnormalities by David R Thorburn, PhD – <http://www.umdf.org/pdf/ThinkMitochondria.pdf>, pg 47

Leigh Syndrome, online OMIM article
Available through UMDF website www.umdf.org, then *Mito Info*, then *disease descriptions*. Click on *Leigh Disease* and follow the links for other resources, including the OMIM article



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