Krabbe disease

Krabbe disease (also called globoid cell leukodystrophy) is a degenerative disorder that affects the nervous system. It is caused by the shortage (deficiency) of an enzyme called galactosylceramidase. This enzyme deficiency impairs the growth and maintenance of myelin, the protective covering around certain nerve cells that ensures the rapid transmission of nerve impulses. Krabbe disease is part of a group of disorders known as leukodystrophies, which result from the loss of myelin (demyelination). This disorder is also characterized by the abnormal presence of globoid cells, which are globe-shaped cells that usually have more than one nucleus.

The symptoms of Krabbe disease usually begin before the age of 1 year (the infantile form). Initial signs and symptoms typically include irritability, muscle weakness, feeding difficulties, episodes of fever without any sign of infection, stiff posture, and slowed mental and physical development. As the disease progresses, muscles continue to weaken, affecting the infant's ability to move, chew, swallow, and breathe. Affected infants also experience vision loss and seizures.

Less commonly, onset of Krabbe disease can occur in childhood, adolescence, or adulthood (late-onset forms). Visual problems and walking difficulties are the most common initial symptoms in this form of the disorder, however, signs and symptoms vary considerably among affected individuals.

Frequency

In the United States, Krabbe disease affects about 1 in 100,000 individuals. A higher incidence (6 cases per 1,000 people) has been reported in a few isolated communities in Israel.

Genetic Changes

Mutations in the *GALC* gene cause Krabbe disease. These mutations cause a deficiency of the enzyme galactosylceramidase. This deficiency leads to a progressive loss of myelin that covers many nerves. Without myelin, nerves in the brain and other parts of the body cannot function properly, leading to the signs and symptoms of Krabbe disease.

Inheritance Pattern

This condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- Diffuse Globoid Body Sclerosis
- Galactosylceramidase Deficiency Disease
- Galactosylceramide lipidosis
- galactosylcerebrosidase deficiency
- galactosylsphingosine lipidosis
- GALC deficiency
- GCL
- GLD
- psychosine lipidosis

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Galactosylceramide beta-galactosidase deficiency
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023521/

Other Diagnosis and Management Resources

- Baby's First Test
  http://www.babysfirsttest.org/newborn-screening/conditions/krabbe
- GeneReview: Krabbe Disease
  https://www.ncbi.nlm.nih.gov/books/NBK1238
- MedlinePlus Encyclopedia: Krabbe disease
  https://medlineplus.gov/ency/article/001198.htm

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Krabbe disease
  https://medlineplus.gov/ency/article/001198.htm
- Health Topic: Leukodystrophies
  https://medlineplus.gov/leukodystrophies.html
- Health Topic: Newborn Screening
  https://medlineplus.gov/newbornscreening.html

Genetic and Rare Diseases Information Center

- Krabbe disease
  https://rarediseases.info.nih.gov/diseases/6844/krabbe-disease

Additional NIH Resources

- National Institute of Neurological Disorders and Stroke: Krabbe Disease
  https://www.ninds.nih.gov/Disorders/All-Disorders/Krabbe-Disease-Information-Page
- National Institute of Neurological Disorders and Stroke: Leukodystrophy
  https://www.ninds.nih.gov/Disorders/All-Disorders/Leukodystrophy-Information-Page
- National Institute of Neurological Disorders and Stroke: Lipid Storage Diseases
  https://www.ninds.nih.gov/Disorders/All-Disorders/Lipid-storage-diseases-Information-Page

Educational Resources

- MalaCards: krabbe disease
  http://www.malacards.org/card/krabbe_disease
- Orphanet: Krabbe disease
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=487
- Tulane University
  http://www2.tulane.edu/tnprc/diseases/krabbe/

Patient Support and Advocacy Resources

- Children Living with Inherited Metabolic Diseases
  http://www.climb.org.uk
- Hunter's Hope Foundation
  https://huntershope.org/
- National Organization for Rare Disorders
  https://rarediseases.org/rare-diseases/leukodystrophy-krabbes/

GeneReviews

- Krabbe Disease
  https://www.ncbi.nlm.nih.gov/books/NBK1238

ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22krabbe+disease%22

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Leukodystrophy,+Globoid+Cell%5BMAJR%5D%29+AND+%28Krabbe+disease%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D

OMIM

- KRABBE DISEASE
  http://omim.org/entry/245200

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