KRABBE DISEASE

WHAT IS KRABBE DISEASE?

Krabbe disease is classified as a lysosomal storage disorder (LSD). Lysosomes are cell organelles that digest and recycle various molecules. Disorders that result in the accumulation of molecules within the lysosomes, including Krabbe disease, are identified as LSDs.

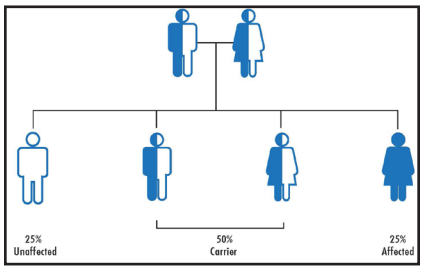
Krabbe disease is divided into two types: infantile form and late-onset form.

THE CAUSE

Krabbe disease is caused by a mutation in the *GALC* gene. The normal function of this gene is to produce an enzyme, galactocerebrosidase, which is responsible for breaking down fats called galactolipids. A gene mutation results in reduced quantity or complete absence of galactosylceramidase, which causes the accumulation of galactolipids in cells, forming globoid cells. The accumulation of these galactolipids causes damage to myelin-forming cells, which impairs the formation of myelin and leads to demyelination in the nervous system.

INHERITANCE PATTERN

Krabbe disease is an inherited autosomal recessive (AR) condition. In order to be affected, the individual must inherit one mutation in the gene from each parent. Each parent is referred to as a carrier who does not show symptoms of the condition.



When two carrier parents of an AR condition have children, there is a 25% chance of having an affected child with each pregnancy.

Krabbe disease affects 1 in 100,000 births.

PATIENT CARE

DIAGNOSIS

1. Enzymatic testing to measure galactocerebrosidase enzyme activity levels in the blood.
2. DNA mutation analysis of the *GALC* gene.

MANAGEMENT and TREATMENT

The management team should include developmental pediatrics, gastroenterology, genetics, neurology, ophthalmology, pulmonology, and physical therapy.

The standard of care for patients with Krabbe disease is hematopoietic stem cell transplant within the first 30 days of life.

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WHAT ARE THE SYMPTOMS?

Primary symptoms include: spasticity, progressive muscle weakness, seizures, and peripheral neuropathy.

The **infantile form** of Krabbe disease is the most common. Symptoms begin within the first year of life and include **irritability, feeding difficulties, muscle weakness, spasticity of the lower limbs with axial hypotonia, and developmental and motor delay.** As the disease progresses, patients will experience seizures, vision loss, peripheral neuropathy, and muscles continue to weaken affecting the ability to move, chew, swallow, and breathe. Patients rarely survive beyond the age of 2 years.

In the **late-onset form**, symptoms begin after the first year of life (childhood, adolescence, or even adulthood). Symptoms include **slow but progressive muscle weakness, seizures, vision loss, peripheral neuropathy, and difficulty with ambulation.** Patients may survive many years after the diagnosis (median survival: 8 years).

RESOURCES

Gene Reviews: Krabbe disease
ncbi.nlm.nih.gov/books/NBK1238/

Genetics Home Reference
ghr.nlm.nih.gov/condition/krabbe-disease

Genetic and Rare Diseases
rarediseases.info.nih.gov/diseases/6844/krabbe-disease

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