Glycogen Storage Disease II (GAA)

Glycogen storage disease II, also known as Pompe disease, is caused by mutations in the GAA gene. This gene encodes for the enzyme alpha-glucosidase, which breaks down glycogen into glucose. Without this enzyme, glycogen can build up to toxic levels, damaging muscles, including the heart muscles, as well as an inability to maintain normal fasting glucose levels. The classic form of the disease emerges in the first few months of life. Babies exhibit muscle weakness, breathing difficulties, heart problems, and fail to thrive. Mortality rates are high, few surviving the first year without treatment. A “non-classic” infantile form appears in the first year of life. Symptoms are similar, but the heart tends to be less severely affected. Even so, breathing difficulties mean that few survive for more than a few years without treatment. A late-onset form of the disease is also known, in which symptoms first appear during late childhood, adolescence, or adulthood. Here muscle weakness and respiratory problems arise, but usually the heart is unaffected. Most sufferers from this form die within 30 years of diagnosis without treatment. Enzyme replacement therapy, along with treatment for the various symptoms, can extend survival to some extent.

The incidence of glycogen storage disease type II is around 1 in 40,000 in the USA, rising to 1 in 14,000 among African Americans. The carrier rate reaches about 1 in 60 in the latter population. The defective genes are inherited in an autosomal recessive manner, typically requiring both parents to be asymptomatic carriers for the faulty gene.

Sources

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