



Fabry Disease

Seminar – Medical bioChemistry

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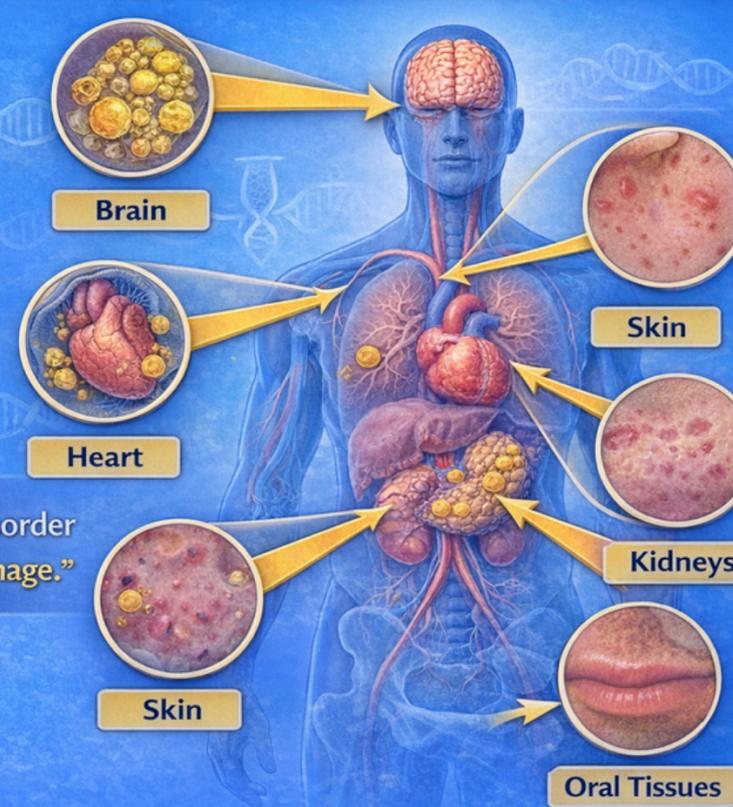
Introduction

Fabry disease is a rare X-linked lysosomal storage disorder caused by deficiency of alpha-galactosidase A, leading to buildup of Gb3 in cells and damage to multiple organs including the kidneys, heart, nervous system, skin, and sometimes oral tissues.

Fabry Disease – Definition

- ✓ Fabry disease is a rare X-linked lysosomal storage disorder
- ✓ Caused by deficiency of alpha-galactosidase A
- ✓ Leads to accumulation of globotriaosylceramide (Gb3) in cells
- ✓ Affects kidneys, heart, *nervous system*, skin, eyes, and oral tissues

“Fabry disease is a rare inherited disorder causing progressive multi-organ damage.”



Brain

Heart

Kidneys

Oral Tissues

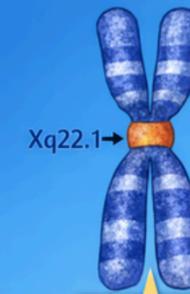
Skin

Skin

Fabry Disease

The GLA gene is located on Xq22.1 (NCBI ID: 2717). It spans ~14.7 kb with 7 exons and encodes alpha-galactosidase A (429 amino acids).

GLA Gene – Name, Sequence & Details



GLA Gene

- Gene name: *GLA* (*galactosidase alpha*)
- Chromosomal location: Xq22.1
- NCBI Gene ID: 2717
- Gene length: ~14,740 bases
- Coding Region: 1290 bp / 7 exons

Enzyme Produced

α -Galactosidase A

Mutation in GLA Gene

↓ Enzyme Activity

Gb3 Build-Up in Lysosome

Mutations in the GLA gene cause Gb3 accumulation and Fabry disease.

Imagine the X chromosome as a huge book.

The **GLA** gene is like a special line in this book, at Xq22.1

GAC...ATG (GLA) ...TGA...

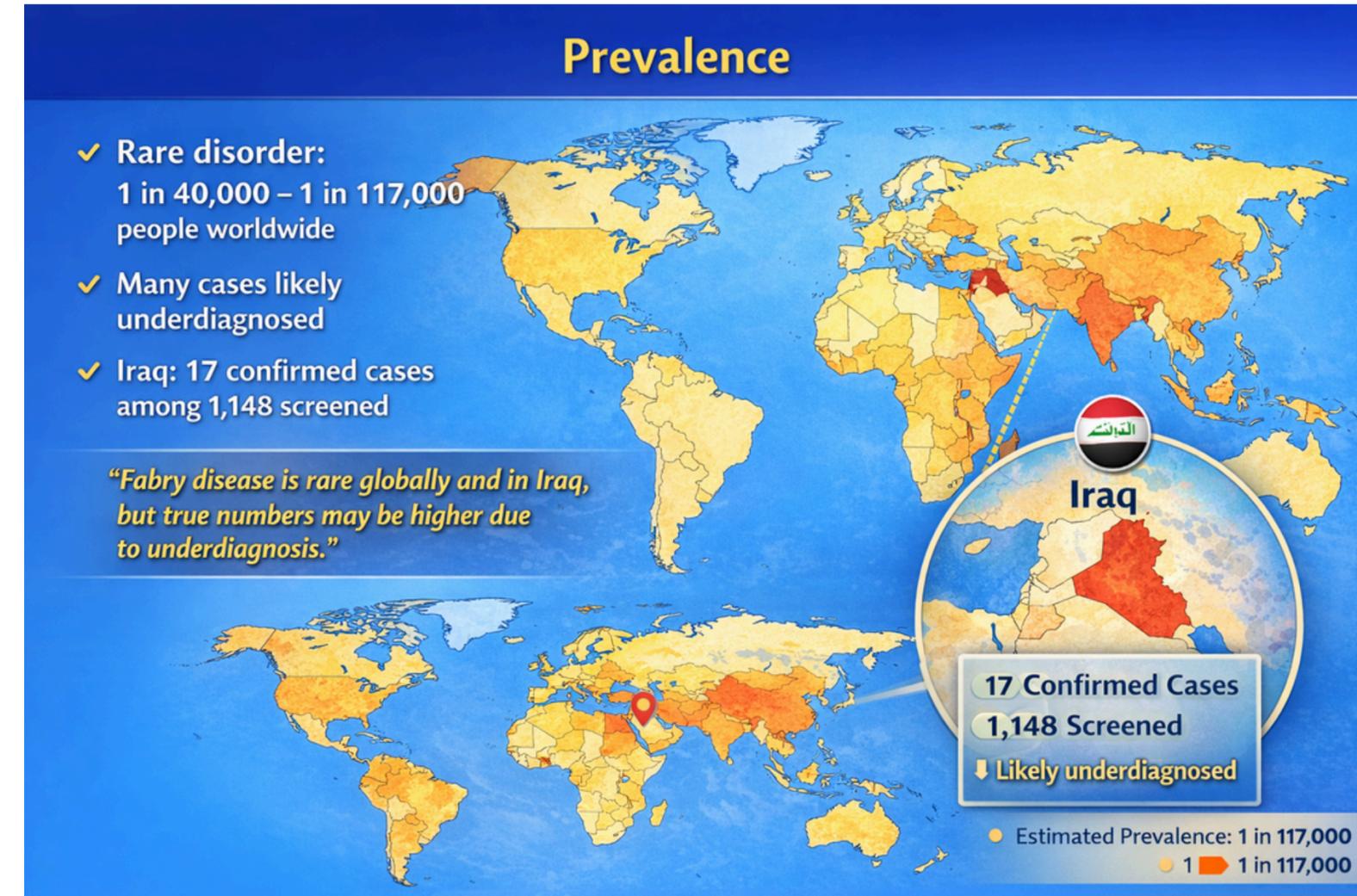
The important lines, called **coding regions** (exons), turn into the alpha-galactosidase A enzyme

Clean up fat!

GLA Gene

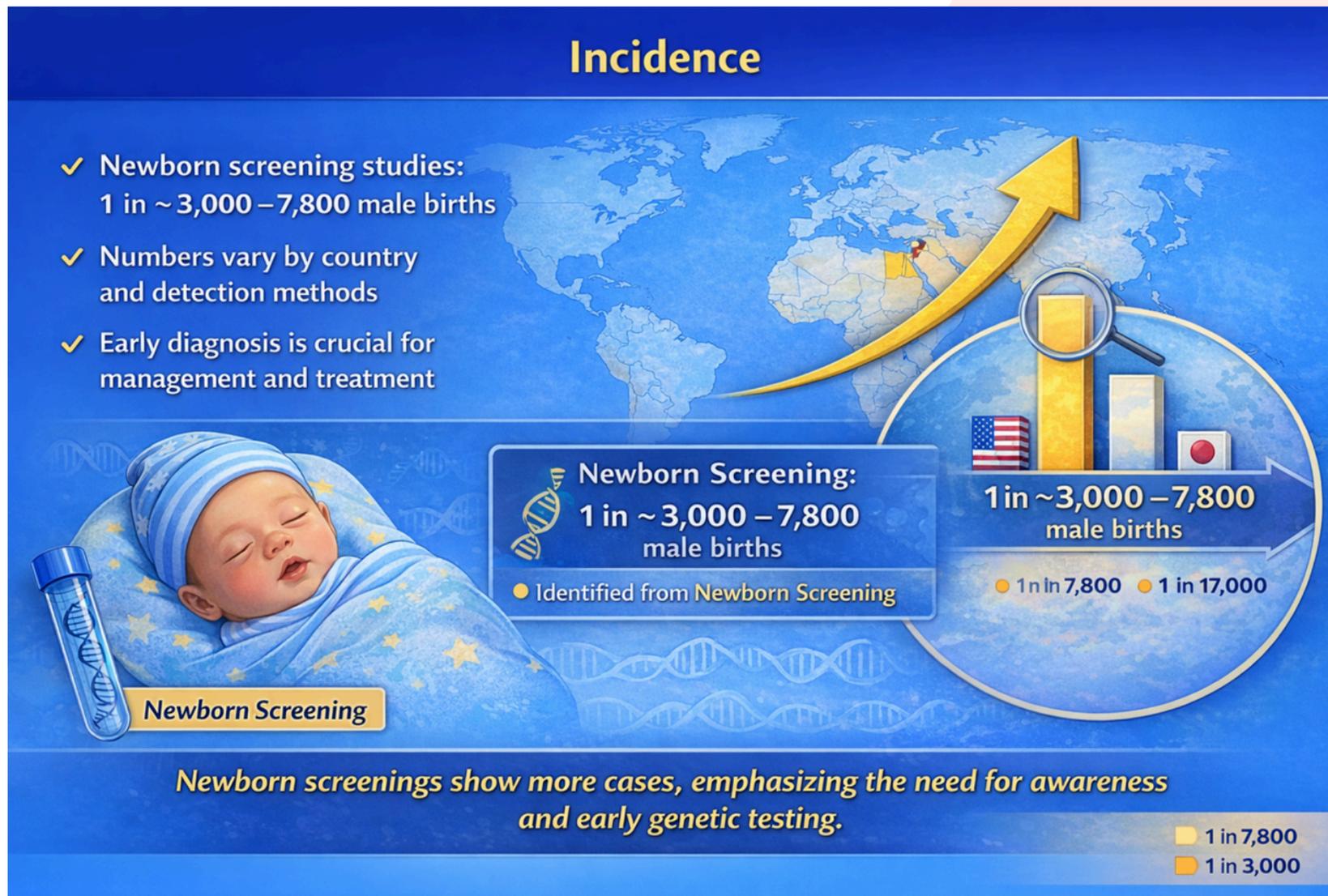
Prevalence of Fabry Disease

Fabry disease is rare (≈ 1 in 40,000–117,000 worldwide) and often underdiagnosed. In Iraq, 17 cases were confirmed among 1,148 people screened.



Incidence of Fabry Disease

Estimated at 1 in 3,000–7,800 male births, Early diagnosis is essential for effective management.



Dental Manifestations :
Oral symptoms include burning mouth sensation, xerostomia (reduced salivary flow), and difficulty chewing or swallowing due to neuropathic pain.



Importance of Early Diagnosis

Prevents irreversible organ damage

Improves quality of life

Allows timely treatment → better long-term outcomes



References

- **Review Articles:**

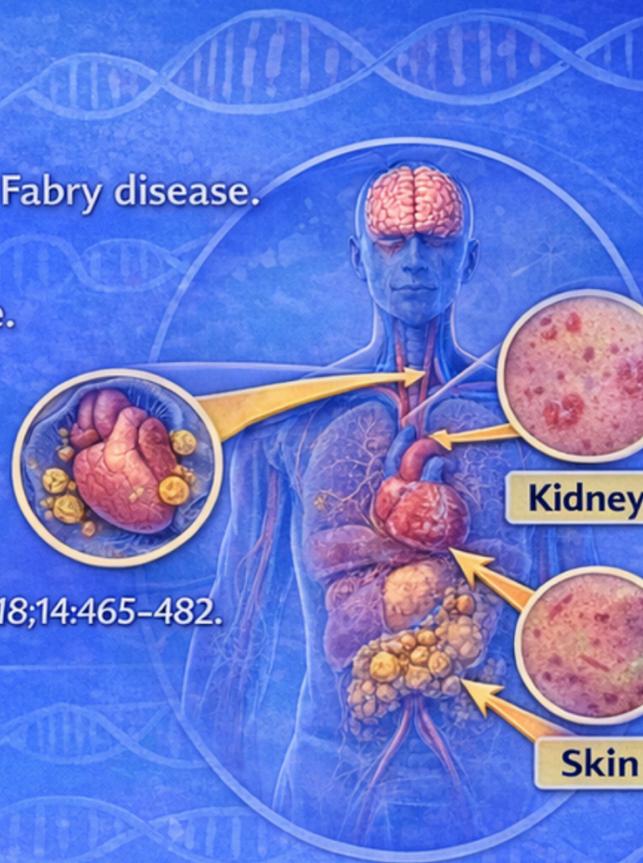
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- MacDermot KD, Holmes A, Miners AH. Natural history of Fabry disease in males. *J Med Genet.* 2001;38:750-760.
- Ortiz A, Germain DP, Desnick RJ, et al. Fabry disease revisited: Management and treatment recommendations. *Nat Rev Nephrol.* 2018;14:465-482.

- **Genetic Databases:**

- NCBI Gene – GLA: <https://www.ncbi.nlm.nih.gov/gene/2717>
- OMIM – Fabry Disease: <https://www.omim.org/entry/301500>

- **Reference Books:**

- Scriver CR, Beaudet AL, Sly WS, Valle D. *The Metabolic & Molecular Bases of Inherited Disease.* 8th ed. 2001.





**THANK YOU
ANY QUESTION?**