MLIP-Associated Myopathy: A case report and review of the literature

Fatema Al Amrani (1), Khalid Al-Thihli(2), Gayathri Narayanappa (3), Almundher Al-Maawali (2)

(1) Pediatric Neurology Unit, Department of Child Health, Sultan Qaboos University Hospital, Sultan Qaboos University, (2) Department of Genetics, Sultan Qaboos University Hospital, Sultan Qaboos University, Muscat, Sultanate of Oman, (3) Department of Neuropathology, National Institute of Mental Health and Neuroscience (NIMHANS), Bangalore, India.

ICNC 2022
17th INTERNATIONAL CHILD NEUROLOGY CONGRESS
ANTALYA, TURKEY I OCTOBER 3-7, 2022

Background

- Etiologies for rhabdomyolysis are variable and include acquired (e.g. toxins or drug-induced, trauma, severe electrolytes imbalance, and inflammatory myopathies) or genetic causes.
- Biallelic pathogenic variants in the *MLIP*-gene have been recently described as a novel genetic cause of rhabdomyolysis.

Objectives

- To report a patient with a biallelic pathogenic variant in the *MLIP* gene causing characteristics clinical features.

Clinical Report

- Thirteen-year-old male with uneventful perinatal history and normal early development presented initially at 5-year old, with history of **muscle cramps in the legs** started at the age of 2-year.
- **Cramp** localized into the calf muscles and alternated between the two legs.
- Lasts for 5-minutes, triggered by intense or prolonged exercises or lifting heavy objects.
- **Interictal exam** was normal.

Investigations

- Createnine phosphokinase (CPK): 4000 – 8000 U/L
- Muscle biopsy (left quadriceps): mild myopathic changes in H & E.
- Electron microscope (EM): aggregation of glycogen granules **(Figure 1).**

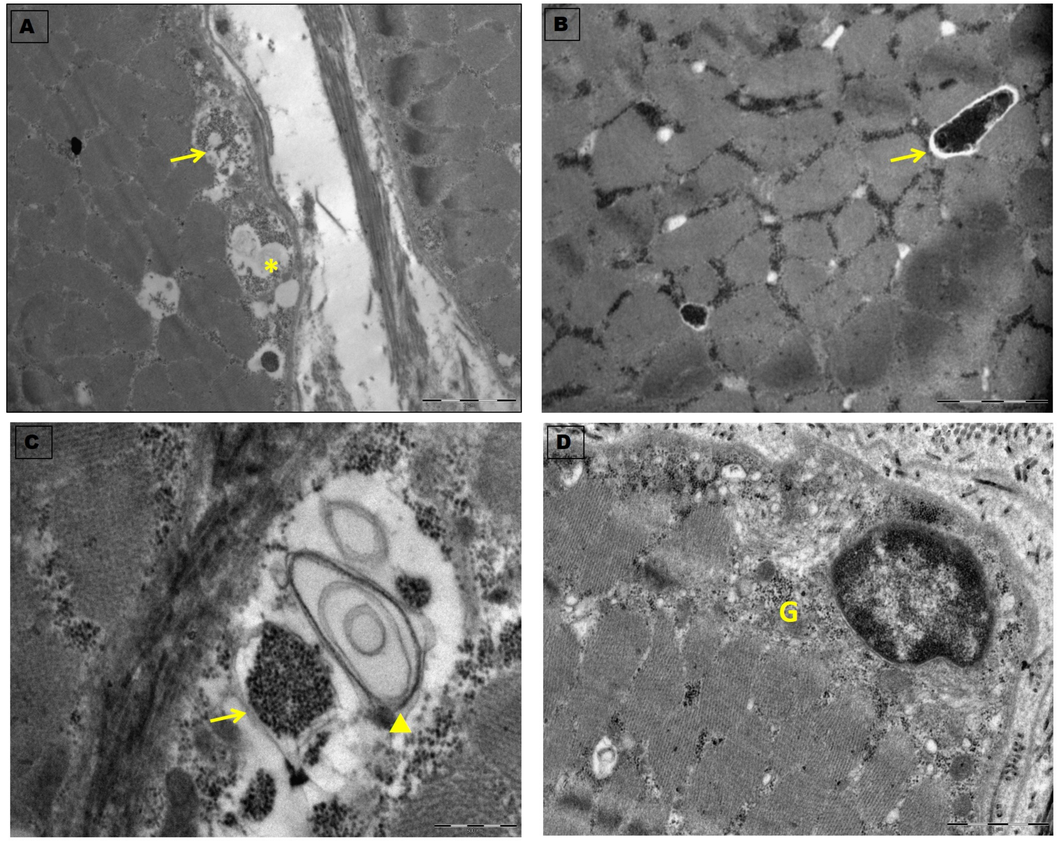

Figure 1: Electronmicrographs of transversely cut skeletal muscle showing

A- Subsarcolemmal non-membrane bound glycogen granules (↑) and lipid (∗) X9300

B- Intermyofibrillar non-membrane bound vacuole with glycogen (↑) X11000

C- Subsarcolemmal glycogen within membrane bound structure(↑) and membranous myelin-like figure (▲)X 30,000

D-Normal nucleus,perinuclear glycogen (G) X 18,500

- Patient was found to have **homozygous variant in *the MLIP* gene (NM_001281747.2: c.1696C>T (p[Gln566Ter]).**
- Both parents were heterozygous for the same variant.

Discussion

- Clinical presentation of our patient is similar to what has been recently reported in patients with biallelic variants in the *MLIP-gene.*
- Index patient had no documented episodes of rhambdomyolysis or muscle weakness and he had no cardiac involvement.
- **Sixty six percent (8/12)** were reported to have muscle phenotype (myalgia, rhabdomyolysis and hyperCKemia).
- **Forty percent (7/12)** were reported to have cardiac involvement.

Conclusion

- ***MLIP*-associated myopathy** is a novel myopathy characterized by recurrent episodes of rhabdomyolysis, muscle ache, mild muscle weakness, and cardiac involvement that might manifest as cardiomyopathy or rhythm abnormalities.
- Further studies are required to understand the precise **function of this protein** and the **pathogenetic mechanism** in this novel myopathy, **muscle biopsy findings**, and the natural history of patients with this myopathy.