MICU1- Related Myopathy with Extrapyramidal Signs

Dear Editor,

We thank the authors for their kind inputs concerning the case report of a 17-year-old boy who presented with proximal myopathy, calf muscle hypertrophy, and skeletal deformities along with choreiform movements of his upper extremities.[1] Muscle MRI revealed an early involvement of the adductors with sparing of the anterolateral compartment of the thigh. Regarding muscle biopsy, it would indeed have been helpful in delineating the underlying pathological process. However, muscle biopsy is an invasive procedure, and considering our logistic limitations it was not feasible. Instead, a noninvasive approach in the form of muscle MRI was adopted.[2] Thus, in the report we have described the clinical and radiological spectrum which can help in identifying this rare entity in similar settings.

With reference to involvement of the other organs, cardiac evaluation including electrocardiogram and echocardiography were normal. The deformity of feet along with hyporeflexia warranted an exclusion of associated peripheral neuropathy. The nerve conduction study was normal, and electromyography demonstrated a typical myopathic pattern. The patient did not manifest microcephaly, ataxia, ptosis, or ophthalmoparesis. He had no history of seizures and magnetic resonance imaging of the brain was normal; thus, EEG was not done.

To identify the causal variants linked with the phenotype, we performed exome sequencing of genes related to muscular dystrophy and congenital myopathy gene panel. We identified the c.1072-1G>C splice variant in the *MICU1* gene in the homozygous state, located in the intron 9 of *MICU1*.[1] It is well documented that any nucleotide alteration in the splice acceptor site (AG) alters the coding region of a gene. This particular variant has previously been reported in a homozygous state in patients affected with myopathy,[3] and it is reported as pathogenic in the ClinVar database. Therefore, valid conclusions can be drawn without a functional analysis. Although, multisystem mitochondrial disorder due to mtDNA variants can present with similar clinical features, the finding of a homozygous pathogenic mutation clinches the diagnosis in favor of *MICU1*-related disorder. Genetic analysis of parents was not financially feasible. However, we have identified the mutation in the homozygous state; hence, it is most likely that both parents are carriers for this variant. The *MICU1* gene runs in the family in an autosomal recessive manner, indicating parents may not manifest the phenotype.

Thus, despite the limitations, the case provides useful information regarding the clinicoradiological features of *MICU1*-related myopathy with extrapyramidal signs.

Ethical standards

The authors confirm that the approval of an institutional review board was not required for this work as it does not involve any new study with human participants. We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines.

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Conflicts of interest

There are no conflicts of interest.

Debaleena Mukherjee, Adreesh Mukherjee, Subhadeep Gupta, Souvik Dubey, Alak Pandit

Department of Neurology, Bangur Institute of Neurosciences, Institute of Post Graduate Medical Education and Research, Kolkata, West Bengal, India

Address for correspondence: Dr. Adreesh Mukherjee, Department of Neurology, Bangur Institute of Neurosciences, IPGMER, Kolkata, West Bengal, India.
E-mail: adreesh03@yahoo.co.in

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