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Coexistence of Myasthenia Gravis and Central Nervous System Demyelination in a Pediatric Patient: A Case Report and Literature Review

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Abstract **Case Report**

Myasthenia gravis (MG) is an autoimmune disorder of the neuromuscular junction, rarely associated with central nervous system (CNS) demyelination. We present a rare pediatric case of an 8-year-old girl with known MG and positive family history, who presented with limb hypotonia more pronounced in the lower extremities. Brain MRI demonstrated multifocal demyelinated plaques in the corpus callosum and bilateral centrum semiovale. These findings are not explained by MG and suggest a coexisting CNS demyelinating process. This case highlights the importance of considering "cross-syndrome" overlap in pediatric MG patients with atypical neurological symptoms.

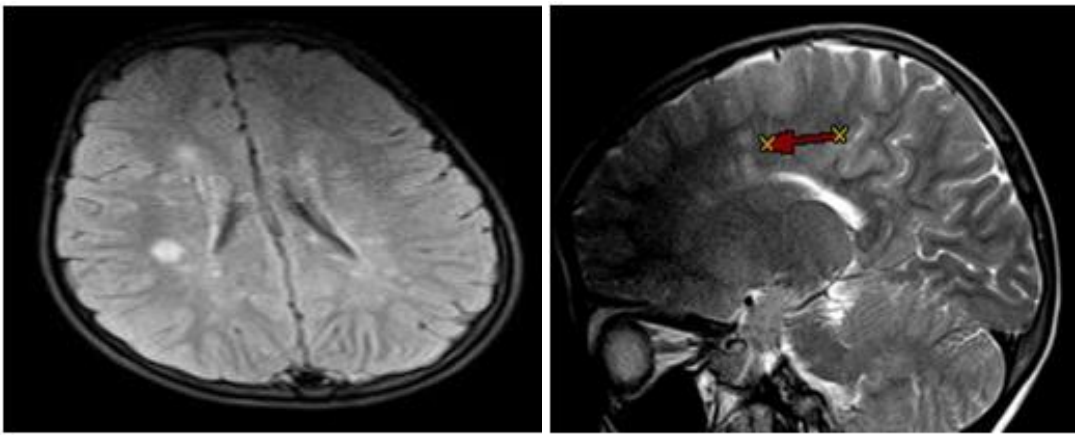
Keywords: Myasthenia gravis, Pediatric neurology, Demyelination, MRI brain, Cross-syndrome.

1. INTRODUCTION

Myasthenia gravis (MG) is an antibody-mediated autoimmune disorder affecting the neuromuscular junction. Its clinical manifestations are typically limited to fatigable weakness, often ocular or generalized, without CNS involvement.

Demyelinating diseases of the CNS (DD-CNS), including multiple sclerosis (MS), neuromyelitis optica spectrum disorder (NMOSD), and MOG-antibody associated disease, have distinct pathophysiology. However, rare cases of coexistence between MG and CNS demyelination have been described, forming a so-called "cross-syndrome".

We report a pediatric case of MG in an 8-year-old girl with positive family history who developed CNS demyelination, adding to the limited but growing literature on this rare association.



2.CASE PRESENTATION

Clinical History

An 8-year-old girl, with a known diagnosis of myasthenia gravis and a positive family history of MG, presented with generalized hypotonia, predominantly affecting the lower limbs. There was no reported visual loss, sensory deficits, or seizures.

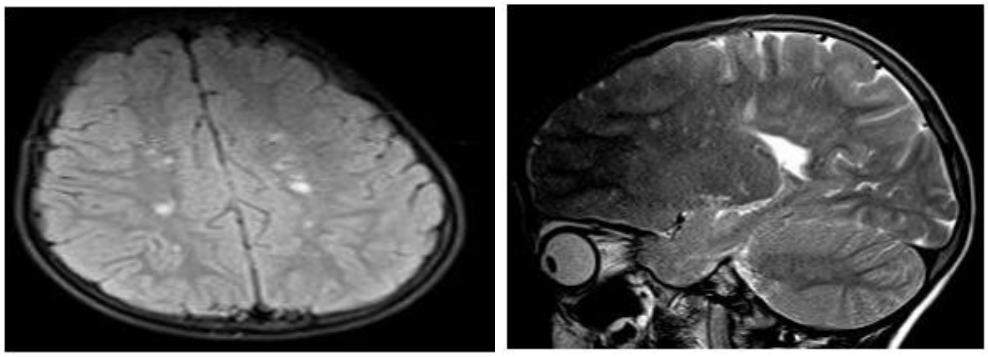
Imaging Findings

Technique: MRI brain (non-contrast) with multiplanar T1-, T2-weighted, and FLAIR sequences.

Findings: Multiple T2/FLAIR hyperintense lesions identified in the corpus callosum and bilateral centrum semiovale. No diffusion restriction, hemorrhage, or mass effect.

Other structures: Cortex, basal ganglia, thalami, brainstem, and cerebellum normal. Ventricular system and CSF spaces within normal limits. Orbits and optic pathways unremarkable.

Interpretation: Multifocal demyelinated plaques, not attributable to MG, consistent with possible CNS demyelinating disease.



2. DISCUSSION

The coexistence of MG with CNS demyelination is extremely rare, particularly in pediatric patients. Luzanova *et al.*, reviewed such cases and proposed three hypotheses:

1. Shared autoimmune predisposition.
2. Treatment-related immunomodulation.
3. Coincidental coexistence of two independent autoimmune disorders.

In our case, the patient's young age and positive family history of MG may support a genetic or autoimmune predisposition. The MRI demonstrated multifocal demyelinating plaques involving typical locations for MS (corpus callosum and centrum semiovale). Importantly, MG itself does not explain CNS demyelination.

This case aligns with the concept of a "cross-syndrome" overlap, where MG patients present with demyelinating lesions. Early identification is important because management strategies may need to address both disorders.

Clinical Recommendations

- Further evaluation: Contrast-enhanced brain and spine MRI, CSF analysis (oligoclonal bands, IgG index), and autoimmune serology (AQP4, MOG).
- Neurology referral: To establish diagnosis of MS, NMOSD, or related disorder.
- Close follow-up: Clinical and radiologic surveillance is essential to monitor disease evolution.

3. CONCLUSION

We report a rare case of an 8-year-old girl with MG and family history, presenting with hypotonia and MRI evidence of CNS demyelination. This case reinforces the need to consider demyelinating disorders in MG patients with atypical neurological findings, even in pediatric populations.

Acknowledgements

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