Case Report

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Eleven-year-old child with COVID-19 induced long segment transverse myelitis

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ABSTRACT

Transverse myelitis (TM) is a clinical syndrome characterized by sensory, motor, and autonomic dysfunctions resulting from immune-mediated spinal cord injury. A possible association between COVID-19 and TM has been recognized. This paper examines the case of an eleven-year-old child who presented with paraplegia and urine retention and was evaluated carefully by a multidisciplinary team comprising a neurophysiologist, a pediatrician, and a neurologist. Sequentially, EMG, NCS, magnetic resonance T2 was conducted to reach the diagnosis of transverse myelitis. The patient was treated with bullous methylprednisolone for three days and showed steady and complete clinical and neurophysiological improvement.

Keywords: COVID-19, transverse myelitis

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INTRODUCTION

Several neurological symptoms have been reported with COVID-19 infection. These include several central nervous system (CNS) manifestations such as acute cerebrovascular disease, transverse myelitis, encephalopathy, and peripheral nervous system (PNS) manifestations like Guillain–Barré syndrome.[1] The first COVID-19 vaccines were introduced in late 2020.[2] Transverse myelitis (TM) is a clinical syndrome characterized by sensory, motor, and autonomic dysfunctions resulting from immune-mediated spinal cord injury.[3]

CASE PRESENTATION

M.I. is an 11-year-old child (DOB: Sept 11th 2009) who had been referred by a urologist for having an abrupt onset of urine retention. He also had a gradual onset of fever for 5 days and bilateral leg pain and paresthesia with mild lower back pain for the last 2 days. The child was in painful distress from lower limb pain and was unable to stand since morning; the patient was wheelchaired with the Foley catheter inserted by the urologist in situ draining 400 cc of urine.

An initial evaluation showed complete paralysis of the lower limbs, power grade I, with brisk knee joint reflexes on both sides.

Initial EMG, NCS showed:

1. Absent motor responses of the fibular and tibial nerves on both sides, recording from distal and proximal muscles.

2. Asymmetrical axonal involvement in upper limb motor nerves (low CMAP amplitude of right median and ulnar nerve, and normal for the left side).
4. Normal sensory response of the sural, median, and ulnar nerves.
Needle EMG testing of (Rt, Lt TA, Rt, FDI) was conducted and showed no spontaneous activity.
MUAP analysis revealed normal amplitude with reduced recruitment.
The first assessment made was acute bilateral slightly asymmetrical mainly motor polyneuropathy of moderate to severe degree. The main pathology observed was axonal degeneration; with clinical correlation, the most likely diagnosis was the axonal form of Guillain-barré syndrome (acute motor axonal polyneuropathy [AMAN]).
PCR test revealed positive for coronavirus. The patient was admitted for observation and supportive therapy (analgesia) but had no clinical improvement neither in skeletal muscle power nor sphincter control, and urinalysis showed urinary tract infection. Moreover, he developed fecal incontinence; hence, MRI of the entire spine was requested, and it showed the following:
Long segment of transverse myelitis involving C3–C8. MRI of the brain two days later showed normal findings. The patient was admitted again to start methylprednisolone 500 mg daily for five successive days with monitoring of any sign of adverse toxicity after the five days. The patient was discharged with only a trivial improvement in the power of the lower limbs. The patient was able to partially move his leg against gravity. However, there was no improvement in sphincter control on trial to change Foley's catheter.
Ten days later, on neurological evaluation, the patient showed greatly improved power of the upper and lower limbs to grade III and could move both against gravity and mild resistance. However, although unable to stand and still wheelchaired, he had normal reflexes and attained complete fecal continence; the catheter was removed five days earlier at home with complete sphincter control.

NCS 2 revealed:
A subsequent study after 2–3 weeks showed almost the same findings. EMG test results were still normal, which somewhat puts AMAN slightly away from being the first differential. These findings are in keeping with other studies on transverse myelitis.

DISCUSSION

EDX study of the upper and lower limbs showed:
1. MNCS of both Rt, Lt fibular and Rt, Lt tibial, and recording from EDE and TA showed relatively absent response.
2. Low CMAP amplitude of the Rt median and a normal finding for the Lt side.
3. Low CMAP amplitude of the Rt and Lt ulnar nerve with normal DML and CV.
4. Normal SNAP amplitude of Rt, Lt median and Rt ulnar n., Rt sural. Needle EMG testing of Rt, TA; Rt, FDI was conducted, and it showed no spontaneous activity.
MUAP analysis revealed normal amplitude, normal with reduced recruitment.
General urine examination revealed post-catheterization urinary tract infection, so the patient was placed on cephalexin for five days and was sent for passive and active physiotherapy.
Six weeks after the last dose of methylprednisolone, a neurological evaluation showed a full spectrum of movements of all the upper and lower limbs, normal gait, normal gag reflex, normal tendon reflexes, and full sphincter control, and the patient claimed that he had stopped using the wheelchair for the past two weeks. GUE was normal.
TM is characterized by focal inflammation within the spinal cord, resulting in neurological dysfunction.[4] Although extremely rare, there are documented sporadic cases in COVID-19 patients from different places, including Kurdistan, Iraq.[5]

Recommendation

TM may be a presentation for COVID-19. NCS may be of benefit for both diagnosing by excluding other causes of AFP and follow up of the response if repeating MRI is not affordable. Response to methylprednisolone may be delayed for more than a month in achieving complete recovery.

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