The Youngest Pediatric Guillain Barre Syndrome associated with COVID-19 Infection

Sir,

COVID-19 pandemic has been ravaging the entire world over the past 14 months. Patients present with various symptoms ranging from acute infective pulmonary involvement to immune-related multi-organ failure (multi-systemic Inflammatory syndrome in children [MIS-C]). In the last 6 months, sporadic cases of GBS with COVID-19 have been reported, but, only in adults.[1-5] Children are rarely affected (<2% of all patients), and usually have mild symptoms. GBS, which is characterized by flaccid ascending flaccid paralysis with/without sensory involvement, has been reported in adult patients with COVID-19.

We report a 3.5-year-old boy who presented with mild-to-moderate fever and centrifugally distributed maculo-papular rash over the body, which faded without scaring in 4 days. On evaluation, he was found to be positive for SARS-CoV-2 by RT-PCR. He got infected from his parents (paramedical staff working in a dedicated COVID-19 facility). He was being treated with IVIG and steroids for the management of MIS-C. He had fever, rash, tachycardia on examination with coronary dilation on 2D ECHO and raised inflammatory markers (ESR 48 mm/h, LDH 829 U/L, CRP 48.3 mg/L, D-Dimer 2058 ng/mL). On the seventh day of illness, he became drowsy and was unable to swallow. Over the next 24 h, he developed rapidly progressive ascending paralysis (power of the lower limb was 0/5 and the upper limb was 1/5 with areflexia) bilateral facial weakness, right ptosis and external ophthalmoplegia with absent gag and dysautonomia (tachycardia and hypertension). He was alert, but needed intubation and mechanical ventilation. His CPK and potassium levels were normal, as was the CSF analysis (protein 38 mg%, sugar 55 mg%, and two lymphocytes). The MRI was [Figure 1] suggestive of spinal root enhancement and thickening with normal brain structures. Nerve conduction studies had features of early GBS (absent F waves and low CMAP amplitude in bilateral peroneal nerves other nerves showed normal latencies amplitude and conduction velocities). The anti-ganglioside antibodies were negative. A clinical diagnosis of GBS was made. He was extubated successfully with improving gag within 48–96 h. His power in all four limbs started improving by 5 days. On day 7 of the presentation, his

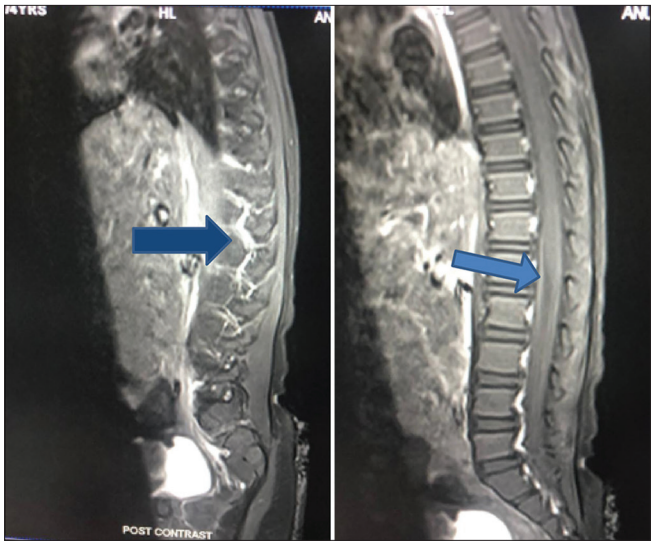

Figure 1: MRI spine showing abnormal thickening and enhancement of spinal nerve roots

upper limb power was >4/5 and lower limb power was 2/5. At follow-up (4 weeks), he was walking independently and had significant improvement in extraocular eye movements with supportive treatment as intravenous immunoglobulin (IvIgG) was already given with intravenous methylprednisolone.

Children account for only 2.1% of all COVID-19 cases.[6] Children <10 years of age account for 1% of total cases.[7] MIS-C mimicking Kawasaki disease has been reported from various centers worldwide. GBS, an autoimmune disease with progressive areflexic paralysis and mild sensory involvement, has been reported in adult patients with COVID-19. The mechanism of GBS related to COVID-19 has not been delineated yet.[3] Probable mechanisms suggested are as follows: (a) post-infectious syndrome, (b) molecular mimicry between viral protein-associated ganglioside and peripheral nerve ganglioside, (c) nerve damage by T cell activation, (d) release of inflammatory mediators by macrophage, and (e) para-infectious mechanism for GBS by hyperinflammatory response to COVID-19 has been suggested.

This child developed GBS within a week of testing positive for COVID-19.

GBS in children progresses rapidly, but recovery is fast if diagnosed and treated timely.

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Conflicts of interest

There are no conflicts of interest.

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