

## Guillain-Barré Syndrome- A Sequelae in COVID-19 Positive Children

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### Introduction

Guillain-Barré Syndrome is important cause of severe, acute weakness in children, and Acute Inflammatory Demyelinating Polyradiculoneuropathy (AIDP) is the most common subtype. [1,2] GBS is characterized by a monophasic, ascending, and symmetrical paralysis that progresses over days to weeks and is associated with areflexia. AIDP is a post-infectious autoimmune process to peripheral nerves which causes inflammation and destruction of myelin. History of past infection was noticed in the majority of cases. Respiratory illness are the most common infectious triggers, but gastrointestinal illnesses, other viruses and immunizations have also been related with GBS.

In Wuhan China in late 2019, severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) originated and rapidly spread around the world. It brought out a pandemic of novel corona virus disease 2019 (COVID-19). The majority of paediatric disease is asymptomatic. The common symptoms of COVID-19 are fever, malaise, and respiratory symptoms, which may range from mild cough to severe pneumonia. It presents occasionally with gastro- intestinal symptoms. [3] However, COVID-19 can present with variety of other symptoms which includes neurological symptoms in adult patients. [4] Anosmia is the most common neurological presentations among COVID-19 patients. However, others include encephalopathy, encephalitis, stroke, acute-disseminated encephalomyelitis, as well as neuro-inflammatory autoimmune diseases.

There are scattered reports of adults with possible GBS and concurrent evidence of COVID-19. [6-10] There are very few previously reported cases on GBS in children with evidence of COVID-19.

### Case

The patient was a previously healthy, 9 -year-old male who presented in outpatient department with progressive weakness in lower limb and difficulty in walking since 10 days. He had history of frequent fall onto his buttocks before presentation. He complained pain in both lower limbs since 8 days. Over the next couple days, he started experiencing bilateral lower extremity weakness that progressed and which leads to inability to walk. He was evaluated at a local family physician where lumbar spine and right ankle x-rays were as normal. Over the next few days, his weakness worsened as he began to develop upper extremity weakness. The patient was transferred to a tertiary care children's hospital for further evaluation [11,12].

The parents gave history of illness 1months back; including fever, upper respiratory infection, and cough. The patient's SARS-CoV-2 nucleic acid amplification was positive. The patient did not have urinary or faecal incontinence. He passes stool once in 3 days and no reported difficulty voiding. He had not lower back pain and bilateral foot paresthesia. Other family members denied any recent respiratory or febrile illness. The father was a daily wage worker and works outside the home. The patient had history of playing outside home and a visit to a local mall 3 weeks prior to presentation, during which he wore a mask. Patient belonged to containment zone for COVID19.

At the time of admission to the paediatric ward, the patient was afebrile with blood pressure 110/78 mmHg, heart rate of 90 beats per

minute, respiratory rate of 20 breaths per minute, and oxygen saturation of 99 % on room air. He appeared anxious but was alert and oriented. He was able to do conversation and able to speak a sentence with 5-6 words at a time. Cranial nerves were intact Overall muscle power was reduced with 4/5 in the upper limbs and 3/5 in the lower extremities. Deep tendon reflexes were absent in lower extremities bilaterally. Sensation was intact to light touch, but proprioception of the distal lower extremities was abnormal. Single breath count test was 14.

An MRI of the spine was done and it was normal. A lumbar puncture was also performed. The cerebrospinal fluid demonstrated albuminocytologic dissociation with 1 nucleated cell/cumm, 1 RBCs/cumm, and protein of 450 mg/dl. Gram stain, culture was negative. Electro diagnostic testing including F waves was performed 10 days after symptom onset. It demonstrated nearly absent CMAP amplitude in both median nerves. Markedly reduce CMAP in both peroneal nerves. Both ulnar and tibial nerves shows increase latency with reduce velocity. Conduction block was seen in left tibial and right ulnar nerve. Sensory nerve conduction showed absent SNAPs in all sampled upper and lower limb nerves. F waves was absent in both peroneal and median nerve. H reflex was absent bilaterally. These findings were compatible with a sensory motor demyelinating polyneuropathy.

A diagnosis of GBS, AIDP form, was made. Patient underwent infectious evaluation for cause of the GBS. Blood, urine, and stool cultures were negative. SARS-CoV2 Ig G antibody was detected in his serum. Further work up showed WBC 14,200/cumm. Treatment was initiated with intravenous immunoglobulin (IVIG) on day two of hospitalization. He was given a total of 2 g/kg of IVIG over 48 hours. His exam demonstrated improvement over the next several days following IVIG with 4/5 upper extremity power and 4/5 lower extremities bilaterally. Physical therapy was initiated. At the time of publication, three weeks following IVIG, he continues to demonstrate slow improvement. He is able to sit and walk independently. He was tested SARS-CoV-2 which came negative on admission.

### Discussion

This case is the first reported case of a child with GBS with past history acute SARS-CoV-2 infection one month back in our set up. GBS in a child has been reported associated with other forms of corona virus. The patient came with obvious symptomatology of GBS with symmetric ascending weakness with loss of reflexes. The workup subsequently

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was consistent with GBS, AIDP form. The CSF showed raised protein without pleocytosis, there was enhancement of the posterior nerve roots in the cauda equina on MRI, and electrophysiological findings (EMG) demonstrated a demyelinating process.

The relation between COVID-19 and GBS was demonstrated previously in case reports of adults with a different variety of GBS, like demyelinating, axonal, and Miller-Fisher in connection with COVID-19. (10-12) typical post infectious presentations have been seen in our report after one month [13-16].

SARS-CoV-2 and other corona viruses, SARS and MERS specifically, have been shown to have neurotropic nature and it causes diseases of the central and peripheral nervous system. [17] The absence of SARS-CoV-2 in the CSF is constant reports as per past publications. The real course and physiology of these reasons have yet to be determined.

#### References

1. Asbury AK (2000) New concepts of Guillain-Barre syndrome. *J Child Neurol* 15: 183-191.
2. Levison LS, Thomsen RW, Markvardsen LK, Christensen DH, Sindrup SH, et al. (2020) Pediatric Guillain-Barre Syndrome in a 30-Year Nationwide Cohort. *Pediatr Neurol* 107: 57-63.
3. Castagnoli R, Votto M, Licari A (2020) Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection in Children and Adolescents: A Systematic Review. *JAMA Pediatr* 174: 882-889.
4. Mao L, Jin H, Wang M (2020) Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China. *JAMA Neurol* 77: 683-690.
5. Vonck K, Garrez I, De Herdt V (2020) Neurological manifestations and neuro-invasive mechanisms of the severe acute respiratory syndrome coronavirus type 2. *Eur J Neurol* 27: 1578-1587.
6. Alberti P, Beretta S, Piatti M (2020) Guillain-Barre syndrome related to COVID-19 infection. *Neurol Neuroimmunol Neuroinflamm* 7: 741.
7. Ottaviani D, Boso F, Tranquillini E (2020) Early Guillain-Barre syndrome in coronavirus disease 2019 (COVID-19): a case report from an Italian COVID-hospital. *Neurol Sci* 41: 1351-1354.
8. Camdessanche JP, Morel J, Pozzetto B, Paul S, Tholance Y, et al. (2020) COVID 19 may induce Guillain-Barre syndrome. *Rev Neurol* 176: 516-518.
9. Dalakas MC (2020) Guillain-Barre syndrome: The first documented COVID-19-triggered autoimmune neurologic disease: More to come with myositis in the offing. *Neurol Neuroimmunol Neuroinflamm* 7: 781.
10. Assini A, Benedetti L, Di Maio S, Schirinzi E, Del Sette M (2020) New clinical manifestation of COVID-19 related Guillain-Barre syndrome highly responsive to intravenous immune globulins: two Italian cases. *Neurol Sci* 41: 1657-1658.
11. Lantos JE, Strauss SB, Lin E (2020) COVID-19-Associated Miller Fisher Syndrome: MRI Findings. *AJNR Am J Neuroradiol* 41: 1184-1186.
12. Sedaghat Z, Karimi N (2020) Guillain Barre Syndrome associated with COVID-19 infection: A case report. *J Clin Neurosci* 76: 233-235.
13. Toscano G, Palmerini F, Ravaglia S (2020) Guillain-Barre Syndrome Associated with SARS-CoV-2. *N Engl J Med* 382: 2574-2576.
14. Centers for Disease Control and Prevention (2020) Multisystem inflammatory syndrome in children (MIS-C) associated with coronavirus disease 2019 (COVID-19).
15. Corman VM, Landt O, Kaiser M, Molenkamp R, Meijer A, et al. (2020) Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. *Euro Surveill* 25: 2000045.
16. Turgay C, Emine T, Ozlem K, Muhammet SP, Haydar AT (2015) A rare cause of acute flaccid paralysis: Human coronaviruses. *J Pediatr Neurosci* 10: 280-281.
17. Li YC, Bai WZ, Hashikawa T (2020) The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. *J Med Virol* 92: 552-555.