

Introduction

COVID-19 causes activation of inflammatory cells, produces inflammatory response and the result can trigger immune mediated process like Guillain Barre Syndrome (GBS). COVID can present with a number of neurological symptoms such as headache, hyposmia, dizziness and hypogeusia during the course of the illness. Even though rare, there are case reports of COVID causing Guillain Barre Syndrome. Here we report a case of COVID-19 associated with GBS that presented to our hospital.

Case Presentation

A 37-year-old male with no significant past medical history presented to the ED with complaints of shortness of breath and dry cough for the last 7 days. He also reports intermittent fevers.

His vitals were temperature 99.3 F, heart rate 103, oxygen saturation 82% in room air, improving to 91% on 2 L Nasal cannula. CXR revealed multifocal pneumonia. He was admitted and started on IV antibiotics. His COVID 19 RT-PCR nasopharyngeal swab test results were positive. He was intubated the next day due to worsening oxygenation and received tocilizumab, convalescent plasma and IV steroids. He was extubated after 15 days on a ventilator.

Post extubation, he was found to have significant neurological deficits causing tetraplegia, areflexia and flaccid tone of upper and lower extremity muscles. Sensations and pain were preserved. He also developed swallowing difficulties which required Dobhoff tube for feeding. He was able to maintain his airway and was breathing well in room air.

MRI of the brain and cervical spine revealed no acute abnormalities. Lumbar puncture was done and Cerebrospinal Fluid (CSF) analysis revealed albumino- cytological dissociation, with protein >250 and a normal white count of 3.3. Encephalitis and encephalomyelitis was ruled out.

Neurology confirmed with diagnosis of GBS due to significant CSF findings and his clinical presentation of rapidly progressing acute flaccid paralysis.

He was started on a five-day course of Intravenous Immunoglobulin (IVIG), but his symptoms persisted. Since the patient did not have any improvement with IVIG, he was started on a 7-day course of plasmapheresis which was done on alternate days.

Patient's muscle strength improved slightly with shrugging of shoulders and slight movements of distal muscles. He was also able to swallow soft diet. He was discharged to acute rehabilitation for aggressive physical and occupational therapy.

References

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- 2) Zhou, Z., Kang, H., Li, S. *et al.* Understanding the neurotropic characteristics of SARS-CoV-2: from neurological manifestations of COVID-19 to potential neurotropic mechanisms. *J Neurol* 267, 2179–2184 (2020)
- 3) Zhao, Hua *et al.* "Guillain-Barré syndrome associated with SARS-CoV-2 infection: causality or coincidence?." *The Lancet. Neurology* vol. 19,5 (2020): 383-384. doi:10.1016/S1474-4422(20)30109-5
- 4) APA Rana, Sandeep MD, FAAN; Lima, Arthur A. MD; Chandra, Rahul MD; Valeriano, James MD; Desai, Troy MD; Freiberg, William DO; Small, George MD Novel Coronavirus (COVID-19)-Associated Guillain-Barré.

Discussion

- Guillain Barre Syndrome (GBS) is an immune mediated disorder that usually occurs following a viral illness.
- The incidence of GBS is reported to increase during outbreaks of infectious illnesses that trigger the disease. The Zika virus epidemics in 2013 and 2015-2016 were linked to an increase in individuals being diagnosed with GBS¹
- There are many possible theories for development of GBS in COVID patients. Most likely one is that antibodies against surface glycoproteins are produced against a pathogen which also respond to similar native protein structures found on the surface of neurons leading to the clinical features seen in GBS².
- Another theory is about the intracranial cytokine storms which could result in the breakdown of the Blood Brain Barrier responsible for the development of Guillain-Barré syndrome².
- Zhao *et al* described first case of GBS -AIDP type associated with COVID 19, but patient developed GBS first without any respiratory symptoms and later found to be COVID positive when she developed dry cough and fever 8 days after being diagnosed with GBS. So a correct correlation between covid and GBS was not able to be established³. Recently, a case report has been published in the US of GBS associated with COVID 19⁴

Conclusion

For every newly diagnosed case of GBS in this pandemic time, COVID testing should also be done to rule out COVID causing GBS. Also, it is very important for clinicians to differentiate between critical illness neuropathy / myopathy and GBS as most of the patients with COVID 19 will be in critical care unit.