SARS-CoV-2 and Guillain-Barre Syndrome (GBS): Insights from ASIA Perspectives

Guillain-Barré syndrome (GBS) is a heterogeneous disorder with factors related to geography that have a major influence on clinical phenotype, disease severity, electrophysiological subtype, and outcome.[1] During the recent Zika virus epidemic, many expected a sharp rise in the number of GBS cases in Asia, just like what was reported in Latin America.[2,3] Intriguingly, Asian countries have not seen a similar spike in GBS cases linked to Zika virus even in a region with a high incidence of GBS, suggesting the unique geographical differences.[4,5] Since the beginning of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic in March 2020 and subsequent reports of cases with neurological manifestations linked to SARS-CoV-2 virus, the number of GBS cases has been in the spotlight and closely monitored across the world.[6,7]

From European perspectives, the epidemiological or phenotypic clues of SARS-CoV-2 being causative of GBS remains unclear. Despite earlier reported increased incidence of GBS linked to SARS-CoV-2 in many Italian centers, recent evidence from an epidemiological study conducted across the UK has shown otherwise.[8,9] There is evidence suggesting GBS to be "para-infectious" rather than the typical acute postinfectious immune-mediated polyneuropathy.[6] In addition, a search on the evidence of molecular mimicry between any SARS-CoV2 proteins and human nerve axonal or myelin proteins and glycoproteins showed no significant homology, making molecular mimicry causation less likely although more scientific research is required.[9] Moving on from this, the next important question to explore is whether concurrent SARS-CoV-2 infections with GBS demonstrate different clinical characteristics, severity, and outcome in various parts of the world.

The data presented by Megha D *et al*.[10] is crucially important and timely for a few reasons. Firstly, despite a major outbreak of SARS-CoV-2 infections started in Asia and the earliest report of GBS with SARS-CoV-2 in these regions, till yet we have a large cohort analysis of GBS associated with SARS-CoV-2 infections. Although the data was not designed to determine the incidence of GBS linked to SARS-CoV-2, the relatively large number of patients provide a good insight into clinical characteristics as well as the overall outcome. Interesting to note is the proportion of GBS subtypes of predominant demyelinating nature (59.5%), higher than expected from an Asian country where acute motor axonal neuropathy is more prevalent.[11] Whether this is the effect of SARS-CoV-2 remains uncertain. Second and important to note was the rates of ICU admission and those requiring ventilation, reaching up to almost 50%. This is consistent with that of the UK cohort, despite demonstrating no significant differences in the pattern of weakness, time to nadir, neurophysiology, CSF findings, or outcome compared to SARS-CoV-2 negative groups.[9] This was likely related to COVID-19 pulmonary involvement, potentially overwhelming the intensive care resources in many less Asian countries if the number of SARS-CoV-2 infections is high. More concerning was that a proportion of patients developed symptoms of SARS-CoV-2 pneumonia 1–2 weeks later with worsening shortness of breath or increasing oxygen requirement. A close observation of this group of patients is needed. Thirdly, we now have better evidence that treatment of GBS linked to COVID-19 infections with intravenous immunoglobulin (IVIg) is safe despite initial concerns of its prothrombotic risk. This has also been shown in the UK cohort.[9]

Till this pandemic is brought under control, we are yet to see the true spectrum of impact from neurological manifestations linked to SARS-CoV-2. Strong epidemiological data is needed to allow us to predict what the virus will do upon rolling out of mass vaccination program and emergence of highly transmissible variants of SARS-CoV-2.

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References

1. Doets AY, Verboon C, van den Berg B, Harbo T, Cornblath DR, Willison HJ, *et al*. IGOS consortium. Regional variation of Guillain-Barré syndrome. Brain 2018;141:2866-77.
2. Cao-Lormeau VM, Blake A, Mons S, Lastere S, Roche C, Vanhomwegen J, *et al*. Guillain-Barré syndrome outbreak associated with Zika virus infection in French polynesia: A casecontrol study. Lancet 2016;387:1531-9.
3. Watrin L, Ghawche F, Larre P, Neau JP, Mathis S, Fournier E. Guillain Barré syndrome (42 cases) occurring during a Zika virus outbreak in French polynesia. Medicine (Baltimore) 2016;95:e3257.
4. Umapathi T, Kam YW, Ohnmar O, Ng BCJ, Ng Y, Premikha M, *et al*. The 2016 Singapore Zika virus outbreak did not cause a surge in Guillain-Barré syndrome. J Peripher Nerv Syst 2018;23:197-201.
5. GeurtsvanKessel CH, Islam Z, Islam MB, Kamga S, Papri N, van de Vijver DAMC, *et al*. Zika virus and Guillain-Barré syndrome in Bangladesh. Ann Clin Transl Neurol 2018;5:606-15.
6. Zhao H, Shen D, Zhou H, Liu J, Chen S. Guillain-Barré syndrome associated with SARS-CoV-2 infection: Causality or coincidence? Lancet Neurol 2020;19:383-4.
7. Toscano G, Palmerini F, Ravaglia S, Ruiz L, Invernizzi P, Cuzzoni MG, *et al*. Guillain-Barré syndrome associated with SARS-CoV-2. N Engl J Med 2020;382:2574-6.
8. Filosto M, Cotti Piccinelli S, Gazzina S, Foresti C, Frigeni B, Servalli MC, *et al*. Guillain-Barré syndrome and COVID-19: An observational multicentre study from two Italian hotspot regions. J Neurol Neurosurg Psychiatry 2020;jnnp-2020-324837. doi: 10.1136/

jnnp-2020-324837. Online ahead of print.
9. Keddie S, Pakpoor J, Mousele C, Pipis M, Machado PM, Foster M, *et al*. Epidemiological and cohort study finds no association between COVID-19 and Guillain-Barré syndrome. Brain 2020:awaa433.
10. MEGHA AT AL AIAN 1303/20.
11. Willison HJ, Jacobs BC, van Doorn PA. Guillain-Barré syndrome. Lancet 2016;388:717-27.

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