

## LETTERS TO THE EDITOR

# COVID-19 provoking Guillain–Barré syndrome: The Bergamo case series

Dear Editor,

At the time of writing, the number of confirmed COVID-19 cases in Italy has dropped to less than 150 cases per day. Now we can finally take a breath and think back on what we have experienced during the last months in our hospital Papa Giovanni XXIII in Bergamo, Lombardy, the epicentre of the Italian pandemic.

Amongst 1832 COVID-19 patients hospitalized between 23 February and 21 May, we diagnosed 17 cases of Guillain–Barré syndrome (GBS). All the patients had a Brighton criteria level of 1 or 2 [1]. The median age was 53 years and 11 were men.

The majority of the patients were admitted to the intensive care unit for severe respiratory distress, and peripheral nervous system involvement became evident at weaning off sedation. Notwithstanding, we are confident that, in accordance with the Brighton criteria, the interval between coronavirus diagnosis and the nadir of weakness was between 12 h and 28 days. If not necessary for diagnosis, cerebrospinal fluid (CSF) analysis was avoided as the majority of the patients were treated with low molecular weight heparin at high doses for primary prevention of SARS-CoV-2 induced thrombophilia. In the four patients who performed CSF analysis, reverse transcription polymerase chain reaction assay on CSF for SARS-CoV-2 was negative.

Nerve conduction studies demonstrated acute inflammatory demyelinating polyneuropathy in 16 cases, according to Hadden criteria [2]. In one case with equivocal results, diagnosis was confirmed with CSF evaluation. Eight patients underwent a blink reflex test, which showed a demyelinating pattern in either the facial and/or the trigeminal nerves in all cases, suggesting a frequent cranial nerve involvement.

Neuromuscular weakness is a common occurrence in the intensive care unit; nevertheless, it is usually due to a critical illness myopathy and neuropathy, the differential diagnosis of which is based on electrophysiological tests. Both of these diseases usually present as a symmetric flaccid limb weakness; however, they must promptly be distinguished considering the proved effectiveness of intravenous immunoglobulin or plasma exchange in GBS.

Amongst our cohort, 15 patients were treated with intravenous immunoglobulin and two received plasma exchange. One patient died because of pulmonary complications. 16 patients were discharged to home or to a rehabilitation centre. To the best of our knowledge, this is the largest number of GBS cases reported following SARS-CoV-2 infection. Other cases were previously described, either singularly or in small groups [3–5]. Interestingly, during the

same period of the previous year, only three cases of GBS were admitted to our hospital.

We believe it worthwhile to communicate our experience and to raise awareness to healthcare professionals dealing with COVID-19 patients regarding the frequent peripheral nervous system involvement of SARS-CoV-2 infection. Intensivists should bear in mind that difficulties in spontaneous breathing and failure of weaning from mechanical ventilation should be a red flag of GBS. Neurologists should be aware of the major responsibility of proper diagnosis, as GBS can be treated with excellent results. Both must have in mind that treatments are particularly efficacious when administered in the early phase of the disease.

## KEYWORDS

COVID-19, critical illness, Guillain–Barré syndrome, mechanical ventilation

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## CONFLICT OF INTEREST

The authors declare no financial or other conflicts of interest.

## AUTHOR CONTRIBUTIONS

**Camillo Foresti:** Conceptualization, Formal analysis, Investigation, Writing-review, Editing. **Maria Cristina Servalli:** Data curation, Formal analysis. **Barbara Frigeni:** Data curation, Formal analysis. **Nicola Rifino:** Data curation; **Benedetta Storti:** Writing-original Draft. **Paolo Gritti:** Supervision, Writing-review, Editing. **Fabrizio Fabretti:** Supervision, Writing-review, Editing. **Lorenzo Grazioli:** Supervision, Writing-review, Editing. **Maria Sessa:** Conceptualization, Writing-review, Editing.





## DATA AVAILABILITY STATEMENT

All COVID-19 patients for whom a neurological consultation/neurophysiological assessment was requested during hospitalization were registered in a dedicated database within an observational study approved by Hospital Institutional Review Board (257/2020, 13/5/2020).

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#### REFERENCES

1. Fokke C, van den Berg B, Drenthen J, et al. Diagnosis of Guillain-Barré syndrome and validation of Brighton criteria. *Brain*. 2014;137:33.
2. Hadden RD, Cornblath DR, Hughes RA, et al. Electrophysiological classification of Guillain-Barré syndrome: clinical associations and outcome. Plasma Exchange/Sandoglobulin Guillain-Barré Syndrome Trial Group. *Ann Neurol*. 1998;44:780-788.
3. Toscano G, Palmerini F, Ravaglia S, et al. Guillain-Barré syndrome associated with SARS-CoV-2. *N Engl J Med*. 2020;382:2574-2576.
4. Alberti P, Beretta S, Piatti M, et al. Guillain-Barré syndrome related to COVID-19 infection. *Neurol Neuroimmunol Neuroinflamm*. 2020;7:e741.
5. 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(5):383-384.