10-15-2020

Reply from the authors: Myasthenic crises in COVID-19

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Journal of the Neurological Sciences 417 (2020) 117061

Contents lists available at ScienceDirect

Journal of the Neurological Sciences

journal homepage: www.elsevier.com/locate/jns

Response to letter to the Editor

Reply from the authors: Myasthenic crises in COVID-19

Search Term: Viral Infection, Myasthenia Gravis, Myasthenic Crises, COVID-19.

Study Sponsorship: None.

Disclosures: Dr. Delly reports no disclosures.

Dr. Syed reports no disclosures.

Dr. Lisak participated as a speaker in meetings sponsored by and received consulting fees and/or grant support from: Alexion, Argenx, Ra Pharmaceuticals, Novartis, Mallinckdrot, Catalyst, Teva Pharmaceuticals, Genentech, Chugai, Medimmune, GLG Consulting, Alpha Sites Consulting, Schlesinger Group Consulting, Slingshot Consulting, Health Sources, Adivo Associates, and Smart Analyst. He has also received funding from the NIH and National MS Society.

Dr. Zutshi reports no disclosures.

We note the comments of Drs. Finsterer, Scorza and Scorza and will take the opportunity to address their concerns.

The authors' main concern is the insufficient substantiation of the diagnosis of myasthenic crisis. The case report was submitted as a letter to the editor as per the journal's requirement. However, the letter to the editor category is often restricting due to word limits, as was in our case; a word limit of 1000 words. Therefore, we chose to share only the most pertinent information about the patient's clinical course. Finsterer et al. proceed to suggest that the respiratory insufficiency could have been due to a myriad of other causes, including a simple pneumonia or effect of the drugs such as hydroxychloroquine, azithromyclin, a macrolide antibiotic, and perhaps vancomycin. We are well aware of this [1,2], noted this in our discussion and indeed did not title the report as myasthenic crisis *caused* by Corona virus disease of 2019 (COVID-19). In fact, we made a note to emphasize that the patient's condition could have indeed been due to many other underlying factors, including other infections and the COVID-19 experimental “treatments” being used in the United States at the time of this patient's deterioration; hydroxychloroquine and azithromycin which were being used under the Emergency Use Authorization (EUA) by the Food and Drug Administration (FDA) [3]. The FDA officially revoked the EUA for these drugs on June 15th 2020, based on the unfavorable emerging data from clinical trials [3]. It is vital to understand that the choice of the use of these drugs was not made by the neurologists consulting on this patient's case, but by the medical intensivists treating severely ill COVID-19 patients in emergency rooms and inpatients settings. In fact, the main purpose of our report was to share the clinical course of a myasthenia gravis (MG) patient with COVID-19 experiencing a crisis in the context of all the treatments being offered at the time and hence the therapeutic dilemmas faced by the neurologists to prevent worsening of MG symptoms while simultaneously trying to treat COVID-19. It should also be noted that other common viral causes of pneumonia were ruled out whereas the COVID-19 real-time RT PCR on Roche cyclers test was consistently positive.

Additionally, our diagnosis of myasthenic crisis was based on the new onset of rapidly progressive respiratory failure that required emergency intubation and mechanical ventilation (MGFA V). While careful monitoring, including of vital capacity (VC) and negative inspiratory force, (NIF) are important, in particular for rapidly worsening patients to help determine the need for intubation and mechanical ventilation, further supporting the diagnosis of myasthenic crisis, the current patient came into the emergency department in obvious severe respiratory distress, already decreased O_2 saturation (a late finding in MG respiratory compromise), and based on clinical judgment, was appropriately intubated after failing O_2 by nasal cannula, rather than waiting to measure her VC or NIF. The status in hospitals, including emergency rooms and intensive care units during this pandemic, can be overwhelming.

Furthermore, initial patient care was provided in the emergency room, they discontinued pyridostigmine on intubation, however, when the neurology team was on board on day 3, pyridostigmine was restarted. Moreover, pyridostigmine is often temporarily discontinued in intubated MG patients due to being an acetylcholinesterase inhibitor and therefore with the potential of increasing bronchial secretions and worsening respiratory symptoms [4]. Adjustment of doses of pyridostigmine by itself, as was suggested by Finsterer et al., has limited use in preventing or treating MG crisis [1,2].

We agree with the Finsterer and colleagues that the patient may not have been receiving ideal therapy for her rheumatological comorbidity, or perhaps her MG prior to this crisis, however, she was not a regular patient at the current healthcare facility. We were not able to connect with her primary caregiver to receive an explanation for why she was on steroids for the past five years and other factors such as refusal of thymectomy and immune-suppressive agents in lieu of steroids as well as the continuous use of hydroxychloroquine. These factors, while important, are not the main purpose of this report.

We cannot prove in an individual case that intravenous immunoglobulin (IVIG) was the major reason for her recovery. Both IVIG and plasma exchange (PLEX) are widely used in MG crisis and in this instance, the consulting neurologist suggested IVIG. Some (including RPL) feel that PLEX may be quicker but this is difficult to prove. Furthermore, not all hospitals have the capacity to preform PLEX.

The authors also state that ours was not the first paper to document a case of MG in COVID-19 patients. However, the paper cited by the authors was in fact published five days after the publication of our case report [5,6]. At the time of submission of our manuscript, there was no existing literature regarding this complication. It is not surprising that not all patients with MG and COVID-19 will develop myasthenic crisis. However, given the time-sensitive and rapidly evolving nature of COVID-19 related medical literature and publications, it is only natural to anticipate more studies concerning this specific subset of patients.

Further documentation and development of local and international registries will help strengthen the scientific community's understanding of the challenge of management of COVID-19 in MG patients.

https://doi.org/10.1016/j.jns.2020.117061
Received 21 July 2020; Accepted 23 July 2020
Available online 27 July 2020
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