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LETTERS TO THE EDITOR

Predictive factors for a severe course of COVID-19 infection in myasthenia gravis patients with an overall impact on myasthenic outcome status and survival

We would like to thank the editor of the *European Journal of Neurology* for the opportunity to respond to the issues raised in the letter to the editor [1] and to clarify certain aspects of our methodology in relation to these concerns. We would also like to thank Dr. Giuliana Galassi and Dr. Alessandro Marchioni from the University of Modena in Italy for their interest in our article [2] and for taking the time to express their different point of view on our research.

In the Czech Republic, myasthenic patients are concentrated into specialized centres. If our two centres in Prague and Brno follow more than 2400 patients, then 93 patients is not such a surprising number. To date, we have already registered 171 confirmed myasthenia gravis (MG) patients with COVID-19 infection, so at present this patient cohort is practically twice the original set. This is also probably related to the high prevalence of COVID-19 in the Czech Republic, which is currently 157,000/1 million inhabitants. To date, 8.1% of MG patients are infected with COVID-19 at the Center for Diagnosis and Therapy of Myasthenia Gravis, 1st Faculty of Medicine, Charles University. In our study, clinical data were collected between August 2020 and March 2021.

The study was designed as a retrospective cohort study. Most of the 34 hospitalized patients grade 5–7 were placed in the intensive care unit, mainly due to shortness of breath and fever with a high risk of rapid progression of COVID-19 infection or worsening of myasthenic symptoms, in a minority of cases. The distinction between a worsened myasthenic patient due to underlying MG as a result of COVID-19 and a not worsened MG patient with severe COVID-19 pneumonia is quite obvious to an experienced neurologist, because myasthenic deterioration in any infection is never manifested only by isolated dyspnoea and respiratory failure, but is always accompanied by other associated specific myasthenic symptoms such as bulbar syndrome and/or oculomotor disorders. As mentioned earlier, only 34 patients were admitted to hospital due to COVID-19 infection. Therefore, computed tomography scans were performed only in this subset of patients and that was the reason why we did not select this parameter for statistical analysis. However, this point is very interesting, and we would be pleased if colleagues would like to collaborate with us on such a study. Conversely, this phenotypical classification of COVID-19 acute respiratory distress syndrome is still a matter of study, as conflicting data have already been published [3] and even recommendations for another therapeutic approach have been postponed until there is clearer evidence [4].

We cannot agree with colleagues about the parameter of forced vital capacity (FVC) being a less sensitive measure, as they claim. FVC is considered to be a basic indicator of the outcome of COVID-19 because shortness of breath is one of the major persistent predominating symptoms in post-COVID-19 patients. FVC is a basic parameter in scoring in various myasthenic scales, such as the Quantitative Myasthenia Gravis Score (QMGS), and it is an integral part of outcomes in MG clinical trials. Therefore, we were simply following basic international standards for scoring MG patients. Since we measured FVC in MG patients by default as part of their routine visits, we had this indicator available prior to COVID-19 infection. The other respiratory indicators mentioned by our Italian colleagues are not part of the international MG standards and scales and, in addition, they are not used in routine clinical practice.

Finally, views on the use of corticosteroids (CS) during COVID-19 have changed and evolved significantly in recent months. Therefore, we claimed that their use remains controversial, although some recent studies point to their certain benefits [5]. We are afraid that our Italian colleagues probably misunderstood the fact that we were not discussing the use of CS in non-COVID-19 MG patients during the COVID-19 pandemic, because CS have always been and will be the gold standard for the treatment of this postsynaptic autoimmune neuromuscular disease, and we definitely did not recommend CS to be discontinued in MG patients. Still, we have observed that previous chronic CS treatment in pre-disease COVID-19 in higher doses (20 mg prednisolone/daily and higher) is a significant risk factor for the severe course of COVID-19 in MG patients and similar results were also observed in multiple sclerosis patients [6]. We agree with the use of dexamethasone at low doses of 6 mg/day to prevent pulmonary fibrosis in COVID-19 MG patients, but administration of higher doses of CS in corticosteroid courses of 1 mg/kg (i.e., means of 60–80–100 mg/prednisolone/daily) in the case of myasthenic exacerbations during COVID-19 infection is considered risky and therefore we prefer to choose the route of intravenous immunoglobulin treatment. As we have mentioned in conclusion, based on our observations, long-term use of CS in higher doses before COVID-19 infection in myasthenic patients predicts a worse

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course of COVID-19 infection that in all likelihood is also due to the instability of MG, which requires these higher doses of CS.

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CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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