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Letter to the Editor

Speculative clues on Myasthenia gravis and COVID-19

Dear Editor,

In the 21st century, humans have witnessed already three times with major epidemics caused by Coronaviruses, namely Severe Acute Respiratory Syndrome (SARS) in 2003, Middle East Respiratory Syndrome (MERS) in 2012 and COVID-19 in 2019. Prajapati et al[1] recently reviewed scientific knowledges on the battle that researchers and clinicians are yet fighting against the novel coronavirus. In this context, there is a growing interest about extrapulmonary manifestations of SARS-Cov2 infection. As far as nervous system involvement is concerned, in the JAMA issue of May 2020 Zubair et al[2] published an exhaustive review on neuropathogenesis and neurologic manifestations of COVID-19, including also special considerations for subjects having complex neurological conditions, such as Myasthenia gravis.

Myasthenia gravis (MG) is a relatively rare acquired, autoimmune disorder caused by an antibody-mediated block of neuromuscular transmission resulting in skeletal muscle fatigability and weakness. It is often associated to thymus pathology such as lack of involution in adulthood, follicular hyperplasia and/or thymoma. Clinical spectrum of MG includes benign (such as ocular MG), disabling or, rarely, fatal forms. Until the middle of the last century, approximately one fourth of MG patients died within few years from diagnosis. By contrast, in last decades, with approval of new therapeutic strategies, a very high percentage of MG patients had a normal or almost normal life expectancy and quality of life[3].

Nevertheless, this is a complex neurological condition that may place these patients at increased risk of developing severe COVID-19 disease[2].

Despite SARS-CoV-2 infection occurs with mild clinical presentation (mimicking a flu-like syndrome) or asymptomatic in most cases, in some patients, usually in the elderly, the virus may lights a fuse triggering an irreversible cascade of immune-mediated, inflammatory and dysco-agulative events that may leads to fatal outcome[4-6]. To date, there is growing evidence of an uncontrolled extension of the pandemic in many countries. In fact, to July 29, 2020, more than 656,000 deaths have been reported worldwide by WHO surveillance, but everybody knows that the real number of deaths is probably much higher.

Although deeply different in terms of etiology, from a speculative point of view, it is challenging to consider MG and COVID-19 linked by some clinical and pathogenetic aspects.

Firstly, subjects with neuromuscular disorders are at particular risk for deterioration with COVID-19, both due to chronic exposure to immunosuppressive drugs, and to the typical respiratory muscle weakness, which can put them at further risk for severe complications in COVID-19. Moreover, albeit respiratory failure in COVID-19 failure is caused by interstitial pneumonia and/or pulmonary thromboembolism, the role of a possible coexistent muscular weakness has not been yet investigated.

Secondly, the positive response to therapies with steroids and intravenous high-dose immunoglobulins has been observed in both diseases and may be ascribed to well-known inflammatory/immune-mediated pathogenetic mechanisms[3-6]. In fact, as well as in COVID-19, also in MG is plausible that viral infections can trigger autoimmunity. Virus-induced autoimmunity is a multi-directional process and current data suggests that viruses can initiate autoimmunity via several pathways including molecular mimicry, epitope spreading, bystander activation and/or immortalization of infected B cells[7].

To date, COVID-19 disease is an extremely novel disease, with necessarily several still dark sides. An accurate monitoring for early detection of neurological manifestations in COVID-19

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as well as the observation of possible similarities with other dysimmune central and peripheral nervous systems diseases (such as the role of thymus-dependent immunity), it is warranted to shed more light on potential common pathogenetic mechanisms and future targeted therapies.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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