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COVID-19

Are patients with multiple sclerosis (MS) at higher risk of COVID-19 infection?

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Dear Sir,

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) disease (COVID-19) emerged first in Wuhan city of China and has been declared a pandemic [1]. Patients with underlying diseases such as diabetes, hypertension, and lung diseases are at higher risk of infection [2]. The symptoms include fever, dry cough, shortness of breath, fatigue, and in some cases gastrointestinal manifestations as well as hyposmia/anosmia and hypogeusia/ageusia [3]. Lymphopenia is a common laboratory finding [4]. Severe cases could develop acute respiratory distress syndrome (ARDS) or become fatal [5]. The rapid spread of the disease raises concerns regarding patients with autoimmune diseases receiving immunomodulatory or immunosuppressive agents such as people with (pw) multiple sclerosis (MS). Different factors play a role in COVID-19 morbidity and mortality in pwMS such as age, smoking habit, disability status, overweight due to reduced mobility, respiratory comorbidities, ongoing disease-modifying therapy (DMT), and the number of medical center visits needed for MRI examination, laboratory exam, clinical visits, or hospitalizations that are relapse related or for medication infusion during pandemic [6]. Considering DMT, first-line treatment includes interferons (IFNs) and glatiramer acetate thatare classified as very low-risk medication for pwMS during COVID-19 pandemic as well as teriflunomide [6]. In particular, INFs are supposed to be effective in treating viral infections as they inhibit replication of the viruses and play a role in developing adaptive immunity [7].

Other medications such as natalizumab and dimethyl fumarate are considered as low risk, while S1P modulator (fingolimod, siponimod, ozanimod, and ponesimod) and cladribine as medications with intermediate risk of infection [6]. Anti-CD20 medications such as rituximab, ocrelizumab, ofatumumab, and ublituximab deplete peripheral B cells which results in decrease of IL-6 production and reduction of inflammatory responses [8]. Of note IL-6 has a critical negative impact in Pneumovirus infection in the mouse [9] and levels of IL-6 are significantly higher in patients with ARDS as compared with patients with only severe pneumonia [10].

Other treatments which are used for irresponsive patients (mitoxantrone, alemtuzumab, and haematopoietic stem cell transplantation) are considered high-risk medications.

Based on the Multiple Sclerosis International Federation (MSIF), should continue their medications and if they develop symptoms or become test positive, consultation is recommended (https://www.msif.org/news/2020/02/10/the-coronavirus-and-ms-what-you-need-to-know/).

On the other hand, vitamin D is an immune modulator which plays an important role in the pathogenesis of many autoimmune diseases. Its deficiency is associated with ARDS, respiratory syncytial virus infection, and influenza and also overproduction of the cytokines [11–13] and prophylactic therapy reduces the risk of respiratory infection [14].

Vitamin D deficiency is considered one of the risk factors in MS, and in most cases, vitamin D is associated with the ongoing DMT to better control the disease course [15]. For pwMS, daily administration of 2000–3000 UI vitamin D supplements is recommended and for cases with vitamin deficiency based on laboratory findings 50,000 IU every 2 weeks for 8 weeks and then following 2000–3000 IU/day [16].

In conclusion, it might be supposed that some pwMS being treated with drugs potentially interfering with viral replication or lowering serum levels of cytokines involved in the development

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of ARDS might be at minor risk of developing severe clinical manifestation from SARS-Cov-2 infection.

Compliance with ethical standards

Conflict of interest None.

Ethical approval None.

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