Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Journal of Clinical Neuroscience 93 (2021) 282–283

Contents lists available at ScienceDirect

Journal of Clinical Neuroscience

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

Correspondence

Letter to the editor regarding "Coexistence of neurological diseases with Covid-19 pneumonia during the pandemic period"

ARTICLE INFO

Article history:
Received 26 July 2021
Accepted 28 July 2021

Keywords:
Neurological disease
COVID-19
Post-COVID 19 neurological syndrome
Prognosis
Neurorehabilitation

Dear Editor,

We read with great interest the article published recently by Gorgulu et al. [1] "Coexistence of neurological diseases with Covid-19 pneumonia during the pandemic period", where the authors investigated the prevalence of COVID-19 in patients presenting to the emergency department for neurological symptoms during the pandemic period, observing that out of 1098 neurological patients, 42 (3.8%) had definitive diagnosis through RT-PCR, and these had an average age of 73 years and had comorbidities, leading to 88% being admitted to the intensive care unit and a fatality rate of 40.5% (17) [1]. We thank the authors for providing us with such valuable evidence, however, we would like to make a few comments on two fundamental aspects in the prognosis of the COVID-19 patient with or without a history of neurological disorders, and the need to design and implement strategies to promote neurorehabilitation in low- and middle-income countries

Post-COVID-19 neurological syndrome was recently described [2,3], characterized by the persistence of neurological symptoms or development of mild or severe acute neurological events following the active phase of COVID-19, leading to high rates of morbidity, mortality, disability and health care costs [2–4]. It is a challenge to define neurological syndrome post-COVID 19, since most of the patients who develop neuroinflammation due to the infection are elderly people with cardiometabolic and neurovascular risk factors, making it difficult to differentiate the etiology precisely [4]. This is even more complex in young patients with severe phenotype development of COVID-19, who may present with cryptogenic stroke during hospital stay or in the short term after the acute phase of COVID-19 [5]. One of the major concerns and that should be a primary objective today, is the careful approach and rehabilitation in this type of patients, who may lose functional capacity due to difficulties in physical therapy, neurocognitive, nutritional, psychological and neurophysiological, due to prolonged stay in intensive care [2,3].

Frontera et al [6] conducted a prospective study where they followed 382 patients who developed neurological complications during the acute phase of COVID-19 for 6 months, observing that 91% at least persisted with 1 abnormal outcome, 56% had limitations in performing activities of daily living, 50% had cognitive impairment, 47% were unable to return to work, and 62% scored worse than average on $\geq$ 1 Neuro-QoL scale (worse anxiety 46%, sleep 38%, fatigue 36%, and depression 25%) [6]. The authors concluded that those who present any type of neurological complication during the acute phase of COVID-19 have a worse prognosis at 6 months compared to those who do not. However, it is observable that almost all of those who present neurological manifestations persist in the long term [6]. Therefore, it is expected that the prognosis in those with a history of neuropsychiatric disorders will be worse [4]. Cerebrovascular diseases, neuroendocrine and neuroimmune disorders are the most frequent complications in this type of patients, and these disorders, in turn, may involve extracranial organs through systemic axes (for example, the neuro-respiratory-inflammasome axis, which produces pulmonary injury) [4,7].

In this order of ideas, it is imperative to propose solutions to what is expected to be an epidemic of unspecific neurological disorders that may compromise the functional capacity of those affected by COVID-19. For this, the implementation and creation of specialized neurorehabilitation units are indispensable [8,9], especially in low- and middle-income countries, where, despite being a concept proposed approximately two decades ago, it is still emerging in these regions [8,9]. In this way, we can reduce the burden of neurological diseases in the near future, and recover or maintain the capacity of those affected. Unfortunately the evidence on this situation is limited and the exact prognostic progress of this

https://doi.org/10.1016/j.jocn.2021.07.056
0967-5868/

particular group of patients is not known, so an international epidemiological registry is needed to estimate the degree of severity and to set new goals for global neurology.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

None.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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