Irish Journal of Medical Science (1971 -) (2021) 190:851–852
https://doi.org/10.1007/s11845-020-02367-4

LETTER TO THE EDITOR

NeuroCOVID: critical review of neuropsychiatric manifestations of SARS-CoV-2 infection

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Received: 31 August 2020 / Accepted: 5 September 2020 / Published online: 9 September 2020

Keywords Corona virus infections · Coronavirus · COVID · Neurologic manifestations · Neuropsychiatry

Dear Editor,

We read with great interest Deana C's critical overview of emerging data amidst the novel coronavirus disease 2019 (COVID-19) pandemics about its treatment approach [1]. This is an increasingly relevant topic of discussion in all medical specialties including neurology and psychiatry. We expand the discussion here.

COVID-19 greatly impacts healthcare systems on a global scale. The widespread societal consequences understandably urge researchers to share information that may contribute to our understanding of this disorder. The plethora of publications regarding SARS-CoV-2 infection initially focused on general clinical presentation but the focus widened to include specific organ involvement as well as negative mental health outcomes. Ling Mao and colleagues' highly cited case series of hospitalized patients is an example of such efforts [2]. Recent reviews of the neurological symptoms of COVID-19 raise relevant questions regarding the quality of the scarce data emerging about neurological involvement [3]. Evidence of neurological disease associated with SARS/MERS-CoV favors the neuroinvasive potential of SARS-CoV-2 [4]. Most commonly reported neurological manifestations include nonspecific symptoms that may be consequence of the systemic inflammatory response rather than direct neurological involvement. In mild cases, the most consistent symptoms include hyposmia and dysgeusia probably related to SARS-CoV-2 pathophysiology (olfactory neuron transport) [2]. Specific neurological findings (e.g., ataxia, seizures) and serious neurological disease have also been reported [2, 5] (Table 1). Laboratory findings are largely nonspecific and SARS-CoV-2 is yet to be detected in cerebrospinal fluid [6]. Elevated D-dimer levels in severe cases may be associated with the increased risk of stroke although this finding could simply be a marker of inflammatory response [2]. Impact of past pandemics on mental health is well established with increased risk of anxiety and depression. The worsening of psychiatric symptoms in this setting is most likely related to chronic stress although there may be contribution of either acute infection or inflammatory response [4]. Individuals may develop stress-related anxiety and depressive disorders associated with several psychological and social factors. These include fear of negative disease outcomes and of transmitting the infection to loved ones; social stigma; unemployment; adjustment to new routines and family dynamics; and excessive workload, isolation, and discrimination in healthcare workers in contact with infected patients.

There are several limitations and biases to be taken into account when analyzing data from single case reports or limited case series: few data from ancillary studies; retrospective nature of the studies; absence of individual patient data to establish causal inferences; short follow-up duration to assess the possible development of postinfectious neurological syndromes; underdetection of neurological signs at admission, particularly in intensive care units with communication and neurological examination limited by several factors (e.g., invasive devices/equipment, constraints imposed by protective

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Table 1 Neurological symptoms and complications associated with SARS-CoV-2 infection

Neurological symptoms
Headache
Dizziness
Nausea/vomiting
Hypogeusia/ageusia
Hyposmia/anosmia
Impaired consciousness
Central respiratory failure
Myalgia
Most common neurological complications
Cerebrovascular
Ischemic stroke
Transient ischemic attack
Hemorrhagic stroke
Cerebral venous thrombosis
Infectious CNS disease
Meningitis/encephalitis
Acute hemorrhagic necrotizing encephalopathy
Encephalomyelitis
Inflammatory/immune
Acute myelitis
Guillain-Barré syndrome
Miller-Fisher syndrome

equipment); and data originating from a limited number of countries.

Data availability Not applicable.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Not applicable.

Consent to participate Not applicable.

Consent for publication Not applicable.

Code availability Not applicable.

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