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LETTER TO THE EDITOR - INFECTION

Comment about the article "SARS-CoV-2 can induce brain and spine demyelinating lesions," Acta Neurochir (Wien) 2020 Jul;162(7):1491–1494

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Dear Editor,

We have recently described a case of SARS-CoV-2 patient with sudden onset of seizure and hyperkinetic delirium, showing multiple demyelinating lesions on brain MRI [4].

The potential of SARS-CoV-2 to trigger immune-mediated neurological disease, at least with respect to the peripheral nervous system, has been elucidated by the reference of five SARS-CoV-2-associated cases with Guillain-Barré syndrome, and few cases of acute multifocal demyelinating lesions have also been reported [2, 3, 5]. Patients had normal CSF and high signal intensities on MRI, typical of acute disseminated encephalomyelitis. Acute disseminated encephalomyelitis is a syndrome of multifocal demyelination, typically occurring weeks after an infection, which generally presents with focal neurological symptoms, often with encephalopathy.

At variance, neurological symptoms in our patient occurred during the infection and were concomitant with respiratory disturbances. She was transferred to rehabilitation after 2 weeks, but after a transient minimal improvement, she was re-admitted in our department.

During re-hospitalization, several diagnostic tests were carried out in order to further support the hypothesis of neurological impairment triggered by SARS-CoV-2 infection. Moreover, we investigated other possible pathophysiological mechanisms related to demyelination.

CSF analysis, including paraneoplastic/autoimmune panel (anti-HuD, anti-Yo, anti-Ri, anti-amphiphysin, anti-MA2, anti-NMDA, anti-CV2), aquaporin 4 antibodies, was negative except for the presence of ten oligoclonal bands and slightly positive IgG index. CSF/serum-albumin ratio was normal. Serum analysis for autoantibodies (anti-ganglioside panel, anti-myelin-associated glycoprotein, anti-ENA, anti-cardiolipin) was negative. Inflammatory and coagulation panels showed normal results. We detected high IgG and low IgM for EBV, CMV, HSV, and VZV. EBV and CMV DNA was not found. About 2 months after COVID-19 infection, both nasopharyngeal swabs and CSF resulted negative for SARS-CoV-2.

A new brain MRI excluded new demyelinating or contrast enhancing lesions, thus supporting the alternative hypothesis of an antecedent demyelinating disease, likely attributable to progressive multiple sclerosis, in line with the CSF oligoclonal bands findings. In fact, the patient's medical history failed to reveal previous neurological symptoms/signs of demyelinating lesions but a progressive frailty syndrome with loss of autonomy of daily living activities.

At first admission, seizures starting from right frontotemporal region and diffusing in homologous contralateral hemisphere were the main initial SARS-CoV-2-related symptoms, whereas anosmia and ageusia were referred few days before [4]. No abnormalities at arterial blood gas analysis were detected; indeed, respiratory failure occurred during hospitalization at the same time delirium developed. Therefore, we originally speculated for a close association between SARS-CoV-2 and demyelinating lesions, although an

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undiagnosed, previously asymptomatic, demyelinating pathology would have been a rather reasonable diagnosis.

During the second hospitalization, the patient slowly improved. No other epileptic seizures or other new neurological symptoms occurred, and she was discharged after 2 weeks without consciousness disturbances.

This case report strongly argues for the need of careful clinico-diagnostic assessment of patients during COVID19 pandemia. Although encephalopathies and encephalitic cases have been increasingly accumulated, a direct neuroinvasion of SARS-CoV-2 has been rarely confirmed, and in most cases, an inflammatory/immunological mechanism has been claimed [1]. Our case rather supports the view that SARS-CoV-2 infection might worsen the clinical neurological status of patients with neuroimmunologic diseases including demyelinating syndromes such as multiple sclerosis.

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Compliance with ethical standards

Patient consent The patient has consented to the submission of this Letter to the Editor for submission to the journal.

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