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Neuroimmunology Reports 1 (2021) 100035

Contents lists available at ScienceDirect

Neuroimmunology Reports

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

Neuro-Behcet's disease in the setting of active COVID-19 infection

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ARTICLE INFO

Keywords:
Neuro-behcet's disease
Sars-cov-2
Novel coronavirus

ABSTRACT

Background: Cases of SARS-COV-2 triggering or exacerbating autoimmune responses has been described in the literature, and it has shown that use of steroids in non-severe COVID-19 may potentially increase mortality.
Case presentation: A 22 year-old African-American man presented with headache, weight, loss, and oral/scrotal ulcerations.
Case report: Neurological exam revealed somnolence and right hemiplegia. MRI was remarkable multiple enhancing lesions involving the brainstem and left hemisphere. He was found to have a positive SARS-CoV-2 test. Work-up was unrevealing, and he was diagnosed with Neuro-Behcet's disease (NBD) based on the International Criteria for Behcet's Disease (ICBD)ackspaceD)BackspaceBackspacep. The patient was treated with systemic steroids, which resulted in both clinical and radiological improvement of his disease without exacerbation of his SAR-CoV-2 infection.
Conclusions: This case presentation suggests that IV steroids may be safe in the treatment of NBD in adult patients presenting with SARS-CoV-2 infection.

Case presentation

A 22 year-old African-American man presented to the emergency department with 3 weeks of extreme fatigue and generalized weakness. Additional symptoms included headache, reduced vision in the right eye, scrotal ulcerations, and weight loss. His-past medical history was remarkable for asthma and migraine headache. There was also a history of ulceration involving the gastrointestinal tract due to uncertain etiology. On admission, he was found to have a low-grade fever of 99.8F. General exam was remarkable for lesions involving the oral and scrotal regions. Neurological exam revealed somnolence with right facial droop, dysarthria, and 3/5 right-sided hemiplegia. A rapid screen test for COVID-19 was positive. HIV, TB-gold, RPR, TSH, Lyme, ANA, anti-SSA, anti-SSB, toxoplasmosis IgG/IgM, ANCA antibodies and liver function tests were unremarkable. An ESR was elevated at 34. Chest x-ray was negative for pulmonary infiltrates or hilar adenopathy. Brain MRI revealed multifocal abnormal enhancing lesions in bilateral cerebral hemispheres, left thalamus, and brainstem (Fig. 1a–d). Spinal fluid analysis showed mild elevation of protein (57 mg/dl), 41 white blood cells (53% Neutrophils), and normal glucose. CSF cytology and flow cytometry demonstrated only neutrophils and was negative for malignancy. CSF ACE levels, toxoplasmosis, and oligoclonal bands were either negative or within normal limits. Encephalitis and bacterial panels on CSF were negative for E. coli, H. influenza, N. menigitidis, listeria monocytogenes, streptococcus, pneumoniae, CMV, enterovirus, HSV-1, HHV6, VZV, and cyptococcus neoformans. All bacterial (including AFB) and fungal cultures were negative. Neurology and rheumatology evaluations were obtained. Based on the presence of oral/GI ulcers and brain MRI findings, the patient was diagnosed with NBD per International Criteria for Behcet's disease (ICBD) (International Team for the Revision of the International Criteria for Behcet's, D., 2014). There was initially concern about potential detrimental effects of steroids in the setting of COVID. However, due to the severity of his neurological disease, the patient was eventually administered a course of methylprednisolone 1 g IV over 4 days, receiving 250 mg IV on day 5, and then transitioning to a prednisone 60 mg taper. Ophthalmology was unavailable for an in-person examination to address the reduced right eye vision, and he was lost to follow-up for his outpatient appointment.

Discussion

Neuro-Behcet's disease (NBD) is an autoimmune disorder characterized by the presence of inflammatory CNS lesions typically involving the brainstem and thalamic regions (Lee et al., 2001) in the setting of mucous membrane ulceration and treated with steroids and immunosuppressive agents. Our patient met the International Criteria for Behcet's disease based on the presence of oral (1 point) and genital (2 points) aphthosis (International Team for the Revision of the International Criteria for Behcet's, D., 2014). Behcet's disease with neurologic involvement is reported to be 10% and mostly affects males. Neuro-

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https://doi.org/10.1016/j.nerep.2021.100035
Received 15 June 2021; Received in revised form 16 September 2021; Accepted 16 October 2021

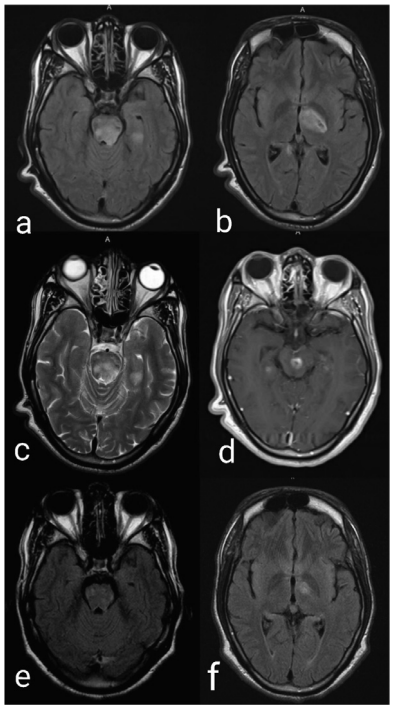

Fig. 1. Brain MRI FLAIR and T2 sequences show multifocal abnormal lesions involving the biiateral cerebral hemispheres, left thalamus, and brainstem (a–c). There was an enhancing brainstem lesion (d). Repeat imaging after 3 weeks showed significant improvement of brainstem and thalamic lesion (e,f).

logical involvement is parenchymal and non-parenchymal (e.g. venous thrombosis and stroke). Parenchymal is further divided into brainstem, multifocal, myelopathy, cerebral cortical and optic neuropathy.

The novel coronavirus, SARS-CoV-2, which emerged in December 2019, results in pulmonary infiltrates that ultimately lead to acute respiratory failure. The literature has described cases of SARS-COV-2 triggering or exacerbating autoimmune responses as well as that use of steroids in non-severe COVID-19 may potentially increase mortality.

To our knowledge, this case represents the first presentation of NBD with active COVID-19 infection. Our suspicion was that the presence of SARS-CoV-2 triggered an exaggerated immune response leading to the NBD exacerbation. Supportive evidence includes inflammatory CSF without a discernible positive central nervous system infection and a significant response to steroids despite otherwise debilitating intracranial lesions. We do not believe that the patient was experiencing a disseminated encephalitis due to SARS-CoV-2 because of the focality of the lesions seen on MRI, the surrounding edema with regard to those lesions, and the presence of gadolinium enhancement of parenchymal lesions with sparing of the leptomeninges.

Our treatment objective was to manage his chief complaint, which was related to the NBD without exacerbating his COVID-19 infection. The choice treatment for acute NBD presentation is IV steroids, an intervention that has been considered either ineffectual or counterproductive in patients with non-severe SARS-CoV-2 infection with supplemental oxygen requirement based on WHO guidelines and results from the RECOVERY trial. Treatment of mild COVID 19 with steroids has been shown to be associated with significantly higher mortality (16.9% vs. 13.5%) with a number needed to harm of 29 (Pasin et al., 2021). As a result of these clinical observations, we were reluctant to treat the patient with IV methylprednisolone and immunomodulating agents. However, we suspected that the SARS-Cov-2 may have triggered an autoimmune response in this patient that worsened during the course of his admission, thus prompting initiation of the steroid regimen described above. In this case, we found that aggressive immunosuppressant therapy nearly resolved the patients' CNS lesions related to NBD without resulting in a disseminated viral infection syndrome. Thus, our patient's favorable outcome suggests that steroids may be safely administered in adults with active NBD in the presence of mild SARS-CoV-2 infection, but results may vary depending on the clinical presentation. Thus, we suggested consideration of steroid treatment in this population following a discussion of risks and benefits with the patient.

Patient outcome

With treatment, the patient's alertness returned to baseline with improvement of speech. He had persistent right face and arm weakness. A repeat brain MRI (Fig. 1e,f) 3 weeks later showed significant improvement of brainstem and thalamic lesions.

Declaration of Competing Interest

I have no conflict of interest to report.

Study funding

No targeted funding reported

Acknowledgments

This work was not funded.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.nerep.2021.100035.

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