The Double Whammy—Opsoclonus–Myoclonus–Ataxia Syndrome and COVID-19: A Case Report

Since the emergence of coronavirus disease 2019 (COVID-19), a plethora of neurological syndromes and complications have been unravelled. Opsoclonus–myoclonus–ataxia syndrome (OMAS) is a rare disorder that was first described in 1962 in infants by Kinsbourne and is much more common in children than in adults. The syndrome is diagnosed by the presence of three out of the following four clinical manifestations: opsoclonus; myoclonus and/or ataxia; behavioural changes and/or sleep disturbances; and tumours or presence of anti-neuronal antibodies.[1] While paraneoplastic OMAS is more common, parainfectious OMAS has also been reported with various infections. We hereby report a case of postinfectious OMAS following COVID-19 infection.

A 64-year-old woman developed COVID-19 infection and presented with fever and breathlessness. She was treated with
oral steroids and minimal oxygen for 5 days. She is a diabetic and had undergone renal transplantation 20 years ago. Her renal function was stable with prednisolone 10 mg and mycophenolate mofetil. On day 11 after recovery from COVID-19, she developed altered behaviour with irrelevant talks followed by one episode of generalized seizure. On examination, she was disoriented with no focal signs. Random blood sugar was more than 600 mg/dL. Laboratory workup revealed normal renal and liver parameters, electrolytes and urine ketones. She was started on levetiracetam and insulin infusion. Two days later, she developed severe generalized myoclonic jerks involving all four extremities and trunk that worsened with stimulus such as sound and movements. On examination, she had marked multidirectional, high amplitude and fast frequency, irregular conjugate eye movements suggestive of opsoclonus. Her speech was slurred and was associated with marked ataxia of limbs and trunk [Video 1]. Magnetic resonance imaging (MRI) of the brain and cerebrospinal fluid (CSF) analysis were normal. She was treated with intravenous steroids (methylprednisolone 1 gm/day for 5 days). A detailed workup for paraneoplastic antibodies (ANNA-1, ANNA-2, PCA-1, MA2, CV2, amphiphysin, SOX1, recoverin, titin, Zic4, GAD65, Tr) and autoimmune antibodies (NMDA, AMPA, GABA-B, LGI-1, CASPR2) in serum and CSF was negative. Whole-body FDG-PET CT was normal. She had moderate improvement in opsonclus and myoclonus jerks following pulse steroids. Subsequently a few days later, her OMA symptoms had worsened and she became drowsy. Hence, she was started on intravenous immunoglobulin (400 mg/kg/day) for 5 days and rituximab 1 gm infusion. She responded well, and her opsoclonus and myoclonus completely improved on follow-up after 2 weeks [Video 2].

Our patient presented with acute onset of opsoclonus–myoclonus–ataxia syndrome during the recovery phase of COVID-19 infection. Other causes like paraneoplastic, autoimmune and drugs were also considered, but her autoimmune, paraneoplastic workup and PET scan of the whole body were negative. Even though her hyperglycaemia and renal disease are risk factors to trigger myoclonus, the sudden onset and the temporal course of the neurological symptoms after COVID-19 infection are more favourable for postinfectious aetiology.

OMAS in adults is commonly associated with malignancies such as small cell lung carcinoma followed by breast, ovarian malignancies and nasopharyngeal carcinoma. Idiopathic and parainfectious causes are more common in patients less than 40 years and are associated with a better prognosis. The presence of infection should not preclude a paraneoplastic workup in any patient presenting with OMAS.

To the best of our knowledge, 16 cases of COVID-19-related myoclonus–ataxia syndrome were published in the literature. All of them had mild-to-moderate pneumonia except one who had severe infection. Neurological symptom onset ranged from as early as 3 days post-COVID-19 infection up to 6 weeks. Nine patients had the three components of OMAS, such as opsonclus, myoclonus and ataxia. Confusion and behavioural changes were reported in two cases. All of them had normal imaging and CSF analysis. Paraneoplastic and autoimmune antibody workup was conducted in three patients, and it was negative. Ten of them were treated with IVIg, out of which three had received both IVIg and pulse steroid. One patient had received oral steroids alone. Twelve patients had significant improvement with immunotherapy. Exact pathogenesis of OMAS post-COVID-19 infection is not known. The probable mechanism behind the pathogenesis of OMAS is an immune-mediated dysfunction of the cerebellum and brainstem. Inflammatory activation of the nervous system by unidentified SARS-CoV-2 antigens could be the cause for neurological symptomatology.

Our patient had a transient response to systemic pulse steroid therapy and antiepileptic drugs; however, she had a remarkable improvement with intravenous immunoglobulin and rituximab. In conclusion, OMAS is a rare complication of COVID-19 infection and early initiation of aggressive immunotherapy may provide complete remission.

Informed written consent
The authors attest that all necessary patient permission papers have been acquired. The patient has consented in the form for her photographs and other clinical information to be published in the journal. The patient is aware that her name and initial will not be published and that every effort will be taken to keep her identity hidden, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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