COVID-19 vaccine induced opsoclonus-myoclonus syndrome: a case report

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OBJECTIVES

Opsoclonus-myoclonus-ataxia syndrome (OMAS) is a complex autoimmune movement disorder characterized mainly by opsoclonus, myoclonus and/or ataxia, and behavioral changes and/or sleep disturbances. The proposed diagnostic criteria are the presence of all three findings or the presence of a tumoral condition or antineuronal antibody positivity in addition to two clinical findings. Opsoclonus is caused by the release of ocular instability and oscillations with the removal of inhibition on saccadic burst neurons located in the paramedian pontine reticular formation and the rostral interstitial nucleus of Cajal as a result of brainstem or cerebellar dysfunction. OMAS in children is most often of paraneoplastic origin, and can also result from parainfectious, postinfectious, toxic and metabolic disorders, and organic events that cause damage to the brainstem or cerebellum. Post-vaccination OMAS has also been reported in a small number of cases. Herein we report a 15-year-old girl who developed OMAS 24 hours after her first dose of mRNA COVID-19 (BioNTech) vaccine.

METHODS

We retrospectively analyzed the patient's data from the database of Kocaeli University Medical Faculty Hospital.

RESULTS

In January 2022, a 15-year-old girl presented to the emergency department with complaints of fever, malaise, headache, subjective vertigo and fainting. The patient had received the first dose of Pfizer-BioNTech BNT16B2b2 mRNA vaccine a day before her hospitalization. Also, she had a history of COVID-19 infections in October 2020 and October 2021, respectively, without any neurologic abnormalities. There was no previous history of other significant health problems. On physical examination, she had a fever of 38°C, ataxia, and opsoclonus. Her cognition was normal. The striking neurological sign was the presence of opsoclonus. When she attempted to align the gaze on a point, there was dysmetric overshoot of the eye movement which persisted in sleep. Uncorrected visual acuity was 20/20 OD and 20/20 OS, with normal pupillary responses. The findings of anterior and posterior segment examination of each eye were normal. Deep tendon reflexes were normal and there were no upper motor neuron signs. Myoclonus and other movement abnormalities were not observed. There were behavioral changes and her sleep pattern was disturbed. There was no organomegaly or lymphadenopathy. The rest of the physical examination was normal. Whole blood count, serum biochemistry and spot urine analysis were normal. Cerebrospinal fluid analysis revealed total protein 23.1 mg/dl, glucose 74.6 mg/dl, and no cells. CSF RT-PCR panels for meningitis-encephalitis and SARS-CoV-2 were negative. SARS-CoV-2 RT-PCR was also negative on nasopharyngeal swab. Serum COVID-19 IgM was negative, and COVID-19 IgG positive. Brain MRI and EEG were normal. Pelvic and abdominal ultrasonography, chest and spinal radiographs were normal. Serum autoimmune encephalitis and paraneoplastic autoantibody panels were all negative. Serum alpha-feto protein (AFP), human chorionic gonadotropin (beta-hCG), and neuron specific enolase (NSE) levels were normal. There was not any evidence of neural crest tumor. The patient received intravenous immunoglobulin (IVIG) with a total dose of 2g/kg for 4 days. After 10 days of hospitalization, her gait was not ataxic, but opsoclonus was still ongoing. Since it continued at the follow-up examination one and a half month later, she was also given 2 doses of rituximab (RTX) infusion (750 mg/m^2) with an interval of 2 weeks. Chaotic eye movements were relatively reduced with rituximab treatment but persisted at the end of 7 months.

CONCLUSIONS

This case suggests a possible autoimmune post-vaccinic etiopathogenesis of OMS, rarely described in the literature. although the side effects of the mRNA COVID-19 vaccine such as acute transverse myelitis, acute demyelinating polyneuropathy, and acute disseminated encephalomyelitis are well known, we believe that OMAS should be listed among the rare neurological side effects of the mRNA COVID-19 vaccine.