Myasthenia gravis with ocular symptoms following a ChAdOx1 nCoV-19 vaccination: A case report

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ABSTRACT

Purpose: We report on the case of a 35-year-old man who developed myasthenia gravis with ocular symptoms following a ChAdOx1 nCoV-19 vaccine injection.

Observations: A 35-year-old man complained of binocular diplopia one month following ChAdOx1 nCoV-19 vaccination. He had weak infraduction of the left eye. Upper and lower extremity strength was normal on presentation. A serum antiacetylcholine receptor antibody titer was elevated at 1.60 nmol/L. His diplopia improved temporarily following the application of an ice pack for 2 min.

Conclusions and importance: This case report describes a rare occurrence of myasthenia gravis with ocular symptoms as a potential complication of ChAdOx1 nCoV-19 vaccination.

1. Introduction

In December 2019, the World Health Organization announced that a novel coronavirus, SARS-CoV-2, was responsible for a pandemic outbreak of coronavirus disease-19 (COVID-19). More than four million people worldwide have died because of this ongoing outbreak. Currently available vaccines have shown excellent and promising results in pre-vaccination: A case report...
both upper and lower extremities, and diarrhea. He developed nausea four days following the vaccination, and all these symptoms then spontaneously resolved. One week after the vaccination, the patient developed an acute-onset of vertical binocular diplopia. On review of the case, there were no other symptoms.

On ocular examination, his visual acuity was 20/20 and intraocular pressure was normal in both eyes. We measured an 8 prism dipters (PDs) left hypertropia. The extraocular motility test showed full ductions of his right eye. But we observed a 75% infrafraction in the left eye. His diplopia temporarily improved following ice packing for 2 min. Both pupils reacted normally to direct light, and we observed no disability in afferent pupillary reactions. The anterior segment examination showed normal findings, and the fundus examination revealed a healthy-appearing optic nerve. Retinas in both eyes were without significant torsion.

His upper and lower extremity strength on both sides was normal, as were his deep tendon reflexes.

Our review of a pre- and post-contrast high-resolution cranial nerve magnetic resonance 3-D imaging using a 3-T system (Magnetom Skyra; Siemens Healthineers, Erlangen, Germany) revealed no abnormality in the cranial nerve III, IV, or VI pathways, and we found no abnormality on magnetic resonance angiography.

Laboratory tests, including white blood cell count, hemoglobin level, erythrocyte sedimentation, C-reactive protein, and electrolytes were all normal. Serological investigations revealed a positive antinuclear antibody result, whereas the patient’s antineutrophil cytoplasmic antibody showed a negative result. The anticardiolipin antibody, ganglioside antibody, and thyroid antibody were all noted to have been within normal range. Acetylcholine receptor antibodies were noted as 1.60 nmol/L, which was above the normal limit (normal range 0–0.500 nmol/L). Based on the above results, the patient was diagnosed with myasthenia gravis with ocular symptoms. No thymus abnormality was observed on chest computed tomography.

3. Discussion

Myasthenia gravis is an autoimmune disease caused by autoantibodies to the acetylcholine receptors at the neuromuscular junction. The availability of acetylcholine receptors at the postsynaptic neuromuscular junction decreases because of antibody destruction and the inflammatory response in myasthenia gravis patients. Most patients with myasthenia gravis commonly have an initial presentation of ocular manifestations, such as pupil-sparing ptosis and/or diplopia. Myasthenia gravis diagnosis can be confirmed by seropositivity of acetylcholine receptor antibodies or of antibodies to other neuromuscular junction proteins, including antimuscle specific tyrosine kinase. Finding elevated acetylcholine receptor antibody levels is highly specific for myasthenia gravis, although only 85%–90% of patients with generalized myasthenia gravis and 50% of ocular myasthenia gravis patients have detectable antibodies.

The key pathogenic mechanism of autoimmune disease such as myasthenia gravis is thought to be molecular mimicry by which viral or bacterial agents trigger an immune response against autoantigens. In the development of myasthenia gravis, antibodies produced by an inflammatory response in myasthenia gravis patients. Most patients with myasthenia gravis following vaccination may cause myasthenia gravis with ocular symptoms. The underlying mechanism of the disease following vaccination requires further investigation.

4. Conclusion

This case report implies that COVID-19 vaccination may cause myasthenia gravis with ocular symptoms. The underlying mechanism of the disease following vaccination requires further investigation.

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

The following authors have no financial disclosures: MCK, KAP, JHM, SYO.

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