

Anti-N-methyl-D-aspartate receptor optic neuritis in a patient without history of encephalopathy

N-methyl-D-aspartate (NMDA) receptors are heteromers composed of two NR1 and NR2 subunits, which interacting with glycine and glutamate play key roles in synaptic transmission and neural plasticity. The antibody against this receptor manifested as anti-NMDA receptor encephalitis, might be excitatory, which is presented with epilepsy, dementia, and stroke, or inhibitory, which is presented with schizophrenia.^[1] It has been observed that most of the patients suffered from different kinds of mentation disturbances, including akinesia, agitation, paradoxical responses, and decreased the level of consciousness. Seizure is seen in 76% of patients (54% with generalized tonic-clonic seizure and 10% with partial complex one) and 92% of patients have been diagnosed with electroencephalography (EEG) abnormality. In this regard, orofacial dyskinesia was among the most associated movement disorders.^[2] Among the patients, 55% have been found with brain magnetic resonance imaging (MRI) abnormality, while 95% have been found with cerebrospinal fluid abnormalities, which are useful laboratory findings on anti-NMDA-receptor encephalitis diagnosis.^[2] This syndrome is more common among females than males, and screening for ovarian teratoma is a main consideration in female patients.^[2]

A 31-year-old female patient was referred to the multiple sclerosis clinic due to the right eye blurred vision. Since the patient complained of pain on eye movements and presented positive right Marcus Gunn pupil, she was diagnosed with right optic neuritis. Her visual activity decreased to 6/10; however, the funduscopy examination was normal. Other neurological examinations were normal. She did not have any history of seizure, psychiatric syndrome, and new movement disorders. Family and medical histories were unremarkable, and drug history was negative too.

Anti-Aquaporin 4 and anti-myelin oligodendrocyte glycoprotein antibodies, vasculitis tests, angiotensin-converting enzyme, anti-Borrelia antibody, and neoplastic screening (including chest and abdominal computerized tomography scans) were normal. EEG was also normal. Oligoclonal band was negative. Brain and cervical cord MRI was normal. Anti-NMDA receptor antibody was positive at high titer. In the visual evoked potential examination, the right P100 latency significantly increased more than the left side. Following high-dose corticosteroid pulse therapy, visual acuity

recovered significantly. Azathioprine was prescribed for maintenance therapy.

According to the existing documents, optic neuritis is not as common as the first manifestation of the anti-NMDA-receptor syndrome. When optic neuritis was presented as an initial presentation of the anti-NMDA-receptor syndrome, it was presented atypical and with cognitive problems and altered mentation.^[3] In the case reported by Mugavin *et al.*, cognitive impairment and emotional outbursts were important clues for the diagnosis of anti-NMDA-receptor encephalitis. However, in our case, the optic neuritis was the only sign and symptom of the disease. Anyway, as far as the authors of the present study are concerned, the characteristic features of anti-NMDA-receptor-induced optic neuritis have not yet been defined clearly.^[3] Recurrent optic neuritis (the second episode) has been reported in a 10-year-old girl with a positive anti-NMDA receptor antibody. She presented three episodes of epileptic seizures after corticosteroid discontinuation.^[4]

In contrast, in a model of experimental autoimmune encephalomyelitis with optic neuritis, it was shown that memantine as an NMDA receptors blocker can protect retinal ganglion cells and cause better optic neuritis prognosis.^[5] Therefore, memantine may be a treatment choice for optic neuritis with anti-NMDA receptor antibody. However, further studies are required to confirm this hypothesis.

The authors of the present study believe that the case discussed here is the only case presentation in which optic neuritis was the only symptom of the anti-NMDA-receptor syndrome and this association might be considered when common etiologies are ruled out. However, further studies are required to examine a larger number of patients with optic neuritis and positive anti-NMDA receptor antibody to confirm the association of optic neuritis with anti-NMDA receptor syndrome.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due

efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

The authors declare that there are no conflicts of interests of this paper.

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