Case report

Anti-MOG antibody associated recurrent optic neuritis

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Introduction

Recurrent optic neuritis is associated with multiple sclerosis (MS) and neuromyelitis optica spectrum disorders (NMOSD)[1]. NMOSD is typically associated with recurrent attacks of optic neuritis and spinal cord involvement and seropositivity for aquaporin-4 antibodies; although some 10-40% remain AQP4 seronegative with NMOSD phenotype. Anti-MOG antibodies have a wider association with optic neuritis, transverse myelitis and encephalitis and is not limited to NMOSD. This distinct disease entity is proposed a new term, MOG-IgG-associated optic neuritis, encephalitis and myelitis (MONEM)[2,3]. We report a case of MOG antibody-associated recurrent optic neuritis that recurred after an unusually protracted interval.

Case report

A 30-year-old man presented with acute onset deterioration of vision in both eyes. The visual loss in the left eye developed over 12 hours and he noted that the vision was reduced to only finger counting. The vision loss was initially patchy, gradually progressing to complete loss of vision. There was no fever or constitutional symptoms. Six days prior to his presentation he had noticed subacute loss of vision in the right eye. He did not have intractable hiccups, vomiting or nausea. The patient did not complain of other neurological deficits. There was no history suggestive of connective tissue diseases.

In the year 2000, at the age of 13 years, he had been diagnosed with steroid sensitive bilateral optic neuritis. In 2005, at the age of 18 he had developed right-sided Bell palsy which had recovered with a short course of steroids and physiotherapy. The rest of his medical history was unremarkable.

On examination, the vision in the right eye was reduced to only perception of light while the visual acuity was 6/60 in the left eye. Fundal examination showed temporal pallor of the left optic disc and blurred margins of the right optic disc. Eye movements were full. Rest of the neurological examination was normal. His general and other system examinations were normal.

The full blood count, liver and renal profiles along with serum inflammatory markers were within normal limits. MRI of the brain and orbits with contrast, were normal. The cerebrospinal fluid analysis including the full report, pyogenic cultures and oligoclonal bands were negative. Serum was negative for aquaporin-4 antibodies and anti-nuclear antibodies. However, anti-MOG antibodies were detected in serum (cell-based assay, Euroimmun).

A diagnosis of anti-MOG antibodies-associated optic neuritis was made. He was treated with intravenous methylprednisolone 1 g daily, pulses continued for 5 days. On day 5 of treatment, his visual acuity had improved to 6/60 on the right and 6/36 on the left. Following intravenous steroid pulses, he was continued on oral prednisolone 1mg/kg/d while commencing on mycophenolate mofetil (MMF) 250 mg twice daily which was gradually titrated up to 1 g twice daily over the next 4 weeks. Prednisolone was tapered gradually over 4 weeks to 20 mg/d.

By the end of one month of treatment his visual acuity had improved to 6/12 in the right eye and 6/6 in the left eye.

Discussion

We report a case of recurrent of optic neuritis with MOG-antibody seropositvity that relapsed after a protracted interval of 17 years. The previous longest interval reported between two episodes of autoimmune optic neuritis is 14 years[4]. Recurrent optic neuritis is characteristic in multiple sclerosis, neuromyelitis optica spectrum disorders and anti-myelin oligodendrocyte glycoprotein (anti-MOG) associated neurological diseases[2].

Anti-MOG IgG is associated with a wide variety of clinical presentations, majority of which are optic neuritis, encephalitis with brain demyelination lesions and myelitis. However, of this wide spectrum of disorders associated with anti-MOG antibodies, only a third of patients fulfil the criteria for NMOSD. Out of the MOG Ig-associated phenotype spectrum the most prevalent is optic neuritis (41-60%) while combined optic neuritis and myelitis occur in only 6-24%[2]. Anti-MOG IgG is considered a unique biomarker of CNS demyelinating disease and is useful in differentiating it from multiple sclerosis[3].

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Myelin oligodendrocyte glycoproteins are a highly immunogenic component of the myelin sheath albeit accounting for less than 0.5% of its composition. Although the disease spectrum of MONEM and aquaporin IgG seropositive NMOSD overlap to a certain degree in clinical presentation, the pathological process has striking differences. In NMOSD, the primary pathology is the astrocyte damage due to the antibodies to aquaporin-4 protein resulting in a secondary loss of oligodendrocytes and demyelination. There is no astrocytopathy in MOG IgG-associated patients, where the pathology is primarily demyelination affecting oligodendrocytes, which predicts better prognosis and good recovery with the disease predominantly affecting the optic nerves.

The rate of relapse of optic neuritis is lower in MOG Ig-associated optic neuritis[5] than in NMOSD. Furthermore, the recovery from an episode of optic neuritis is better than in NMOSD and are at a lower risk of sustained visual impairment as one episode may result in less retinal neuronal loss in MONEM.

Treatment of MOG Ig-associated optic neuritis is with intravenous methylprednisolone, plasma exchange or intravenous immunoglobulin similar to other CNS immune-mediated conditions. Intravenous methylprednisolone followed by oral corticosteroid therapy has shown short-term benefit by accelerating the rate of recovery of vision[6,7]. However unlike in NMOSD, long-term management options with steroids and immune suppression has not been adequately studied. The monophasic nature and lower risk of relapse in MOG antibody-associated optic neuritis brings uncertainty in to the need for long-term therapy. The use of immunosuppressants may reduce the number of relapses[8]. In patients with relapse following acute treatment with steroids, use of intravenous immunoglobulins or mycophenolate mofetil (MMF) is the next option in treatment. Prolonged steroid taper is recommended as second line drugs such as MMF may take months to reach full efficacy[2].

The challenge in management of MOG antibody-associated disease is the long-term management. The need for therapy itself is a decision of uncertainty given the possibility of monophonic disease with good recovery. The relevance of persistence of MOG antibodies and its titres in predicting the necessity for long-term therapy remains unresolved[2].

References

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