Recurrent Optical Neuritis and Systemic Lupus Erythematosus in a case of benign form of Neuromyelitis Optica Spectrum Disorder

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Abstract

Introduction: Neuromyelitis optica (NMO) can occur in the context of autoimmune diseases, particularly systemic lupus erythematosus, in what is now defined as NMO spectrum disorders (NMOSD).

Case Report: We describe a case of a 32-year old woman with recurrent optic neuritis and a long-standing history of systemic lupus erythematosus (SLE). She was subsequently found to be seropositive for neuromyelitis optica immunoglobulin G (NMO-IgG) (anti-aquaporin-4 antibody) and was diagnosed with NMOSD. Five years after this diagnosis the patient remains clinical stable (no relapses) with low doses of oral prednisolone.

Discussion: There are no specific recommendations for the treatment of NMO/SLE overlapping cases and few data exist on a possible benign form of NMO. We present a case illustrative of a good-outcome NMOSD.

Keywords: Systemic lupus erythematosus, Neuromyelitis optica, NMO-IgG aquaporin-4 antibody.

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Introduction

Neuromyelitis optica (NMO) is an inflammatory CNS syndrome distinct from multiple sclerosis (MS) that is associated with serum aquaporin-4 immunoglobulin G antibodies (AQP4-IgG) [1]. Traditionally, NMO was considered a monophasic disorder consisting of simultaneous bilateral optic neuritis and longitudinally extensive transverse myelitis, but the discovery that most patients with NMO have detectable serum anti-bodies that target the water channel aquaporin-4 (AQP4-IgG) and that these are highly specific for clinically diagnosed NMO and have pathogenic potential, further broadened the clinical and neuroimaging spectrum of NMO. Transverse myelitis, optic neuritis, relapsing myelitis or neuromyelitis optica can occur in the context of autoimmune diseases, particularly systemic lupus erythematosus and Sjögren’s syndrome [2-7], but recent studies show that rather than a secondary vasculitic complication of the systemic disorder, these manifestations in patients with systemic lupus erythematosus or Sjögren’s syndrome who are seropositive for AQP4-IgG represent the coexistence of two autoimmune diseases [8-10], warranting a different therapeutic approach.

Case Report

We present the case of a 32 year old woman with a diagnosis of SLE on hydroxychloroquine, with long standing malar rash since age 16, a three year non-erosive polyarthritis involving the ankles, elbows and metacarpal joints and ANAs (anti-nuclear) and anti-dsDNA (anti-double stranded DNA) antibodies positivity, with no antiphospholipidic antibodies. In December 2008, she had a retrobulbar optic neuritis in the left eye and was admitted at another institution. Visual acuity was 1/10 in the left eye and her brain MRI showed high intensity signal STIR (short tau inversion recovery) on the left optic nerve (image not available), but was otherwise unremarkable. She was started on high dose methylprednisolone (1 g daily for 5 days) and then prednisolone 40 mg for three weeks with slow tapering. Her vision gradually improved and she partially recovered at the end of the first month. Her visual acuity was 8/10, but there was slight pallor of the optic disc and her visual field testing showed a cecocentral scotoma (Figure 1). She remained asymptomatic for nearly two years, but in February 2011 she presented to our department with a painless sudden onset of loss of vision in the right eye. Her visual acuity was 2/10 in the right eye and there was no optic disc edema. The visual field testing now showed a de novo arcuate scotoma in the right eye (Figure 2) and the brain MRI revealed an T2 high signal of the right optic nerve with no gadolinium enhancement and a slight atrophic left optic nerve (Figure 3); there were no lesions in the brain parenchyma or the spinal cord. On the Visual Evoked Potentials (VEP) there was a bilateral increase in the P100 waves latency. Her immunological testing was identical to the previous afore mentioned and her CSF count was normal, with no oligoclonal bands. She was again started on high dose methylprednisolone followed by oral prednisolone (1 mg/kg/day, daily dose of 60 mg) for 1 month and a maintenance dose of 10 mg/day with complete recovery. Her visual acuity at 1 month was 8/10 in the left eye and 10/10 in the right eye and she remains asymptomatic since. Given the diagnosis of SLE and recurrent optic neuritis, we tested her for AQP4-IgG antibodies, which turned to be positive with high titters by ELISA and CBA (Cytometric Bead Array) testing (99.8 and 7680, respectively). NMO spectrum disorder (NMOSD) diagnosis was assumed. Five
years after the last optic neuritis the patient remains asymptomatic, without relapses and with no lesions in the brain parenchyma or in the spinal cord, with an Expanded Disability Status Scale (EDSS) score of 1 (slight atrophic left optic nerve).

**Discussion**

Typical SLE central and/or peripheral nervous system involvements are seizure, depression, multiple mononeuritis but several other manifestations may occur including

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**Figure 2.** Visual field testing: Arcuate scotoma in the right eye.

**Figure 3.** Brain MRI: T2 high signal of the right optic nerve with no gadolinium enhancement and a slight atrophic left optic nerve.
transverse myelitis, demyelination or cranial nerve involvement. According to the American College of Rheumatology (ACR) classification for neuropsychiatric manifestations of SLE, all NMO criteria can be accounted as lupus nervous system manifestation [11]. This case is illustrative that the presence of recurrent optic neuritis or transverse myelitis disease in a patient with a previous diagnosis of LES should warrant the testing for AQP4-IgG. In the last International consensus diagnostic criteria for NMOSD [1] it was established that clinical diagnosis of SLE, systemic sclerosis, or myasthenia gravis may coexist with NMOSD clinical syndromes in AQP4-IgG-seropositive patients and that these patients have a narrow therapeutic window, thus needing a more appropriate and aggressive immunosuppressant treatment.

Some studies concluded that without such treatment, more than 50% of patients with NMO will be functionally blind, or will progress to wheelchair-dependence within 5 years [12]. There are no specific recommendations for the treatment of NMO/SLE overlapping cases. High dose corticosteroids followed by long time immunosuppressive treatment seems to be the most effective way to attack prevention. Recommendations of the Neuromyelitis Optica Study Group (NEMOS) [13] say that relapse and intermittent treatment of AQP4-IgG-positive patients with limited forms of NMO should follow that of patients with typical NMO. Since the discovery of the anti-AQP4 antibody several heterogeneous clinical presentations of NMO have been recognized. Some reports describe a possible benign form of NMO [14], with an EDSS score of ≤3.0 at 10 years after onset [15, 16]. Patients with good-outcome NMO presented with a lower rate of optic neuritis onset and lower EDSS scores in the early phase of disease compared with those with conventional NMO [16]. In our case, five years after the diagnosis of NMSSD and with low doses of oral prednisolone, the patient remains clinically stable, with no relapses and no disability (EDDS=1), in what seems to be a illustrative example of a good-outcome NMO.

Abbreviations
ACR: American College of Rheumatology; ANA: Anti-nuclear; anti-dsDNA: Anti-double stranded DNA; AQP4-IgG: Serum aquaporin-4 immunoglobulin G antibodies; CBA: Cytometric bead array; EDSS: Expanded Disability Status Scale; MS: Multiple sclerosis; NMOSD: Neuromyelitis Optica Study Group; NMO: Neuromyelitis optica; NMOSD: Neuromyelitis optica spectrum disorder; STIR: Short tau inversion recovery; VEP: Visual evoked potentials

Competing interests
The authors declare no conflict of interest.

References