CASE REPORT

Herpes Simplex Virus 2 Meningoencephalitis-Associated Bilateral Optic Neuritis and Radiculitis

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ABSTRACT

The most common ocular complication of herpes simplex virus (HSV) is acute retinal necrosis. We present a rare case of a patient with HSV-2 meningoencephalitis that developed severe vision-threatening optic neuritis. The patient was treated with steroids and IVIG, which allowed a rapid improvement in her vision.

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Introduction

Optic neuritis presents in a variety of autoimmune diseases, most commonly multiple sclerosis.¹ It has also been shown to happen in relation to viral infections, particularly with pediatric Herpesviridae infections.² The purpose of this case report is to present a case of optic neuritis developing concomitantly with herpes simplex virus (HSV)-2 meningoencephalitis and to discuss our treatment approach.

Case report

A 57-year-old white female with a history of IgM lymphoplasmacytic lymphoma in remission presented with 4 weeks of worsening malaise, mild bilateral blurred vision, confusion, and headaches. Her neurological exam was unremarkable for any motor or sensory impairments. MRI of the brain showed nonspecific white matter lesions. MRI of the orbits had significant motion artefact and within these confines, no overt optic nerve lesions or enhancement were found. A lumbar puncture was performed which revealed opening pressure of 24.5 cm H₂O (although she was in a flexed position), WBC 142 (86% lymphocytes), protein 163 mg/dL, and glucose 32 mg/dL. Cytology and flow cytometry were negative for malignant cells. PCR was

positive for HSV-2. Other infectious workup was negative. She was prescribed acyclovir 10 mg/kg every 8-h and acetazolamide 500 mg twice a day.

Ophthalmology exam revealed visual acuity (VA) of 20/40 right eye (OD) and 20/25 left eye (OS). She had a trace relative afferent pupillary defect (rAPD) of the right eye and colour vision was 2/11 OD and 4/11 OS with Ishihara plates. Optic nerve examination was significant for mild nasal optic disc swelling with hyperemia OD and mild to moderate nasal disc swelling with hyperemia and a flame-shaped disc haemorrhage OS.

The next day, her VA declined to 20/80 OD and 20/40 OS as well as an increased rAPD in the right eye. On hospital day five, her vision had worsened to counting fingers at 2-ft. OD and 20/200 OS with increased disc swelling OU as well as a more prominent rAPD in the right eye.

Due to the rapid decline of her vision and lumbar puncture showing high number of inflammatory cells, optic neuritis was suspected rather than papilledema secondary to elevated intracranial pressure. She was prescribed 1 g methylprednisolone for three days. After three days of the steroids, her VA was 20/800 OD and 20/40 OS, with a 2+ APD in the right eye. Optic nerve swelling was stable (Figure 1). Due to the minimal improvement of vision particularly in the right

Figure 1. Fundus photographs after 3 days of IV methylprednisolone showing mild disc swelling OD and moderate swelling OS.

eye with the steroids, she was prescribed 0.5 g/kg/day of IVIG for 4 days. Systemic steroid (prednisone 60 mg oral daily) and antiviral (IV acyclovir) were continued. At this time, she also started to complain of proximal left lower extremity weakness and pain. MRI of the lumbar spine showed enhancement of several cauda equina nerve roots consistent with radiculitis.

After the four-day course of IVIG, her vision was significantly improved to 20/50 OD and 20/30 OS. There was 1+ rAPD in the right eye. She still had moderate optic nerve swelling OD and mild to moderate nasal disc swelling OS. She left lower extremity weakness was improving.

Five days later, she showed continued improvement with mild disc swelling OU. She was discharged on 1 g valacyclovir three times a day. In outpatient follow-up 2 months later, she had VA 20/20 OU with no rAPD. Ishihara plates were 11/11 OU. She had pallor in both optic nerves consistent with optic nerve atrophy (Figure 2). The retinal nerve fibre layer thickness was 59 μ m OD and 77 μ m OS.

Discussion

Amongst the Herpesviridae, the most common cause of optic neuritis is varicella zoster.² Historically, it most commonly presents in the pediatric population.² To our knowledge there have only been two case reports of HSV-associated optic neuritis in the literature.^{3,4} One case was with HSV-1⁴ while the patient refused lumbar puncture in the other case.³ Most of the literature describes acute retinal necrosis as the complication of HSV encephalitis.² Antivirals alone did not prevent the rapid progression of our patient's visual symptoms, and the fact that it was successfully treated with corticosteroids and IVIG suggests an inflammatory or possible autoimmune process rather than direct viral infiltration of the optic nerve. This is supported by the fact that she also developed lumbar radiculitis.

Although our patient had elevated opening pressure on her lumbar puncture, we believe that the vision loss was likely related to inflammatory optic neuritis as it was rapid and the intracranial

Figure 2. Fundus photos 2 months after discharge showing pallor OU.

pressure was only modestly elevated. Further, the patient was in a flexed position during measurement so the measurement was likely falsely elevated. Nevertheless, acetazolamide was started as a precaution. The MRI of orbits did not show any enhancement of the optic nerves. However, the images were significantly degraded due to motion artefact preventing adequate evaluation. Based on her fundoscopic exam, the degree of inflammation and appearance of the optic nerve head was most consistent with distal optic neuritis.

Corticosteroids alone were the treatment for optic neuritis in the prior case reports.^{3,4} Our patient had minimal improvement with corticosteroids so a 4-day course of IVIG was initiated. This led to a drastic improvement in her symptoms. We cannot know for certain how much of the patient's visual recovery was due to the use of IVIG, but significant improvement was seen after it was started.

In summary, this case highlights that HSV-2 can potentially trigger an inflammatory and/or autoimmune reaction in the CNS leading to vision-threatening optic neuritis. In such patients, the use of

IVIG might be beneficial, especially in cases unresponsive to high dose IV steroid therapy.

Declaration of interest

No pertinent conflicts of interest to report.

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