

A Rare Case of Asymmetric Optic Neuritis after Inactivated Influenza Vaccine

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Abstract

We report a case of a 48-year-old woman who presents with asymmetric bilateral optic neuritis 2 weeks after receiving the inactivated influenza vaccine. She was treated with steroids with resolution of her symptoms.

Introduction

Neurological complications after vaccination are rare, and the development of optic neuritis is even more rare. Both inactivated and live attenuated influenza vaccines have been associated with the development of optic neuritis. Post-influenza vaccine optic neuritis usually develops two to three weeks following vaccination [1]. We describe a case of asymmetric bilateral optic neuritis following inactivated influenza vaccination.

Case presentation

A 48-year-old Hispanic female with a past medical history of hyperthyroidism on methimazole, presented to the emergency department complaining of one day of right eye vision loss, eye lid swelling, and pain associated with extra ocular movements.

Patient reported that two weeks after receiving the intramuscular inactivated flu vaccine in her primary care's office she had an episode of "bilateral ocular pain associated with flashes of bright lights." She was treated with oral antibiotics for presumed acute sinusitis without improvement, then presented to our institution with a marked decrease in vision of her right eye. Patient denied any other constitutional symptoms, sick contacts, recent travel or tick exposure.

Examination of the right eye showed reduced visual acuity (20/200), superior optic disc edema, and blurred disc margins suggestive of optic neuritis. Left eye examination showed a new decrease in visual acuity (20/30), but the remainder of the left eye exam was otherwise unremarkable.

Initial CT brain and orbits failed to show signs of acute intracranial pathology, or abnormal enhancement. MRI brain did not reveal parenchymal or leptomeningeal enhancement but showed mild prominence of the peri-sheath fluid involving the proximal optic nerves

bilaterally. Given the atypical presentation of optic neuritis in this patient, she was admitted for further evaluation.

Serologic evaluation revealed an erythrocyte sedimentation rate of 37 mm/h and a positive HLA-B27. Angiotensin converting enzyme, antinuclear antibodies, rheumatoid factor, thyroid stimulating hormone, free thyroxine levels, complement (C3/C4) were normal. C-reactive protein, rapid plasma reagin (RPR), HIV antibodies, Sjogren antibody, hepatitis B and C studies were negative.

Lumbar puncture was performed revealing an opening pressure of 13 cmH₂O. Cerebrospinal fluid (CSF) was clear, without leukocytosis or oligoclonal bands, protein and glucose levels were normal. Gram stain, bacterial and fungal cultures, acid fast bacilli staining, VDRL, borrelia burgdorferi antibodies, cryptococcal antigen and HSV-1 and HSV-2 PCR in CSF were negative.

The patient received intravenous steroids for three days followed by a medrol pack for a total of twenty-one days with marked improvement of her vision. Three weeks after the initial presentation, the patient was seen by the ophthalmology team, this time as an outpatient, at which time her vision acuity had improved significantly.

Discussion

Optic neuritis is an uncommon medical condition, described as an inflammation of the optic nerve, which commonly affects one eye but bilateral involvement has been well described. Patients describe a rapid decrease in vision associated with eye pain, headache, and flashes of light. Findings can include decreased vision, visual field defects, sluggish eye response to light, swelling of the optic discs, and loss of color vision [2].

All reports of vaccine induced optic neuritis were tabulated in a review article published in 2013. Thus far, this review together with a recent case of influenza vaccine induced optic neuritis yielded a total of 15 case reports of influenza vaccine induced optic neuritis in the literature. The influenza vaccine was the most common vaccine associated with optic neuritis accounting for 37% of vaccine induced optic neuritis. The rabies vaccine was second most common vaccine contributing to 20% of all cases of vaccine induced optic neuritis [1, 3].

The pathophysiology of neurologic complications including optic neuritis post vaccine remains unclear. The most prevalent explanation is that optic neuritis is triggered by an immune-mediated process perhaps by a molecule in the vaccine, coupled with a possible host genetic predisposition [4]. Diagnosis requires a negative work up for other etiologies known to cause optic neuritis and a temporal relationship to receiving the vaccine. Epidemiological data suggests optic neuritis occurs days to weeks (usually 2 to 3 weeks) following vaccination [1].

As in most of the cases reported, our patient received heat killed inactivated influenza vaccination two weeks prior to her symptoms. Almost none of the cases disclose if the patients had received influenza vaccination in past years or if they had a prior history of adverse events associated with other immunizations. Most of the case reports of influenza vaccine induced optic neuritis in the literature were treated with steroids (80%), and complete recovery was evident in 58% of patients who were started on steroids. Of the three case reports where patients were not started on steroids, all patients developed optic atrophy [1, 3].

Our patient did not have adverse events with prior vaccinations, but did test positive for HLA B27. Rheumatological work-up, CSF analysis and a comprehensive screening for autoimmune and other infectious conditions were unremarkable, thereby strongly suggesting a temporal relationship between the inactivated influenza vaccine she received two weeks prior and the onset of her symptoms.

Although attention should be raised on the possibility of vaccination-induced optic neuritis, the influenza vaccine still represents one of the most important prevention tools in decreasing morbidity and mortality from influenza.

In the future, both animal and epidemiological studies may be useful to further elucidate the temporal relationship between influenza vaccination and optic neuritis and the mechanisms underlying this disease, although this may represent a challenge due to the rare occurrence of optic neuritis following vaccination.

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References

1. **Jun B, Fraunfelder FW.** Atypical optic neuritis after inactivated influenza vaccination. *Neuroophthalmol*, 2017; 42:105–108.
2. **Pillar G, Toubi E.** Vaccination-induced bilateral optic neuritis: rare but existing. *Isr Med Assoc J*, 2012; 14:690–691
3. **Stubgen JP.** A literature review on optic neuritis following vaccination against virus infections. *Autoimmun Rev*, 2013; 12:990–997.
4. **Rubinov A, Beiran I, Krasnitz I, Miller B.** Bilateral optic neuritis after inactivated influenza vaccination. *Isr Med Assoc J*, 2012; 14:705–707.