

# Single intravitreal dobesilate injection for the treatment of acute idiopathic optic neuritis: a case report

## Abstract

We report a case of acute idiopathic optic neuritis and describe for the first time that intravitreal administration of dobesilate speeds the recovery of visual loss and results in better vision at one month.

**Keywords:** optic neuritis, dobesilate, intravitreal injection, fibroblast growth factor

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## Introduction

Optic neuritis is an acute inflammatory condition of the optic nerve. The aetiology for optic neuritis varies including inflammation, infections, exposure to toxins and genetic disorders.<sup>1</sup> In most cases the aetiology remains unknown, and in this case, the disease is termed idiopathic optic neuritis.<sup>2</sup> Consequently, to date, many issues regarding the management of patients with acute idiopathic optic neuritis remain unsolved. Here, we report the case of a patient with idiopathic optic neuritis successfully treated with intravitreal administration of dobesilate.

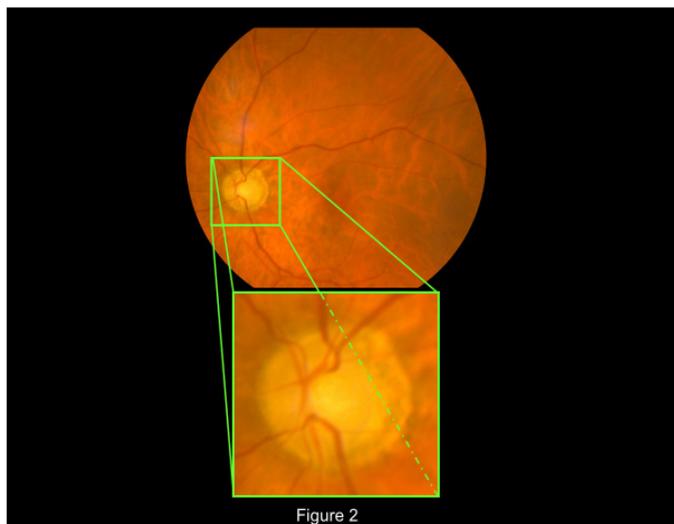
## Case presentation

A 63 years-old male presented with complete loss of light perception in his right eye due to a 12 years history of optic neuritis. He had no history of neurologic and systemic diseases. At presentation, he referred a 5 days history of sudden vision loss in his left eye. His best-corrected visual acuity (BCVA) of the left eye was 0,05 and he could count fingers at 50 cm distance with corrected light projection with the left eye. Fundus examination revealed that the patient suffered optic neuritis at his left eye: an apparent papillitis with a practically absent optic cup of indistinct margins, and a haemorrhage in the temporal portion. Venous congestion was also evident (Figure 1A). The slit-lamp exam of the anterior segment was normal. After discussing with the patient, the benefits and risks of possible treatments, he chose intravitreal dobesilate administration. Informed consent was obtained. The study was approved by the Institution review board and it followed the principles outlined in the Declaration of Helsinki. The patient received an intravitreal solution of dobesilate (150 µL) in his left eye. Dobesilate was administered as a 12.5% solution of diethylammonium 2,5-dihydroxybenzenesulfonate (etamsylate, Dicynone® Sanofi-Aventis, Paris, France) in the operating room

under complete aseptic conditions with topical anaesthesia. Topical ciprofloxacin was given 4 times a day for 5 days postoperatively. After treatment, patient was examined at day 1, and at weeks 2 and 4. At day 1, injected eye underwent an ophthalmic examination for discarding anterior chamber reaction and intraocular pressure rise. Over time the condition improved (Figure 1B). Fundoscopy after 1 month of treatment revealed that papillitis and haemorrhage have resolved (Figure 2). Furthermore, BCVA notably improved from baseline (treatment start) to 0,6 at 1 month follow-up visit. Colour vision also improved. No recurrent episodes of optic neuritis were reported at 3 months follow-up visit, and no adverse effects were referred.



**Figure 1** Left eye fundus photograph with optic disc papilledema before (A) and 2 weeks after intravitreal injection of dobesilate (12,5 mg) (B). The optic disc edema and haemorrhage (arrow) markedly improved after treatment.



**Figure 2** Resolution of papillitis and haemorrhage 4 weeks after intravitreal injection of dobesilate (12,5 mg).

## Discussion

Optic neuritis is an acute inflammatory disorder of the optic nerve with sudden loss of vision, which can vary in severity from slight deficit in the field of vision to complete loss of light perception, followed in many patients by spontaneous improvement over several months. However, although visual improvement occurs in most patients, abnormalities are common in other aspects of visual function, such as the visual field, colour vision, and contrast sensitivity.<sup>3,4</sup> Optic neuritis in adults is typically idiopathic or demyelinating and is characterized by unilaterality (only 0.4% of patients develop symptoms in both eyes simultaneously).<sup>5</sup> It is not associated with any systemic or other neurological symptoms.<sup>2</sup> The presumed pathophysiology of optic neuritis is inflammation and demyelination of the optic nerve. Activated peripheral T- cells migrate across the blood-brain barrier and release cytokines and other inflammatory mediators leading to neuronal cell death and axonal degeneration.<sup>6</sup> After the acute event, axonal damage leading to axonal loss can produce severe and sometimes irreversible visual impairment. Thus, in addition to reducing the number and severity of attacks, preventing axonal loss and subsequent disability is a goal of many of the existing and emerging therapies for optic neuritis. Corticosteroids have been recommended for treating optic neuritis. However, it has been reported that there was no conclusive evidence about the benefits of either intravenous or oral corticosteroids treatment regimens in terms of recovery of visual acuity.<sup>7</sup>

An inflammatory agent, fibroblast growth factor (FGF), has been described in ocular diseases which can be quite efficiently treated with dobesilate, an inhibitor of FGF activity.<sup>8,9</sup> FGF was the first angiogenic growth factor that was isolated,<sup>10</sup> although it was later shown that angiogenesis induced by FGF was rather the consequence or the triggering of an inflammatory phenotype in the endothelium than a merely direct angiogenesis inductor. Inflammation elicited by FGF is prone to the consolidation of a positive inflammatory feedback loop, typical of chronic diseases, since it induces the upregulation of the synthesis of COX-2 and phospholipase A2, which reciprocally promote the expression of FGF.<sup>11</sup> The well documented

anti-inflammatory effects of the inhibition of FGF by dobesilate could explain the positive results in treating the idiopathic optic neuritis with this compound reported here.

## Conclusion

Optic neuritis is an acute inflammatory disorder with sudden vision loss. Although corticosteroids are used for treating this condition, no conclusive evidence about the benefit of this therapy in terms of visual acuity recovery has been reported. We show here the efficacy and safety of a single intravitreal injection of dobesilate in a patient with idiopathic optic neuritis. Rapid normalization of optic cup and improvement in visual acuity after treatment suggests that this drug represents a potential efficacious therapeutic approach for the treatment of patients with optic neuritis.

## Conflict of interests

The author declares there is no conflict of interest.

## Acknowledgments

None.

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