Original article

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Intravitreal Bevacizumab in Nonarteritic Anterior Ischemic Optic Neuropathy

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Abstract

The Hippocratic Corpus played a key role to the disengagement of illness from the divine element that was believed to be to cause of all illnesses and injuries. Especially for the illnesses of the psyche (some call it “self” or “soul”), the Hippocratic physicians managed to recognize their biological origin and to create a “primitive” nosological structure. The aim of this paper is to identify the etiological factors of the illnesses of the psyche, according to the Hippocratic authors and to correlate them to modern medical observations. The Hippocratic physicians enumerated certain etiological factors for the occurrence of the illnesses of the psyche: imbalance of the humours, injuries of the head, extreme emotions, along with environmental features that were supposed to favor the appearance of such illnesses, such as the climate, the quality of the water, the winds, etc.

Keywords: Hippocratic medicine; History of medicine; history of psychiatry; psyche

Introduction

Non-arteritic anterior ischemic optic neuropathy (NAION) is a disease caused by ischemia of optic nerve which leads to optic nerve swelling and acute painless vision loss (1). In 15% of cases the contralateral eye is affected in 5 years (1,2). It is probably due to inefficient blood supply by short posterior cilliary arteries and usually affects patients with small optic nerve cupping (3-6). Ischemia causes release of vascular endothelial growth factor (VEGF) which in turn increases vascular permeability and leads to vasogenic edema (7). Induced edema in the setting of crowded disc leads to a compartment like syndrome in optic nerve head (1,8,9) that reduces blood supply to unaffected segments of optic nerve (5). There is no accepted treatment modality for this disease. In one case report, a patient had improved vision after intravitreal Bevacizumab (IVB) injection (7). Bevacizumab is a well-known anti VEGF agent (1). If according to this

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theory VEGF plays an important part in the pathogenesis of NAION, IVB can be helpful in its treatment. In this study we investigated the effectiveness of IVB in patients with NAION.

Material and Methods

In this prospective case series, 11 patients were studied. Patients with visual loss due to NAION in less than 15 days and preferentially less than 7 days were enrolled to the study. Exclusion criteria were active uveitis, history of prior optic neuropathy, advanced glaucoma, proliferative diabetic retinopathy and clinically significant macular edema. All patients were provided with required information and informed written consents were obtained from the participants. In all patients lab tests including complete blood count, sedimentation rate and C - reactive protein were taken. A history of polymyalgia, recent weight loss, headache, temporal artery tenderness and jaw claudication to rule out giant cell arteritis was taken. A complete slit lamp biomicroscopy and dilated fundus exam was performed. Visual field was evaluated with SITA-standard 30-2 Humphrey program. 1.25 mg/ 0.1mL of Bevacizumab was injected into vitreous in operation room condition. Injection was performed with 27 gauge needle 4mm and 3.5 mm posterior to limbus in phakic and pseudophakic patients respectively. Patients were treated with topical bethametason and chloramphenicol every 6 hours for 1 week. After one week patients were examined for visual acuity, intraocular pressure, any vitreous reaction and optic nerve edema. Perimetry was repeated for the affected eye with the same program.

Results

Patients were between 50 to 70 years old including 5 males and 6 females. Lab tests of patients were in normal range. None of patients were suspected to have giant cell arteritis. The outcome was remarkable. Visual acuity significantly improved in 5 patients. Visual acuity of patients before and post injection are presented in table 1. Optic disc edema was completely or remarkably resolved in 1 week, even in those with no improved visual acuity. The accompanying splinter hemorrhage cleared in that time. We did not notice a remarkable change in visual field defects, even in those with improved visual acuity.

Table 1: Pre and post-injection visual acuity of patients

Patient	Gender	Age	VA pre IVB	VA post IVB
1	F	75	0.5 m cf	2.0 m cf
2	M	53	2/10	6/10
3	M	46	0.5 m cf	4/10
4	F	56	4.0 m cf	5/10
5	F	56	2/10	2/10
6	M	53	4.0 m cf	1/10
7	M	49	0.5 m cf	3/10
8	F	59	HM	2.0 m cf
9	F	61	1/10	1/10
10	F	62	1.0 m cf	2.0 m cf
11	M	59	2/10	5/10

VA post IVB; Visual acuity 2 weeks after IVB injection, VA pre IVB; Visual acuity at presentation, Cf; count finger, HM; hand motion

One of patients whose visual acuity did not improve reported a better quality of vision compared to contralateral eye that had an attack one year earlier. In the course of study one patient had improved visual acuity in right eye after IVB, but the left eye which had an attack of NAION 3 weeks later failed to show such an improvement. In the course of study, no vitreous reactions were observed and intraocular pressure measures were within normal limits.

Discussion

NAION leaves patients with significant morbidity and affects quality of life considerably. There is no accepted treatment modality due to our incomplete understanding of the disease (1). IVB was used in a patient with visual loss due to NAION after 3 weeks of attack. In 9 days, optic disk swelling resolved remarkably and visual acuity improved to 20/100 from 20/400. Simultaneously, significant resolution of dye leakage in flourescein angiography was noticed. Visual acuity improved to 20/70 ten days later. This improvement of visual acuity and optic disc edema with significant resolution of leakage suggests that increased vascular permeability due to VEGF may play an important role in NAION (7). Levodopa is used for newly-onset NAION and its benefit is probably due to ability of dopamine to inhibit VEGF induced vasogenic edema (10,11). Improvement of visual acuity and considerable resolution of disc edema in 1 week after IVB in our study confirms a significant role of VEGF in the pathogenesis of this disease. As IVB is used safely in neovascular macular degeneration and macular edema associated with other retinal vascular disorders (1) its use can be recommended in NAION if other trials confirm its effectiveness. In this study we followed patients only for 1 week after IVB to rule out spontaneous resolution of edema that occurs in natural course of the disease leading to disk pallor in 4 to 6 weeks (1,5). Long term follow-up may reveal even more improvement in visual acuity and perhaps quality of vision.

In conclusion, IVB may be beneficial in treatment of NAION by reducing optic nerve head edema caused by VEGF induced vascular permeability.

Conflicts of interest

The authors declare that they have no conflict of interest.

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