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OPTIC NEUROPATHY STUDY AT TERTIARY CENTER

Shweta Walia[A], Pushpa Varma[B]

[A] - *Assistant Professor, Department of Ophthalmology, MGM Medical College, Indore, MP, India*

[B] - *Professor, Department of Ophthalmology, SAIMS, Indore, MP, India*

Ophthalmology

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Corresponding Address

Dr Shweta Walia
Flat 117, A3, Milan Heights,
Near Agarwal Public School,
Indore, 452001
Email: drshweta_2007@yahoo.com
Telephone number: 9893553234

Abstract:

Introduction: Optic neuropathies are degenerative process of optic nerve and can be hereditary or acquired. The acquired causes of optic neuropathy (ON) are idiopathic, inflammatory, ischemic, compressive, traumatic and toxic.

Objective: To describe etiology, clinical characteristics and visual outcomes of a large cohort of patients presenting to a tertiary care hospital with acquired ON

Material and Method: This prospective interventional study of 75 cases presenting with ON at MGMMC, MYH, Indore, India between November 2008- February 2016. Each patient underwent complete ophthalmological and systemic examination. Treatment was started according to the etiology and final diagnosis made. The main outcome measures were visual acuity at 3 months, 1 and 2 years of follow-up, with analysis of risk factors for poor visual outcomes, recurrrence and the time course of visual recovery.

Result: The mean age was 44 years (range 5 - 70 years), 56 % female, 36% unilateral, 71 % had an underlying diagnosis. Visual acuity at presentation ranged from no perception of light to 20/60. 33 had improvement in visual acuity after treatment at 3 months follow up. Recurrence was seen in 6 cases .Clinical characteristics including time of presentation, visual acuity at presentation, bilateral and ischemic, traumatic and toxic optic neuropathies were associated with poor visual outcomes.

Conclusion: Careful clinical evaluation is essential rule in the diagnosis of optic neuropathy. Recognition of etiology and risk factors can alter the visual and neurological prognosis.

Key words: Optic neuropathy, ischemic, inflammatory, traumatic, toxic

Introduction

Optic neuropathies are a degenerative process of the optic nerve and can be hereditary or acquired.[1] The acquired causes of optic neuropathy are idiopathic, inflammatory, ischemic, traumatic and toxic. The purpose of this study is to describe etiology, clinical characteristics and visual outcomes of a large cohort of patients presenting to a tertiary care hospital with optic neuropathy (ON).

Material and Method

This is a prospective interventional study of 75 cases presenting with ON done at MGMMC, MYH, Indore between November 2008 - February 2016. Each patient underwent complete ophthalmological and systemic examination. The diagnosis of ON was made by expert clinical judgment, which included assessment of visual acuity, visual fields, pupils, and dilated fundoscopy. Each of the patients in the study received an

MRI to assess for demyelinating lesions and rule out other potential causes. All patients underwent VEP to know status of optic nerve conductivity. Patients were excluded if there was any uncertainty in the diagnosis, if there was a potentially confounding factor that could have affected vision (eg. amblyopia or hereditary optic neuropathy or malignancy) or if there was any evidence of a previous episode of optic neuritis (from history or on examination). All patients also underwent complete blood counts, ESR, serum, Vitamin B12 level, blood sugar, coagulation profile. Treatment was started according to the etiology and final diagnosis made. Inflammatory, Traumatic and Toxic optic neuropathy were treated as per ONTT recommendations. All cases were given 1500mcg of methylcobalamine for 1 month as supportive treatment. Ischemic optic neuropathy cases underwent treatment for underlying systemic illness. The main outcome measures were visual acuity at 3 months, 1 and 2 years of follow-up, with analysis of risk factors for poor visual outcomes, recurrrence and the time course of visual recovery.

A poor visual outcome was defined as vision <20/40 (in the affected eye in unilateral cases and in the eye with worse visual acuity at presentation in bilateral cases).

Results

Of the 75 patients presenting with optic neuropathy, 42 had at least 1 year follow-up and 35 had at least 2 year follow-up .The mean age was 44 years (range 5 - 70 years), 56 % were female, 36% had unilateral involvement, 71 % had an underlying diagnosis (13,23,12, 7 and 5 cases of ischemic, inflammatory, traumatic and toxic optic neuropathy respectively) . Visual acuity at presentation ranged from no perception of light to 20/60. 33 had improvement in visual acuity after treatment at 3 months follow up. Recurrence was seen in 6 cases which were either idiopathic or inflammatory optic neuropathy cases. (See Table 1 for baseline characteristics and table 2 for clinical features).

Table 1 Baseline Characteristics of Patients (n = 75)

Age (Years)	
Mean	44 years
Range	5- 70
Female (%)	56
Underlying diagnosis	
Idiopathic	22
Ischemic	13
Inflammatory	23
Traumatic	12
Toxic	5

Table 2 Clinical Features on Presentation (n =75)

Clinical Finding	Number
Average duration of symptoms prior to presentation (days)	7 (2- 30)
Laterality (%)	36% unilateral
Subjective loss of visual acuity	75 (100%)
Pain with eye movement	25 (33.3%)
Headache	48 (41%)
Color vision deficit	61 (74.8%)
Vision too poor to measure	14 (18.6 %)
Optic nerve edema	64 (74.8%)
Relative afferent pupillary defect in unilateral, n = 27	27
Relative afferent pupillary defect in bilateral, n = 48	9
Visual acuity (worse eye if bilateral)	
≥20/20	0
<20/20–≥20/40	0
<20/40–≥20/200	9 (12%)
<20/200–>counting fingers	52 (69.3%)
Counting fingers-no light perception	14 (18.6%)

Table 3 Visual outcome at 3 months follow-up

Visual Outcomes (Worse Eye at Presentation if Bilateral)	Visual Acuity at 3 Months n = 75
≥20/20	12 (16%)
<20/20–≥20/40	21 (32.84%)
<20/40–≥20/200	19
<20/200–>counting fingers	11
Counting fingers to no light perception	12

Table 4 Analysis of eyes with visual outcome of <20/40 at 3 months of follow-up

characteristics	n = 42
Male : female	17:25
Time of presentation	14 days- 30 days
Vision at presentation	20/200 - no PL
Laterality	33 bilateral
Etiology Idiopathic Ischemic Inflammatory Traumatic Toxic	 10 (45.4%) 11 (84.6%) 7 (30.4%) 10 (83.33%) 4 (80%)

Discussion

In this study, we report the clinical characteristics and visual outcomes of one of the largest cohorts of patients with optic neuropathy. The clinical characteristics of the patients included a preponderance of females (56%) and a high proportion of patients with bilateral involvement (64%). The primary objective of the study was to perform a detailed analysis of visual outcomes following optic neuropathy. To date, there have been only a few studies of optic neuropathy that have reported visual outcome data.

In order to optimize the analysis of visual outcomes, we predetermined follow-up intervals of 3 months, 1 year and 2 years so that patients could be compared given similar amounts of time for recovery. We also attempted to minimize the potential impact of confounding factors that could have affected visual outcomes by excluding patients if there was any evidence of previous episodes of optic neuritis, any coexisting process that might have affected vision, or any uncertainty in the diagnosis. By using strict inclusion criteria and standardizing follow-up intervals, we attempted to isolate a cohort of patients with definite first-episode optic neuritis whose visual outcomes were directly related to the course and severity of the disease.[2]

In our study we found that out of 75 patients 42 patients (56%) had visual acuity of <20/40 at 3 months of follow-up. Maximum improvement of vision was seen by 3 months, no recovery was seen at 1 and 2 years of followup.16 % of patients were 20/20 or better and 44 % were 20/40 or better .In the ONTT, 79% of the participants had started to improve by 3 weeks; and 93%, by 5 weeks. Improvement may continue after this, especially in patients with poor vision, up to a period of 12 months. After 1 year of follow-up 50% of the patients overall were 20/20 or better, and 68% of the patients were 20/40 or better though good functional visual recovery is seen in most patients, around 5% to 10% of patients fail to recover fully.[3]

Factors associated with poor visual outcome at 3 months follow-up (vision <20/40) were vision at presentation of < 20/200, time of presentation of 14 days after onset of diminution of vision, bilaterality, ischemic, traumatic and toxic optic neuropathies. Beck and Smith reported that in contrast to ischemic optic neuropathies and compressive optic neuropathies, a gradual recovery of visual acuity with time is characteristic of inflammatory optic neuropathies.[4] For most patients with ON, visual function begins to improve 1 week to several weeks after onset, even without any treatment. However, permanent residual deficits in color vision and contrast and brightness sensitivity are common.[5] Decreased visual acuity secondary to inflammatory optic neuropathy may be permanent. Final visual outcome may be better in patients with an isolated episode of inflammatory optic neuropathy, compared with patients who eventually develop Multiple Sclerosis. Up to 75% of female patients and 35% of male patients initially presenting with inflammatory optic neuropathy ultimately develop MS.[3,6,7]

Conclusion

Although the study cohort was uniform insofar as each patient included had a first episode of optic neuropathy, the underlying causes of optic neuropathy were mixed, and the treatment regimens were varied; both of these factors may have influenced the speed of visual recovery by the patients in this study. The variability of treatment also limited assessment of the impact of specific treatments on visual outcomes.

In summary, we report the clinical characteristics and visual outcomes of a cohort of patients with first-episode optic neuropathy.

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