Original article

An overview of idiopathic optic neuritis in eastern Nepal

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Abstract

Background: Inflammation of the optic nerve is a common cause of visual loss due to optic nerve pathology.

Objective: To report the clinical features, demographic pattern and response to pulse steroid therapy in patients with idiopathic optic neuritis in eastern Nepal.

Materials and methods: The hospital data of patients with idiopathic optic neuritis admitted to the department of ophthalmology in a tertiary level center in eastern Nepal between Jan 2000 to Dec 2006 were retrospectively analyzed. The parameters studied were demographic pattern, clinical features, visual acuity and field defects.

Results: Thirty-six patients (52 eyes) were found to have optic neuritis (papillits in 36 and retrobulbar optic neuritis in16 eyes). The male to female ratio was1.25:1. The mean age of the patients was 33.56±17.88 years (95 % CI=24.66 - 42.45). The most common modes of presentation were loss of visual acuity and color vision defect. One patient had features suggestive of multiple sclerosis. Vision improved in 42 eyes at discharge from the hospital. Response to pulse methylprednisolone therapy was good in most (42 eyes) of the cases except for the patients having initial visual acuity of no light perception.

Conclusion: Response to pulse methylprednisolone therapy is good in patients with initial visual acuity of at least perception of light. Demographic and clinical features of our patients were different from those reported from the western world. Some similarity was observed between studies reported from the oriental countries.

Keywords: optic neuritis, demographic pattern, pulse steroid therapy.

Introduction

Inflammation of the optic nerve is a common cause of visual loss due to optic nerve pathology. Optic neuritis is classically divided into typical (idiopathic) and atypical types, depending on the absence of any other inflammatory disease other than multiple sclerosis (MS) or by evidence of inflammatory disease respectively (Trobe J D, 2001).

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Idiopathic optic neuritis presents with sub-acute loss of central vision with or without pain. This condition is known to improve with or without therapy. Recognition of this condition is important due to its association with multiple sclerosis (MS) particularly in adults. Proper initial therapy with corticosteroids or interferons has shown to halt or delay the onset of multiple sclerosis in these patients[1]. Moreover, there are reports that the existing evidenced based guidelines are not used by many neurologists and ophthalmologists because of their unawareness of the efficacy of the recommended treatment schedule (Wakakura et al 1999, Leueck et al 2008, Biousse et al 2008).

There are a few studies available on this subject from the eastern part of the world, particularly from Japan, China and Singapore, which show different demographic characteristics than those described in optic neuritis treatment trial (ONTT) or in literature from the western world (Wakakura et al 1999, Zhang et al 2008, Wang et al 2001, Beck et al 1995).

There is a paucity of data on optic neuritis from Nepal. We undertook this study to find out the demographic pattern, clinical characteristics and treatment outcome of optic neuritis presenting to the Department of Ophthalmology at the B P Koirala Institute of Health Sciences (BPKIHS), Nepal.

Subjects and methods

The data on patients hospitalized with the diagnosis of idiopathic optic neuritis were analyzed retrospectively using the hospital records (from Jan 2000 to Dec 2006) of BPKIHS. All the patients of age more than 18 years admitted with the diagnosis of idiopathic optic neuritis and treated with pulse steroid therapy were included. Optic neuritis was diagnosed by the presence of acute decrease in visual acuity with defective color vision and relative afferent pupillary defect. The patients having the above features with swelling of optic nerve on ophthalmoscopy were diagnosed as having papillits and those not having optic nerve swelling were diagnosed as having retrobulbar optic neuritis. The patients with the diagnosis of ischemic, toxic or hereditary optic neuropathy were excluded from the study. The patients with inflammatory retinal or uveal signs, except those with mild vitritis, were also excluded. The patients having visual acuity of better than 6/12 were not admitted for high dose steroid treatment at our institute and thus were excluded from the study.

Systemic history collected from the records was a previous diagnosis of multiple sclerosis and a previous episode of similar ocular ailment. Demographic features (age, gender, and race) and ocular complaints were noted in all cases. Ocular complaints enquired about were ocular pain, headache and painful extraocular movements.

Ocular examination included recording of best corrected visual acuity (using refraction and Snellen's chart), color vision test (with Ishihara's pseudoisochromatic color vision chart), ocular movements evaluation (to rule out inter-neuclear ophthalmoplegia), swinging torch light test (to record relative afferent pupillary defect, particularly in cases with unilateral involvement) and fundus evaluation under mydriasis (with both direct and indirect ophthalmoscopy).

The patients with the diagnosis of optic neuritis had undergone neurological examination by a neurologist or an internist. Investigations to rule out sinusitis, computed tomography (CT) scan wherever possible and blood sugar estimation in patients older than 35 years were performed. Erythrocyte sedimentation rate (ESR), total and differential leucocytes counts and venereal disease research laboratory (VDRL) test for syphilis were also obtained before therapy. Perimetry was obtained using Goldmann perimeter (between 2001 and 2004) and Humphrey Automated Perimeter (model Zeiss Humphrey after January 2005) in eyes with visual acuity of at least 6/60 during the initial presentation.

The patients were treated with pulse methylprednisolone therapy: intravenous methylprednisolone 1gm/day for 3 days diluted in 5% dextrose solution followed by an 11 days' tapering course of oral prednisolone (Trobe J D, 2001) in all cases presenting within 3 weeks of decrease in vision. Three patients presented late, with profound loss of binocular vision without any evidence of systemic precipitating factors. These patients were also treated with pulse steroids and were included in this study.

Results

Between Jan 2000 and Dec 2006, we found 36 patients with the diagnosis of optic neuritis fulfilling the inclusion criteria. The age range of the patients was 25 to 42 years and there was no significant gender difference (M: F= 1.25:1). Most of the patients belonged to the hilly region (55.56 %). Details of demography are elaborated in Table 1.

Of the 36 patients, 16 (47.22 %) had bilateral involvement. One patient had a history of recurrent attacks (disc pallor was noted in the previously affected eye).

Most of the patients presented to the hospital between 7 - 14 days of onset of symptoms. The most common symptom was decrease in vision which was found in all patients. Other common symptoms were painful extraocular movements and headache. Photopsia and/

Table 1
Demographic characteristics

Total number of patients	36
Number of eyes	52
Age distribution (years)	
Mean ± SD	33.56±17.88
95% CI	24.66 - 42.45
Median	31
Sex	
Male	20 (1.25:1)
Females	16
Race	
Hill natives	14
Hill tribes	6
Terai	10
Newar	2
Indian	4

or Uhthoff's phenomenon (Table 2) were not found in any of the patients.

In the affected eyes visual acuity ranged from 6/18 to no light perception. Visual acuity of less than 3/60 was recorded in 46 eyes (85.19 %), of which 12 (22.22 %)

Table 2
Ocular characteristics

Type	Papillitis	Retrobulbar optic neuritis
Right eye	6	3
Left eye	6	5
Bilateral involvement	12	4
No. of patients	24	12
No. of eyes	36	16

eyes had visual acuity of no light perception. Afferent pupillary defect was recorded in all patients with unilateral involvement. Color vision defect was present in all affected eyes with perception of light.

Visual fields were plotted in all patients having visual acuity of better than 6/60 on the first or second day of treatment. Central, centro-cecal and arcuate scotomas

Table 3
Clinical features

Duration of symptoms (days)	
Mean ±SD	9.89 ± 5.83
95 % CI	7.08 -12.70
Symptoms	
Decrease in vision / color vision	All (no. of eyes)
Painful extra-ocular movements	12
Headache	10
Painless	10
Fever	2
Previous attack	1

were the most common field defects observed. Details of visual fields evaluation during follow up and at the first examination are elaborated in Table 5.

Following the treatment, there was improvement of symptoms in most of the patients (42 eyes; 77.78%). Those not responding to therapy were the patients with initial vision of no light perception (Table 4).

Most (80%) of the patients did not return for follow-up visit at 6 months. At least two follow-up records were available in only 16 cases. Patients who were not followed-up were those who had poor or no visual recovery at the time of discharge. Written communications to them to their permanent address were not responded to.

The distribution of visual acuity at the time of discharge (5 -14 days of admission) and the last follow-up is elaborated in Table 4. Two bilateral cases with NPL vision, one patient with bilateral involvement with PL vision and the remainder with unilateral involvement with PL of vision were lost to follow-up.

None of the patients except one had clinical features suggestive of multiple sclerosis. Neurological

examinations in all the patients were within normal limits. There were no patients with sinusitis. None of the patients were positive for VDRL test.

CT scan was obtained in 19 patients and didn't show any evidence of mass lesion or sinusitis. One patient who had obtained magnetic resonance imaging (MRI) scan from elsewhere, however, showed features suggestive of multiple sclerosis (MS).

Discussion

Medical literature on idiopathic optic neuritis from the eastern part of the world is limited (Wakakura et al 1999, Wang et al 2001, Zhang et al 2008). To the best of our knowledge, this is the first report on the demographic pattern and treatment outcome of optic neuritis from Nepal.

Table 4
Visual acuity (eyes)

Visual acuity	At presen-tation	At discharge	Visual acuity at last follow up
NPL	12	6	4
PL	14	2	1
FCCF	6	2	0
>FCCF - <3/60	12	2	1
>3/60 - <6/60	6	4	1
6/60 - 6/24	1	10	2
6/18	1	6	2
6/12		6	2
6/9		8	3
6/6		6	3
Total (eyes)	52	52	19

Table 5
Visual fields

	Presentation	Last follow up
Central scotoma	2	6
Centrocecal	2	2
Arcuate / biarcuate	2	2
Nasal step	1	1
Altitudinal	1	1

Table 6
Results of treatment at discharge from the hospital

Result	No of eyes
Improved	42
Decreased	0
Remained unchanged	10

Idiopathic optic neuritis is a diagnosis of exclusion. It is important to recognize this condition and rule out other causes of optic neuritis due to differences in management, response to therapy and prognosis.

In many aspects, this report is different from the reports of optic neuritis from other parts of the world. The mean age of our patients was similar to that reported in Optic Neuritis Treatment Trial (ONTT) Study, though our patients were younger than those reported from oriental countries (Wakakura et al 1999, Zhang et al 2008, Wang et al 2001). Females are reported to be involved more frequently in the ONTT, as against our study, where we found a slight male preponderance, which is in concurrence with the other reports from the eastern region of the world (Wakakura et al 1999, Zhang et al 2008, Wang et al 2001, Beck et al 1995). We found a high prevalence of the disease in patients belonging to the hilly region of Nepal. We have no plausible explanation for this. Similar racial and geographical variation has not been reported to the best of our knowledge. It has been reported that retrobulbar optic neuritis is more common in adults (Beck & Trobe, 1995) though we found more frequent occurrence of papillitis. There was a high occurrence of bilateral optic neuritis in our study. Most of our patients presented in 1-2 weeks of onset of symptoms. The presenting complaint in all the patients was visual impairment. Few patients also complained of painful extraocular movements and headache. Uhthoff's symptoms were not observed in any of our patients.

Visual acuity in most of our patients was poor at the time of presentation. Eighty-five percent of the eyes had visual acuity of <3/60 at the time of presentation. There was also a high prevalence (22.22 %) of patients presenting with no light perception, which is higher than that of any report published on optic neuritis. The ONTT study reported only 3 % of patients presenting with no light perception.

The patients in our part of the world generally seek ophthalmic consultation only when they are disabled due to poor visual acuity.

Idiopathic optic neuritis has been shown to be associated

with MS and responds to corticosteroids, particularly to methylprednisolone (Trobe, 2001). A meta-analysis of trials on optic neuritis showed that methyprednisolone reduced the number of patients without clinical improvement at 30 days (OR =0.60; range = 0.42-0.85) but did not result in long term improvement in visual outcome (OR=0.96, range = 0.71-1.31) (Brusaferri & Candelise, 2000). Since this type of treatment is associated with side effects (Ray & Gragoudas, 2001), some investigators do not treat these patients. Others reserve this type of treatment for patients with bilateral involvement, severe visual loss or recurrent optic neuritis (Trobe, 2001; Hickman et al 2002).

Four treatment options have been suggested for these patients presenting with the first attack of optic neuritis: 1) IV methylprednisolone with or without MRI scan; 2) MRI scan and if there are 2 or 3 mm typical signal abnormalities, acute treatment with IV methylprednisolone with consideration of initiating prolonged treatment with interferon beta or glatiramer acetate, 3) MRI for diagnostic and prognostic purposes but with treatment deferred; 4) no MRI withthe treatment deferred (Trobe, 2001).

More than three-fourths of our patients responded to pulse methylprednisolone therapy, which is in accordance with the ONTT study report and the studies published from Japan and Singapore (Wakakura et al 1999, Zhang et al 2008, Wang et al 2001, Beck et al 1995). Our study showed beneficial effect of the pulse steroid therapy in the Nepalese population.

The patients having initial vision of no light perception did not do well with pulse steroid therapy. However, in other patients, final recovery of visual acuity was not related to the pretreatment visual acuity.

In the beginning of the study period, we did not have MRI facility at our institute. A few patients had CT scan, which did not show any abnormality in the brain or the orbits.

A low conversion rate to multiple sclerosis is perhaps due to the short follow-up period. Having all the patients followed-up is difficult in our part of the world partly because there is a general tendency that most of the patients do not come for follow-up once their symptoms are relieved or if the fellow eye is normal. Longer and proper follow-up is required to find out the incidence of multiple sclerosis in these patients.

Since this is a hospital-based study, it may underestimate the actual magnitude of the problem. As the economically deprived patients generally present to hospitals when the disease is very disabling, high prevalence of bi-laterality and poor initial vision were found in our study.

Conclusion

The demographic and clinical characteristics of optic neuritis in eastern Nepal are different from those reported from the western world. However, there is some similarity with those reported from China, Japan and Singapore. Response to pulse methylprednisolone therapy is good in patients with initial visual acuity of at least perception of light.

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