



## Clinical Profile of Optic Neuritis in Kashmiri Population

Authors

**Arsalan Un Nisa<sup>1</sup>, Afroz Khan<sup>2</sup>, Parvez Ahmad Shah<sup>3</sup>**

### Introduction

Optic neuritis (ON) is an acute inflammatory disorder of the optic nerve. The disease is characterized by unilateral or bilateral sudden loss of vision, often accompanied by periocular pain. The majority of cases are idiopathic in origin. However, demyelination, specifically multiple sclerosis (MS), is reported to be the most common etiology in the Western literature.<sup>1,2</sup> In India and other Asian countries the incidence of MS is reported to be low.<sup>3</sup> Although the clinical syndrome of acute optic neuritis has been well recognized for many years, much information about optic neuritis was obtained from a multicenter study called 'The Optic Neuritis Treatment Trial (ONTT)<sup>4</sup>. The investigators in ONTT enrolled patients with acute unilateral optic neuritis. Although the primary objective of the trial was the assessment of the efficacy of corticosteroids in the treatment of optic neuritis, the trial also provided invaluable information about the clinical profile and natural history of this disease. The aim of present study was to study the clinical profile and short term visual outcome of acute optic neuritis in kashmiri population.

### Material and Methods

This prospective observational study was conducted at a tertiary care center for which approval was obtained from the ethical committee

of the institution. A total of 38 eyes of 35 patients with acute optic neuritis (ON) were included in this study. Patients of ON were included in the study after obtaining informed consent. ON was diagnosed on the basis of history and clinical examination, which included sudden unilateral or bilateral visual loss of less than 4 weeks duration, presence of relative afferent pupillary defect, dyschromatopsia, and normal or swollen optic disc on fundus examination. Other optic neuropathies, such as ischemic, infective, traumatic, toxic, hereditary, and compressive, were excluded from the study. Patients under the age of 15 were excluded from the study.

Detailed history was obtained, which documented onset of visual loss, duration, association with pain, any previous attack, and history of any other neurological symptoms. Clinical examination included Snellen's visual acuity (VA), evaluation of pupils, slit-lamp biomicroscopy, and fundus examination.

Cases thought to have other neurological deficits were referred to neurologist for evaluation. Investigations included Goldman visual field (GVF) wherever possible, visual evoked response and color vision with Ishihara pseudo-isochromatic plates. Inability to read any one of the Ishihara test plates was considered abnormal. Magnetic resonance imaging (MRI) of the brain and orbit with contrast was done in all patients.

Hemogram, total and differential white blood count; erythrocyte sedimentation rate, chest X-ray, Mantoux test, and serology for syphilis, toxoplasmosis, and toxocarasis were obtained in all cases. Patients were treated with intravenous methylprednisolone (1gm) given in 100ml of normal saline over a period of one hour for 3 consecutive days followed by oral prednisolone (1mg/kg body weight) for 11 days and then dose was tapered over next 4 days. Patients were followed up at 1 week, 1 month, 3 months and 6 months after the last day of treatment. At all follow-up visits complete eye examination was carried out.

### Results

Total of 38 eyes of 35 patients were included in this study. Most of the patients were seen in the age group of 25-44 years (n=23, 65%). The mean age of presentation was 37.43 years with a standard deviation of 9.36 years. Out of 35 patients, 24 were females and 11 males, with a female preponderance of 2.2:1. Out of 35 patients 32 (91%) had unilateral disease and 3 (9%) had bilateral disease on presentation. All patients presented with sudden loss of vision, whereas pain was an accompanying feature in 14 cases (40%) and loss of visual field in 3 cases (9%). Among 38 eyes, 26 eyes (68.5%) had papillitis and 12 eyes (31.5%) had retrobulbar neuritis. On fundus examination most common finding was swelling of optic disc, which was seen in 22 eyes (57.9%) of the patients, whereas accompanying peripapillary hemorrhages were seen in 4 eyes (10.5%). In 11 eyes (28.9%) of retrobulbar neuritis, optic disc was normal and in one eye

optic disc pallor was seen because of previous attack of optic neuritis. At last follow-up most of the eyes (n=29, 76.3%) had optic disc pallor, whereas optic disc was normal in only 9 eyes (23.68%) at last follow-up. Mean logMAR visual acuity at presentation was  $1.39 \pm 0.92$ . Most of the eyes (n=20, 52.6%) presented with visual acuity between 6/12 to 6/60, 15 eyes (39.5%) had visual acuity of less than 6/60, which included two eyes with visual acuity of no perception of light. Only 3 eyes (7.8%) had visual acuity better or equal to 6/12 (Table-1,2). On last follow-up mean logMAR visual acuity was  $0.13 \pm 0.15$ , with most of the eyes (n=35, 92%) having visual acuity of better or equal to 6/12 (Table-1,2). At presentation most of the eyes (n=34, 89.5%) could not even read a single plate on ishihara chart and only 4 eyes (10.5%) could read some plates. At last follow-up 29 eyes (76.3%) could read all color plates correctly whereas 9 eyes (23.7%) could read atleast some plates (Table-3). Most common field defect on perimetry seen was central/centrocecal in 21 eyes (55.2%), severely depressed field in 5 eyes (13%), enlargement of blind spot in 4 eyes (10.5%), arcuate in 2 eyes (5.2%), altitudinal and peripheral rim, each in 3 eyes (7.9%). On contrast enhanced MRI most common location of optic nerve involvement was that of orbital segment (n=07, 18%), whereas no enhancement was seen in 28 eyes (74%). On visual evoked potential increased P100 latency was seen in 16 (42%) eyes, increased P100 latency with decreased amplitude in 17 (44.7%) eyes, deformed wave pattern in 3 (7.8%) eyes and normal in 2 (5.2%) eyes.

Visual acuity	On presentation	At day 7	At 1 month	At 3 months	At 6 months
$\geq 6/6$	0	0	7	11	16
$< 6/6$ to $\geq 6/12$	3	13	24	23	19
$< 6/12$ to $\geq 6/60$	20	23	7	4	3
$< 6/60$	15	2	0	0	0
<b>Total</b>	<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>

**Table 2:** Mean LogMAR VA

	Mean logMAR visual acuity $\pm$ SD	t-stat*	p value
At baseline	1.39 $\pm$ 0.92	--	--
At day 7	0.53 $\pm$ 0.33	6.28	< 0.001
At 1 month	0.23 $\pm$ 0.22	8.21	< 0.001
At 3 month	0.18 $\pm$ 0.18	8.38	< 0.001
At 6 month	0.13 $\pm$ 0.15	8.63	< 0.001

\*compared with visual acuity at baseline

**Table 3:** Color Vision at presentation and at 6 months follow up

Color vision defect	No of eyes	Percentage
At presentation	Could read all plates	0
	Could not read any plate	34
	Could read some plates	04
At 6 months follow up	Could read all plates	29
	Could read some plates	9
	Could not read any plates	0

### Discussion

The Optic Neuritis Treatment Trial (ONTT) initially undertaken to evaluate the role of corticosteroids in the management of ON was a pioneering study that shaped our understanding of ON. Since then many research studies have been conducted to understand the disease and its association with MS. Western data suggest that at least 50% of patients with ON will eventually develop MS,<sup>5</sup> but studies from Asia and Africa<sup>6</sup> present a contrasting scenario. An Indian study conducted before the commencement of the ONTT had indicated that the clinical profile of ON in our country may be different from that presented in the Western literature<sup>7</sup>. The present study has been conducted with the aim of understanding the clinical picture of ON in Kashmiri population in India. The age of presentation and female preponderance noted in the present study was similar to that reported by the ONTT and other studies.<sup>6</sup> Bilateral presentation was seen in 9% of the patients in the present study and is less than when compared to 16%-35% reported in other studies from this region<sup>6</sup>.

A significant deviation from the ONTT report is the increased frequency of papillitis, which was 68.5% in the present study as compared with 35.3% in the former. The above figures suggest that papillitis is more or as common as RBN, in the Asian population.

Another remarkable difference is absence of pain in 60% of our cases compared with 7.8% in the ONTT<sup>4</sup> and this is consistent with other studies from Asia.<sup>6</sup>

Idiopathic ON and ON associated with MS are considered to have good visual prognosis. As per a report of the ONTT around 93.3% of patients recovered VA of 20/40 or better<sup>4</sup> which was similar to 92% seen in our study. However, the other Asian studies have suggested an overall poorer visual outcome when compared with the ONTT population.<sup>6,8</sup> A study from Africa reported extremely poor visual outcome of ON in the African population, with only 27% of eyes gaining VA of 20/40 or more.<sup>9</sup>

Color vision is almost always abnormal in patients with optic neuritis and is usually more severely affected than the visual acuity. At presentation in our study most of the eyes (89.5%) could not even read a single plate on Ishihara chart and only 4 eyes (10.5%) could read some plates, and no patient could read all plates correctly. In the ONTT, Ishihara color plates were abnormal in the affected eye in 88% of patients and Farnsworth-Munsell 100-Hue test was abnormal in 94% (Optic neuritis study group, 1991)<sup>4</sup> which was similar to our study. A more sensitive test of color vision, the Farnsworth-Munsell 100-Hue test has been recommended for detection of various optic neuropathies, including optic neuritis.

Visual field defects in patients with optic neuritis vary within wide limits. In majority of cases, the primary defect is a central scotoma that is more pronounced for colored than for white test objects and for red objects more than blue objects. In our study central or paracentral scotoma was the most common field defect seen in 19 eyes (52.7%) and other studies also reported the central or paracentral scotomas to be the most common field defect in ON.<sup>10,11</sup>

MRI is used routinely in the evaluation of patients when optic neuritis is the first demyelinating. Typically, the goal is to identify whether there is evidence of prior demyelinating episodes in the brain. In our study, we performed gadolinium-enhanced MRI brain with optic nerve in all the 35 cases (38 eyes). Out of 38 eyes, optic nerve enhancement was seen in 10 (26%) of the eyes which was less than seen in ONTT (77%). Orbital segment of optic nerve was the most common site of enhancement (18%). Although the percentage of eyes having optic nerve enhancement on MRI was less in our study compared to above mentioned studies, one possible reason for this disparity could be the small sample size in our study.

In conclusion the clinical profile of optic neuritis in our study was almost similar to other previous studies except that we noticed less percentage of pain and optic nerve enhancement on MRI in our patients, which could be attributed to smaller sample size of our study. In future a similar study with larger sample size is warranted.

## References

1. Ebers GC. Optic neuritis and multiple sclerosis. *Arch Neurol* 1985;42:702-4.
2. The Optic Neuritis Study Group. The clinical profile of optic neuritis. Experience of the Optic Neuritis Treatment Trial. *Arch Ophthalmol* 1991;109:1673-6.
3. Singhal BS. Multiple sclerosis: Indian experience. *Ann Acad Med Singapore* 1985;14:32-6.
4. Optic Neuritis Study Group. The clinical profile of acute optic neuritis. Experience of the Optic Neuritis Treatment Trial. *Arch Ophthalmol*. 1991;109:1673–1678.
5. Rodriquez M, Siva A, Cross SA, O'Brien PC, Kurland LT. Optic neuritis: A population-based study in Olmsted County, Minnesota. *Neurology* 1995;45: 244-50.
6. Wang JC, Tow S, Aung T, Lim SA, Cullen JF. The presentation, aetiology, management and outcome of optic neuritis in an Asian population. *Clin Experiment Ophthalmol* 2001;29:312-5.
7. Jain IS, Munjal VP, Dhir SP, Gangwar DN. Profile of optic neuritis in Chandigarh and surrounding areas. *Indian J Ophthalmol* 1980;28:195-200.
8. Lim SA, Goh KY, Tow S, Fu E, Wong TY, Seah A, *et al.* Optic neuritis in Singapore. *Singapore Med J* 2008;49:667-71.
9. Pokroy R, Modi G, Saffer D. Optic neuritis in urban black African community. *Eye (Lond)* 2001;15:469-73.
10. Marshal D. Ocular manifestations of multiple sclerosis and relationship to retrobulbar neuritis. *Trans Am Ophthalmol Soc* 1950; 48:487-525.
11. Hyllested K, Moller P. Follow-up on patients with history of optic neuritis. *Acta Ophthalmol*. 39:283-289, 1979.