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A clinical case study on short term visual outcome of optic neuritis with IV Methyl prednisolone

KEYWORDS: clinical presentation, optic neuritis, optic neuritis treatment trial, visual outcome with steroid treatment

Dr.C.Sreenivasulu	Dr. k. vidyasagar
Associate professor of Neurology, KMC, GGH, Kurnool	Associate professor of General medicine, KMC, GGH, Kurnool

Dr.D.Nischala Rama	Dr.U.Murali
Post graduate in Ophthalmology,KMC, REH, Kurnool.	Postgraduate in General medicine, KMC, GGH, Kurnool.

ABSTRACT *This study conducted over 3 years (2013 to 2015) of time, in neurology department, in government general hospital , Kurnool.30 patients were studied to evaluate the clinical profile and response to treatment with IV Methylprednisolone in patients of optic neuritis.patients were examined and investigated and treated with IV methylprednisolone for period of 5 days and status of vision assessed after 6 to 8 weeks. Among the 30 patients males were 13(43.3%) and females were 17(56.6%) in the age group of 12 to 65 years, complete visual loss is seen in 4 (13.3%) and partial visual loss is seen in 26(86.6%),unilateral involvement is seen in 18 (60%) and bilateral involvement is seen in 12 (40%) and fundus was normal in 19 (63.3%) ,hyperemia of optic nerve head and other changes were seen in 11 (36.7%). Prolonged p100 was the most commonly found abnormality on VEP which was seen in 19(65.5%) and absent wave was found in 10(34.4%).MRI was done in 13 patients out of which 8(61.5%) patients had normal MRI and 5 (38.4%) had abnormal findings. This study concluded that a Significant visual improvement is seen in 16(53.3%) and minimal improvement is seen in 14(46.7%) patients receiving IV Methylprednisolone consecutively for 5 days at 4 to 6 weeks.*

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 peri-ocular 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.[1,2] In India and other Asian countries the incidence of MS is reported to be low.[3,5] Moreover, various studies from South East Asia have documented difference in etiology, clinical presentation, and prognosis of ON when compared with the Western population.[6,9] .

Materials and methods:

This prospective evaluatory study was conducted in the Department of Neurology ,Government general hospital,Kurnool, for which approval was obtained from the ethical committee of the institution. 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 12 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 evaluation of pupils, slit-lamp examination, and fundus examination. Investigations included Goldman visual field (GVF) wherever possible, visual evoked response , and color vision with Ishihara pseudo-isochromatic plates. An inability to read any one of the Ishihara test plates was considered abnormal. Magnetic resonance imaging (MRI) of the brain and orbit with contrast, although advised in all patients, could only be performed in 13 cases due to financial constraints. Hemogram, total and differential white blood count; erythrocyte sedimentation rate, chest X-ray, Mantoux test were obtained in all cases.

All patients received treatment in the form of 1 gm of Methyl prednisolone in 100 ml of normal saline given intravenously over 1hour for five consecutive days followed by oral tapering for 2 weeks. The patients were followed up at 1 week, 2 weeks,4 weeks and 6 weeks after the last day of treatment. Analysis included descriptive data of demographic profile, clinical presentation, and visual outcome.

Visual loss	Number	Percentage
Complete	4	13.3%
Partial	26	86.6%
Total	30	100%

Results:

In this study which was done over a period of 3 years , 42 eyes of 30 patients were diagnosed with optic neuritis and treated with IV Methyl prednisolone. The age distribution is between 12-65 years, mean age being 33.4 years.

Table 2.Sex distribution
A slight female preponderance of 1.3:1 was noted.
Table 3.Laterality distribution

Sex	Number	%
unilateral	18	60%
Bilateral	12	40%
Total	30	100

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Laterality	Number	Percentage
Male	13	43.3%
Female	17	56.6%
Total	30	100%

Out of 30 patients,18(60%) patients had unilateral optic neuritis while 12 (40%)patients had bilateral optic neuritis. Results of the hemogram; total and differential white blood count; erythrocyte sedimentation rate; chest X-rays, Mantoux test were normal in all cases.

Visual loss	Number	Percentage
Complete	4	13.3%
Partial	26	86.6%
Total	**30**	**100%**

Table 4. Visual loss distribution

Out of 30 patients,26 (86.6%) patients had partial loss of vision,4 had complete loss with loss of perception of light,all patients had pain in the eye and dyschromatopsia.

Automated perimetry was done in 13 patients. central scotomas were present in 8 cases(61%),centrocecal scotomas were seen in 4 cases(30.7%) ,diffuse reduction in sensitivity in 1 case (7.6%).

Table5.Visual field defects distribution

Visual field defects	Number (n=13)	Percentage
Central scotomas	8	61%
Centro cecal scotomas	4	30.7%
Diffuse reduction in sensitivity	1	7.6%

Laterality	Number	Percentage
Male	13	43.3%
Female	17	56.6%
Total	30	100%
Centro cecal scotomas	4	30.7%
Diffuse reduction in sensitivity	1	7.6%

Fundus examination by direct ophthalmosope revealed normal disc in 19 cases (63.3%), hyperaemic disc in 8 cases (26.7%) optic atrophy in 3 cases(10%).

Table 6. Fundus examination

Disc appearance	Number	Percentage
Normal	19	63.3%
Hyperaemic	8	26.7%
Optic atrophy	3	10%
Total	**30**	**100%**

Fig 1.normal optic disc

Fig 2.Primary optic atrophy

Visually evoked potentials (VEP) was done in 29 patients of which,P 100 latency was prolonged in 19 cases and absent wave forms were seen in 10 cases.

Fig.3VEP showing P100 latency

Table 7 VEP FINDINGS

VEP findings	Number	Percentage
Prolonged P 100	19	65.5%
Absent wave form	10	34.4%
Total	29	100%

Magnetic resonance imaging (MRI) plain brain was done in only 13 patients .Out of which peri ventricular white matter intensities were seen in 5 (38.4%) patients of which one patient had a large segmental myelitis in MRI,8 (61.5%) were normal. In others, MRI was not done due to economical constraints.

Table 8 MRI FINDINGS

MRI Finding	Number(n=13)	Percentage
PVWMI*	5	38.4%
Normal	8	61.5%

*Peri ventricular white matter intensities

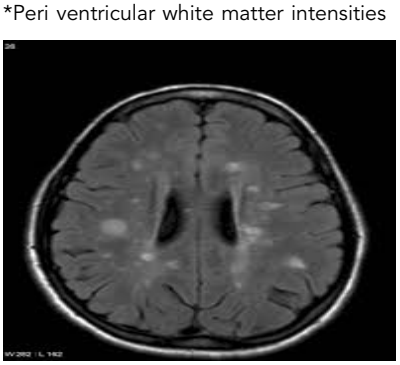

Fig 4.MRI brain Axial section showing periventricular white matter intensities

CSF analysis was done in one patient which revealed oligo clonal bands.

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Significant Response to IV Methyl Prednisolone was noticed in 16 patients (53.3%) in first 6 weeks and minimal response was seen in 14 patients (46.7%).

Table 9. Response to steroids

Response	Number	Percentage
Minimal	14	46.7%
Significant	16	53.3%
Total	30	100%

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,[12,13] but studies from Asia and Africa[6-9,14] 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.[15]

Apart from the above study conducted before the ONTT no other study is available that clarifies the status of ON in the country. The present study has been conducted with the aim of understanding the response of IV Methyl prednisolone in ON cases .The age of presentation and female preponderance noted in the present study was similar to that reported by the ONTT and other studies.[6,9] Bilateral presentation was seen in 40% of the patients in the present study.

Papillitis, was noticed in 8(26.7%) in the present study which is low as compared with 53.3% in a study done by saxena *et al* . Another remarkable difference is presence of pain in 100% of our cases compared with7.8% in the ONTT[2] and 73% in a study by saxena *et al.* Involvement of the fellow eyes was suspected in 19.4% of unilateral cases in the form of decreased contrast sensitivity, although no defect in color vision or visual field was noted. Since we used GVF, the subtle changes that could have been picked up on Humphrey visual fields may have been missed in this study and so it is possible that we have documented lower rates of fellow eye involvement.[2,6]

Recurrence was seen in 16% and was more common with RBN. The ONTT has reported an overall risk of recurrence to be 28% at 5 years follow-up and was more frequent in their MS group and in patients without MS who were in the oral prednisolone treatment group.[17]

Although it was not possible to do MRI in all patients, intracranial de-myelination changes consistent with MS were seen in 37.5% of patients (8 out of 32) in whom it was

done in contrast to 48.7% (203 out of 417) reported by the ONTT.[2] Four cases in our study had MS. We acknowledge that there is a possibility of underestimation of MS in our study given the fact that MRI was not performed in all cases; however, other reports from the south eastern region also show low incidence of MS in the population from this part of the world.[5-9] The limitations of our study include not doing automated perimetry and not obtaining MRI in all cases and no long term follow up for assessing the late response of drug and visual outcome of the patients after 6 weeks.

No higher investigations like CSF analysis for oligoclonal bands and Anti aquaporin 4 levels in serum were done.

Conclusion:

As the visual outcome of the patients who were on methyl prednisolone was found to be significantly better than at presentation,it can be concluded that IV Methyl prednisolone plays a positive role in the outcome of the patients with optic neuritis.

Table 10. Comparision of demographic and clinical profile of optic neuritis of various studies

	Present study	ONTT	Saxena *et al*	Singapore (Lin *et al*)	Taiwan (Lin *et al*)	Singapore (Wang *et al*)	Japan (wakakura *et al*)
Age range in yrs	12-65	18-46	15-58	12-70	7-80	11-67	14-55
Sex ratio(f:m)	1.3:1	3:1	2.2:1	3:1	1:1	0.6:1	3:1
papillitis	26.7%	35%	53.5%	60%	53%	65.4%	50%
pain	100%	92%	73%	71%	59%	50%	56%
Bilateral	40%	nil	19%	16.4%	34.9%	19%	Nil
MS	16.5%	30.1%	5%	25.5%	14.7%	6.5%	5.6%
recurrence	13.3%	28%	16%	29%	33.95%	Not reported	Not reported

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