Optic Neuritis : Characteristics and Visual Outcome

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Abstract

Objective : To determine clinical characteristics of patients with optic neuritis and visual outcome after intravenous methylprednisolone treatment.

Method : A total of 81 patients with optic neuritis were reviewed retrospectively with regard to their clinical characteristics by dividing into two groups as follows :- group I had isolated optic neuritis and group II had optic neuritis with demyelinative disease. The visual outcome in these patients before and after intravenous methylprednisolone treatment was analyzed.

Results : Of 81 patients with optic neuritis, 63 patients (77.8%) had isolated optic neuritis and 18 (22.2%) patients were optic neuritis with demyelinative disease. The ages of the patients ranged from 16 to 59 years (mean = 35.3 years) in patients with isolated optic neuritis and from 16 to 73 years of age (mean = 35.8 years) in patients with optic neuritis with demyelinative disease. After treatment, 45 patients (52 eyes) with isolated optic neuritis and 14 patients (25 eyes) with optic neuritis with demyelinative disease who were followed-up for more than 10 days were studied. After treatment, 60 per cent of the isolated optic neuritis patients and 24 per cent of the optic neuritis patients with demyelinative disease had a visual acuity of 6/12 or better respectively. The isolated optic neuritis who had an onset interval to treatment of less than 8 days had a visual acuity better than 6/9 in 75 per cent.

Conclusion : The final visual outcome in patients with isolated optic neuritis who received earlier treatment was better than those who received treatment later.

Key word : Isolated Optic Neuritis, Optic Neuritis With Demyelinative Disease, Methylprednisolone, Visual Outcome

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Patients with optic neuritis who were enrolled in the Optic Neuritis Treatment Trial (ONTT) were prospectively randomized to receive treatment within 8 days of the onset of vision loss into three groups: oral placebo, oral prednisolone (1 mg/kg/day for 14 days) and intravenous methylprednisolone (1 g/day for 3 days and subsequent oral prednisolone for 11 days). Pulsed methylprednisolone has been demonstrated to accelerate visual recovery but did not improve the final visual outcome. In contrast, oral prednisolone at a dosage of 1 mg/kg/day has shown no benefit in the treatment of optic neuritis, moreover, it has been proven to increase the rate of recurrence of the disease[1,2].

This study was proposed to determine the clinical characteristics of patients with optic neuritis and their visual outcome after intravenous methylprednisolone treatment.

MATERIAL A ND METHOD

Eighty-nine patients with optic neuritis who were treated with pulsed intravenous methylprednisolone at Siriraj hospital from March 1996 to June 2001 were reviewed. Data collection included sex, age, interval from onset to treatment, associated symptoms, ophthalmoscopic findings, visual field defect, and initial and final visual outcome.

Eight patients were excluded because the final diagnosis were other diseases such as Leber's hereditary optic neuropathy, brain tumor and concurrent HIV infection. Eighty-one patients were divided into 2 groups according to the type of optic neuritis; isolated optic neuritis and optic neuritis with demyelinative disease.

The criteria for those with isolated optic neuritis included :-[3]

1. Onset of visual loss less than 30 days before treatment.

2. Progressive loss of vision and/or periocular pain particularly on eye movement.

3. Abnormal visual acuity, color vision and visual field defect consistent with optic neuropathy.

4. Relative afferent pupillary defect with a normal or swollen disc.

5. No evidence of a contributory systemic illness associated with optic neuropathy.

Eight patients who had an onset interval of more than 30 days before treatment and less than a 10 day follow-up period were excluded.

RESULTS

Of 81 patients with optic neuritis, 63 patients (77.8%) had isolated optic neuritis and 18 (22.2%) patients had optic neuritis with demyelinative disease. Of 63 isolated optic neuritis patients, 49 patients (77.8%) had their first episode of optic neuritis. The age of patients with isolated optic neuritis ranged from 16 to 59 years (mean = 35.3 years). The female : male ratio was 2.5 : 1. The interval from onset of symptoms to treatment varied from 2 to 30 days (mean = 11.2 days). Associated symptoms of pain, especially on eye movement, headache and vomiting were found in 34 (54%), 12 (19%) and 1 (1.5%) patients respectively (Table 1).

Visual field defects, initial and final visual acuity were evaluated in patients with isolated optic neuritis before and after treatment with pulsed methylprednisolone. Results were obtained in 45 patients (52 eyes) who had a follow-up period of more than 10 days. Of these patients, 25 patients (28 eyes) had an onset interval to treatment of less than 8 days (mean = 4.6 days) and 20 patients (28 eyes) had an onset between 8 days and 30 days (mean = 17.4 days). Goldmann or Humphry field analyzer was used to examine 27 patients (31 eyes) who had an initial visual acuity not worse than counting fingers and demon-

Table 1. Characteristics of patients with optic neuritis.

Characteristics	Isolated optic neuritis	%	Optic neuritis with demyelinative disease	%
Number of patients	63	77.8	18	22.2
First attack : recurrence	49 : 14		7 : 11	
Female : male	2.5 : 1		17 : 1	
Age (average/years)	16-59	35.3	16-73	35.8
Onset (average/days)	2-30	11.2	1-60	10.7
Pain on eye movement	34	54	11	61.1
Headache	12	19	4	22.2
Vomiting	1	1.5	0	0

strated a central scotoma, altitudinal field defect and generalized depression in 11 (36%), 5 (16%) and 5 (16%) eyes respectively (Table 2).

Lumbar puncture was performed in 29 patients, one patient of whom demonstrated a positive oligoclonal band in the cerebrospinal fluid. She also had abnormal MRI findings and was diagnosed later with clinically definite multiple sclerosis.

Of 18 optic neuritis patients with demyelinative disease, 7 patients (38.9%) had experienced their first episode of optic neuritis. The patients' ages ranged from 16 to 73 years (mean = 35.8 years). The female: male ratio was 17 : 1. The interval from the onset of symptoms to treatment varied from 1 to 60 days (mean = 10.7 days). Associated symptoms of pain, especially on eye movement and headache were found in 11 (61%) and 4 (22%) patients consecutively.

Visual outcome was obtained in 14 patients (25 eyes) who had an onset interval from 1 to 14 days (mean = 4.4 days) and a follow-up period of more than 10 days. Visual fields were used to examine 4 patients (5 eyes) and showed a central scotoma, generalized depression and bitemporal hemianopia in each eye and an enlarged blind spot in 2 eyes.

Table 2. Visual field defects in patients with optic neuritis.

Type of visual field defect	Isolated optic neuritis	%	Optic neuritis with demyelinative disease	%
Central scotoma	11	36	1	20
Altitudinal field defect	5	16	-	-
Diffuse visual field loss	5	16	1	20
Paracentral scotoma	4	13	-	-
Enlarged blind spot	4	13	2	40
Superior temporal field defect	1	3	-	-
Bitemporal hemianopia	1	3	1	20
Total	31	100	5	100

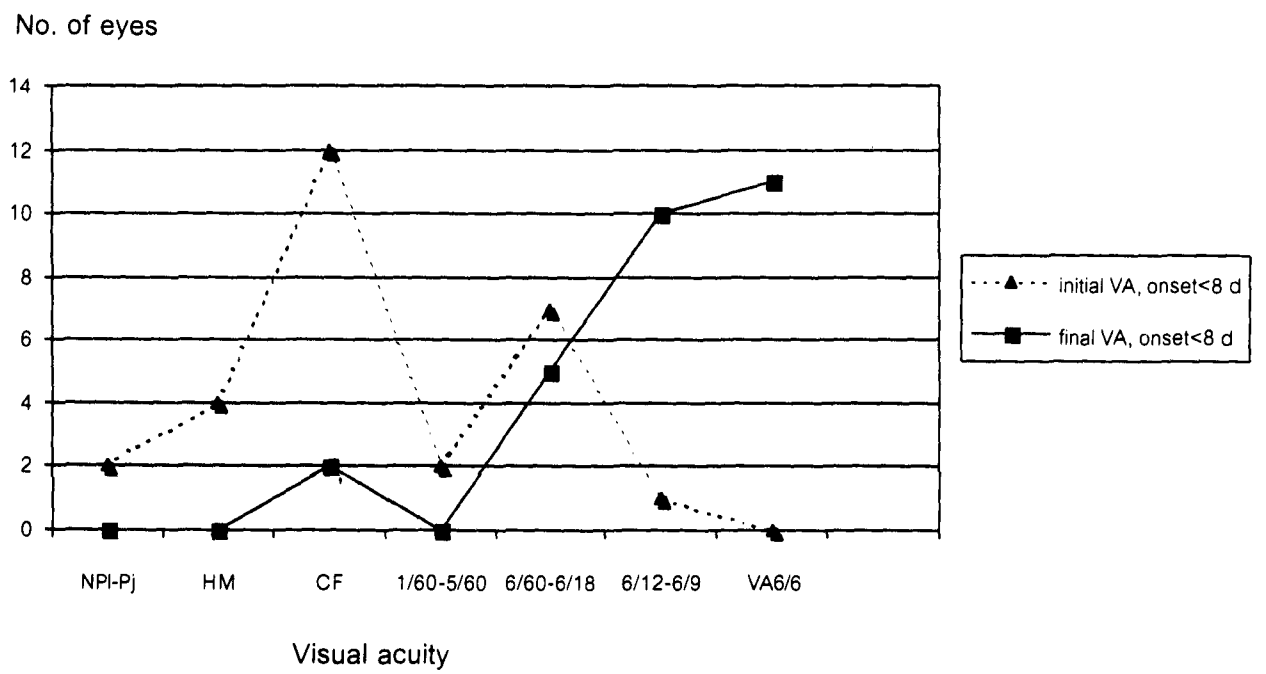

Fig. 1. Initial and final visual outcome of patients with isolated optic neuritis (onset < 8 days).

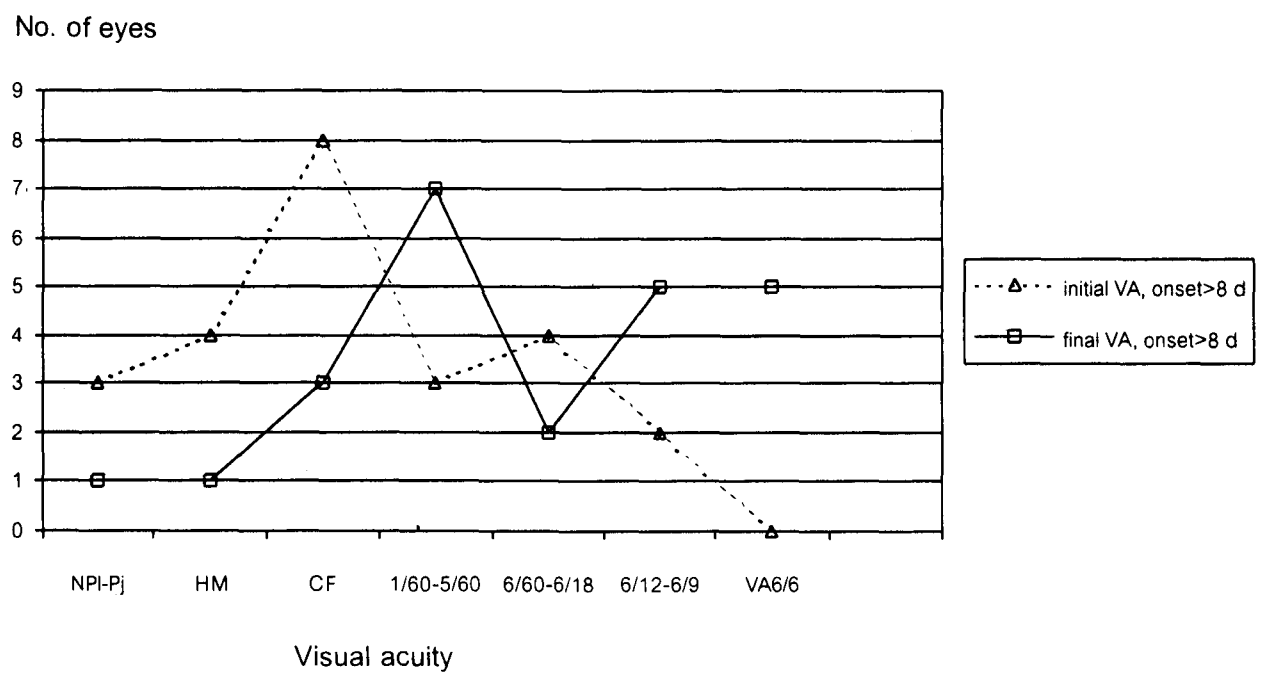

Fig. 2. Initial and final visual outcome of patients with isolated optic neuritis (onset > 8 days).

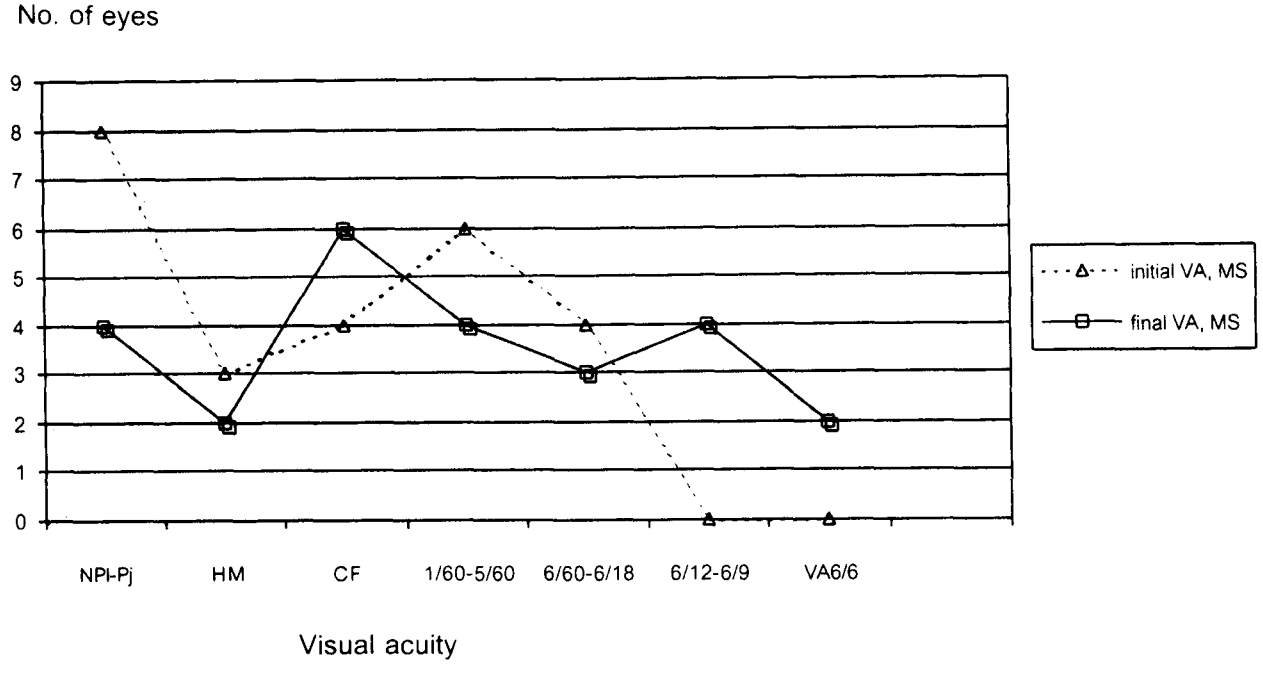

Fig. 3. Initial and final visual outcome of patients with optic neuritis with demyelinative disease (MS).

Approximately 70 per cent of the isolated optic neuritis patients had an initial visual acuity at the level of counting fingers or better while 60 per cent of the optic neuritis patients with demyelinative disease had an initial visual acuity worse than counting fingers. After treatment, 60 per cent of the isolated optic neuritis patients and 24 per cent of the optic neuritis patients with demyelinative disease had a visual acuity of 6/12 or better respectively. The isolated optic neuritis group particularly the individuals who had an onset interval of less than 8 days had a visual acuity better than 6/9 in 75 per cent (Fig. 1, 2 and 3).

DISCUSSION

Optic neuritis is an inflammatory disease of the optic nerve, which is usually caused by demyelination and results in acute painful visual loss. It normally occurs in late teenage to adult females. In the present study, the female : male ratio for isolated optic neuritis was 2.5 : 1.

As well documented by the ONTT study group, approximately half the patients demonstrate diffuse visual field loss in the affected eyes and asymptomatic visual field defects in the fellow eyes are also common[4].

In contrast to the ONTT study group, 36 per cent of the defects in the affected eyes of the present patients were central scotoma and very few patients had asymptomatic field defects in the fellow eyes as previously noted, which may be related to the use of more sensitive perimetric methods in the ONTT study [5,6]. Moreover, the lower proportion of abnormalities in the fellow eyes may result from the authors' inattention to examine the visual field in the patients who had severe visual loss in the affected eyes.

Interestingly, the mean onset interval of optic neuritis with demyelinative disease was shorter than that of the isolated optic neuritis group which might be due to earlier recognition by the patients and also because they have only one good eye remaining.

The authors' finding that, after treatment by intravenous methylprednisolone, 60 per cent of the affected eyes in the isolated optic neuritis group had a visual acuity of 6/12 or better compared to only 24 per cent in the optic neuritis with demyelinative disease group. Despite the similar level of initial visual acuity, the isolated optic neuritis patients with an onset interval of less than 8 days were found to have an improvement in vision that was much better than those with an onset interval of more than 8 days.

When compared with 90 per cent of patients who had a final visual acuity of 6/9 or better after treatment in the ONTT study[1], the presented patients did so in 75 per cent which may be due to the shorter follow-up time.

Based on the ONTT study, the 5-year cumulative probability of clinically definite multiple sclerosis (CDMS) was 30 per cent[7,8]. The authors could not demonstrate the relationship between optic neuritis and CDMS and the results of treatment because of the smaller sample size and the shorter follow-up time. However, one patient who had an oligoclonal band in the cerebrospinal fluid and abnormal MRI findings subsequently developed CDMS.

The authors suggest that if it is decided to treat isolated optic neuritis patients, earlier treatment will accelerate vision recovery. Nevertheless, long-term follow-up and a study with a larger sample size are required for further evaluation of the final vision outcome.

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REFERENCES

1. The Optic Neuritis Study Group. Visual function 5 years after optic neuritis: Experience of the optic neuritis treatment trial. Arch Ophthalmol 1997; 115: 1545-52.
2. Trobe JD, Sieving PC, Guire KE, et al. The impact of the optic neuritis treatment trial on the practices of ophthalmologists and neurologists. Ophthalmology 1999; 106: 2047-53.
3. Kaufman DI, Trobe JD, Eggenberger ER, Whitaker JN. Practice parameter: The role of corticosteroids in the management of acute monosymptomatic optic neuritis. Neurology 2000; 54: 2039-44.
4. Keltner JL, Johnson CA, Spurr JO, Beck RW. Baseline visual field profile of optic neuritis. Arch Ophthalmol 1993; 111: 231-4.
5. Perkins GD, Rose FC. Visual signs at presentation. In: Optic neuritis and its differential diagnosis. New York : Oxford University Press Inc; 1979: 43-73.
6. Rizzo JF, Lessel S. Optic neuritis and ischemic optic neuropathy: Overlapping clinical profiles. Arch Ophthalmol 1991; 109: 1668-72.
7. The Optic Neuritis Study Group. The 5-year risk of MS after optic neuritis: Experience of the optic neuritis treatment trial. Neurology 1997; 49: 1404-13.
8. The 5-year risk of MS after optic neuritis: Experience of the Optic Neuritis Treatment Trial (1997 classical article). Neurology 2001; 57: S36-45.

โรคประสาทตาอักเสบ : ลักษณะอาการและอาการแสดง และผลการรักษา

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วัตถุประสงค์ : เพื่อศึกษาลักษณะอาการและอาการแสดง และผลการรักษาผู้ป่วยโรคประสาทตาอักเสบ ที่ได้รับการรักษาด้วยยาเมธิลเพรดนิโซโลน

วิธีการ : ทำการศึกษาผู้ป่วยโรคประสาทตาอักเสบจำนวนทั้งสิ้น 81 ราย โดยแบ่งเป็น 2 กลุ่ม คือกลุ่มผู้ป่วยที่เป็นโรคประสาทตาอักเสบแต่ไม่เป็นโรค multiple sclerosis และกลุ่มผู้ป่วยที่เป็นโรคประสาทตาอักเสบที่เป็นโรค multiple sclerosis ร่วมด้วย และทำการเปรียบเทียบผลการรักษาในผู้ป่วยทั้งสองกลุ่ม

ผล : พบผู้ป่วยโรคประสาทตาอักเสบจำนวน 63 รายที่ไม่เป็นโรค multiple sclerosis ร่วมด้วย ซึ่งมักมีอาการสายตามัวในช่วงอายุตั้งแต่ 16 ปีถึง 59 ปี (อายุเฉลี่ย 35.3 ปี) และพบผู้ป่วยโรคประสาทตาอักเสบที่เป็นโรค multiple sclerosis ร่วมด้วยมีจำนวน 18 ราย ซึ่งมักมีอาการสายตามัวในช่วงอายุตั้งแต่ 16 ปีถึง 73 ปี (อายุเฉลี่ย 35.8 ปี) ผลของการรักษาผู้ป่วยโรคนี้ด้วยยาเมธิลเพรดนิโซโลนในผู้ป่วยโรคประสาทตาอักเสบที่ไม่เป็นและเป็นโรค multiple sclerosis ร่วมด้วยที่สามารถติดตามผลการรักษาได้อย่างน้อย 10 วันภายหลังได้รับยา จำนวน 45 และ 14 ราย ตามลำดับพบระดับสายตาดีกว่าหรือเท่ากับ 6/12 ร้อยละ 60 และ 24 ตามลำดับ และพบว่าผู้ป่วยที่เป็นโรคประสาทตาอักเสบแต่ไม่เป็นโรค multiple sclerosis ที่ได้รับการรักษาภายในระยะเวลา 8 วันหลังมีอาการสายตามัวมีระดับสายตาดีกว่าหรือเท่ากับ 6/9 ร้อยละ 75

สรุป : ผู้ป่วยที่ได้รับการรักษาอย่างรวดเร็ว จะทำให้มีระดับสายตาเป็นปกติได้เร็วที่สุด

คำสำคัญ : โรคประสาทตาอักเสบที่ไม่เป็นโรค multiple sclerosis ร่วมด้วย, โรคประสาทตาอักเสบที่เป็นโรค multiple sclerosis ร่วมด้วย, ยาเมธิลเพรดนิโซโลน, ระดับสายตา

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