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Research Article

A STUDY ON CLINICAL PROFILE AND OUTCOME OF VISUAL PARAMETERS OF OPTIC NEURITIS PATIENTS IN A TERTIARY EYE CARE CENTRE

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ABSTRACT

Objective: The objective is to study the clinical profile and changes in visual parameters after the treatment of patients with ON. Optic neuritis (ON) is the inflammation of the optic nerve secondary to autoimmune, infectious, or inflammatory conditions.

Methods: This prospective interventional research was done at the ophthalmology department of a tertiary eye care center. 36 cases diagnosed with ON have been analyzed, treated, and followed up for 1 year, for the type of clinical presentation, rate of recurrence, and changes in visual parameters.

Results: The prevalence rate was bimodal, more common among age groups between 46 and 55 years at 32% and age group 16–25 at 27%. A higher prevalence rate was seen in females in 63% of cases. The bilateral presentation was observed in 18%. 44% of cases presented as retrobulbar neuritis (RBN) whereas 56% were as papillitis. At 1 year follow up Optic disc edema suggestive of papillitis was seen in 17% of cases, normal disc with RBN in 44% and disc pallor in 32% discs. At the final follow-up after 1 year, 75% of patients could read maximum (10/13) color plates, 64% of cases showed standard contrast sensitivity and 47% showed normal visual field. VA of 6/60 or worse at presentation was seen in 53% cases and <6/12 in (84%) cases which improved to better than 6/12 in 58% cases and better than 6/60 in 67% cases at final follow up at 1 year. The most common visual field abnormality at presentation was generalized field constriction in (34%), central or centrocecal scotoma in (18%), hemianopia or quadrantanopia (12%), and enlarged blind spot in (06%) cases. During the final follow-up at 1 year, 22 cases (61%) showed normal field. Visual Field could not be tested in (30%) at presentation as vision was <3/60, although visual evoked potential was abnormal in all of 36 (100%) cases with mean P 100 latency being 128 ms. Furthermore, 3 (8%) cases demonstrated additional neurological symptoms till the final follow-up and were subsequently identified to be multiple sclerosis (MS). Recurrence rate was 08 (22%) within 1 year follow-up, of which 06 (17%) cases were clinically RBN and 02 (05%) were papillitis.

Conclusion: In our study, findings of clinical profile and visual outcomes of ON patients were different from that of Western studies as well as from those done previously in the Indian population, notably lesser prevalence of MS, although other differences were not very significant.

Keywords: Optic neuritis, Multiple sclerosis, Recurrence rate, Centrocecal Scotoma, Bimodal, Visual field abnormality.

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INTRODUCTION

Typical optic neuritis (ON) is a presentation of inflammation of the optic nerve mostly associated with systemic demyelinating syndromes namely multiple sclerosis (MS), Neuromyelitis Optica. [1,2]. Typical cases are usually treated by intravenous steroids followed by tapering oral doses, although the dose and the tapering regimens vary [3,4]. ON in young age is marked by increased incidence of bilaterality and advanced optic disc edema but has rapid recovery and better prognosis [5]. While recurrent ON due to MS is stated as a prominent etiology in Western studies, numerous other etiologies of ON have been reported, namely autoimmune, infectious, granulomatous, demyelinating, and paraneoplastic disorders. [6]. Furthermore, numerous researches from tropical Asia have pointed out variation in etiology and outcomes in ON when compared with the western population [7-10].

Objective

The purpose of the current study was to analyze the clinical profile and changes in visual parameters after treatment in patients with ON.

METHODS

This prospective interventional study has been done at the ophthalmology department and RIO at SCB medical college and Hospital Cuttack from January 2021 to December 2022. 36 ON cases have been investigated, treated, and monitored within a study period of 2 years.

Inclusion criteria

Cases of ON were enrolled in the research after diagnosis based on history, symptoms, and signs such as typical visual loss with pain, pupillary signs, color vision abnormalities, normal or pale or edematous optic disc, past history of similar attack, and additional neurological signs.

Exclusion criteria

Pediatric patients, patients who did not give consent or did not come for regular follow up were excluded.

Ocular investigation

Comprised of Snellen's visual acuity (VA), assessment of pupil for afferent defect, slit-lamp bio-microscopy and disc evaluation with +90 D lens, indirect ophthalmoscopy, fundus fluorescein angiogram, Humphrey Visual field analysis, contrast sensitivity on Pelli-Robson chart and color vision through Ishihara pseudo-isochromatic plates wherein inability to read 10 out of 13 plates was considered subnormal.

All patients were referred to a neurologist and radiologist for further assessment. VEP for P100 latency, MRI with the contrast of brain and orbit, complete hemogram, erythrocyte sedimentation rate (ESR), chest X-ray, serology for tuberculosis, toxoplasmosis, serum folate, and vitamin B12 levels have been performed in all cases.

All cases were treated with intravenous methylprednisolone 1 g/day for 3–5 days followed by oral prednisone 1 mg/kg/day for 11 days,

followed by rapid tapering [11,12]. The enrolment period was first 1 year and cases were followed up after 1 week, 1st, 3rd, 6th month, and finally 12th month. Required clearance from the Institutional Ethical Committee was obtained, and informed consent was collected from all patients. Declaration of Helsinki was followed.

RESULTS

Thirty-six cases were enrolled in this study within 1 year.

Table 1 shows that among 36 patients, 27% of cases were aged <25 year, 32% of patients were among 46–55 years and 09% of patients in age of more than 56 years.

Table 2 shows the prevalence and sex-wise distribution of ON. Retrobulbar neuritis (RBN) was diagnosed in 16 (44%) and Papilitis in 20 (56%) cases. Females were affected more with 23 (63%) cases than males with 13 (37%) cases.

Table 3 compares findings at the presentation and final follow-up at 1 year. The presenting symptoms were sudden loss of vision in all 36 (100%) cases, while ocular pain was present in 24 (67%) cases. Hemogram, white blood cell, ESR, chest X-ray, and serology were normal in all patients.

Optic disc edema suggestive of papillitis was seen in 56% of cases at presentation but in 17% of cases at 1-year follow-up. 44% discs appeared normal but were clinically diagnosed as RBN on VEP. 32% discs appeared pale due to optic atrophy at 1 year follow-up.

88% of cases which were not able to read 10 out of 13 Ishihara pseudo-isochromatic plates showed defective color vision at the time of presentation. Correspondingly, 96% of eyes were not able to recognize single letter with the maximum contrast sensitivity with the Pelli-Robson chart. During the final follow-up, 75% of eyes were able to read 10/13 of the color plates and 64% eyes showed normal contrast sensitivity.

VA at presentation was VA <6/12 in (84%) cases, VA <6/60 in (53%) of cases and only (16%) cases had VA >6/12. During the final follow-up at 1 year, there was marked recovery with VA >6/12 in (67%) cases, VA >6/60 in (58%) cases.

Visual Field investigation at presentation revealed generalized field constriction in (34%), Central or centrocecal scotoma in 18%, hemianopia or quadrantanopia (12%) followed by enlarged blind spot in (06%) cases. During the final follow-up at 1 year, 22 eyes (61%) showed normal field. Visual Field could not be tested in (30%) at presentation as vision was <3/60, although Visual evoked potential was abnormal in all 36 (100%) cases with mean P 100 latency being 128 ms.

Table 4 shows that recurrent ON within 1-year follow-up has been observed among 8 (22%) from which one was a known case of MS, 2 other cases showed demyelination on MRI and 5 patients showed normal reports on MRI. 06 (17%) cases were clinically RBN and 02 (05%) were papillitis.

DISCUSSION

ON is comparatively uncommon in children than adults [13]. Moreover, the etiology of ON in children is mostly due to para-infectious conditions and around 25% is because of acute demyelinating syndromes, associated with a good prognosis [14,15]. Numerous researches have been documented on the spectrum of ON [16] but only few have been documented from among Indian populace [11,14]. According to a Western study, at least 50% of cases of ON ultimately progresses to MS [16], however, few researches from Asia and Africa [17,18] reported dissimilar consequence. Our current observation was directed with the purpose of considering the clinical spectrum of ON in the eastern India population.

Table 1: Distribution of age

Age (years)	Number of patients (*n*=36), *n* (%)
16–25	10 (27)
26–35	7 (20)
36–45	4 (12)
46–55	12 (32)
56–70	3 (9)

Table 2: Type of optic neuritis at presentation and sex distribution

Types	Male	Female	Total cases, *n* (%)
RBN	5	11	16 (44)
Papilitis	8	12	20 (56)
Total, *n* (%)	13 (37)	23 (63)	36 (100)

RBN: Retrobulbar neuritis

Table 3: Compares findings at presentation and final follow up at 1 year

Signs	Presentation (%)	Final (%), 1 year
OPTC disc		
Edema	20 (56)	6 (17)
Normal	16 (44)	19 (51)
Palor	0	11 (32)
Colour vision		
<10 out of 13	31 (88)	9 (25)
Contrast	34 (96)	25 (64)
Visual acuity		
PL–<1/60	9	5
1/60–<3/60	21	11
3/60–<6/60	23	17
6/60–<6/12	31	9
6/12–6/6	16	58

OPTC: Optic disc PL, PL: Perception of light

Table 4: Recurrence rate within 1 year follow-up

Recurrence	Frequency (%)
RBN	6 (17)
Papilitis	2 (5)

RBN: Retrobulbar neuritis

The age distribution of the study population and female preponderance in our current observation was comparable with the earlier reported studies [7,10]. In our study, the bilateral presentation has been observed among 18% of cases which is comparable to already reported studies [7,10,19] with the percentage of 16–35% while African research documented the bilateral presentation as 80% [20].

VA and Visual evoked potential were abnormal in all of 36 (100%) cases with mean P 100 latency being 128 ms and are important clinical parameters to rule out other causes of disc edema. The recurrence rate was 08 (22%) within 1 year follow-up, of which majority 06 (17%) cases were clinically RBN and 02 (05%) were papillitis. 3 (8%) cases in our study had MS although there is a possibility of underestimation of MS in our study given the fact that MRI was normal in many cases, though other studies from Southeast Asia also showed a low prevalence of MS [7,9,18,20]. The overall risk of recurrence reported by other studies was found to be 28% at 5 years of follow-up and there was more recurrence in the MS group than without MS who were on the oral prednisolone therapy [21].

Limitation

This was a hospital OPD-based study and does not represent the population. Furthermore, study duration and sample size were less, and

no long-term follow-up was conducted. In many cases, etiology could not be established and treatment was given empirically.

CONCLUSION

MS was less frequently associated with ON in our study than Western population although there is a possibility of underestimation of MS based on normal MRI findings, but it was associated with poorer prognosis which may be because of late hospitalization and thus delayed institution of steroids. In our study, other differences in findings of clinical profile and visual outcomes of ON patients were not very significantly different from that of Western studies or those done previously in the Indian population.

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AUTHORSHIP CONTRIBUTIONS

Dr.PranatiChaudhury and Dr. Anita Misra – Design and Data collection or processing, editing the manuscript. Dr.PranatiChaudhury, Dr. Anita Misra, Dr. SubhrajyotiMohanty, Dr. KalpanaBadwal,Dr. Rupa Gupta,Dr. PriyambadaSubudhi analysis or interpretation, literature search, manuscript writing and submission.

CONFLICTS OF INTEREST

No conflicts of interest.

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