Original Research Article

Aetiological Profile of Optic Atrophy: A hospital based prospective study

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Abstract

Objectives: This study was to evaluateclinical presentations and aetiological profiles of patients with optic atrophy.**Methods:**The patients had undergone complete ophthalmological examination, i.e. anterior segment examination with the help of slit lamp and posterior segment examination with the help of direct and indirect ophthalmoscopy. Visual fields and colour vision were performed whenever required and in possible cases. CT scan and MRI of the brain and orbits were done to rule out intracranial space-occupying lesions.**Results:**Mean age of the patients was 47.87±18.21 years.126(63%) patients were males. 146(73%) patients had bilateral involvement of eye. 82(41%) patients had glaucomatous optic atrophy.113(56.5%) had pressure and traction atrophy. Amon them this pressure and traction atrophy had included 74(65.49%) glaucomatous optic atrophy.126 patients had BCVA <6/60-CF 1 mt. Among them, 6/60-CF 1 mt was seen in 63(50%) pressure and traction atrophy and 47(37.30%) consecutive atrophy.**Conclusions:**Optic atrophy was commonly found in older age male population. Bilateral involvement was commonly seen. Glaucomatous atrophy was the main type optic atrophy. Second common was consecutive optic atrophy. Pressure and traction was the most common aetiological factors of optic atrophy. BCVA <6/60-CF 1 mt was seen in most of the patients. Most of the pressure and traction optic atrophy patients had <6/60-CF 1 mt BCVA. Hence, Ophthalmological counselling, preventive measures, early diagnosis and prompt treatment of aetiological factors are necessary for prevention from optic atrophy.

Key words: Optic atrophy, Aetiology, Glaucomatous, Age group, Gender

Introduction

Optic atrophy is a caused by degeneration of optic nerve and visual pathways, particularly retinogeniculate section. It is a pathological term referring to shrinkage of optic nerve.On ophthalmoscopyoptic disc looks pale along with abnormal surface & margins of the disc [1].

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Optic atrophy has traditionally taken a back seat to more wellknown causes of visual impairments [2,3]. However, it has nevertheless been shown to be one of the leading causes of blindness, contributing up to 25. 4% of blindness, depending on the sample populations [4,5] . The irreversibility of this condition, as well as the fact that it cannot be attributed to a single cause, but rather, is the end result of a motley assortment of diseases[6,7], may be just some of the factors underlying the relative scarcity of epidemiological studies in this field. In the past, the aetiology of optic atrophy was unknown in approximately 25% -50% of

the cases studied[5,8]Clinically, optic atrophy manifests as changes in the colour and the structure of the optic disc, associated with variable degrees of visual dysfunction[9].Objectives of this study was to evaluate the clinical presentations and various aetiological factors of optic atrophy.

Materials & Methods

This present study was conducted in the Department of Ophthalmology, SKMCH, Muzaffarpur, Bihar, with collaboration of the Department of Ophthalmology, PMCH, Patna, Bihar, India during a period from May 2019 to February 2020. All subjects were signed an informed consent. Data was collected with irrespective of age and sex.

A total number of 200 cases of optic atrophy with irrespective of age and sex by the user random sampling were enrolled.

All the patients were diagnosed by fundus examination. Later, data was collected by taking a detailed clinical history. Demographics, chief complaints, including the duration of the problem and presence of any systemic diseases were asked.

Patients diagnosed to have optic atrophy on ophthalmoscopic examination were included.

Procedures: The subjects had undergone complete ophthalmological examination, i.e. anterior segment examination with the help of slit lamp and posterior segment examination with the help of direct and indirect ophthalmoscopy. Visual fields and colour vision were performed whenever required and in possible cases. CT scan and MRI of the brain and orbits were done to rule out intracranial space-occupying lesions.

Statistical Analysis

Data was analysed by using MS-Office software. All the data was tabulated and percentages were calculated. Mean ± Standard deviation was observed.

Observations

A total of 200 patients of optic atrophy with age group 20 to >60 years were enrolled. Most of the patients 80(40%) were in age group of 41-60 years. Mean age of the patients was 47.87±18.21 years.

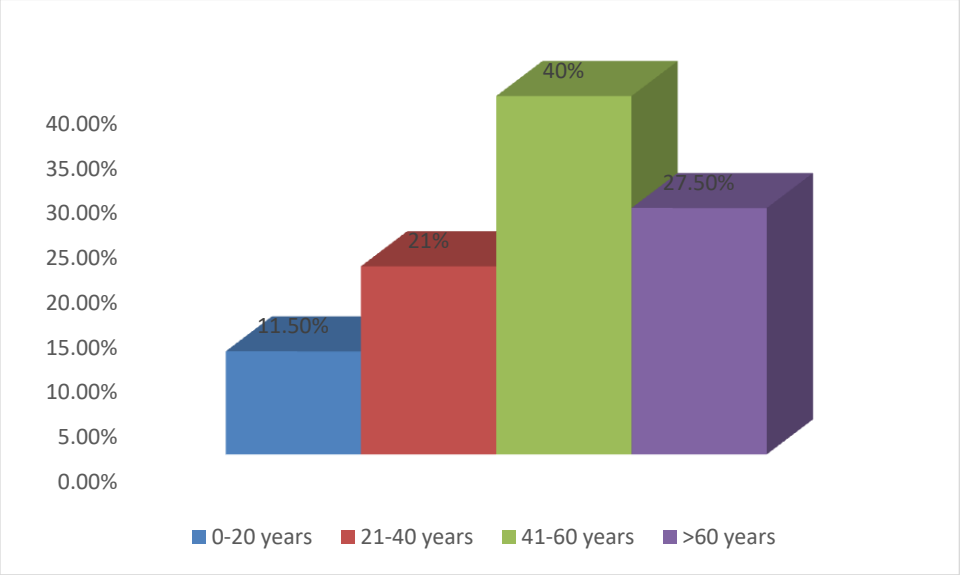

Figure.1: Age wise distribution of the patients with optic atrophy.

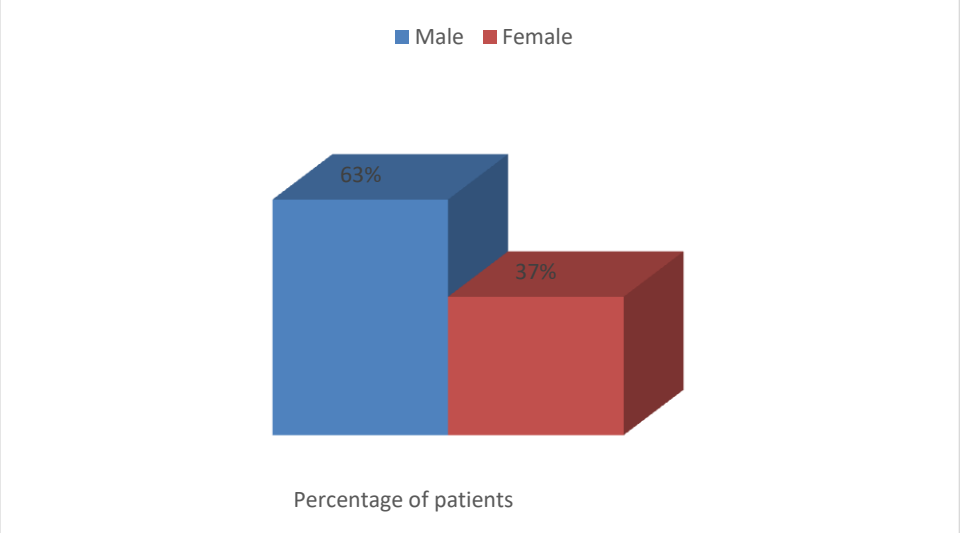

Figure 2: Gender wise distribution of patients with optic atrophy

In this study, 126(63%) patients were males. And 74(37%) patients were females

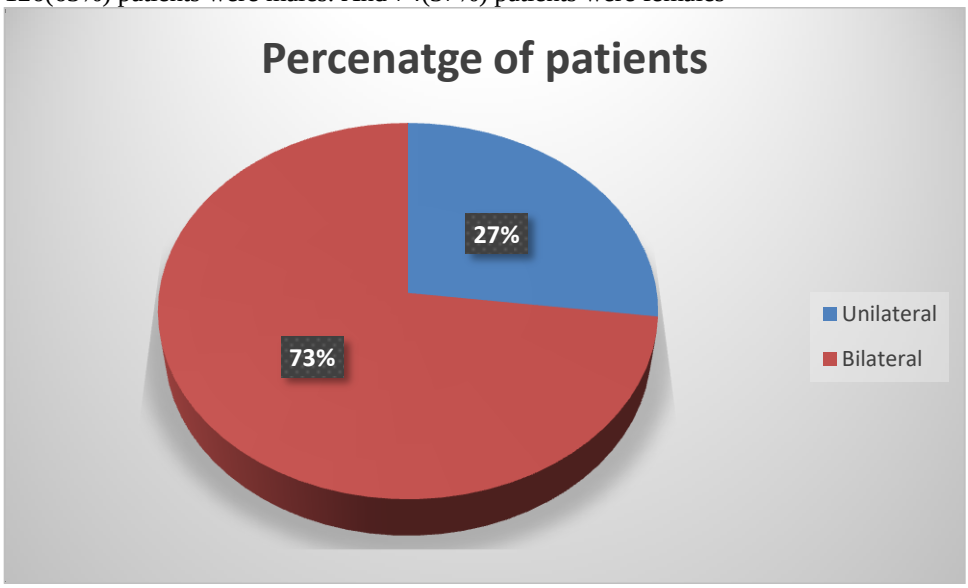

Figure 3:Laterality of optic atrophy patients

In this presentstudy, 54(27%) patients had unilateral involvement. 146(73%) patients had bilateral involvement of eye.

Table.1. Showing the type of optic atrophy

Type of optic atrophy	No. of patients	% of patients
Primary	34	17%
Secondary	21	10.5%
Consecutive	63	31.5%
Glaucomatous	82	41%
Total	200	100%

Optic atrophy patients had 34(17%) primary, 21(10.5%) secondary, 63(31.5%) consecutive and 82(41%) glaucomatous type of optic atrophy.

Table.3. Showing the aetiology of optic atrophy

Aetiology of optic atrophy	No. of patients	Percentage of patients
1. Pressure and traction atrophy	**113**	**56.5%**
Glaucomatous optic atrophy	74	65.49%
Post Papilloedematous optic atrophy	14	12.39%
Intracranial tumours without raised ICT	25	22.12%
2. Consecutive optic atrophy	**55**	**27.5%**
Retinitis pigmentosa	47	85.45%
Post PRP	08	14.55%
3. Circulatory optic atrophy	**11**	**5.5%**
CRAO	04	36.36%
AION	07	63.64%
4. Post-inflammatory	**06**	**3%**
5. Traumatic optic atrophy	**13**	**6.5%**
6. Idiopathic	**02**	**01%**
Total	200	

In this present study, most of the patients 113(56.5%) had pressure and traction atrophy. Amon them this pressure and traction atrophy had included 74(65.49%) glaucomatous type of optic atrophy, 14(12.39%) post papilloedematous optic atrophy and 25(22.12%) intracranial tumours without raised ICT. 55(27.5%) consecutive optic atrophy had included 47(85.45%) retinitis pigmentosa and 8(14.55%) post PRP. 11(5.5%) circulatory optic atrophy had included 4(36.36%) CRAO and 7(63.64%) AION. Post inflammatory was 6(3%), 13(6.5%) patients had traumatic optic atrophy and Idiopathic was 2(1%).

Table.6.Showing the aetiology with relation to visual acuity on both eyes.

Aetiology	**6/6-6/18**	**6/24-6/60**	**<6/60-CF 1 mt**	**<CF 1mt-PL**	**No PL**	**Total**
Pressure & traction atrophy	16(76.12%)	42(76.36%)	63(50%)	67(54.92%)	15(50%)	203(57.34%)
Consecutive atrophy	-	11(20%)	47(37.30%)	44(36.06%)	-	102(28.81%)
Circulatory	05(23.81%)	03(5.45%)	07(5.55%)	05(4.1%)	02(6.67%)	22(6.21%)
Post-inflammatory	-	-	04(3.17%)	-	-	04(1.13%)
Traumatic atrophy	-	-	-	06(4.92%)	13(43.33%)	19(5.37%)
Idiopathic	-	-	05(3.97%)	-	-	05(1.41%)
Total	21(100%)	55(100%)	126(100%)	122(100%)	30(100%)	354(100%)

In this present study,BCVA was examined in both eye of the patients. 21 patients were seen BCVA 6/6-6/18. Among them, 6/6-6/18 BCVA was seen in16(76.12%) pressure and traction atrophy and 5(23.81%) circulatory atrophy patients. 55 patients had BCVA 6/24-6/60. Among them, 6/24-6/60 BCVA was seen in 42(76.36%) pressure & traction atrophy, 11(20%) consecutive atrophy and 3(5.45%) circulatory atrophy. 126 patients had BCVA <6/60-CF 1 mt. Among them, 6/60-CF 1 mt was seen in 63(50%) pressure and traction atrophy, 47(37.30%) consecutive atrophy, 7(5.55%) circulatory atrophy and 6(4.92%) traumatic atrophy. 39 patients had no PL. Among them, no PL was seen in 15(50%) pressure and traction atrophy, 2(6.67%) circulatory atrophy and 13(43.33%) traumatic atrophy.

Discussions

Optic atrophy, pallor of the optic nerve head, is a sign found in patients with visual loss due to pathology of the optic nerve or retinal ganglion cells. There are many causes.

In this present study, 200 patients of optic atrophy were included. Age group of patients were 20 years to >60 years. Most of the patients were belonged in age 41-60 year. Mean age of the patients was 47.87±18.21 years.And most of the 126(63%) patients were males. 74(37%) cases were females.

This is in accordance with the study conducted byBajracharya K et al [10] study where the mean age was reportedas 53.16±18.1 years. In a study by T. S. Oluleye et al. [11] itwas 40.8 years.

Road traffic accidents leading to traumatic optic atrophy may be another reason for the optic atrophy being more common among males.This difference of gender with male preponderance was also documented in the Chaddah M Ret al [8] study, T. S. Oluleye et al [11] study and Kumar MP et al [12] study, with the male-female ratios being 1.9: 1, 2: 1 and 2: 1 respectively. The reason for the males being more affected with optic atrophy may be attributed to the X-linked recessive inheritance of Retinitis Pigmentosa.

In this present study, most of the patients had 146(73%) bilateral involvement of optic atrophy. 54(27%) patients had unilateral involvement of optic atrophy.

Most of the Optic atrophy patients 82(41%) had glaucomatous, 63(31.5%) consecutive and 34(17%) primary. Most of the glaucomatous atrophy was in 4^{th} to 6^{th} decades of life.

This is in accordance with the study conducted by Bajracharya K et al, [10] where it was 93.1% in this age group. Out of 70 eyes of 35 patients, 32 eyes have IOP between 21 to 30 mmHg, 36 eyes have IOP between 31to 40 mmHg, and 2 eyes had IOP between 41 to 50 mmHg. In the present clinical study, glaucoma is the main cause of optic atrophy82(41%. This is in accordance with KrishnaVM et al [13] study where it was 28%.

In this present study, most of the patients 113(56.5%) had pressure and traction atrophy. 74(65.49%) glaucomatous optic atrophy was the main cause of pressure and traction atrophy.55(27.5%) consecutive optic atrophy was causes mainly by 47(85.45%) retinitis pigmentosa. This is in accordance with Krishna VM et al[13] study where it was 22%. This finding was not in concordance with T. S. Oluleye et al[11] study where it was 3%.

11(5.5%) circulatory optic atrophy was occurred due to 7(63.64%) AIONand 4(36.36%) CRAO. This is in accordance with Krishna VM et al10 study where it was 4%. Out of the 8 cases, 5 cases are due to AION, and 3 cases are due to CRAO. Post inflammatory optic atrophy was 6(3%), 13(6.5%) patients had traumatic optic atrophy and Idiopathic was 2(1%). This is in accordance with Chaddah M R et al [8] study, T. S. Oluleye et al[11] study and Krishna VM et al[13] study where it was 7%, 8% and 6% respectively. However, in Kumar P et al [12] study, it was reported as 2%.

In this present study, BCVA was examined in both eye of the patients. Most of the patients (126 patients) had BCVA <6/60-CF 1 mt. <6/60-CF 1 mt visual acuity was found in most of the 63(50%) pressure and traction atrophy and 47(37.30%) consecutive atrophy patients.

6/24-6/60 (55 patients) BCVA was found in most of the patients of 42(76.36%) pressure & traction atrophy. 39 patients had no PL. It was occurred in most of the patients of 15(50%) pressure and traction atrophy and 13(43.33%) traumatic atrophy. 6/6-6/18 (21 patients) visual acuity was in most of the patients of 16(76.12%) pressure and traction atrophy.

Jallu et al [14]found a higher incidence, larger tumors and a larger proportion of patients (44.2%) presenting with unilateral or bilateral blindness when compared to the west. They attributed their findings to lack of insight and unique cultural restraints that lead to late presentations in this population.

Race, ethnicity and low socioeconomic strata appear to be independently associated with increased vision loss that includes preventable causes with known risk factors and causes that are amenable to surgical and medical intervention [15].Thus. more comprehensive information about our patients might have helped to explain our particular findings.

Conclusions

This present study concluded that theOptic atrophy was commonly found in older age male population. Bilateral involvement was commonly seen. Glaucomatous atrophy was the main type optic atrophy. Second common was consecutive optic atrophy. Pressure and traction was the most common aetiological factors of optic atrophy. BCVA <6/60-CF 1 mt was seen in most of the patients. Most of the pressure and traction optic atrophy patients had <6/60-CF 1 mt BCVA. Hence, Ophthalmological counselling, preventive measures, early diagnosis and prompt treatment of aetiological factors are necessary for prevention from optic atrophy.

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