Original Research Article

Optic disc oedema presentation and causes at a tertiary centre

Porika Ram Mohan Lal[1], Bonu Chandrasekhar Rao[2*]

[1,2]Assistant Professor, Department of Ophthalmology, Osmania General Hospital, Hyderabad, Telangana state, INDIA.
Email: kpkiranmai1@gmail.com

Abstract

Background: Optic disc swelling can be caused by a number of conditions including papilloedema. The term papilloedema refers specifically to optic disc swelling secondary to raised intracranial pressure (ICP). **Aim:** The aim of the study was to determine the clinical causes and aetiology of optic disc swelling. **Materials and Methods:** This study was a observational study which was conducted from July 2016 to June 2017 in department of ophthalmology in Osmania General Hospital, Hyderabad. **Results:** In 50 patients 70 eyes were studied. 27 were males and 23 were females out of 50 patients. Optic neuritis was the most common cause for optic disc swelling and it was seen in 24 patients. The next common cause was papilloedema which constituted about 20 patients, which was followed by diabetic papillopathy and neuroretinitis which constituted 2 each, VKH and retinal vein occlusion constituted 1 each. The main complaint in the study was decreased vision followed by headache and eye pain. Decreased vision was seen in 30 patients (60%), headache was seen in 26 (52%) which was mostly seen in papilloedema and eye pain was seen in 20 patients which was mostly seen in optic neuritis patients. **Conclusion:** The most common cause of optic disc oedema was optic neuritis and papilloedema.

Key Words: Optic disc swelling, disc oedema.

***Address for Correspondence:**
Dr. Bonu Chandrasekahar Rao, Assistant Professor, Department of Ophthalmology, Osmania General Hospital, Hyderabad, Telangana state, INDIA.
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INTRODUCTION

Optic disc swelling is the swelling of the optic nerve as it enters the back of the eye due to raised intracranial pressure. Fluid surrounding the brain is constantly produced and reabsorbed, maintaining just enough intracranial pressure to help protect the brain if there is blunt head trauma.[1,2] Optic neuritis, non-arteritic anterior ischemic optic neuropathy, compressive optic neuropathy, retinal vein occlusion, diabetic papillopathy are the clinical causes of unilateral optic disc swelling.[3,4] Papilloedema, infiltrative optic neuropathy, toxic optic neuropathy and malignant hypertension are the causes of bilateral optic disc swelling. The most common cause of optic disc swelling is anterior ischemic optic neuropathy.[5] In India, no studies were done on the common causes and clinical features of optic disc swelling. The aim of the study was to determine the clinical causes and aetiology of optic disc swelling.

MATERIALS AND METHODS

This study was a observational study which was conducted from July 2016 to June 2017 in department of ophthalmology in Osmania General Hospital, Hyderabad. This study consisted of 50 patients out of which 27 were males and 23 were females. All patients had to undergo visual acquity, detailed slit lamp examination, 90 D examination, indirect ophthalmology, colour vision, fundus photography, fundus fluroscein angiography. Optic neuritis treatment trial (ONTT), Ischemic optic neuropathy decompression trial (IONDT) and elevated intracranial pressure were the diagnostic criteria of Optic neuritis.

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RESULTS

In 50 patients 70 eyes were studied. 27 were males and 23 were females out of 50 patients. The mean age of patients were 33.85 years (ranged from 16 to 63 years). Patients were more in the age group of 30 to 60 years.

Table 1: Demographic distribution

Sex	Males: 27	Females: 23
Age	10-20 years	22%
	21-30 years	30%
	31-40 years	28%
	41-50 years	10%
	51-60 years	8%
	>60 years	2%

Table 2: Causes for disc oedema.

Causes	Number of patients
Optic Neuritis	24
Papilloedema	20
Diabetic Papillopathy	2
Neuroretinitis	2
VKH	1
Retinal vein occlusion	1

Table 2 shows that optic neuritis was the most common cause for optic disc swelling and it was seen in 24 patients. The next common cause was papilloedema which constituted about 20 patients, which was followed by diabetic papillopathy and neuroretinitis which constituted 2 each, VKH and retinal vein occlusion constituted 1 each.

Table 3: Causes of bilateral disc oedema

Causes	Number of patients
Optic Neuritis	5
Papilloedema	16
Neuroretinitis	2
VKH	1

Table 3 shows that 24 patients had bilateral disc oedema, in which the main cause was papilloedema constituting 16 patients, followed by optic neuritis which constituted 5 patients, neuroretinitis was seen in 2 patients and VKH was seen in 1 patients.

Table 4: Causes of Papilloedema

Causes	Number of Patients
Meningitis	7
Superior sagittal sinus thrombosis	4
Intracerebral haemorrhage	2
Subdural haematoma	1
Grade IV hypertensive retinopathy	1
Idiopathic	1

Table 4 shows that out of 16 cases of papilloedema, 7 had meningitis, 4 had superior sagittal sinus thrombosis, 2 had intracerebral haemorrhage, 1 had subdural haematoma, 1 had grade IV hypertensive retinopathy and 1 had idiopathic. The main complaint in the study was decreased vision followed by headache and eye pain. Decreased vision was seen in 30 patients (60%), headache was seen in 26 (52%) which was mostly seen in papilloedema and eye pain was seen in 20 patients which was mostly seen in optic neuritis patients.

DISCUSSION

Dysfunction or a partial arrest of axoplasmic transport is led by compression of the optic nerve and may result in optic disc oedema. Optic disc oedema is not because of increased intracranial pressure, whereas papilloedema is due to raised intracranial pressure. Raghavendra Ijeri *et al*;[6] reported that a total of 43 consecutive cases with optic disc oedema were enrolled. Out of 43 cases, twenty were females and twenty three were males. Out of the 43 cases, 15 cases had papilloedema, 20 cases had optic neuritis, one had anterior ischemic optic neuropathy (AION), 2 had diabetic papillopathy, 2 had Vogt Koyanagi Harada Syndrome (VKH), one had hemiretinal vein occlusion and 2 cases had neuroretinitis. A total of 34.9% patients had papilloedema, 46.5% had optic neuritis, 4.6% each had neuroretinitis, VKH and diabetic papillopathy, and 2.3% each had AION and hemi-retinal vein occlusion, whereas in our study, 27 were males and 23 were females out of 50 patients. Optic neuritis was the most common cause for optic disc swelling and it was seen in 24 patients. The next common cause was papilloedema which constituted about 20 patients, which was followed by diabetic papillopathy and neuroretinitis which constituted 2 each, VKH and retinal vein occlusion constituted 1 each. The main complaint in the study was decreased vision followed by headache and eye pain. Iijima K *et al*;[7] conducted a study in which the most common cause of the bilateral disc swelling was increased intracranial pressure (ICP) (59%); followed by pseudopapillitis (16%); uveitis (8%); hypertensive retinopathy (5%); bilateral optic neuritis, acute disseminated encephalomyelitis (ADEM) and optic disc drusen (all at 2% each); and leukemia (1%). Unknown etiology accounted for 6% of the cases. Nakao K *et al*;[8] reported that thirty-two eyes (27.6%) of 16 VKH patients had disc swelling. The mean age of the patients with disc swelling was higher than that of those without disc swelling (58.9 vs. 41.4, P = 0.0001). The disc-macula distance to disc diameter (DM/DD) ratio of the eyes with disc swelling was higher than that of those without disc swelling (2.81 vs. 2.59, P = 0.0007). The cup to disc (C/D) ratio of the eyes with disc swelling was smaller than that of those without disc swelling (0.18 vs. 0.32, P = 0.000001). The intraocular pressure was lower (P = 0.0084), and the refractive error was larger (P = 0.019), in eyes with disc swelling than in those without. There was no significant association between the presence of disc

swelling and the range of retinal detachment, cerebrospinal fluid cell count, recurrence rate of VKH, or the incidence of sunset glow fundus. 13 eyes of 7 patients had visual field defects even after the inflammation subsided, and these patients were older, had a higher DM/DD ratio, and had a smaller C/D ratio than those without visual field defects, among the eyes with disc swelling whereas in our study, decreased vision was seen in 30 patients (60%), headache was seen in 26 (52%) which was mostly seen in papilloedema and eye pain was seen in 20 patients which was mostly seen in optic neuritis patients. Rajendram R *et al*;[9] reported that Vogt-Koyanagi-Harada (VKH) disease is a granulomatous multisystem inflammatory disorder that classically affects the uvea, inner ear, meninges, and skin. We report three patients who presented with initial findings suggestive of bilateral optic neuritis requiring CSF analysis and brain images. None of these patients had extraocular changes. Fluorescein angiography of the retina led to the diagnosis of VKH disease in all patients. Vogt-Koyanagi-Harada disease should be included in differential diagnosis of bilateral optic neuritis, even when extraocular manifestations of the disease are absent. In such cases, fluorescein angiography will aid diagnosis. Jung JJ *et al*;[10] reported that non-arteritic anterior ischemic optic neuropathy was the most common disorder (34.7%) that presented with optic disc swelling. ON was identified in 15 patients (30.6%). Seven out of 49 patients (14.3%) had intracranially associated diseases, such as papilledema and compressive optic neuropathy. Pseudopapilledema was noted in four patients (8.2%). Other diseases (e.g., papillophlebitis, neuroretinitis, and diabetic papillopathy) were seen in six patients (12.2%). Ocular pain was observed more commonly in patients with ON ($p = 0.001$). Patients with ON expected a better visual prognosis than patients with NA-AION (0.12 ± 0.32 vs. 0.49 ± 0.35, $p = 0.001$).

CONCLUSION

The most common cause of optic disc oedema was optic neuritis and papilloedema.

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