ISSN: 0975-3583,0976-2833 VOL13, ISSUE 03, 2022

Study of etiology and clinical features in patients of optic disc oedema at a tertiary centre

Sridhar Baratan[1], Nivean Madhivanan[2], Prathiba Devi Nivean[3]

[1]Professor, Department of Ophthalmology, Sri Lakshminarayana Institute of Medical Sciences, Osudu Agaram, Kudapakkam Post, Villianur, Puducherry – 605502, India.
[2]Academic Director, MN Eye Hospital, Tondiarpet, Chennai, India.
[3]Medical Director, MN Eye Hospital, Tondiarpet, Chennai, India.

Corresponding Author: Dr. Sridhar Baratan, Professor, Depatement of Ophthalmology, Sri Lakshminarayana Institute of Medical Sciences, Osudu Agaram, Kudapakkam Post, Villianur, Puducherry – 605502, India.
Email: sridhar.baratan@gmail.com

Abstract

Background: Optic disc edema refers to axonal distension and elevation of the optic disc. Optic disc oedema is a common clinical problem where the ophthalmologist plays an important role in the diagnosis, management. Present study was aimed to determine the etiology and clinical features in patients of optic disc oedema at a tertiary centre. **Material and Methods:** Present study was single-center, prospective, observational study, conducted in patients above 18 years of age, presenting with unilateral or bilateral disc edema. **Results:** During study period 62 patients of optic disc oedema underwent evaluation. Majority of patients were from 41-60 years age group (46.77 %), female (58.06 %) & had bilateral optic disc oedema (74.19 %). Common clinical symptoms noted were headache (75.81 %), diminution of vision (46.77 %), nausea/vomiting (45.16 %) & transient obscuration of vision (17.74 %). In present study, finding of optic disc oedema was associated with idiopathic intracranial hypertension (IIH) (17.74 %), optic neuritis (16.13 %), intracranial space occupying lesion (SOL) (16.13 %), optic neuropathy (11.29 %), meningitis/encephalitis/ meningoencephalitis (8.06 %), pseudopapilledema (6.45 %) & diabetic papillopathy (4.84 %). **Conclusion:** Diagnosis of optic disc oedema is often associated with grave underlying process, hence it requires thorough evaluation. Common etiologies of optic disc edema were idiopathic intracranial hypertension, optic neuritis and intracranial space occupying lesion.

Keywords: optic disc oedema, idiopathic intracranial hypertension, optic neuritis, intracranial space occupying lesion.

Introduction

Optic disc edema refers to axonal distension and elevation of the optic disc. Swollen optic disc, disc edema, papilledema, papillitis, choked disc and elevated optic nerve are terms that are frequently used to describe swelling of the optic disc.[1] The clinical causes associated with unilateral optic disc swelling are optic neuritis (ON), non-arteritic anterior ischemic optic neuropathy (NA-AION), compressive optic neuropathy, retinal-vein occlusion, diabetic papillopathy etc.[2]

Optic disc edema arises from the blockage of retrograde and orthograde axoplasmic transport in the optic nerve. Inflammatory, infectious, and other factors may impede the flow and various factors should be considered in evaluation of such patients including age, systemic disorders, duration of symptoms, visual loss, and unilaterality or bilaterality of the disease.[3,4]

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 03, 2022

Optic disc oedema is a common clinical problem where the ophthalmologist plays an important role in the diagnosis, management. Recognizing prevalent etiologies of disc swelling is important for health planning/intervention. Present study was aimed to determine the etiology and clinical features in patients of optic disc oedema at a tertiary centre.

Material And Methods

Present study was single-center, prospective, observational study, conducted in Department of Ophthalmology, Sri Lakshminarayana Institute of Medical Sciences, Osudu Agaram, Kudapakkam Post, Villianur, Puducherry, India. Study duration was of 2 years (January 2020 to December 2021). Study approval was obtained from institutional ethical committee.

Inclusion criteria

- Patients above 18 years of age, presenting with unilateral or bilateral disc edema, willing to participate in the study.

Exclusion criteria

- Patients with hazy media impairing the visualization of fundus.
- Patients not giving consent.

Study was explained to patients in local language & written consent was taken for participation & study. All consecutive cases of optic disc oedema diagnosed at the department of Ophthalmology were enrolled for this study.

Patients were evaluated with detailed history of symptoms (onset, duration and progression), medical history, past history. Examination findings including general physical examination, pulse, blood pressure were noted. Investigations including complete hemogram, serum lipid profile, thyroid test, chest x ray and cerebrospinal fluid analysis was done in specific cases. Magnetic resonance imaging and computerized tomography scan was done whenever required.

All the patients were subjected to detailed ophthalmic examination including visual acquity, detailed slit lamp examination, 90D examination, indirect ophthalmoscopy examination, colour vision, fundus photography, Fundus fluroescein angiography whenever indicated.

Fundus evaluation using direct ophthalmoscope and +90D aspheric volk lens and Haag streit B M 900 slit lamp biomicroscope. Optic disc evaluation using +90D condensing lens was done and disc cup size, colour, cup disc ratio, cup disc asymmetry between two eyes, hyperaemia of disc, blurring of disc margins, forward protrusion of disc, haemorrhage over disc, tortuosity of vein and venous pulsation were noted. Fundus photography was done in all patients.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

Results

During study period 62 patients of optic disc oedema underwent evaluation. Majority of patients were from 41-60 years age group (46.77 %), female (58.06 %) & had bilateral optic disc oedema (74.19 %).

Table 1: General characteristics

	No. of patients	**Percentage**
Age groups (in years)		
19-30	8	12.90%
31-40	10	16.13%
41-50	15	24.19%
51-60	14	22.58%
61-70	8	12.90%
>70	7	11.29%

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 03, 2022

Mean age (mean ± SD)		
Gender		
Male	26	41.94%
Female	36	58.06%
Laterality of Disc Edema		
Unilateral	16	25.81%
Bilateral	46	74.19%

Common clinical symptoms noted were headache (75.81 %), diminution of vision (46.77 %), nausea/vomiting (45.16 %) & transient obscuration of vision (17.74 %).

Table 2: Symptoms

Symptom	No. of Cases	% of Cases
Headache	47	75.81%
Diminution of vision	29	46.77%
Nausea/Vomiting	28	45.16%
Transient obscuration of vision	11	17.74%
Lateral Rectus Palsy	3	4.84%
Diplopia	2	3.23%

In present study, finding of optic disc oedema was associated with idiopathic intracranial hypertension (IIH) (17.74 %), optic neuritis (16.13 %), intracranial space occupying lesion (SOL) (16.13 %), optic neuropathy (11.29 %), meningitis/encephalitis/meningoencephalitis (8.06 %), pseudopapilledema (6.45 %) & diabetic papillopathy (4.84 %).

Table 3: Clinical diagnosis

Clinical diagnosis	Frequency	Percentage
Idiopathic intracranial hypertension (IIH)	11	17.74%
Optic Neuritis	10	16.13%
Intracranial space occupying lesion (SOL)	10	16.13%
Optic Neuropathy	7	11.29%
Meningitis/Encephalitis/Meningoencephalitis	5	8.06%
Pseudopapilledema	4	6.45%
Diabetic Papillopathy	3	4.84%
Retinal Vasculitis	2	3.23%
Orbital Pseudotumor	2	3.23%
Hydrocephalus	2	3.23%
Eclampsia	2	3.23%
Cavernous Sinus Thrombosis	1	1.61%
Central retinal vein occlusion	1	1.61%
Papillophlebitis	1	1.61%
Malignant HTN	1	1.61%

Discussion

Optic disc swelling is a bothersome finding in clinical practice. It may be a presentation of benign conditions as in pseudopapilledema, sight‐threatening conditions as in ischemic optic neuropathy, or life‐threatening conditions with elevated intracranial pressure.

The clinical features associated with unilateral optic disc swelling are demyelinating optic neuritis (ON), non-arteritic anterior ischemic optic neuropathy (NA-AION), compressive optic neuropathy, retinal-vein occlusion, and diabetic papillopathy. Cases with bilateral optic

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 03, 2022

disc swelling are often associated with papilledema, infiltrative optic neuropathy, toxic optic neuropathy, and malignant hypertension.[3,4]

A detailed history and careful evaluation are necessary as the treatment strategy highly depends on it's underlying etiologies. Diagnosing early optic disc edema and identifying the cause behind it is very important to halt the disease progression. Several investigations including fundus photographs, fundus fluorescein angiography (FFA), and optical coherence tomography (OCT) are frequently done to find out disc swelling.[5]

Diagnostic testing can help differentiate papilledema from other causes of disc edema, follow the course of papilledema, and determine the underlying etiology. The first step is neuroimaging of the brain. Magnetic resonance imaging (MRI) with gadolinium contrast is generally preferred. Additional sequences, magnetic resonance venography (MRV), can be used to detect venous obstruction in the dural sinuses and in the neck.[7,8]

In study by Parajuli A et al.,[8] mean age of the patients was 32.54 ± 13.97 years with the majority being female. The most common cause of disc edema was idiopathic intracranial hypertension (IIH) (37.5%,). Majority of the patients complained of isolated diminution of vision (38.4%). Among the eyes affected, 78.3% had best corrected visual acuity (BCVA) 6/6-6/18, 36.6% had color vision defect and 31.4% had reduced contrast sensitivity. The most common visual field defect was isolated enlarged blind spot (39.7 %).

Raghavendra I[9] studied 43 consecutive cases with optic disc oedema, 23 were males, 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.

Maya P et al.,[10] noted that most common cause of the disc edema was papilloedema (54%) followed by optic neuritis (18%); optic neuropathies (9%); pseudopapilledema (7%); diabetic papillopathy (5%). Most common age group affected was 21-40 years (39%). Our study population had Male to Female ratio of 1:1.1. Bilateral disc edema was 3.5 times more common than unilateral presentation. Space occupying lesions were found to be most common cause of Papilledema. Decreased vision and headache was main symptom reported by majority of patients.

Osaguona VB et al.,[11] studied 66 patients with bilateral or unilateral disc swelling. These included 23 males with a male: female ratio of 1:1.87. The age range was from 3 years to73 years; mean age 36.9 years (SD15.3). A total of 109 eyes were affected with bilateral involvement in 43 patients. Papillitis 15 (22.7%), brain tumor 8 (12.1%), and tilted disc 6 (9.1%) were the most frequent diagnosis. Papilledema in 20 (30.3%) patients, optic neuritis 19 (28.8%), and pseudopapilledema 11 (16.7%) were the most frequent etiologic processes of optic disc swelling.

Among 98 patients in study by Vaidya K et al.,[12] females (64%) were frequently affected. It was noted more in the 21 – 50 age groups. Papilledema was the most frequent cause (35.7%) of disc edema followed by papillitis (28.6%), pseudopapilledma (18.4%) and ischemia (17.3%), respectively. Brain tumors (13%) were the most common etiology for papilledema.

In study by Patel IK et al.,[13] among 50 consecutive cases of optic disc oedema, 29 were male and 21 females. Majority had optic neuritis (46 %), papilloedema (20 %), grade 4 hypertensive retinopathy (8 %), anterior ischemic optic neuropathy (AION) (6 %), neuroretinitis (4 %), diabetic papillopathy (6 %), central retinal vein occlusion (4 %), traumatic optic neuropathy (4 %) and Vogt Koyanagi Harada syndrome (2 %). Patients presented to us with most common complaint of dimness of vision (62%) followed by headache (36%), eye ache (26%), floaters (4%) and bilateral diplopia (2%).

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 03, 2022

OCT is a tool which can be used to quantify disc edema based on retinal nerve fiber layer (RNFL) thickness, which is found to be increased in disc edema. It is a noninvasive, noncontact testing tool often used to evaluate optic nerve, retina, and macular pathologies.[14] Neuroimaging is recommended for unexplained optic disc edema (especially bilateral). Typically, the preferred imaging study is MRI of the brain and orbit with and without contrast.

Conclusion

Diagnosis of optic disc oedema is often associated with grave underlying process, hence it requires thorough evaluation. Common etiologies of optic disc edema were idiopathic intracranial hypertension, optic neuritis and intracranial space occupying lesion.

References

1. Hayreh SS. Pathogenesis of optic disc edema in raised intracranial pressure. Prog Retin Eye Res 2016; 50:108–144.
2. Miller NR, Newman NJ, Biousse V, Kerrison JB, editors. Walsh & Hoyt's clinical neuro-ophthalmology: the essentials. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2008.
3. Schirmer CM, Hedges TR 3rd. Mechanisms of visual loss in papilledema. Neurosurg Focus 2007;23:E5.
4. Van Stavern GP. Optic disc edema. Semin Neurol 2007;27:233–43.
5. Bassi ST, Mohana KP. Optical coherence tomography in papilledema and pseudopapilledema with and without optic nerve head drusen. Indian J Ophthalmol 2014;62:1146–51.
6. H. E. Fazzone, D. R. Lefton, and M. J. Kupersmith, "Optic neuritis: correlation of pain and magnetic resonance imaging," Ophthalmology, vol. 110, no. 8, pp. 1646–1649, 2003.
7. M. J. Kupersmith, T. Alban, B. Zeiffer, and D. Lefton, "Contrast-enhanced MRI in acute optic neuritis: relationship to visual performance," Brain, vol. 125, no. 4, pp. 812–822,2002.
8. Parajuli A et al., A Clinical Study of Optic Disc Edema in a Tertiary Eye Center of Nepal, Nepal J Ophthalmol 2019; Vol 11 (22): 122-129
9. Raghavendra Ijeri, Jyoti R.C., Optic Disc Oedema: Presentation and Causes at a Tertiary Centre in North Karnataka, Delhi J Ophthalmol 2018;29;31-34.
10. Maya Pensiya, Anju Kochar, Nawab Ali, Arif Khan, Evaluation Of Hundred Consecutive Cases Of Optic Disc Oedema At A Tertiary Care Centre In North-West Rajasthan Delhi Journal Ophthalmology 2020 ; 31 (3) .23-27
11. Osaguona VB, Kayoma DH. Etiology of Optic Disc Swelling in a Tertiary Care Center in Nigeria. Niger J Clin Pract 2020;23:1690-4.
12. Vaidya K et al., Optic Disc Edema in Tertiary Eye Centre, Nepal J Ophthalmol 2018; Vol 10 (20): 139-142
13. Patel IK, Solu TM, Gandhi YR, Balraj SS. An analysis of clinical presentations and etiology of optic disc oedema. IP Int J Ocul Oncol Oculoplasty 2020;6(1):29-32.
14. Gaur D, Pai HV. Optical coherence tomography in the evaluation of disc edema. Kerala J Ophthalmol 2019;31:17-23.