A CLINICAL STUDY OF PAPILLOEDEMA

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ABSTRACT

BACKGROUND

Papilloedema is swelling of the optic discs caused by raised intracranial pressure, often results in optic nerve damage due to axoplasmic stasis.

The aim of the study is to evaluate the exact aetiology, early diagnosis of Papilloedema and timely intervention to improve the visual outcome to a fairly good extent.

MATERIALS AND METHODS

This study is designed to enumerate the various causes of papilloedema, highlighting the clinical manifestations, management and the visual prognosis in the patients attending the Department of Ophthalmology, GGH, Kakinada.

RESULTS

The observations from the study were analysed and compared with the existing literature.

CONCLUSION

Papilloedema is an important sign of serious ocular and systemic disease that should be recognised early and seeks prompt treatment to prevent permanent visual loss.

KEYWORDS

Raised ICT, Pseudo-Tumour Cerebri, ICSOL, MRI scan.

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BACKGROUND

Papilloedema is a bilateral condition where raised intracranial pressure transmitted to the optic nerve sheath, results in nerve fibre ischemia, venous obstruction and dilatation leads to loss of vision. It is typically associated with symptoms like headache, vomiting especially in the morning and transient obscuration of the vision.

The main morbidity of papilloedema is visual loss and the major mechanism for permanent optic nerve damage is axoplasmic flow stasis and resultant intraneuronal ischemia.[1]

The visual disturbances occurring in one of both eyes were of three types: recurrent attacks of transient obscuration, permanent blindness, and various types of visual field defects.[2]

Knowledge regarding papilloedema is of fundamental and equal importance to neurologists, neurosurgeons and ophthalmologists and occasionally it is the ophthalmologist's opinion regarding papilloedema, which is the key factor in deciding the line of management.

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Early observers described all cases with acquired changes in the optic discs other than pallor and atrophy as optic neuritis. It was not until 1908 that Parsons introduced the term 'papilloedema' to apply to cases showing more than 2 dioptres of swelling associated with raised intracranial pressure and retained the term papillitis for moderate degrees of optic neuritis of varied aetiology.

After the cause of papilloedema is identified and treated, and any pressure increase in the spinal fluid has returned to normal, optic disc swelling gradually will go away over six to eight weeks.

Aims and Objectives

1. To study the aetiology and other ocular manifestations of papilloedema
2. To assess the visual outcome after appropriate management.

MATERIALS AND METHODS

This prospective study is designed to enumerate the various causes of papilloedema, highlighting the clinical manifestations, management and the visual prognosis in patients attending the Department of Ophthalmology, GGH, Kakinada during the period of 2011-2013. This includes patients who directly attended ophthalmic OPD and those who were referred from the Department of Paediatrics, Neuromedicine and Neurosurgery.

Ocular examination was done by:

- Best corrected visual acuity (BCVA) using Snellen's (for distance), near vision test plates (for near) and colour vision using Ishihara colour vision plates were recorded.
- Anterior segment examination using slit lamp was done and pupillary reaction (direct & indirect) noted.
- Fundus examination was done with direct ophthalmoscope and with a 90 D lens using a slit lamp.
- Visual fields were recorded with Humphrey's field analyser.

RESULTS

1. Age Incidence

Papilloedema is seen in all age groups but it appeared less in extremes of ages and peaks between 2nd to 5th decades.

Age in Years	No. of Cases
1-10	5
11-20	11
21-30	13
31-40	11
41-50	6
51-60	4
Total	50

Table 1. Showing Age Incidence of Papilloedema

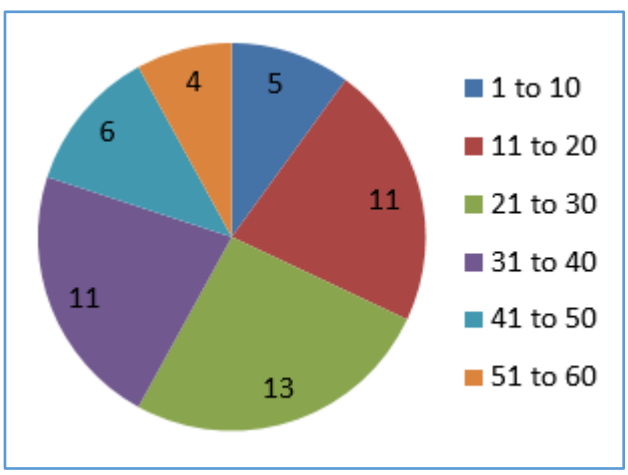

Figure 1. Showing Age Incidence of Papilloedema

2. Gender Distribution

In the present study, females are more affected with papilloedema than males.

Gender	No. of Cases	Percent
Male	22	44%
Female	28	56%

Table 2. Showing Gender Distribution in Papilloedema

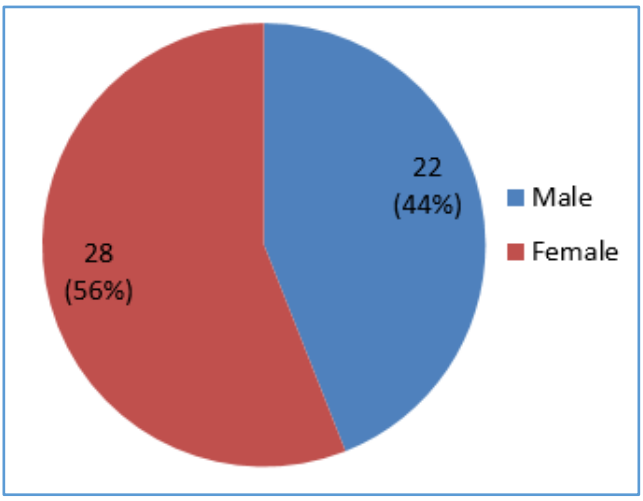

Figure 2. Showing Gender Distribution of Papilloedema

3. Aetiology of Papilloedema

Papilloedema is of varied aetiology. But intracranial space occupying lesions appear to be the most common cause, as in 26 out of 50 cases studied, it is proved to be the commonest cause of papilloedema. This is followed by benign intracranial hypertension, which is seen in 8 cases and TB meningitis, which is also seen in 8 cases. The other causes include hypertensive retinopathy grade IV and encephalitis.

Aetiology	No. of Cases	Male	Female
Intracranial space occupying Lesions	26	11	15
Benign intracranial Hypertension	8	3	5
Hypertensive retinopathy grade IV	6	4	2
TB Meningitis	8	3	5
Encephalitis	2	1	1
Total	**50**	**22**	**28**

Table 3. Showing Aetiology of Papilloedema

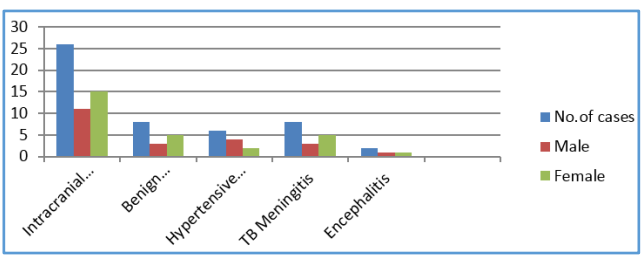

Figure 3. Showing Aetiology of Papilloedema

4. Age Wise Distribution of Aetiological Factors

In the present study, the predominant cause of papilloedema in the age between 20-50 years is intracranial space occupying lesions, followed by BIH and HTN Retinopathy. TB Meningitis appeared to be the most common cause in the age group of 1-20 years.

Aetiology	1-10	11-20	21-30	31-40	41-50	51-60
I ICSOL	2	5	5	7	3	4
BIH	-	11	4	3	-	-
HTN Retinopathy	-	-	3	-	3	-
TB Meningitis	2	4	1	1	-	-
Encephalitis	1	1	-	-	-	-
Total	**5**	**11**	**13**	**11**	**6**	**4**

Table 4. Showing Age wise Distribution of Aetiological Factors

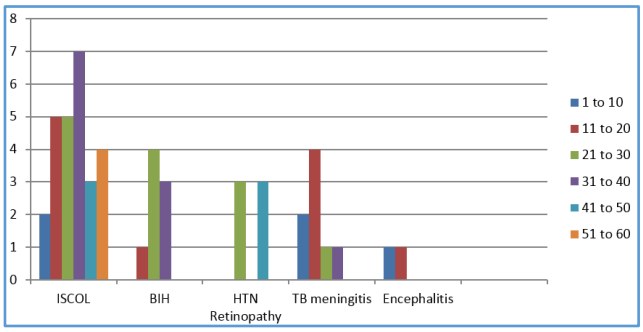

Figure 4. Showing Age wise Distribution of Aetiological Factors

5. Age Incidence of Papilloedema Due to Intracranial Space Occupying Lesions

In the current study, ICSOL are seen in all age groups but they are most commonly seen between 20 - 50 years. The most common cause of Intracranial space occupying lesion is found to be intracranial tumours which is seen in 14 cases. The other causes are haematomas and tuberculomas.

Age	1-10	11-20	21-30	31-40	41-50	51-60	Total
ICSOL	2	5	5	7	3	4	26

Table 5. Showing Age Incidence of Papilloedema Due to Intracranial Space Occupying Lesions

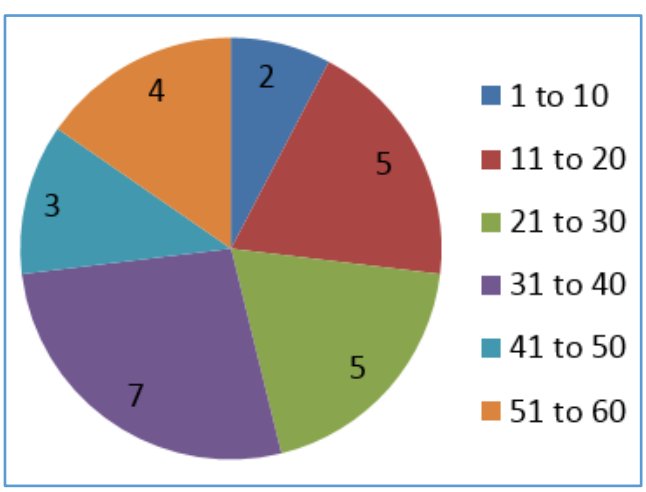

Figure 5. Showing Incidence of Papilloedema Due to Intracranial Space Occupying Lesions

6. Age Incidence of Papilloedema Due to Benign Intracranial Hypertension (BIH)

Benign intracranial hypertension is predominantly seen between 20-40 years of age with a remarkable female preponderance. Most cases have an associated lateral rectus palsy which is a false localizing.

Aetiology	1-10	11-20	21-30	31-40	41-50	51-60
BIH	-	1	4	3	-	-

Table 6. Showing Age Incidence of Papilloedema Due to Benign Intracranial Hypertension (BIH)

7. Clinical Manifestations of Papilloedema

In the current study, headache is the most common presenting feature of papilloedema followed by vomiting. Visual loss is present in 24 of 50 cases. While these being the predominant clinical features, the other less common but clinically significant presentations related to the nature of the lesion are also identified.

Symptoms	No. of cases
Head ache	31
Vomiting	22
Transient visual obscuration	3
Diplopia	4
Visual loss	24
Others	4
Motor weakness	0
Fever	6
Seizures	4
Amenorrhoea	2
Tinnitus	2
Hearing loss	5
Reeling sensation	2

Table 7. Showing Clinical Manifestations of Papilloedema

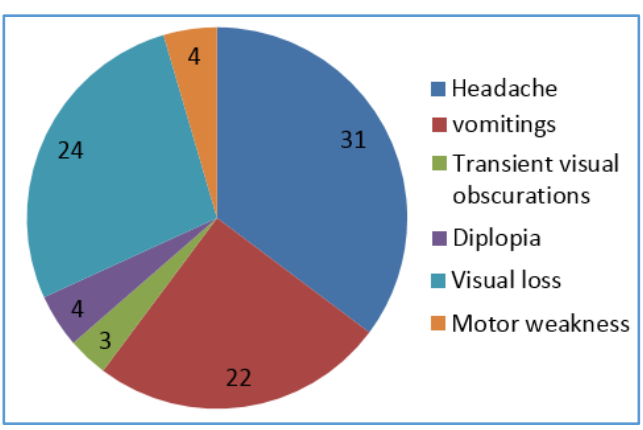

Figure 6. Showing Clinical Manifestations of Papilloedema

8. Visual Acuity at Presentation

In most cases of papilloedema, the visual acuity is normal or only minimally decreased. But in a few cases, which presented at a late stage, there is a gross deterioration of vision.

BCVA	No. of Cases
6/6-6/12	32
6/18-6/36	12
6/60 - CF l mt	2
< CF l mt- PL+	2
NO PL	2

Table 8. Showing Visual Acuity at Presentation

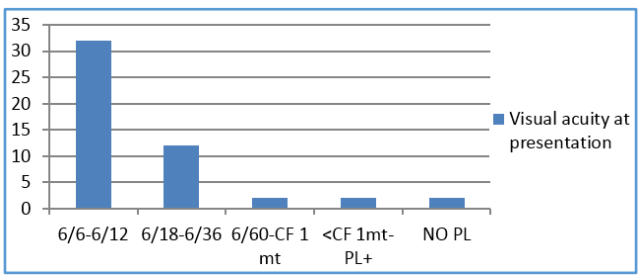

Figure 7. Showing Visual Acuity at Presentation

9. Incidence of Stage of Papilloedema at Presentation

In the present study, 31 out of 50 cases presented to us at established stage of papilloedema, 10 cases presented at chronic stage. 3 cases presented at a very late stage by which time secondary optic atrophy has set in.

Stage of Papilloedema	No. of Cases
Early Stage	0
Established Stage	31
Chronic Stage	10
Atrophic Stage	3
Grade IV HTN	6

Table 9. Showing Incidence of Stage of Papilloedema

The visual prognosis of the papilloedema cases studied by us showed a reasonably good vision in 30 cases which showed either recovery or a sustained vision without further deterioration during the course of follow up. While 4 cases showed a gross fall of visual acuity due to atrophic changes in the optic disc.

DISCUSSION

In the present study, papilloedema was found in all age groups with more common occurrence in 2nd-5th decade. The mean age of the patients was 30.52 years. Of the 50 cases, 5 cases belong to paediatric age group. The gender distribution of the current study shows a female preponderance with 56% of cases belonging to the female gender. In the USA, the annual incidence per 100,000 persons has been estimated to be 0.9 in the general population and 3.5 in females 15-44 years of age.[3] Pseudotumor cerebri being one of the important causes of papilloedema, which has a female preponderance, might have resulted in female preponderance in the current study.

Papilloedema occurs due to various intracranial conditions. In the present study, Intracranial space occupying lesions is found to be the predominant cause with 26 of 50 cases being caused by them. Papilloedema can be caused by an intracranial mass lesion or by other factors. Visual symptoms frequently accompany papilloedema, which can lead to permanent visual loss if left untreated.[4] The next common cause was Benign intracranial Hypertension which was found in 8 cases. This is followed by TB Meningitis. The other causes being Grade IV HTN Retinopathy and Encephalitis.

In this study, the common cause of papilloedema between 1-20 years was TB meningitis followed by ICSOL. In the age group of 20-40 years, ICSOL followed by TB Meningitis and BIH and HTN Retinopathy are the causes. Between 40-60 years, ICSOL is again the leading cause, followed by Hypertension. In this study, ICSOL is seen in all age groups but is more common in 30-50 years. Of the 26 cases of ICSOL, 14 are due to intracranial tumours, 4 are haematomas and 8 are tuberculomas. The age distribution of BIH in the present study is ranging from 20 to 40 years. In total of 8 cases, the aetiology was BIH. 5 of 8 cases were women of reproductive age group. Idiopathic intracranial hypertension (IIH) is a syndrome characterized by elevated intracranial pressure that usually occurs in obese women in the childbearing years.[5]

BCVA at presentation in 44 cases ranged from 6/6 to 6/36. In 6 cases the vision was 6/60 to PL+. In 2 cases, it was No PL. Cases of BIH, HTN and most cases of ICSOL that presented early, had a good visual acuity. But cases that presented at a late stage had a poor vision. In the current study, 31 of 50 cases are of stage II, 10 cases of stage III and 3 cases are of stage IV. HTN Retinopathy grade IV is seen in 6 cases. The stage of papilloedema is an important diagnostic and prognostic guide of the underlying disease.

Papilloedema can be managed medically or surgically depending on the cause. In 34 cases, medical management was done while 16 cases are treated surgically. Medical management included weight reduction, measures to reduce the ICT with oral steroids, diuretics or hyperosmotic agents. Surgical modalities of treatment include either V-P shunt or excision of the tumour. Diuretics are the first line of treatment, can reduce ICP by increasing CSF absorption or decreasing its production, and usually are well tolerated. Surgical procedures include creation of ventriculoperitoneal or lumboperitoneal shunts, which normalizes ICP by increasing CSF drainage, and should be considered when medical therapy fails. In selected cases, when vision is threatened, optic nerve sheath fenestration may be performed to reach its proper decompression.[6]

Papilloedema is a significant fundus finding with a lot of concern to ophthalmologist, neurosurgeon and neurophysician as it needs a thorough evaluation to find out the aetiology. Papilloedema requires prompt work up and consultation with other specialities to diagnose and treat the cause at the earliest.

Apart from clinical history, CT scan, MRI and other investigations are important tools to diagnose the lesion and to note its location, nature and extension. MRI protocol consisting of a 5-mm transverse T2w TSE sequence; a T2*w, 3D CISS sequence; a T1w, 3D MP-RAGE sequence with and

without contrast medium; and a transverse T1w, (2-mm) 2D TSE sequence with fat-suppression technique with intravenous contrast medium is suitable to visualize the macroscopic changes in papilloedema.[7]

Visual prognosis depends upon the stage of papilloedema, duration and removal of the causative factor. Early shunt procedures will relieve the raised ICT and papilloedema can be relieved. The BCVA at presentation in 85.2% cases ranged from 6/6 - 6/36. Cases of BIH, HTN retinopathy Grade IV Hypertension had a good visual outcome with medical treatment.

Of the supratentorial tumours, craniopharyngiomas, meningiomas and pineal gland tumours are more common. Infra tentorial tumours commonly noted are CP angle tumours and ventricular tumours. Posterior fossa tumours, which account for about two-thirds of all brain tumours are often associated with obstructive hydrocephalus and prolonged papilloedema. Supratentorial tumours that occupy the suprasellar area (such as craniopharyngioma) directly compress the optic nerve, but may also cause hydrocephalus and papilloedema. Optic nerve gliomas invade the optic nerve tissue and impair visual functions.[8] ICSOL's that presented to us at an early stage, had a favourable visual outcome after surgical management. But cases that presented at a late stage had a gross visual fall despite treatment.

CONCLUSION

Thus, this study re-emphasizes the fact that papilloedema is a sign of serious ocular or systemic condition that requires proper evaluation and treatment because the underlying cause could lead to loss of vision and loss of life. This study gives immense knowledge about the various neuro ophthalmological disorders and helps in understanding the incidence of these diseases and learn the practical approach in diagnosing these disorders. Interaction with neurosurgeon and neurophysician helps in acquiring knowledge regarding the methodical approach in tackling the cases and thus protect the patient from blindness. Early diagnosis and timely management can lead to a reasonably good visual outcome.

REFERENCES

[1] Lee AG, Wall M. Papilloedema: are we any nearer to a consensus on pathogenesis and treatment? Curr Neurol Neurosci Rep 2012;12(3):334-339.
[2] Hayreh SS. Optic disc edema in raised intracranial pressure. VI. Associated visual disturbances and their pathogenesis. Arch Ophthalmol 1977;95(9):1566-1579.
[3] Rigi M, Almarzouqi SJ, Morgan ML, et al. Papilloedema: epidemiology, etiology, and clinical management. Eye Brain 2015;7:47-57.
[4] Schirmer CM, Hedges TR. Mechanisms of visual loss in papilloedema. Neurosurg Focus 2007;23(5):E5.
[5] Wall M. Idiopathic intracranial hypertension. Neurol Clin 2010;28(3):593-617.
[6] Ferreira BFA. Papilloedema: a comprehensive assessment. J Neurosci Rural Pract 2017;8(4):683-684.
[7] Seitz J, Held P, Strotzer M, et al. Magnetic resonance imaging in patients diagnosed with papilloedema: a comparison of 6 different high-resolution T1- and T2(*)-weighted 3-dimensional and 2-dimensional sequences. J Neuroimaging 2002;12(2):164-171.
[8] Goldenberg-Cohen N, Ehrenberg M, Toledano H, et al. Preoperative visual loss is the main cause of irreversible poor vision in children with a brain tumor. Front Neurol 2011;2:62.