

## Original Article

# Etiologies of Optic Disc Edema in Tertiary Eye Care Centre in Nepal

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## Abstract

**Introduction:** Optic disc edema is a common clinical finding that can be caused by benign to vision and or life-threatening conditions. **Objective:** To investigate the etiologies of optic disc edema among patients presenting to Tilganga Institute of Ophthalmology, Kathmandu, Nepal. **Materials and Methods:** A retrospective chart review of patients with optic disc edema presenting to Neuro-ophthalmology department of Tilganga Institute of Ophthalmology from May 2012 to May 2014, was made. **Results:** 98 patients were diagnosed with disc edema. 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. **Conclusion:** Papilledema along with other causes, are common etiologies for disc edema. A detailed history and careful evaluation are necessary as the treatment strategy highly depends on it's underlying etiologies.

**Key words:** Optic disc edema, Papilledema, Pseudo papilledema, Ischemic optic neuropathy

## Introduction

Optic disc edema is often encountered in our routine clinical practice. It is a term used to signify swelling of the optic nerve head with fluid within or surrounding the axons resulting in axonal distension. The blockage of axoplasmic transport to the optic nerve can be of mechanical or vascular in origin [Van Straven GP et al, 2007].

“Optic disc edema” is the collective term used to describe optic disc swelling due to various

causes; “papillitis” denotes inflammation of the optic disc; “papilledema” indicates disc swelling due to elevated intracranial pressure, and “pseudo papilledema” is a normal physiological variant of optic disc which has apparent optic disc swelling simulating some features of papilledema. Ischemic optic neuropathy results from the infarction of the optic nerve head due to occlusion of the posterior ciliary arteries.

The most common cause of optic disc edema in Caucasians has been reported to be anterior ischaemic optic neuropathy (AION) (Miller et al, 2008). In the Asian population non-arteritic anterior ischaemic anterior optic neuropathy (NA-AION) was found to be the most common cause [Jung JJ et al, 2011]. There is a lack of optic disc edema reports that have studied the

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etiologies in Nepal. Therefore, this study was conducted to determine the etiologies of optic disc edema in the Nepalese population.

### Materials and Methods

We conducted a retrospective study of patients initially diagnosed with disc edema presenting to the Neuro-ophthalmology department of Tilganga Institute of Ophthalmology during the period from May 2012 to May 2014. Unilateral as well as bilateral disc edema of all grade were enrolled. Our study followed the standard study protocol. It was reviewed and approved by the Institutional Review Board of Tilganga Institute of Ophthalmology.

A detailed history and ophthalmic examinations were obtained. Ophthalmic examination included best corrected visual acuity, pupillary reaction, color vision test (Ishihara test), dilated fundus examination (90 D Lens) and visual field test (Humphrey Visual Field Analyzer, Carl Zeiss Meditech). Blood investigations, B-scan, intracranial examinations by magnetic resonance imaging (MRI), magnetic resonance venography (MRV) or computed tomography (CT) were done wherever necessary.

All data utilized in this study were collected through chart review and then entered into the standardized form. The data were subsequently entered into Microsoft Excel 2007 and converted into Statistical Package for Social Sciences (SPSS) ver. 16.0 for Windows (SPSS Inc. USA) for statistical analysis.

### Results

98 patients presented to the Neuro-ophthalmology department with disc edema. There was a preponderance of the female population (n = 63. 6%) with a female to male ratio of 1.8:1. Mean age of the patient was 37.2 ± 16.5 years (age range 6 – 77 years). The age, gender, and laterality of the study population are shown in Table 1.

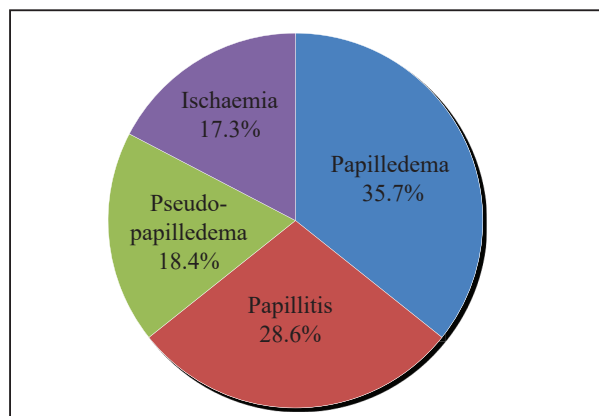
**Table 1: Characteristics of patients with disc edema (n=98)**

Characteristics	
Age (yrs)	35.5
Gender (female:male)	64% female (1.8:1)
Involvement	
Bilateral	61 (62.2%)
Unilateral	37 (37.8%)

The most common cause of disc swelling was papilledema which was observed in 35 patients (Figure 1). Other causes of disc swelling were papillitis observed in 28 patients, pseudopapilledema in 18 patients and ischaemic disc edema was seen in 17 patients (Figure 2).

Brain tumor (37.1%) was the most common etiology for papilledema. Following brain tumor were pseudotumor cerebri (28.6%) and cerebral venous sinus thrombosis (17.1%). Other less common etiologies were hydrocephalus with aqueductal stenosis, intracerebral hematoma, non-communicating hydrocephalus, tubercular meningitis and post-trauma. Meningioma was the most frequent brain tumor followed by glioma, glioblastoma multiforme, and cerebro pontine angle mass.

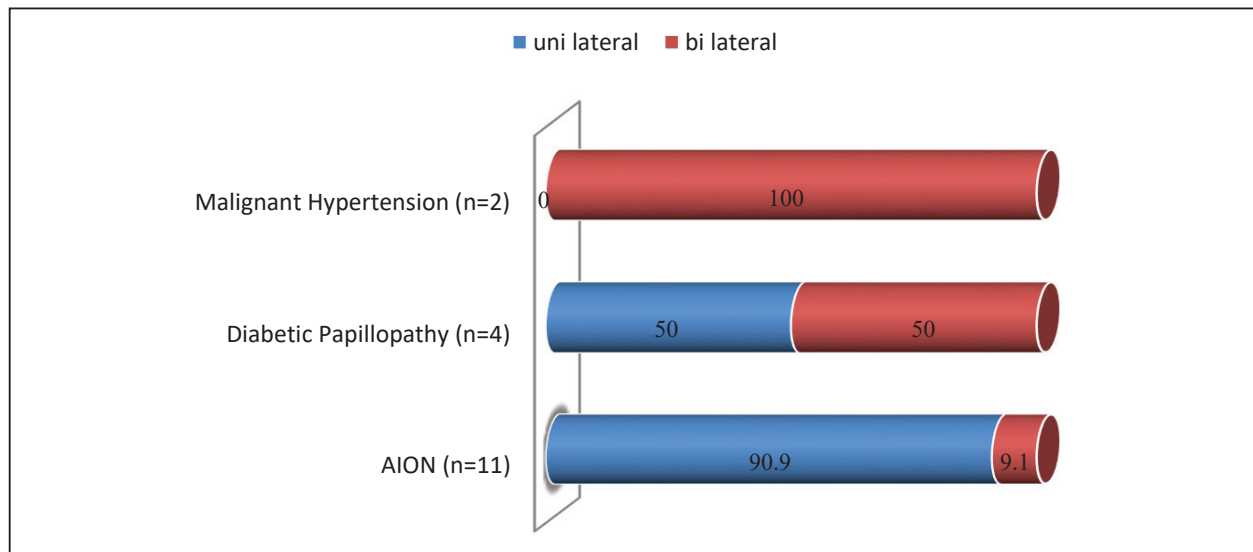
When examined according to age group (eg, ≤ 20 years, 21 – 50 years, and ≥ 51 years), disc edema was more common in the 21 – 50 years age group (Table 2).



**Figure 1: Etiologies of disc edema**

**Table 2: Etiology by age**

	≤ 20 years (n=19)	21 – 50 years (n=58)	≥ 51 years (n=21)
Papilledema	8(42.1%)	25(43.1%)	2(9.5%)
Papillitis	7(36.8%)	10(17.2%)	11(52.4%)
Pseudopapilledema	4(21.1%)	12(20.7%)	2(9.5%)
Ischaemia	0	11(19%)	6(28.6%)



**Figure 2: Etiology of Ischaemic optic disc edema**

### Discussion

This study analyzed the etiology of optic disc edema. Papilledema was the most frequent cause of optic disc edema in this study. This result is consistent with the study of Lijima et al, 2014. Papillitis, pseudo papilledema and ischaemic causes followed papilledema respectively, as the causes of disc edema. Papilledema had been described as the most frequent etiology for disc swelling in the studies published in 1971 [Duke-Elder et al, 1971] and in 1984 [Matsumara et al, 1984]. However, other causes of disc swelling noted during these studies such as anemia, lead poisoning, and thyroid ophthalmopathy were not observed in our study. Though thyroid ophthalmopathy is frequently seen in our routine clinical practice, disc swelling secondary to compressive optic neuropathy owing to thyroid eye diseases

are not routinely referred to our neuro-ophthalmology department. Disc swelling was seen more commonly in the 21 –50 age groups. This study has observed ischaemia to be less common cause of disc edema as compared to other three causes papilledema, papillitis and pseudopapilledema, respectively. This observation is in contrast to the study of Jung et al, 2011. Their study had observed ischaemia (non-arteritic anterior ischaemic optic neuropathy, NA-AION) to be more frequent cause of disc edema followed by papilledema. This could be explained as their cohort comprised older aged population with co-existing medical conditions (e.g., diabetes mellitus, hypertension and hypercholesterolemia). These conditions are associated with the higher rate of NA-AION diagnosed in older patients [Kerr et al, 2009 & Kim et al, 2007].

Walsh and Hoyt's Clinical Neuro-ophthalmology includes a description of the frequency of onset of papilledema in various diseases (Miller N et al, 1982). Brain tumor was the most frequent cause of papilledema which was consistent in this study as well. Following brain tumor, pseudotumor cerebrii and cerebral venous thrombosis were the leading cause for papilledema. This suggests that optic disc swelling should be sought in the differential diagnosis of a number of disorders associated with disc edema. Careful examination of the central nervous system is prudent as a work-up of patients presenting with disc edema.

In our study, pseudopapilledema was usually associated with refractive error of hypermetropia and small tilted disc, optic nerve head drusens and crowded discs. In clinical practice, pseudopapilledema is the most common mistaken diagnosis of true disc edema. Therefore, it is very important to differentiate true disc edema from pseudopapilledema as proper recognition may spare the patients from unnecessary testing.

This study has few limitations. As it includes patients referred to neuro-ophthalmology department, disc edema with other causes (e.g. compressive neuropathy due to thyroid, diabetic papillopathy) might have been overlooked. Patients with retrobulbar neuritis and optic disc pallor were excluded from this study. So, the frequency of optic neuritis might be higher than we found in our study. The relatively small sample size cannot also be generalized to the whole Nepalese population. This study may help to improve our clinical practice and future study on disc edema.

### Conclusion

Although ischemic optic neuropathy was found to be common in different parts of the world, papilledema was found to be common in our study.

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