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Bilateral disc edema in patients of hypothyroidism

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Abstract
Background: Papilledema is clinically defined as optic disc swelling secondary to raised intracranial pressure (ICP). Commonly encountered causes of papilledema include mass lesions, cerebral edema, hydrocephalus, shunt failure, and idiopathic intracranial hypertension (IIH). Less frequently encountered etiologies of papilledema include systemic disease processes and medications. Hypothyroidism is one of the rare causes of disc edema.
Purpose: To study the association of bilateral disc oedema with hypothyroidism.
Materials and Methods: A total of 8 female patients of age group 22-38 years, presenting with severe headache, on fundus examination diagnosed with bilateral disc oedema, all patients underwent systemic evaluation including BP, blood sugar levels, lipid profile, thyroid profile and MRI and Neurophysician opinion. These patients had varying degrees of hypothyroidism and it was the causative factor for disc oedema.
Conclusion: Hypothyroidism is the causative factor for disc oedema in female patients, which can be diagnosed by serological tests. Treating hypothyroidism is essential, as disc oedema shows complete resolution without residual visual deficit.

Keywords: Papilledema, hypothyroidism

Introduction
Papilledema is clinically defined as optic disc swelling secondary to raised intracranial pressure (ICP). Unilateral or bilateral optic disc swelling requires the clinician to obtain a thorough history and perform a detailed general, neurologic, and ophthalmologic exam to develop a broad differential diagnosis.
Commonly encountered causes of papilledema include mass lesions, cerebral edema, hydrocephalus, shunt failure, and idiopathic intracranial hypertension (IIH). Less frequently encountered etiologies of papilledema include systemic disease processes and medications.
It is important for the clinician to consider these other medically treatable etiologies before attributing papilledema to IIH /pseudotumorcerebri (PTC) and considering an invasive procedure such as cerebrospinal fluid (CSF) shunting. Hypothyroidism is one of the rare causes of disc edema.

Material and Methods
A total of 8 female patients in the age group 22-38 years, presenting with severe headache were included. This study was done in Basaweshwar Teaching and General hospital, Kalburgi over duration of 3 years.
On fundus examination they were diagnosed with B/L disc edema. All patients underwent systemic evaluation including BP, blood sugar levels, lipid profile, thyroid profile and MRI and Neurophysician opinion. These female patients had varying degrees of hypothyroidism.
On examination, the patients were alert and cooperative. Visual acuities were normal, pupillary reactions were brisk and no color vision deficit. No Visual field defects were noticed except enlarged blind spot in cases of established papilledema.
Extraocular movements were normal and no diplopia. The fundoscopic examination revealed bilateral papilledema without hemorrhage or exudates. Thorough Slit lamp Bio microscopy using 78D and 90D lenses was done to rule out Pseudo-papilledema. Neurological examination revealed no abnormality. History of systemic medications was not significant.

Results
Out of the 8 patients, 5 were married out of which 4 had history of infertility.

Gynecological history revealed menstrual irregularities in all the patients. MRI revealed features suggestive of raised. Intracranial pressure in 3 patients who had established Papilledema. CSF Analysis showed elevated protein levels in all the patients and on Thyroid function tests all the patients had elevated TSH and reduced FT3 and FT4 levels.

Table 1: CSF Analysis

Patient number	CSF Protein Level (mg/L)
1	340
2	288
3	360
4	392
5	320
6	362
7	344
8	237
Mean	330

Table 2: Hormone details

Hormone	Mean SD (± SD)
TSH (µIU)	32.68 ± 1.58
Free T3 (pg/ml)	2.28 ± 0.62
Free T4 (ng/ml)	0.86 ± 0.06

Discussion

Benign intracranial hypertension (BIH) is defined by modified Dandy's criteria that includes symptoms and signs suggestive of increased intracranial pressure (ICP), normal cerebrospinal fluid composition, no abnormal neurologic finding apart from occasional sixth nerve palsy, no episode of impaired consciousness, for which no secondary cause is evident on neuroimaging or other evaluations.

Neuroimaging plays an important role in excluding secondary causes of increased ICP. CSF opening pressure is another important diagnostic procedure as papilledema may not be present in all cases. In adults, an opening CSF pressure of >250 mm of H2O confirms raised ICP.

Thyroxine alters CSF dynamics by affecting sodium transport. Elevated CSF protein resulting from hypothyroidism was reported to cause intracranial hypertension (Frost *et al*. 2004) [1] by altering the Blood Brain Barrier. Idiopathic intracranial hypertension has been reported to concur with primary hypothyroidism (Adams *et al*. 1994 [2], Giuseffi *et al*. 1991 [3], Radhakrishnan *et al*. 1986) [4].

Conclusion

Hypothyroidism is the causative factor for B/L disc edema in female patients, which can be diagnosed by simple serological tests. Treating hypothyroidism is essential as disc edema shows complete resolution without residual visual deficit.

Thorough evaluation of these patients will help us in diagnosing the cause and treating it resulting in complete recovery and avoiding surgical interventions like CSF shunting.

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