Clinical profile, systemic associations and outcomes of patients with idiopathic intracranial hypertension [IIH] in a tertiary referral center in Southern India

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Abstract:

Background and objectives: Idiopathic intracranial hypertension [IIH] is characterized by features of raised intracranial pressure in absence of any other intracranial pathology. This study aims to describe the clinical profile of patients including imaging findings and intracranial and systemic associations

Methods:This is a retrospective case series from a tertiary care centre in Southern India, diagnosed to have idiopathic intracranial hypertension from Jan 2012 to Dec 2015 and had required admission for the same. Patients fulfilling modified Dandy-Walker criteria for IIH were included. Inpatient and outpatient records for the patients were used to obtain information regarding clinical features, treatments and review visits. Imaging was reviewed on a PACS system.

Results- Total of 52 patients were reported. Headache and visual impairment were the most common complaints. Very high incidence of visual impairment was seen [63%], with blinding vision in 13.46%.Systemic illnesses were reported which may are seen with IIH, specially endocrinopathies in the form of hypothyroidism, polycystic ovarian disease, hypocortisolism and obesity. A high percentage of patients with bilateral transverse sinus/transverse-sigmoid junction stenosis [61.53%] was noted. Medical therapy was with acetazolamide most commonly followed by torsemide. Surgical therapy was with optic nerve sheath fenestration [9.6%], theco-peritoneal shunt [13.46%] and sinus stenting [3.84%]. Worsening of disease was seen in two patients who had normal visual acuity and two patients with affected vision. No patients progressed to blinding vision. Recurrence was seen in 4.3% of patients and they improved after restarting therapy.

Conclusion- This study describes clinical features of patients with IIH. Aggressive management for the same is suggested in view of possibility of morbidity with delay in treatment.

Keywords: Idiopathic intracranial hypertension, systemic associations, clinical profile, South India

Introduction:

Idiopathic intracranial hypertension [IIH] is characterized by features of raised intracranial pressure in absence of any other intracranial pathology such as mass lesions, infections or venous thrombosis. The term idiopathic is preferred to the previously used term benign intracranial hypertension, because if untreated carries a significant risk of morbidity. Intracranial hypertension has also been associated with systemic diseases commonly with obesity and metabolic syndrome, however these associations have not been proven(1). This study aims to describe the clinical profile of patients including imaging findings and intracranial and systemic associations.

Patients and methods:

This is a case series from a tertiary care centre, of all patients diagnosed to have idiopathic intracranial hypertension from Jan 2012 to Dec 2015 and had required admission for the same. Inclusion criteria was- patients fulfilling modified Dandy Walker classification(2)

-Symptoms or signs of intracranial hypertension

-Documented elevated intracranial pressure

-Normal CSF composition.

-Normal neuroimaging (found on MRI, including MRV).

-No other explanation of increased ICP found.

Exclusion criteria- alternative causes of vision loss, ocular or cranial(3)

Data was recorded from stored information in medical records section, from the neurology and vision data from ophthalmology department of our hospital. Patients' demographic characteristics and clinical details were noted. Presenting complaints, initial examination findings, systemic examination, imaging and c.s.f findings were recorded. All patients underwent ophthalmic examination with visual acuity examination and field examination. Follow up reports from both the departments were noted. Visual acuity was recorded on each follow up. Blinding vision was defined as best visual acuity less than 6/60. Data was entered on to a Microsoft Excel spreadsheet. For descriptive purposes mean and standard deviation for numerically measured variables and frequencies and percentage for categorical variables was calculated. T test was used to compare quantitative data, and p value was considered significant if less than 0.05.

Results:

A total of 52 patients were admitted during the study period with a discharge diagnosis of idiopathic intracranial hypertension meeting the selection criteria[Table 1]. Mean age was 27.37 years [range 12 to 44 years], with a female preponderance [88.46% females]. Headache was the most common complaint [75%]. Visual impairment at presentation was second common complaint, present in 63.46% of patients. Vomiting was present in 14 patients [46.92%].

Table 1: Clinical characteristics of patients

Patient characteristics	Out of total of 52 patients	Percentage
Age [in years]	12-44	
Females/males	46/6	88.46/11.54
Clinical features		
Headache	39	75
Vision at presentation		
-Normal (6/6 or 20/20 vision)	19	36.53
-Affected (6/12-6/30 or 20/40-20/100)	26	50
-Blinding (6/60 or 20/200 – no perception)	7	13.46
Diplopia	16	30.76
Vomiting	14	26.92
Obesity	23	44.23
Dysfunctional uterine bleeding	12	23.07
Hypothyroidism	10	19.23
Hypocortisolemia	6	11.53
Autoimmune disease	7 [SLE-3, LA-2, Autoimmune thyroiditis-1, rheumatoid arthritis-1]	13.46
Optic nerve tortuous	39	75
Prominent perioptic subarachnoid spaces	31	59.61
Partial empty sella	30	57.69
Bilateral transverse sinus/transverse–sigmoid junction stenosis	32	61.53
Surgical treatment		
Optic nerve sheath fenestration	5	9.6
Theco-peritoneal shunt	7	13.46
Sinus stenting	2	3.84

Visual complaints were present in 33 patients [63.46%]. Total of 7 patients had blinding visual loss defined as vision worse than 6/60 or 20/200. Visual acuity was normal in 19 patients [36.53%]. There was no significant difference in the c.s.f. pressures in the patients who had visual impairment vs. patients who did not have visual impairment. [Means of 32.2 and 30.06 respectively with a p value of 0.79]. There was no significant difference in the c.s.f. pressures in the patients who had blinding vision loss vs. patients who did not have visual complaints. [Means of 32.2 and 30.06 respectively with a p value of 0.79].

Systemic features were evaluated. Endocrinological co-morbidities were common. Obesity [BMI >30] was present in 23 patients [44.2%], dysfunctional uterine bleeding in 12 patients i.e. 23.07% of patients. hypothyroidism in 10 patients 19.23 patients and hypocortisolemia in 6 patients [11.53%]. Autoimmune illnesses were present in seven patients. [three patients had systemic lupus erythematosus, two had anti-phospholipid antibody syndrome, one had autoimmune thyroiditis and one patient had rheumatoid arthritis.

Imaging findings showed tortuous optic nerves in 39 patients [75%], which was the most common finding. Prominent peri-optic halo and partial empty sella were present in 31 and 30 patients. Transverse sinus, transverse-sigmoid junction stenosis was seen in 32 patients [61.53%] [Figure 1]. Mean c.s.f. pressure was found to be 30.04 cm c.s.f., with a range of 22 cm c.s.f. to 63 cm csf.

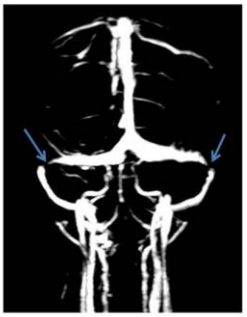

Figure 1: Magnetic resonance venogram showing transverse-sigmoid junction stenosis [arrows]

Acetazolamide was used in all patients as a starting medication. Torsemide was used in eight patients [15.38%]. Optic nerve sheath fenestration was done in five patients out of which three had blinding vision at presentation, and in two other patients who had theco-peritoneal shunt failure/infection. Theco-peritoneal shunt was done in a total of seven patients. In three patients shunting was done in view of worsening of vision despite medical management, where as four patients had presented with blinding vision loss. Two out of seven of our patients with blinding vision improved with shunting procedure. Both had presented within one month of onset of visual symptoms. Others had presented after three months which could have been the reason for poor outcome. One patient had overdrainage syndrome following shunt surgery, and had responded well with conservative treatment with adequate hydration.

Two patients underwent transverse sinus-sigmoid junction balloon plasty and stenting at the stenosis to reduce intracranial pressures. Both patients had presented with severe headache and blinding visual loss, and had no improvement with medical therapy. One patient had optic nerve sheath fenestration, with no significant improvement. There were no procedure related complications. So far both patients had complete resolution of headache and both patients have reported 50% improvement in vision.

46 patients came for follow up visits. Mean time of follow up was 18.16 months. Improvement in visual acuity was seen in 91% of the patients. Number of patients with normal vision improved from 36.53% at first visit to 60.86% at follow up[28 out of 46 patients followed up]. Additional improvement in visual acuity not reaching normal values was noted in 14 patients[Figure 2]. In 11 patients [78.5%] improvement occurred in the first three months. Resolution of papilloedema was seen from 1st month of follow-up in 3.8% patients, by 3rd month in 55% and in 88.88% by 6th month. Two patients had recurrent symptoms and papilloedema on examination at the last follow up secondary to treatment non-compliance. Time to recurrence was less than six months, and both showed improvement on restarting treatment.

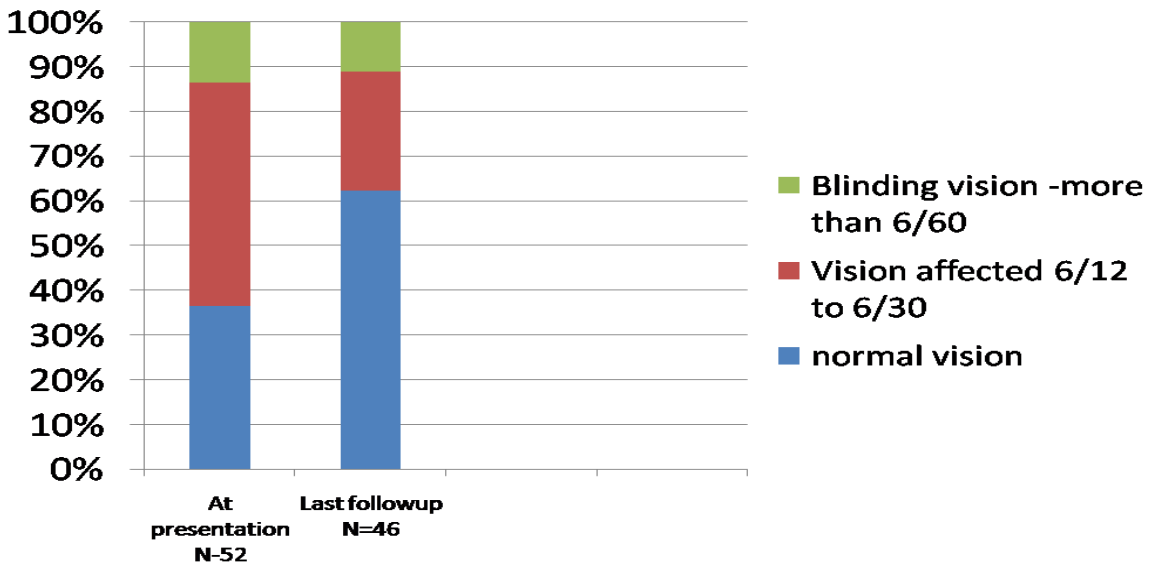

Figure 2: Change in vision from baseline to last follow-up. More patients had normal vision at follow-up

Discussion:

This study provides a profile of patients who were diagnosed to have idiopathic intracranial hypertension at a tertiary care center in southern India. Earlier description with 'benign' is currently out of favor in view of patients who can have blinding vision and may have poor recovery especially if delay occurs in initiating treatment. Multiple studies have shown potential morbidity associated with intracranial hypertension in the form of vision loss. Severe visual impairment has been reported in 5 to 25 percent of patient in follow up studies(4,5). In an Indian follow up study the visual impairment was found to be present in 9% of patients(4). Our study had a higher number of patients with vision loss with 63.46% of patients having vision loss at presentation and 13.46% had blinding vision loss. The large number of patients with visual impairment is because of our center being a tertiary referral care center. 91.86% of patients had improvement in visual acuity on follow-up. At last follow up 36.88% patients had some form of vision impairment, and 10.8% had blinding vision loss. Of all the patients on therapy, no patients had progressed to develop blinding visual loss. However two patients had progressed from no visual complaints to having mild vision problems. Patients who presented with blinding vision [fulminant IIH] had high probability of persisting vision problems, especially if therapy was delayed. In our series patients who showed no improvement were those who had presented after 3 months, and shunt surgery or optic nerve sheath fenestration did not show any improvement. In a case series of patients Thambisetty et al describe 16 cases of fulminant IIH, where surgical treatment was done in all patients, with a median delay between to surgery being 3 days [few hours to 37 days]. Despite this 50% patients persisted to be legally blind.(6) Our center being a tertiary care center, patients are referred from far distances from across the country. There is a significant delay in the initiation of treatment because of the same.

Systemic findings occurring in our cohort that were noted were largely endocrinological, especially obesity, dysfunctional uterine bleeding, hypothyroidism and hypocortisolemia. autoimmune illnesses were seen in 7 patients. A thorough documentation of endocrinological abnormalities is suggested. Influence of these systemic findings to the frequency and degree of vision could not be analyzed.

Aggressive management with early shunting procedure is advised in patients who present with blinding vision loss, or have ongoing vision loss. In patients who have ongoing worsening of vision or no improvement, option of stenting of transverse sinus stenosis is an additional means of reducing intra-cranial pressure. A high percentage of patients with bilateral transverse sinus/transverse-sigmoid junction stenosis [61.53%] was noted, and has been seen in multiple studies. This finding has been studied recently and comparing with normal subjects revealed that Bilateral TS stenosis of >50% was seen in 94% of patients with IIH compared with 3% of controls. Transverse sinus stenosis is the

most sensitive MR imaging co-relate of idiopathic intracranial hypertension(7). Digital subtraction angiography studies [venous phase] have showed presence of stenosis in around 30% of patients with IIH(8). Balloon plasty and stenting is an option and safety and efficacy of the same is to be determined. Previously such interventions were associated with complications such as hemorrhage. With improvements in intervention procedures(9), this is one option that can be considered especially in patients who present with blinding visual loss. We had two patients with IIH in whom we did angiography with sinus stenting who showed improvement in vision by 50% post procedure.

Shunting procedures should be hence considered as an emergency and performed as early as possible in patients with blinding vision loss. There are no controlled trials on which procedure is preferable. Type of procedure varies on availability of expertise of doing the procedures. If the patient's headache improves with lumbar puncture a c.s.f. shunting procedure with a lumbar-peritoneal shunt is preferred. Optic nerve sheath fenestration is preferred when visual loss is severe and out of proportion. (6) At our center we follow the following algorithm- If a patient presents with blinding vision loss, to start medical management and post the patient for emergency shunt surgery. Availability of skill is the most important step in choosing optic nerve fenestration or shunt surgery. If a patient presents with severe headache which responds to lumbar puncture, a theco peritoneal shunt may be more beneficial. If vision loss is out of proportion to headache then first optic nerve sheath fenestration may be preferred. In patients with predominant headache and none or mild visual problems, medical management with acetazolamide is started and the dose is increased to the maximum tolerated. Most of our patients were on a dose of 750 mg per day. Follow up with visual acuity and visual fields after one week is utmost important. If any worsening is noted then doses of the medication is increased or another diuretic added, usually torsemide. If worsening persists, then a decision for shunt surgery is considered.

Recurrence was seen in 4.3% of patients and they improved after restarting therapy. This is low as compared to long term studies in our country [9.3%] and in the United States [9%,15%](4,5,10). This may be because of longer duration of follow up in those studies.

Our institute being largely a referral center, bias is expected and is probably the reason for high percentage of patients with significant visual impairment. Additionally delays in referral add to the morbidity. Studies involving community hospitals are important to design, as prevalence and prognosis of this disease is poorly recognised. Of utmost importance is education and awareness among general physicians to start therapy early or early referral, in view of significant visual co-morbidity associated with delay in treatment.

Conclusions

Headache and vision loss are the common presentations of patients with IIH, and occur secondary to elevated intra-cranial pressures in absence of known intracranial pathology. Identification of IIH and prompt initiation of management is essential to prevent morbidity. Medical therapy helps in improving visual impairment. Patients who present with blinding visual loss or those who have persistent worsening of vision should be considered for urgent surgical treatment in the form of shunt surgery or optic nerve sheath fenestration as delay can lead to persistent visual impairment. Finding of transverse sinus/transverse sigmoid junction stenosis is common in patients with IIH and patients with blinding visual loss who do not respond to surgical therapy, option of sinus stenting should be considered.

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