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CLINICAL AND RADIOLOGICAL PROFILE OF PATIENTS OF IDIOPATHIC INTRACRANIAL HYPERTENSION PATIENTS ATTENDING TERTIARY CARE HOSPITAL IN SOUTH INDIA

Neurology

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ABSTRACT

Background: idiopathic intracranial hypertension (IIH) is one of the causes of headache presenting in tertiary hospital. However, there are only limited studies on IIH. **Aim**: To study the clinical and radiological profile of IIH patients. **Setting and Design:** hospital based observational descriptive study. **Material and Methods:** Headache patients were admitted and evaluated in the department of Neurology (from April 2021 to April 2022) detailed history, clinical examination, and neuroimaging, Cerebral spinal fluid (CSF)routine analysis and manometry were done. After evaluation, diagnosed 32 cases of IIH by modified Dandy criteria and the secondary causes of raised intracranial pressure and primary ocular pathology were excluded. **Results:** Entire study population were females. The mean age was 30 years. 16 (50%) cases were obese, 9 overweight and normal BMI were seven. All case has Headache, bifrontal headache was very common rather than occipital as presentation. Bilateral papilledema seen in all except one case of secondary optic atrophy with equivalent finding in Optical Coherent tomography. CSF analysis was normal and CSF pressure was elevated(≥250mmg) in all cases. Empty Sella was the most common radiological finding (26/32; 81.25%). **Conclusion:** IIH typically affects females of childbearing age group, mostly obese. However, it is not uncommon in the nonobese female as seen in the present study. In Indian subcontinent overweight and obesity may not be a dominant risk factor for the development of IIH. Cases with normal BMI with clinical features of raised intracranial pressure, refractory headache, visual symptoms and normal neuroimaging or empty Sella on MRI should be evaluated for IIH.

KEYWORDS

Idiopathic Intracranial Hypertension (IIH)

INTRODUCTION

Idiopathic intracranial hypertension (IIH) is very well-defined entity in literature. It is particularly frequent in overweight adolescent girls and young women, attaining an incidence of 19 to 21 per 100,000, as compared with 1 to 2 per 100,000 in general population. It is a characterized by elevated intracranial pressure without any identifiable brain pathology and with normal cerebrospinal fluid (CSF) composition and diagnosed using modified Dandy criteria. The pathophysiology is not known but multiple theory has tried to explain. Several endocrine, menstrual abnormalities (particularly amenorrhea), and use of oral contraceptives, have been postulated as causative factors, but none has been substantiated and some recent experience suggests that there is a functional obstruction to outflow in the venous sinuses. [1]

Many authors tried to explained the casual association between IIH and obesity but pathological mechanism is still not clear. [2] In one study by Sugarman et al. [3] possible mechanism as raised-intraabdominal pressure due to central obesity which in turn increase cardiac filling pressure causing obstruction of venous return from brain, leading to raised intracranial venous and ICP. Proposed study by Y Lampel et al, [4] corelate the high-level leptin in obese women and IIH, but these study does not explain the IIH occurring in normal BMI patients of IIH. There are only very few studies that analysed clinical and radiological profile of IIH patients and also no such studies from our college yet.

Therefore, this study has been done with an aim of documenting the patient diagnosed with IIH, their clinical and radiological profile in Neurology department, MGM Govt. Hospital, Tiruchillapalli, Tamil Nadu, India during one-year period.

AIM AND OBJECTIVE:

To study the clinical and radiological profile of IIH cases.

MATERIAL AND METHODS

Study design and population

This is a hospital based descriptive observational study where we have analysis the clinical and radiological findings in cases of IIH. All IIH diagnosed in past one year (from April 2021 to April 2022) were included in the study.

Ethical Approval

This study was carried out at the Neurology department, MGM Govt. Hospital, Tiruchillapalli, Tamil Nadu, India. The study was reviewed and approved by the institutional Ethical Committee.

Data collection

The detailed history was obtained from all headache patients. The questionnaire recorded the symptoms and examination with reference to the general condition including BMI and CNS examination. Ophthalmic evaluation was done for all patients including fundus examination, OCT and perimetry. MRI brain, MRA and MRV was done for all patients.

Written informed consent were taken from 32 cases for the study and lumber puncture which include CSF manometry and analysis and for some therapeutic purpose. There were 32 eligible cases of IHH. Diagnosis was made using dandy modified criteria, secondary causes (CNS infection, intracranial space occupying lesion, trauma, stroke, and CVT) of raised ICT as well as history of glaucoma, retinal disease, other diseases involving optic nerve (multiple sclerosis, NMOSD) were excluded.

RESULTS:

Demographic data

Total 32 cases of IIH, all female. Age ranges from 16 to 46 years, both mean and median age was 30 years, all were in reproductive age group and 50% of them had sedentary lifestyles. The patients were categories into three groups based on BMI, normal BMI (18.5-24.9 kg/m2), overweight (25 -29.9kg/m2) and obese(≥30kg/m2) as per the World Health Organization criteria. [5] 16 (50%) cases were obese,9(28.12%) overweight and 7(21.87%) were having normal BMI.

Clinical symptoms and sign

All patients have headaches, was the initial symptoms reported by patients and the second most common symptoms was blurring of vision followed by transient obscuration of vision [Table 2].

Table 1:

Clinical features	Number of cases(n=32)
Headaches	32 (100%)
Blurring of vision	26(81.25%)
Transient obscuration of vision	20(62.5%)
Neck and shoulder pain	10(31.25%)
Double vision	10(31.25%)

Nausea and vomiting	2(6.25%)
Loss of vision	1(3.22%)
Tinnitus	1(3.22%)

Headache characteristic in our patients, the duration of headache ranges from 2 weeks to 4 years. Based on the duration of the headache we categorised them into three groups, acute (< I month), subacute (1 month- 3months) and chronic presentation (>3months). Among the cases, 10(31.25%) patients had acute,14 (43.75%) had subacute, and chronic presentation were 8(25%).

Most common pattern of headache was bifrontal, which was reported in 20 (62.5%) cases followed by 6 (18.75%) of holocranial involvement and least was occipital 2(6.25%) pattern, rest was bifrontal- temporal. The commonest character of headache was throbbing, which was reported in 22(68.75%) cases followed by heaviness of head in 25% cases. On assessing the severity using visual analog scale, severity range from 5 -6 scale. The frequency of headache was weekly at the beginning in all cases then become daily one to two weeks prior to admission in all the cases. In 50% cases headache was more after awakening in the morning. The most common visual symptom was transient visual obscuration followed by 27 cases of impairment of vision and one had complete loss of vision.

Papilledema
All cases have papilledema of different grade, 4 cases had modified frisen grade 1, 6 cases grade 2, 12 cases grade 3, six and three cases of grade 4 and 5 respectively and one case with secondary optic atrophy

CSF Manometry
CSF manometry was done in all the study subjects and CSF pressure was raised above the cut off value (≥250mmg) in the all-study subjects.

CSF Examination
All cases have normal CSF study (biochemistry and cytology)

Optical coherent tomography (OCT)
Papilledema in 31 cases

Perimetry
Ten and 21 cases of enlarged blind spots and peripheral constriction of visual field respectively.

Radiological finding:
In present study among the radiological sign empty Sella is the most common finding (81.25%). six (18.75%) patients have normal MRI finding, other radiological finding was Posterior sclera flattening (62.5%), Optic nerve sheath distension (56.25%), Optic nerve vertical tortuosity (56.25%), Optic nerve head protrusion (37.5%) and none of the patients has Stenosis of transverse sinuses

Table 2

Radiological finding	Number of cases (%)
Empty Sella	26(81.25%)
Posterior sclera flattening	20(62.5%)
Optic nerve sheath distension	18(56.25%)
Optic nerve vertical tortuosity	18(56.25%)
Optic nerve head protrusion	12(37.5%)
Stenosis of transverse sinuses	0(0%)
Normal MRI	6(18.75%)

DICCUSSION:

IIH, a syndrome of headache, papilledema, minimal or absent focal neurological signs, and normal CSF composition, all occurring in the absence of enlarged ventricles or intracranial mass on CT or MRI brain imaging. It was first described in 1897 by Quincke. [1] still now the syndrome has no established cause so called it idiopathic. Most acceptable hypothesis is syndrome of reduced CSF absorption due to impaired absorptive mechanism through the extracranial lymphatics or the arachnoid granulation may lead to raised ICP.

The incidence of IIH is less common in general population compared to overweight young girls and women, [6] with incidence 1 to 2 per 100,000 in the general population and 19 to 21 in overweight girls and young women. the annual incidence of IIH is 0.9/100,000 persons and 3.3/100,000 females between 15 and 44 years of age [7] most being obese, to which our present study is similar (i.e., age ranges from 16 to 46 year).

In the present study, most common age group of presentation was 20 to 40 years with mean age of 31 years, which is similar to many previous studies, whose mean age of presentation between 29 to 32 years. [8],[9],[10],[11]

In this study all case were female (32 case), but many previous studies have reported male cases also. [9],[11],[12],[13] But these previous study also female were more than male with frequency of female cases 92%,[9] 97.57%,[11] 89%[12] and 93.83%.[13] This may be due to less sample size and short duration of study.

All our cases were at reproductive age group which is similar to literature but one previous study shown involving non-reproductive age group more than 50 years (12 cases).[14]

In present study, 16 (50%) cases were obese and 9(28.12%) cases were overweight, which has almost similar to study by Sharma et al., with 50.82% of obesity cases and 26.33% of overweight cases.[14] Although western literatures have reported significant proportion of obesity among IIH cases, this study (21.87%) and some other Indian studies, [15],[16] found IIH in many cases with normal BMI too. Even non-obese cases presenting with headache with papilledema with normal neuro imaging should undergo evaluation for IIH. The pathological mechanisms association between IIH and an obese are still not very clear,[2] though various explanation have been given,[17],[18],[19],[20] but all these does not explained IIH in normal BMI, non-steroid users.

Headache was present in all our cases and is also the most frequently reported symptom in IIH [8],[10],[11],[14],[21],[22] ranging from 78% to 100% cases of IIH. Most common pattern of headache was bifrontal, which was reported in 20 (62.5%) cases followed by 6 (18.75%) of holo-cranial involvement and least was occipital 2(6.25%) pattern, occipital headache is describe as most common in literature. [1], [23] Other symptoms include blurring of vision (81.25%), transient visual obscuration (62.5%), double vision due to abducens nerve palsy (31.25%), neck and shoulder pain (31.25%), vision loss (3.22%) and tinnitus (3.22%). Of 50 IIH cases, a prospective study [6], symptoms included headache (92%), transient visual obscuration (72%), intracranial noisescase /tinnitus (60%), visual loss (26%), and diplopia (38%). On assess the severity using visual analog scale headache severity was ranging from 5 -6 scale, that is moderate to severe, continuous and throbbing, these finding are similar to study by Tasdemir et al,[24] All cases have papilledema of varying frisen grading and one seconadry optic atrophy. In one Indian study 122 cases[14] also report one IIH case of secondary atrophy and 7 (5.74%) cases of IIH without papilledema (IIHWOP), where as in present study all cases have papilledema, a cardinal feature of IIH.

In present study commonest radiological sign empty Sella (81.25%). six (18.75%) patients have normal MRI finding, other radiological finding was Posterior sclera flattening (62.5%), Optic nerve sheath distension (56.25%), Optic nerve vertical tortuosity (56.25%), Optic nerve head protrusion (37.5%) and none of our patients has Stenosis of transverse sinuses, this almost similar to one recent Indian study by Sharma et al,[14] except bilateral stenosis of transverse sinuses (45.08%) in their study were noted. Hingwala et al. [25] found peri optic nerve sheath distension in 95.2% and empty Sella in 76.2% cases. Study by Brodsky MC et al.,[21] the MR imaging found empty Sella in 70% of IIH patients, flattening of the posterior sclera in 80%, enhancement of the prelaminar optic nerve in 50%, distension of the peri optic subarachnoid space in 45%, vertical tortuosity of the orbital optic nerve in 40%, and intraocular protrusion of the prelaminar optic nerve in 30%. They concluded that in IIH patients, all neuroimaging signs except for intraocular protrusion of the optic disc are highly significant for the presence of elevated ICP.[21] Another study[14] radiological sign and it did not have statistically significant correlation with CSF opening pressure. It is well mentioned in the literature that none of the MRI brain and MRV are specific for IIH.

CONCLUSION:

The present study highlights the clinical and radiological profile of IIH patient from our hospital. Obesity and female sex (especially childbearing age group) preponderance in IIH have already been described in many western studies. However present study differs as nonobese contributed to 21.87% cases, which is a newer observation. So, cases with clinical features of raised ICP and normal neuroimaging even in non-obese should be evaluated for IIH. Similarly western literatures emphasize more on flattening of globe and optic nerve sheath distension as radiological findings of IIH, whereas in present

empty Sella was the most noticeable radiological observation and many can have normal MRI imaging.

Another interesting observation was Frontal headache was most common whereas western literature emphasizes on occipital. Early diagnosis of IIH crucial to prevent serious consequences like loss of vision in this subgroup patients, keeping high index of suspicion in patients of refractory headache and visual symptoms.

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