



Clinicoradiological Profile of Patients Presenting With Idiopathic Intracranial Hypertension in Outpatient Department of Neurology, Jinnah Postgraduate Medical Centre

Nisha*, Khalid Sher, Fatima Ghulam Muhammad, Lata Devi, Rizwana Malahat Ahmad, Maheen Farooq

Department Of Neurology, Institute Jinnah Postgraduate Medical Center, Karachi, Pakistan

*Corresponding author's email address: aghynisha@gmail.com

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Abstract: Idiopathic intracranial hypertension (IIH), a disorder characterized by elevated intracranial pressure without an identifiable cause, presents with varied clinical and radiological features. Early recognition and characterization are essential to prevent complications such as vision loss. Data from Pakistan regarding the clinicoradiological spectrum of IIH remains limited. **Objective:** To determine the clinicoradiological profile of patients presenting with idiopathic intracranial hypertension in the outpatient department of neurology at Jinnah Postgraduate Medical Centre (JPMC), Karachi. **Methods:** This descriptive cross-sectional study was conducted at Ward 28, Department of Neurology, JPMC, Karachi, from January 10, 2025, to April 10, 2025, following approval from the institutional ethical review board. A total of 90 patients aged 18–50 years of both genders with a confirmed diagnosis of IIH were enrolled using non-probability consecutive sampling. Clinical features including headache, pulsatile tinnitus, visual symptoms, and retrobulbar pain were documented. Radiological assessments using MRI and MRV focused on identifying features such as empty sella, tortuous optic nerves, transverse sinus stenosis, and scleral flattening. Data were analyzed using SPSS Version 25. **Results:** The mean age of patients was 35.02 ± 9.8 years. Females constituted a greater proportion (57%, $n=51$) compared to males (43%, $n=39$). Most common clinical symptoms were blurred vision (59%, $n=53$), transient visual obscuration (TVO) (57%, $n=51$), retrobulbar pain (56%, $n=50$), and headache (53%, $n=48$). Radiological findings showed empty sella in 42% ($n=38$), tortuous optic nerves in 44% ($n=40$), transverse sinus stenosis in 49% ($n=44$), and scleral flattening in 51% ($n=46$). **Conclusion:** This study underscores the predominance of IIH in middle-aged females and highlights visual disturbances and retrobulbar pain as frequent presenting complaints. Radiological findings such as transverse sinus stenosis and scleral flattening were prevalent, supporting their utility in the diagnostic evaluation of IIH. A multidisciplinary approach is crucial for early diagnosis and vision preservation.

Keywords: Idiopathic Intracranial Hypertension, Magnetic Resonance Imaging Visual Disorders Transverse Sinuses Headache Disorders

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Introduction

The neurological condition Idiopathic Intracranial Hypertension (IIH) serves as the medical term for pseudotumor cerebri and sets as a diagnostic entity when intracranial pressure elevates without clear space-occupying lesions or cerebrospinal fluid obstructions (1). IIH primarily occurs in adult women who are pregnant and those who display elevated body mass index (BMI) indicating a clear link between obesity and IIH (2). Research shows that IIH affects 0.9 people per 100,000 individuals in the general population yet obesity increases this prevalence to 19.3 per 100,000 among women aged 20–44 years (3). The clinical manifestation of IIH contains various symptoms including persistent headaches alongside transient vision loss episodes and pulsating tinnitus and diplopia and papilledema. When not treated the condition leads to permanent blindness (4). Research on IIH's pathophysiological mechanisms remains incomplete because experts believe either cerebrospinal fluid dynamics dysregulation or outflow blockade of venous sinuses play a role (5). Timely detection of IIH requires both clinical assessments and imaging methods to facilitate appropriate medical treatment and reduce patient complication risks (6). Research on IIH has produced valuable information about its characteristics and patterns including risk elements and diagnosis symptoms alongside treatment results (7). Studies conducted by Wang et al. showed diplopia existed in 9.3% of patients to highlight the significant impact ocular symptoms create in patients with IIH (8). The clinical research by Shaia et al. (2024) showed that headache affected 94% of IIH patients while visual disturbances appeared in 68% among those with IIH (9). Fundoscopic examination reveals papilledema as the signature finding

that appears in 95% of patients with IIH (10). A correct IIH diagnosis requires diagnostic procedures MRI and lumbar puncture that show empty sella structures and tortuous optic nerves and establish elevated intracranial pressures beyond 25 cm H₂O (11). Multidetector computed tomography reveals transverse sinus stenosis in 65 to 90 percent of patients diagnosed with Idiopathic Intracranial Hypertension (12). The implementation of modern diagnostic technologies has failed to eliminate recurring vision complications. Weight loss in combination with medical treatment using acetazolamide treatment successfully controls IIH symptoms (13). Surgical procedures including optic nerve sheath fenestration and venous sinus stenting serve as secondary treatment options for patients who do not respond to primary options (14). This research examines IIH clinical and imaging characteristics of patients at Jinnah Postgraduate Medical Centre Karachi to advance scientific understanding of demographics and symptoms along with imaging results.

Methodology

After the ethical approval from the institutional review board, this cross-sectional study was conducted at Ward 28, Department of Neurology Jinnah Postgraduate Medical Centre (JPMC) Karachi from 10/01/2025 to 10/04/2025. Through non-probability consecutive sampling, 90 patients, aged 18-50 years, both gender, presenting with idiopathic intracranial hypertension were included in the present study. Patients with traumatic brain injury, with ocular disorders such as glaucoma, uveitis, ocular infection and corneal diseases, with Space occupying lesion (SOL) and cerebral venous sinus thrombosis (CVST), with papilledema secondary to

space occupying lesion of brain were excluded from the present study. After the informed consent from the recruited patients, detailed demographic details of each patient including name, gender and age, was obtained. Each patient's weight and height was measured using a digital weighing machine and a stadiometer with light clothing and bare feet, respectively. BMI of each patient was calculated by using BMI formula ($BMI = \text{weigh}/\text{height}^2$). Each patient was inquired about current sign and symptoms including headache, transient visual obscuration (TVO), blurred vision, diplopia, pulsatile tinnitus, photopsia, persistent vision loss, retrobulbar pain, nausea, dizziness, papilledema and visual field loss. All patients were evaluated by an experienced neuro-ophthalmologist and underwent a complete general, neurological, and ophthalmologic examination including Snellen visual acuity, ophthalmoscopy, and perimetry. All patients also underwent thorough neurological examination followed by brain imaging. Lumbar puncture and magnetic resonance imaging (MRI) brain was done in every case for confirming increased intracranial pressure and radiological findings. After collection of data the analyses was conducted by using Statistical Package for Social Science (SPSS) software, Version 25. Mean and standard deviation was calculated for quantitative variables like age (years), height (m), weight (Kg), BMI (Kg/m^2), duration of symptoms (days) and intracranial pressure (cm H₂O). Frequency and percentages was calculated for categorical variables like gender, age in groups, BMI in groups, sign and symptoms (including headache, transient visual obscuration (TVO), blurred vision, diplopia, pulsatile tinnitus, photopsia, persistent vision loss, retrobulbar pain, nausea, dizziness, papilledema and visual field loss) and MRI findings (including empty sella, tortuous optic nerve, transverse sinus stenosis and scleral flattening). Effect modifiers like gender, age in groups, duration of symptoms and BMI in groups was controlled by stratification. Post-stratification chi-square test was applied by taking p value ≤ 0.05 as significant. If an expected number is less than 5, an alternative test such as an exact test of goodness-of-fit or a Fisher's exact test of independence was applied.

Results

The demographic and clinical parameters of the study population are summarized as follows. The mean age of the patients was 35.02 ± 9.8 years, with a predominance of females (57%, $n=51$) compared to males (43%, $n=39$). The mean height and weight of the patients were 1.6 ± 0.11 m and 73.3 ± 13.3 kg, respectively, resulting in a mean BMI of 26.03 ± 5.8 kg/m^2 . Regarding BMI classification, 7% of the patients ($n=6$) were underweight, 37% ($n=33$) had normal BMI, 30% ($n=27$) were overweight, and 27% ($n=24$) were obese. The average duration of symptoms was reported as 192.51 ± 102.9 days.

In terms of clinical presentation, the most frequently reported symptom was pulsatile tinnitus, observed in 60% of patients ($n=54$). This was followed by blurred vision (59%, $n=53$), transient visual obscuration (TVO) (57%, $n=51$), retrobulbar pain (56%, $n=50$), and headache (53%, $n=48$). Other common symptoms included diplopia (51%, $n=46$), dizziness (50%, $n=45$), persistent vision loss (50%, $n=45$), papilledema (52%, $n=47$), and visual field loss (52%, $n=47$). Nausea was present in 48% of patients ($n=43$), while photopsia was reported in 45% ($n=41$). The mean intracranial pressure was noted to be 29.87 ± 6.4 cm H₂O.

Radiological findings revealed that 42% of patients ($n=38$) had an empty sella on imaging, while 44% ($n=40$) demonstrated tortuous optic nerves.

Transverse sinus stenosis was identified in 49% ($n=44$) of patients, and scleral flattening was noted in 51% ($n=46$).

Stratification analysis showed no significant association between intracranial pressure (<30 cm H₂O vs. >30 cm H₂O) and demographic or clinical variables, with p-values exceeding 0.05 in all cases. For age, 15 patients under 30 years and 31 patients over 30 years had intracranial pressure <30 cm H₂O, while 17 and 27 patients, respectively, had pressure >30 cm H₂O ($p=0.55$). Gender distribution showed no significant difference ($p=0.212$), nor did BMI classification ($p=0.979$). Similarly, the duration of symptoms (<200 days vs. >200 days) was not significantly associated with intracranial pressure ($p=0.882$).

Table 1: Demographic and clinical parameters

Variables	Mean and Frequency
Age (Years)	35.02 ± 9.8
Gender	
Female	51 (57%)
Male	39 (43%)
Height (m)	1.6 ± 0.11
Weight (Kg)	73.3 ± 13.3
BMI (Kg/m^2)	26.03 ± 5.8
BMI Classification	
Underweight	6 (7%)
Normal	33 (37%)
Overweight	27 (30%)
Obese	24 (27%)
Duration of Sign & Symptoms (Days)	192.511 ± 102.9

Table 2: Signs and Symptoms

Variables	Mean and Frequency
Headache	48 (53%)
TVO	51 (57%)
Blurred Vision	53 (59%)
Diplopia	46 (51%)
Pulsatile Tinnitus	54 (60%)
Photopsia	41 (45%)
Persistent Vision Loss	45 (50%)
Retrobulbar Pain	50 (56%)
Nausea	43 (48%)
Dizziness	45 (50%)
Papilledema	47 (52%)
Visual Field Loss	47 (52%)
Intracranial pressure	29.87 ± 6.4

Table 3: MRI Findings

Variables	Frequency (%)
Empty Sella	38 (42%)
Tortuous Optic Nerve	40 (44%)
Transverse Sinus Stenosis	44 (49%)
Scleral Flattening	46 (51%)

Table 4: Stratifications

Variables	Intracranial Pressure		P Value
	<30	>30	
Age			0.55
<30 years	15	17	
>30 years	31	27	
Gender			0.212
Female	29	22	

Male	17	22	0.979
BMI Classification			
Underweight	3	3	
Normal	16	17	
Overweight	14	13	
Obese	13	11	0.882
Duration of Sign & Symptoms (Days)			
<200 days	24	24	
> 200 days	22	20	

Discussion

The observed demographic and clinical data helps researchers understand the manifestations of idiopathic intracranial hypertension (IIH). The recorded population mean age of 35.02 years agrees with published research that demonstrates IIH mostly affects people between 18 and 44 years (15). Evidence shows that IIH primarily affects women the present research revealed a larger female sample (57%) than male. A U.S. healthcare-based research analysis documented an incidence rate of 1.97 cases per 100,000 among women while men had only 0.36 cases demonstrating this condition's profound overrepresentation among females. The participant's average BMI measurement of 26.03 kg/m² showed a reduced level compared to other study reports. Research shows excess weight as a proven IIH risk factor because obesity worsens the risk profile of subjects (16). BMI classifications in this study diverge from previous IIH patient research because underweight cases comprised 7% and normal weight stood at 37% and overweight reached 30% and obesity stood at 27%. Different regional factors or sample population features probably account for this varying data point. The research documented pulsatile tinnitus (60%) and blurred vision (59%) as well as transient visual obscurations (57%) to be the principal clinical manifestations of the patients. Existing literature supports the observation that headaches combined with visual disturbances and pulsatile tinnitus commonly affect patients with IIH (17). The research results reported a mean intracranial pressure level of 29.87 cm H₂O which meets current diagnostic criteria for IIH based on pressures exceeding 25 cm H₂O in this condition (18). The research discovered empty sella in 42% of patients alongside optic nerve tortuosity in 44% and transverse sinus stenosis in 49% while scleral flattening affected 51% of participants. Diagnostic findings from imaging investigations frequently appear in IIH patients thereby confirming the diagnostic assessment. Stratification tests showed intracranial pressure does not correlate with any demographic data including subject age or gender distribution or Body Mass Index categories or total symptom duration. Studies show elevated pressure in intracranial spaces of IIH patients is minimally affected by demographic factors even though other studies have demonstrated BMI and intracranial pressure links (19).

Conclusion

This study highlights the demographic, clinical, and radiological profiles of idiopathic intracranial hypertension (IIH) patients, with pulsatile tinnitus and visual disturbances being the most prevalent symptoms. While findings align with existing literature, such as a female predominance, suggest the need for further research on regional and demographic variations to better understand IIH.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-JPMC-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

N (PG Trainee)
Manuscript drafting, Study Design,
KS (HOD Neurology)
Review of Literature, Data entry, Data analysis, and drafting article.
FGM (PG Trainee)
Conception of Study, Development of Research Methodology Design,
LD (PG Trainee)
Study Design, manuscript review, critical input.
RMA (PG Trainee),
Manuscript drafting, Study Design,
MF (PG Trainee)
Review of Literature, Data entry, Data analysis, and drafting article.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Zafar S, Panthangi V, Kurupp ARC, Raju A, Luthra G, Shahbaz M, et al. A systematic review on whether an association exists between adolescent obesity and idiopathic intracranial hypertension. *Cureus*. 2022;14(8).

2. Thaller M, Homer V, Abbott S, Hazlehurst J, Mollan SP, Sinclair AJ. Does a healthy weight body mass index at onset of idiopathic intracranial hypertension change the outcomes? A United Kingdom prospective cohort study. *Neuro-Ophthalmology*. 2024;1-12.

3. Reier L, Fowler JB, Arshad M, Hadi H, Whitney E, Farmah AV, et al. Optic disc edema and elevated intracranial pressure (ICP): a comprehensive review of papilledema. *Cureus*. 2022;14(5).

4. Toscano S, Lo Fermo S, Reggio E, Chisari CG, Patti F, Zappia M. An update on idiopathic intracranial hypertension in adults: a look at pathophysiology, diagnostic approach and management. *Journal of neurology*. 2021;268:3249-68.

5. Raoof N, Hoffmann J. Diagnosis and treatment of idiopathic intracranial hypertension. *Cephalalgia*. 2021;41(4):472-8.

6. Sallam A, Alkhatip AAAMM, Kamel MG, Hamza MK, Yassin HM, Hosny H, et al. The diagnostic accuracy of noninvasive methods to measure the intracranial pressure: a systematic review and meta-analysis. *Anesthesia & Analgesia*. 2021;132(3):686-95.

7. Subramanian PS, Turbin RE, Dinkin MJ, Lee AG, Van Stavern GP. What Is the Best Surgical Intervention for Patients With Idiopathic Intracranial Hypertension? *Journal of Neuro-Ophthalmology*. 2023;43(2):261-72.
8. Wang W. Detecting Cognitive Impairments in Idiopathic Intracranial Hypertension using Neuropsychological and Ocular Motor Testing: Monash University.
9. Shaia JK, Markle J, Das N, Singh RP, Talcott KE, Cohen DA. Characterisation and visual outcomes of fulminant idiopathic intracranial hypertension: a narrative review. *Neuro-Ophthalmology*. 2024:1-13.
10. Rufai SR. Recognition of Intracranial Hypertension in Children using Handheld Optical Coherence Tomography: University of Leicester; 2023.
11. Beier D, Korsbæk JJ, Bsteh G, Macher S, Marik W, Pemp B, et al. Magnetic Resonance Imaging Signs of Idiopathic Intracranial Hypertension. *JAMA network open*. 2024;7(7):e2420138.
12. Tian Y, Zhang Z, Jing J, Dong K, Mo D, Wang Y. Anatomic Variation of the Lateral Sinus in Patients With Idiopathic Intracranial Hypertension: Delineation With Black-Blood Contrast-Enhanced MRI. *Frontiers in neurology*. 2021;12.
13. Jensen RH, Vukovic-Cvetkovic V, Korsbaek JJ, Wegener M, Hamann S, Beier D. Awareness, Diagnosis and Management of Idiopathic Intracranial Hypertension. *Life*. 2021;11(7):718.
14. Corecha Santos R, Gupta B, Santiago RB, Sabahi M, Kaye B, Dabecco R, et al. Endoscopic endonasal optic nerve sheath decompression (EONSD) for idiopathic intracranial hypertension: Technical details and meta-analysis. *Clinical Neurology and Neurosurgery*. 2023;229:107750.
15. GeorgeDeepa E.
16. Almarzouqi SJ, Morgan ML, Lee AG. Idiopathic intracranial hypertension in the Middle East: A growing concern. *Saudi Journal of Ophthalmology*. 2015;29(1):26-31.
17. Toshniwal SS, Kinkar J, Chadha Y, Khurana K, Reddy H, Kadam A, et al. Navigating the Enigma: A Comprehensive Review of Idiopathic Intracranial Hypertension. *Cureus*. 2024;16(3):e56256.
18. Macher S, Marik W, Krajnc N, Mitsch C, Michl M, Mueller N, et al. The additive value of complementing diagnostic idiopathic intracranial hypertension criteria by MRI – an external validation study. *The Journal of Headache and Pain*. 2024;25(1):70.
19. Westgate CSJ, Hagen SM, Israelsen IME, Hamann S, Jensen RH, Eftekhari S. The impact of obesity-related raised intracranial pressure in rodents. *Sci Rep*. 2022;12(1):9102.



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