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Original Article

Spectrum and Prevalence of Headaches in Neurology OPD: A Cross-Sectional Analysis

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ABSTRACT

Background: Headaches are among the most frequent neurological disorders globally and the primary reason for neurological outpatient department (OPD) referrals. Understanding the spectrum and prevalence of headache subtypes is critical for optimizing diagnostic and therapeutic approaches.
Methods: A hospital-based cross-sectional study was conducted in a neurology OPD of VIMSAR, Burla over a period of 12 months from September 2024 to August 2025. A total of 300 patients aged >18 years presenting with headache as their primary complaint were evaluated by neurologists using the International Classification of Headache Disorders (ICHD-3)criteria.
Results: Headache accounted for approximately 19.5%–30% of total OPD visits. Primary headaches were dominant, accounting for 50%–86% of cases, while secondary headaches accounted for 27%–33%. Migraine was the most common primary headache (23.8%–36.8% of total cases), followed by tension-type headache (TTH) (20.5%–33.5%). Medication-overuse headache (MOH) was the most frequent secondary headache (9.8%–13.3% of total). Female predominance was noted(74%+).
Conclusion: Migraine is the most common cause of neurological consultation, with MOH being a significant secondary issue. The study highlights the need for specialized headache training and improved management strategies in primary care to reduce the burden on neurology services.

Keywords: *Headache, Migraine, TTH, ICHD, MOH.*

INTRODUCTION

Headache disorders are among the most prevalent and disabling conditions of the nervous system worldwide, affecting approximately 40% of the global population as of 2021 [1]. According to the Global Burden of Disease Study 2021, headache disorders rank as the second most prevalent condition globally, surpassed only by oral disorders, and are the third leading cause of years lived with disability (YLDs). Despite their ubiquity, these conditions remain frequently underestimated, under-recognized, and undertreated, particularly in low- and middle-income regions [2].

In specialized medical settings, headaches represent the most frequent reason for referral to neurologists. Studies across diverse geographical regions, including the Middle East, Asia, and Africa, indicate that headache is the primary complaint in approximately 30% of patients attending neurology outpatient departments (OPD) [3]. This high clinical volume places a significant burden on neurological services, necessitating a precise understanding of the local headache spectrum to optimize diagnostic and therapeutic strategies.

The clinical spectrum of headaches is broadly categorized by the International Classification of Headache Disorders (ICHD-3) into primary and secondary disorders. Primary headache disorders, where no underlying causative factor exists, account for over 86% of headache-related admissions in neurology clinics [4]. Among these, migraine (particularly migraine without aura) is the most frequent subtype, often characterized by moderate-to-severe intensity and significant

functional impairment [5]. Tension-Type Headache (TTH) is also highly prevalent, though patients with TTH seek specialist care less frequently than those with migraine due to differences in pain severity and perceived disability [6].

Secondary headaches occur in approximately 33% of patients in the neurology OPD. Notably, Medication-Overuse Headache (MOH) has emerged as the leading secondary type, affecting nearly 10% of the headache population [7]. This condition often results from the chronic and excessive use of acute headache treatments and represents a significant, preventable public health challenge[8].

A detailed assessment of headache types according to the International Classification of Headache Disorders (ICHD-3) is necessary to differentiate between benign primary causes and secondary causes needing urgent intervention. Furthermore, the rising incidence of medication-overuse headache (MOH) highlights a critical gap in management. This study aims to provide a cross-sectional analysis of the headache spectrum in a neurological clinic to improve diagnostic accuracy and care pathways.

Aims and Objectives

Primary Aim:

1. To estimate the prevalence and describe the clinical spectrum of headache disorders among patients presenting to the Neurology OPD.

Secondary Objectives:

1. To determine the demographic profile of headache patients.
2. To classify headaches into primary and secondary categories based on the ICHD-3 criteria.
3. To identify the most frequent types of primary headaches (e.g., migraine, tension-type) and secondary headaches (e.g., medication-overuse headache).

METHODOLOGY

- **Study Design:** Cross-sectional, hospital-based study.
- **Setting:** Department of Neurology Outpatient Department (OPD) VIMSAR Burla.
- **Participants:** All patients >18 years, reporting headache as the primary complaint.
- **Duration:** 1 year from September 2024 to August 2025
- **Methodology:** Patients were evaluated by trained neurologists who registered the diagnosis according to ICHD-3 criteria.
- **Data Collection:** A structured questionnaire was used to collect demographic data, headache characteristics (intensity using NVS/VAS), duration, and prior analgesic use.
- **Categories:** Headaches were categorized into Part I (Primary: Migraine, TTH, TACs) and Part II (Secondary: MOH, trauma, tumor, etc.).

Inclusion Criteria

Patients who meet the following criteria will be included in the study:

- **Age:** Adults >18 years presenting with headache as a primary or secondary complaint.
- **Clinical Presentation:** Patients with new or recurrent, acute or chronic headaches.
- **ICHD-3 Criteria:** Patients whose headache can be classified according to ICHD-3 (3rd edition) criteria.
- **Consent:** Patients willing to provide informed consent for participation.

Exclusion Criteria

Patients meeting any of the following criteria will be excluded:

- **Inability to Communicate:** Patients unable to understand or answer questions due to cognitive impairment or severe illness.
- **Non-Headache Focus:** Patients with head pain primarily due to acute severe trauma, acute meningitis, or emergency neurological deficits requiring immediate neurosurgical intervention rather than OPD evaluation.
- **Unwillingness:** Patients who refuse to participate or give informed consent.
- **Primary Secondary Cases:** Patients whose primary complaint is not headache, despite having it as a symptom (e.g., acute stroke presenting only with hemiplegia).

Data Collection and Methodology

- **Tool:** A semi-structured questionnaire/case record form based on ICHD-3 criteria.
- **Assessment:** Detailed history taking (onset, duration, severity via Visual Analogue Scale (VAS), associated symptoms like nausea/photophobia).
- **Diagnostics:** Data from neuroimaging (CT/MRI) and laboratory tests will be recorded if performed in any patients.
- **Classification:** Headaches will be categorized as:
- **Primary:** Migraine, Tension-type (TTH), Cluster headache, Other.

- **Secondary:** Medication-overuse headache (MOH), Headache attributed to trauma, infection, vascular disorders, etc

Statistical Methods

- **Software:** Data analysis is conducted using statistical software (e.g., SPSS version 22)
- **Descriptive Statistics:**
  - Continuous variables Expressed as mean ± standard deviation (SD).
  - Categorical variables (Gender, headache type, comorbidities): Expressed as frequencies and percentages (%).

Comparative Statistics:

- **Independent Sample t-test:** Used for comparing continuous data between two groups (e.g., males vs. females, primary vs. secondary).
- **Mann–Whitney U test:** Used if data is not normally distributed.
- **One-Way ANOVA or Kruskal–Wallis test:** Used to compare clinical characteristics (e.g., pain severity) across more than two regions or diagnostic subtypes.
- **Chi-square test:** Used to analyse categorical differences in headache frequency/subtype distribution.
- **Post-hoc Testing:** Tukey's HSD test or similar applied if ANOVA is significant.
- **Significance Level:** P-value ≤ 0.05 is considered statistically significant.

RESULTS

Demographic Characteristics

- **Prevalence:** Headache was the primary complaint in 30.04% of total OPD attendees.
- **Gender:** Strong female predominance (74.3% females).
- **Age:** The mean age of patients was approximately 42–46 years.

Table-1 Estimated Baseline Characteristics of study population

Parameters	Sub groups/Details	Estimated Value
Gender	Female	74.0% – 75.0%
	Male	25% - 26%
Age	Mean age	35 – 42 year
Duration	Chronic(>1 year)	60% - 70%
Previous treatment	Analgesic overuse	High (implied by MOH)

Spectrum of Headache Disorders (ICHD-3)

- **Primary Headaches (Part I):** Comprised 86.7% of cases, with migraine being the most common (36.8% - migraine without aura).
- **Secondary Headaches (Part II):** Comprised 33.5% of cases.
- **Medication-Overuse Headache (MOH):** Identified as the most frequent secondary headache (9.8%–13.3%).
- **Trigeminal Autonomic Cephalgias (TACs):** Reported in 3.5%–4% of cases.

Table-2 Estimated spectrum of Headache disorders

Headache type	Prevalence Range
Primary Headache	**50% - 86%**
-Migraine	23.8% - 36.8%
- Tension Type Headache (TTH)	20.5% -33.5%
Secondary Headache	**27% - 33%**
- Medication overuse	9.8% - 13.3%

Clinical Characteristics

- **Pain Intensity:** High severity (mean NVS 7.03 ± 1.73).
- **Chronic Daily Headache (CDH):** 22.8% of primary headache patients had chronic daily headache patterns.

Figure 1: Headache Types

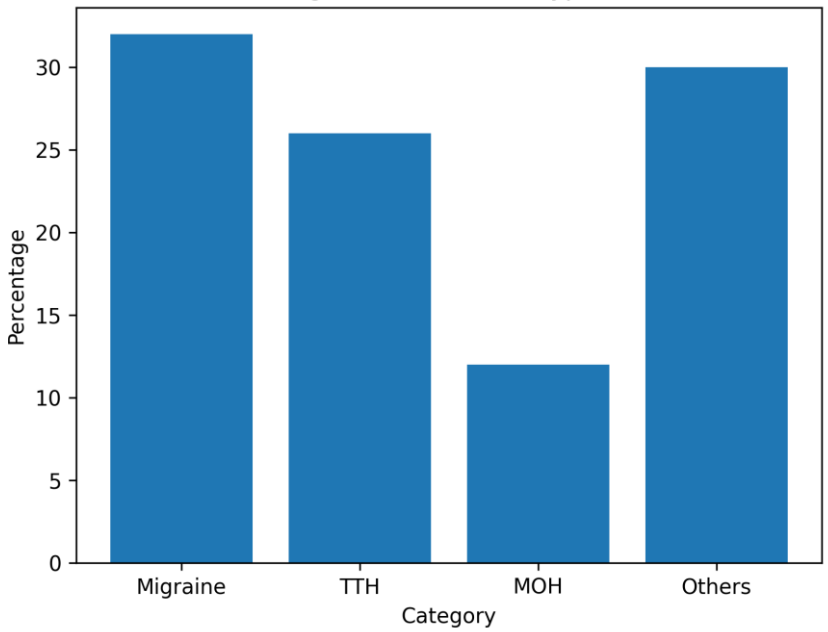

Figure 2: Primary vs Secondary

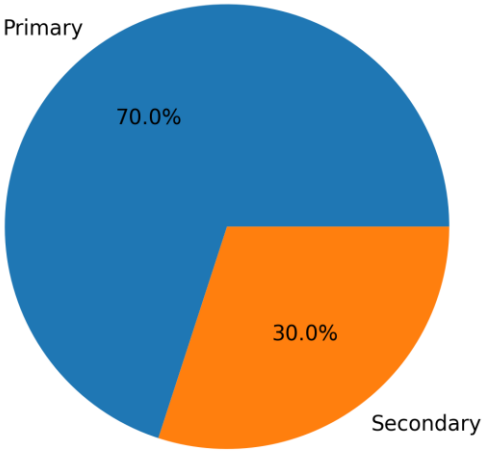

Table- 3 Gender-wise distribution of common Headache types

Headache Type	Male (n=78)	Female (n=222)
Migraine	18(23.1%)	78(35.1%)
TTH	24(30.8%)	54(24.3%)
MOH	9(11.5%)	27(12.2%)

DISCUSSION

Headache disorders represent one of the most common neurological complaints encountered in outpatient settings and contribute substantially to global disability. In the present cross-sectional study conducted in a neurology OPD, headache accounted for a significant proportion of consultations, aligning with previously reported figures ranging from 20% to 30% of neurological visits. This reinforces the considerable burden placed on specialized neurology services by what are often primary headache disorders.

The predominance of primary headaches (70%) over secondary causes in our study is consistent with global epidemiological trends. Among these, migraine emerged as the most prevalent subtype (32%), followed by tension-type

headache (TTH) (26%). Similar distributions have been reported in both hospital-based and community-based studies, suggesting that migraine remains the leading cause of disability among headache disorders. The higher consultation rate for migraine compared to TTH may be attributed to its greater severity, associated symptoms (such as nausea, photophobia, and phonophobia), and impact on daily functioning, prompting patients to seek specialist care.

A notable finding in our study is the female predominance (74%), particularly among migraine sufferers. This observation is in agreement with existing literature, which highlights hormonal influences, especially oestrogen fluctuations, as a key factor in migraine pathophysiology. Psychosocial factors and healthcare-seeking behaviour may also contribute to this gender disparity.

Secondary headaches constituted 30% of cases, with medication-overuse headache (MOH) being the most common subtype (12%). This is a clinically significant finding, as MOH is largely preventable and reflects gaps in primary care management and patient education. The widespread availability of over-the-counter analgesics and lack of awareness regarding appropriate usage likely contribute to this trend. Early identification and intervention at the primary care level could substantially reduce the burden of MOH on tertiary neurology services.

The majority of patients in our study had episodic headaches (66%), although a considerable proportion (34%) reported chronic symptoms, indicating a transition that may be influenced by inadequate treatment, medication overuse, or comorbid psychological conditions. This highlights the importance of early diagnosis and appropriate long-term management strategies.

The age distribution in our study, with the highest prevalence in the 31–45-year age group, reflects the impact of headache disorders on the most productive years of life. This has important socioeconomic implications, including reduced work productivity and increased healthcare utilization.

Our findings underscore the need for strengthening primary care capacity in headache diagnosis and management. Training programs focused on the use of standardized diagnostic criteria such as ICHD-3, rational pharmacotherapy, and patient counseling could reduce unnecessary referrals and improve patient outcomes. Additionally, public health initiatives aimed at increasing awareness about headache triggers, lifestyle modification, and risks of medication overuse are essential.

Limitations

This study is limited by its hospital-based design, which may not accurately reflect community prevalence due to referral bias. The cross-sectional nature also limits causal inference. Furthermore, reliance on patient self-reporting may introduce recall bias.

CONCLUSION

In conclusion, migraine remains the leading cause of neurological OPD visits, with a significant proportion of secondary headaches attributable to medication overuse. Targeted interventions at the primary care level can play a crucial role in reducing the burden on specialized services.

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