International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

# A Study of Demographic Data of Patients Presenting with Different Type of Headaches to a Tertiary Care Hospital

**Dr. P. Valli Krishna Priya[1], Dr. Aruna Kumari Upputuri[2], Dr. M. Bhargavi Devi[3], Dr. G. Bindu Narmada[4], Dr. A. Sita Kanthima[5], Dr. N. V. Sundarachary[6], Dr. T. Bhanu Chandra Prasad[7]**

[1]Senior Resident, Department of Neurology, Guntur Medical College, Guntur, AP, India

[2]Associate Professor, Department of Neurology, Guntur Medical College, Guntur, AP, India (Corresponding Author)

[3]Assistant Professor, Department of Neurology, Guntur Medical College, Guntur, AP, India

[4]Assistant Professor, Department of Neurology, Guntur Medical College, Guntur, AP, India

[5]Assistant Professor, Department of Neurology, Rangaraya Medical College, kakinada, AP, India

[6]Professor, Department of Neurology, Principal, Guntur Medical College, Guntur, AP, India

[7]Senior Resident, Department of Neurology, Guntur Medical College, Guntur, AP, India

**Abstract:** ***Background: Headache is a prevalent neurological condition causing global disability. This study evaluated demographic and clinical profiles of patients with primary and secondary headaches in a tertiary care setting. Methods: A prospective observational study was conducted from September to December 2024 at the Department of Neurology, Government General Hospital, Guntur. A total of 288 patients aged >18 years presenting with headache were included. Clinical evaluations, neuroimaging, and lumbar punctures were performed when necessary. Headaches were classified per the International Classification of Headache Disorders, 3rd edition. Results: Of 288 patients, 172 (59.7%) had primary headaches, and 116 (40.3%) had secondary headaches. Migraine was the most common primary headache (34.4%), with a female predominance (M:F = 1:3.95), peaking at 31–40 years. Tension-type headache (20.8%) was associated with systemic comorbidities and small vessel disease. Among secondary headaches, cranial/cervical vascular disorders (28.4%) were most common. Non-vascular intracranial disorders and infections each accounted for 19.8%. Idiopathic intracranial hypertension was frequent in young obese women. Cerebral venous sinus thrombosis and giant cell arteritis were notable vascular causes. Conclusion: Primary headaches were more common, especially migraine and tension-type headache. Migraine was linked to cardiometabolic comorbidities. Tension-type headaches showed broader systemic associations. Secondary headaches were varied and regionally influenced. Vascular causes and intracranial hypertension were predominant secondary types. Understanding headache types and regional patterns is essential for effective diagnosis and treatment.***

**Keywords**: Migraine; Tension-type headache; Secondary headache; Idiopathic intracranial hypertension; Cerebral venous sinus thrombosis; Neuroimaging

## 1. Introduction

Headache is among the most common neurological symptoms worldwide, representing a major cause of disability and healthcare burden. The Global Burden of Disease (GBD) Study 2016 estimated that nearly **3 billion** individuals suffer from migraine or tension-type headache; of these, ~1.04 billion people have migraine, which contributes disproportionately more to years lived with disability (YLDs) than tension-type headache.[1]

More recent GBD analyses reinforce this trend: in 2019, headache disorders ranked **third** among neurological conditions in terms of age-standardized disability-adjusted life years (DALYs) globally. From 1990 to 2021, the global prevalence of migraine increased by ~58.2%, rising from ~732.6 million to 1.16 billion cases, with a parallel ~58.3% increase in DALYs. Tension-type headache (TTH) also saw notable growth: between 1990 and 2021, prevalence and incidence rose by ~38%, and TTH now affects nearly 961 million people globally.[2]

The clinical spectrum of headache disorders is broad, ranging from benign, self-limiting episodes to chronic, refractory forms that significantly impair quality of life. While secondary headaches may be symptomatic of underlying structural, infectious, or vascular pathology, the majority are primary in nature.

On the pathophysiological side, studies have increasingly elucidated the role of the trigeminovascular system and neuropeptides such as calcitonin gene-related peptide (CGRP). Activation of the trigeminal ganglion, release of CGRP, and vasodilation and neurogenic inflammation are thought to be central mechanisms in migraine attacks. These insights have spurred development of targeted therapies (e.g. CGRP receptor antagonists, monoclonal antibodies) that show promise in both acute and preventive settings.[3]

**Aims and Objectives:**

- To evaluate the demographic data of Headache.
- To differentiate Primary & Secondary Headaches.

## 2. Materials and Methods

**Study Design**: Hospital-based prospective observational study.

**Duration of the Study**: September 2024 to December 2024.

**Source of the Data**: All patients aged above 18 years presenting with headache to the Department of Neurology, Government General Hospital, Guntur.

**Sample Size**: 288

**Inclusion Criteria:**
Patients aged above 18 years presenting to the Department of Neurology with headache.

**Exclusion Criteria:**
- Age < 18 years.
- Pregnancy.
- Other severe systemic diseases.
- Patients who have not given written consent.

**Method of Study:**
- Open-label prospective observational study.
- Baseline data will be collected using a pre-structured case proforma.
- History & Complete clinical and neurological examination will be done.
- Neuroimaging and lumbar puncture will be performed if necessary.
- Patients are categorized into primary and secondary headaches using International classification of Headache 3rd edition:

## 3. Results

Total data of 288 patients was collected of which males were 86 (29.9%) and females were 202 (70.1%).

Primary Headache: 172 (59.7%)

Secondary Headache: 116 (40.3%)

**Primary Headache:**

**Table 1**

| | | |
|---|---|---|
| Migraine | 99 | 57.6% |
| Tension type headache | 60 | 34.9% |
| TACs | 6<br>Paroxysmal Hemicrania – 4<br>Cluster Headache – 2 | 3.5% |
| Other primary HA | 7<br>Hypnic Headache – 1<br>Primary cough Headache – 2<br>Headache Associated with sexual activity – 2<br>Nummular Headache – 2 | 4.1% |

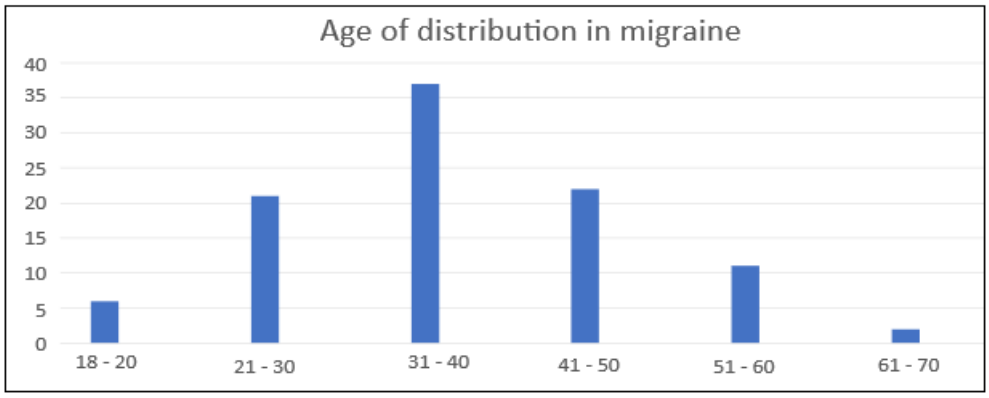
**Secondary Headache:**

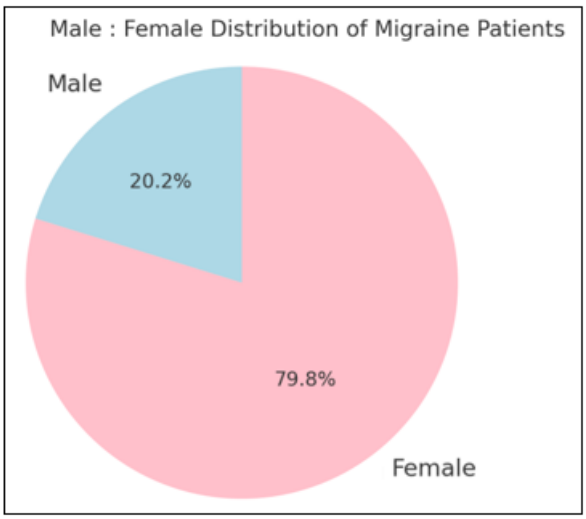
| | | |
|---|---|---|
| Headache attributed to trauma or injury to the head and/or neck | **1** | 0.9% |
| Headache attributed to cranial or cervical vascular disorder | **33**<br>Giant cell Arteritis – 4<br>Subarachnoid Haemorrhage – 3<br>Cerebral sinus venous thrombosis – 11<br>Intracranial haemorrhage – 4<br>Ischemic - 6<br>Cavernous sinus thrombosis – 2<br>Takayasu arteritis – 1<br>Cavernous sinus thrombosis – 2<br>Aneurysmal Headache – 2 | 28.4% |
| Headache attributed to non-vascular intracranial disorder | **23**<br>Idiopathic Intracranial Headache - 15<br>Post Lumbar puncture Headache -5<br>Pachymeningitis – 3 | 19.8% |
| Headache attributed to a substance or its withdrawal | **1**<br>Medication over usage HA | 0.9% |
| Headache attributed to infection | **23**<br>Viral meningitis – 10<br>Bacterial meningitis - 4<br>Tuberculosis – 8 | 19.8% |
| Headache attributed to disorder of homeostasis | **7**<br>Hypertensive Headache - 7 | 6% |
| Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial/cranial structures | **29**<br>Cervicogenic Headache – 15<br>Vestibular paroxysmia – 1<br>Refractive error – 5<br>Sinusitis – 8 | 25% |

Migraine patients 99 (34.4%) M: F - 20:79 (1:3.95) with Peak Age Group: 31 - 40 years (37 cases). Migraine with aura 10.1%, Migraine with TTH 5.1%, Ophthalmoplegic migraine 1%, Retinal migraine 2 %, vestibular migraine 7%, Hemiplegic migraine 1%, catamenial migraine 2%, status migrainosus 1%. 38.4% of total migraine patients were classified into subtypes. DM (38.38%) and HTN (28.28%) are the most common comorbidities. Imaging findings were white matter changes 6 patients, calcified granuloma in 5, sinusitis in 2, Small Vessel Disease in 2 patients.

**Table 2:** Age distribution in Migraine

| Age | N | (%) |
|---|---|---|
| 18 - 20 | 6 | 6.7% |
| 21 -30 | 21 | 23.3% |
| 31 - 40 | 37 | 41.1% |
| 41 - 50 | 22 | 24.4% |
| 51 – 60 | 11 | 12.2% |
| 61 – 70 | 2 | 2.2% |

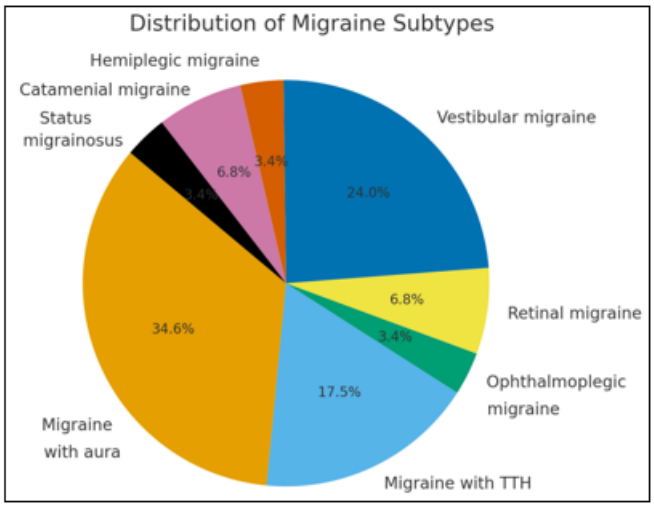


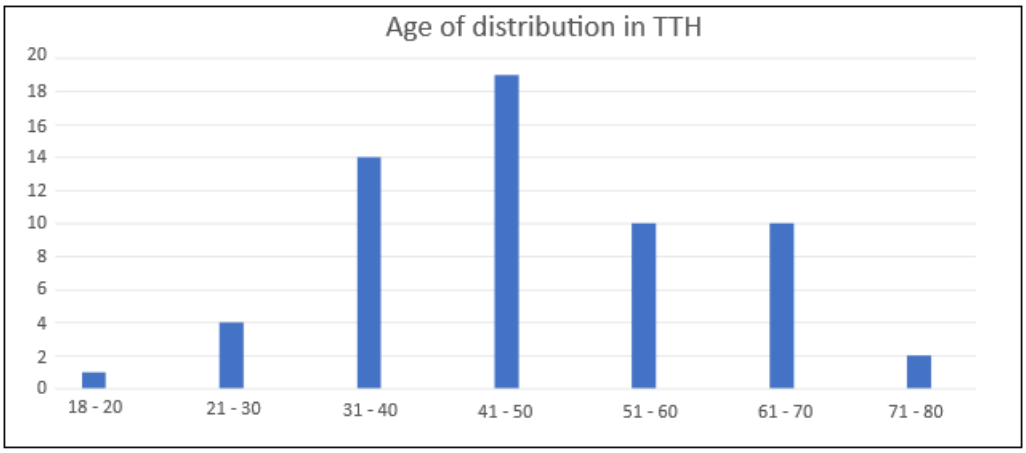




TTH (60): % of total cases: 20.8% M:F ratio: 13:47 (1:3.6). Most common in 31–50 years: 33 patients. HTN 26 (43.3%), DM 17 (28.3%), hypothyroidism 6 (10%), obesity 4 (6.7%), anaemia 3.3%, Pulmonary Tuberculosis 1.7%, COPD 1.7%. Greater variety of systemic illnesses compared to migraine group. Imaging findings SVD in 16.7%, chronic infarcts in 6.67%.

**Table 3:** Age distribution in TTH

| Age | N | (%) |
|---|---|---|
| 18 - 20 | 1 | 1.7% |
| 21 -30 | 4 | 6.7% |
| 31 - 40 | 14 | 23.3% |
| 41 - 50 | 19 | 31.7% |
| 51 – 60 | 10 | 16.7% |
| 61 – 70 | 10 | 16.7% |
| 71 - 80 | 2 | 3.3% |






IIH: out of total 15 patients 2 patients have no papilledema. 12 patients were females in age group of 31 - 40 years.
Migraine with TTH: 5 patients.

Of 11 Cerebral sinus venous thrombosis cases 5 patients were of 21- 30 years.

6 patients with headache attributed to refractive errors were in the 18 - 30 years age group.

## 4. Discussion

In the present study, migraine accounted for 99 cases (34.4%) with a marked female predominance (M:F ratio 1:3.95) and peak prevalence in the 31- 40 year age group (37 cases), consistent with global epidemiology showing migraine is most common in young to middle-aged women[4]. Subclassification was possible in 38.4% of patients, with migraine with aura (10.1%) being the most frequent, followed by vestibular migraine (7%).

Comorbidity analysis revealed high rates of diabetes mellitus (38.38%) and hypertension (28.28%), aligning with evidence that migraine, particularly with aura, is linked to metabolic syndrome and increased cardiovascular risk[5].

Neuroimaging revealed white matter hyperintensities in 6 patients, calcified granulomas in 5, sinusitis in 2, and small vessel disease in 2; the 6% prevalence of WMHs aligns with prior reports of excess lesion burden in migraineurs[6].

**Tension Type Headache:**
In our cohort, tension-type headache (TTH) accounted for 60 cases (20.8%) with a female predominance (M:F ratio 1:3.6)[7]. The most affected age group was 31–50 years (33 patients), consistent with the observation that TTH commonly affects working-age adults.

Compared to the migraine group, TTH patients showed a **greater burden and variety of systemic illnesses**, with hypertension (43.3%) and diabetes mellitus (28.3%) being most frequent, followed by hypothyroidism (10%), obesity (6.7%), anemia (3.3%), pulmonary tuberculosis (1.7%), and COPD (1.7%). This broader comorbidity profile suggests that TTH may be more strongly associated with chronic systemic conditions than migraine, possibly reflecting the impact of psychosocial and lifestyle factors.

Neuroimaging revealed small vessel disease in 16.7% and chronic infarcts in 6.67%, higher than in the migraine group, highlighting the potential contribution of vascular and structural brain changes to chronic headache expression.[8]

In our study, secondary headaches accounted for 116 cases (40.3%) of all headache presentations, which is higher than the 18–33% prevalence. The most common cause was cranial or cervical vascular disorders (33 cases, 28.4%), including cerebral venous sinus thrombosis (11), ischemic stroke (6), intracranial hemorrhage (4), giant cell arteritis (4), subarachnoid hemorrhage (3), cavernous sinus thrombosis (2). This aligns with previous reports noting vascular etiologies as the leading contributors to secondary headaches, especially CVST in young adults and GCA in older patients[9].

Non-vascular intracranial disorders contributed 23 cases (19.8%), mainly idiopathic intracranial hypertension (15), followed by post-lumbar puncture headache (5) and pachymeningitis (3) with IIH most common in 31 - 40 years age. This supports earlier findings that IIH is one of the more frequent secondary headache diagnoses in specialized centers, particularly among obese women of childbearing age[10].

Infections accounted for 23 cases (19.8%) of secondary headaches in this study, with meningitis (viral and bacterial) being the predominant cause. In our cohort, viral meningitis was more frequent than bacterial and tubercular meningitis, aligning with the global epidemiology where viral causes are generally more common. However, the presence of tubercular meningitis is regionally significant, as South Asia continues to carry a high burden of tuberculosis-related CNS infections[11].

Headaches attributed to disorders of homeostasis contributed to 7 cases (6%) in our series, primarily hypertensive headaches. These headaches usually occur in the setting of severe or rapidly rising blood pressure, hypertensive crisis, or encephalopathy. The prevalence of hypertensive headache varies, as mild to moderate hypertension rarely produces headache, but in acute elevations it becomes a significant clinical manifestation.

Taken together, our results highlight that secondary headaches are diverse, with vascular disorders and IIH predominating, and that regional factors such as infections (TB meningitis) also play an important role.

## 5. Conclusion

In this study, primary headaches, particularly migraine (34.4%) and tension-type headache (20.8%), accounted for the majority of cases, with a strong female predominance and peak prevalence in young to middle-aged adults.

Migraine was most often linked with cardiometabolic comorbidities and white matter changes, while tension-type headache showed a broader systemic comorbidity burden and higher rates of small vessel disease, suggesting differing systemic associations.

Secondary headaches (40.3%) were also significant, with vascular disorders and idiopathic intracranial hypertension predominating, alongside infectious etiologies such as tubercular meningitis that remain regionally relevant.

These findings highlight the need for careful differentiation between primary and secondary headaches, early identification of comorbidities, and judicious use of neuroimaging to guide management.

## References

[1] GBD 2016 Headache Collaborators. **Global, regional, and national burden of migraine and tension-type headache, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016**. *The Lancet Neurology.* 1 Nov 2018; 17(11):954-976. doi: 10.1016/S1474-4422(18)30322-3.
[2] World Health Organization. *Migraine and other headache disorders* [Internet]. WHO; 6 March 2024 [cited 2025 Sep 28].
[3] Chen ST, Wu JW. A new era for migraine: The role of calcitonin gene-related peptide in the trigeminovascular system. Prog Brain Res. 2020; 255: 123-142. doi: 10.1016/bs.pbr.2020.05.012. Epub 2020 Jun 16. PMID: 33008504.
[4] Lipton RB, Bigal ME. Migraine epidemiology, impact, and risk factors. *Neurol Clin*. 2009;27(2):421–434.
[5] Sacco S, et al. Migraine and risk of ischemic heart disease: a systematic review and meta-analysis. *Eur J Neurol*. 2015;22(6):1001–1011.
[6] Swartz RH, Kern RZ. Migraine is associated with MRI white matter abnormalities: a meta-analysis. *Arch Neurol*. 2004;61(9):1366–1368.
[7] Jensen R, Stovner LJ. Epidemiology and comorbidity of headache. *Lancet Neurol*. 2008;7(4):354–361.
[8] Ashina S, Bendtsen L, Ashina M. Pathophysiology of tension-type headache. *Curr Pain Headache Rep*. 2005;9(6):415–422.
[9] Bousser MG, Ferro JM. Cerebral venous thrombosis: an update. *Lancet Neurol*. 2007;6(2):162–170.
[10] Misra UK, Kalita J, et al. Spectrum and outcome of central nervous system tuberculosis: a hospital-based study. *Clin Neurol Neurosurg*. 2010;112(9):859–863.
[11] Markey KA, et al. Idiopathic intracranial hypertension: epidemiology and risk factors. *Lancet Neurol*. 2016;15(1):78–91.