

## Original Research Article

# A study of migraine cases in a tertiary care hospital neurology outpatient department: demography, sub classification and clinical features

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**Received:** 11 October 2018

**Revised:** 20 October 2018

**Accepted:** 24 October 2018

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### ABSTRACT

**Background:** Recurrent headache disorders impose a substantial burden on headache sufferers, family and society. In India, 15 to 20% of people suffer from migraine with an adult female: male ratio of 2:1. This study has been done with an aim at documenting the different types of migraine, their clinical presentations among patients presented to the Headache clinic, Neurology outpatient Department, Government Rajaji Hospital, Madurai during a one year period.

**Methods:** The patients registered at Headache clinic, Neurology outpatient Department, Government Rajaji Hospital, Madurai during one year period between the March 2009 and February 2010 with the diagnosis of migraine as per International Headache Society 2004 criteria were taken for this study. The clinical material was collected from the records and by patient interviews with a detailed pre-prepared proforma. The various parameters of the patients were compared, classified and analysed with specific reference to national and international studies.

**Results:** Migraine is the commonest type of headache comprising of about 76% of total cases of headache. Migraine without aura (48%) was more common than migraine with aura (32%). Female preponderance was noticed in all subtypes of migraine, age of onset being in 2<sup>nd</sup> and 3<sup>rd</sup> decade for majority of the subgroups of migraine, with positive family history in 45% of cases, with predominant unilateral in presentation and temporal in location, lasting for 12 to 24 hours in majority of cases.

**Conclusions:** Migraine is the commonest type of headache in patients observed in this study. Among subtypes migraine without aura is the commonest. Second and third decade is the commonest age group of onsets.

**Keywords:** Classification, Clinical profile, Demography, Migraine

### INTRODUCTION

Headache is one of the chief complaints among patients attending neurology outpatient department. More than 90% of patients with headache will have primary headache. Primary headaches are defined as headaches that are not caused by an identifiable underlying

structural, vascular or systemic illness. Hence the diagnosis of primary headache begins with the exclusion of secondary causes for headache. Migraine along with Tension type headache and Trigeminal autonomic cephalalgias form the group of primary headaches. Although Tension type headache is the most common kind of headache, patients with this type of headache

rarely seek treatment unless it is daily in occurrence or severe. Hence migraine is the most common headache diagnosis for patients attending headache clinic. Patient's history is essential tool to diagnose migraine. Migraine is among the most common disorders of the nervous system. They are pandemic and, in many cases, life-long conditions. Headache with neuralgia is referred to since the times of ancient Egyptians (1200 BC), with Hippocrates (460-377 BC) describing the visual aura in migraine and its relief through vomiting.<sup>1</sup> In India, 15 to 20% of people suffer from migraine with an adult female: male ratio of 2:1.<sup>2</sup> Migraine is a chronic, often inherited condition involving brain hypersensitivity and lowered threshold for trigeminal vascular activation. Recurrent migraine imposes a substantial burden on headache sufferers, family and society, typically affecting individuals when they are in their teens or twenties with peak prevalence around the age of 40. Migraine results in a marked decrease in patient's quality of life as measured by physical, mental and social health related indices. However, in many of the times migraine remains underdiagnosed and patients with migraine are undertreated. Although migraine is extraordinarily common, its epidemiology and clinical profile are only sparsely documented. Authors undertook this study with an aim of documenting the epidemiology, clinical profile and classification of migraine among patients presented to the Headache clinic, Neurology out patient Department, Government Rajaji Hospital, Madurai during one year period between the March 2009 and February 2010 and comparing the same with previous published studies.

## METHODS

The patients registered at Headache clinic, Neurology Outpatient Department, Government Rajaji Hospital, Madurai during one year period between the March 2009 and February 2010 were taken for this study. Government Rajaji Hospital is a tertiary care teaching hospital attached to Madurai medical college serving the public of Madurai district and nearby districts. Patients are referred to headache clinic of the neurology department from other outpatient departments of the hospital and also from private clinics and primary health centers. The clinical material was collected from the patient records and by patient interviews with a detailed pre-prepared proforma.

### Inclusion criteria

- Patients registered at the Headache clinic, Neurology Outpatient Department, Government Rajaji Hospital, and Madurai during one year period between the March 2009 and February 2010
- Patients in all age groups in both sexes, of any racial and socioeconomic denomination
- Patients were followed up for one year from the date of their registration and those who completed one year of follow up

- All headaches were classified according to the International Headache Society Criteria 2004.

### Exclusion criteria

- Patients with systemic, metabolic, traumatic disorders and or radiological findings that were documented to be directly or indirectly related to the causation of headache
- Headache located or transmitted to the cranium from the Maxillo /Mandibulofacial region, pharynx, paranasal sinuses, neck and ear
- Patients with incomplete clinical profiles, diagnostic and treatment records
- Patients who did not complete the one year follow up.

The clinical presentations, radiological features, laboratory results, neurophysiological patterns, treatment and its response on follow up, the progress and complications were documented and tabulated in a master chart. The various parameters of the patients were compared, classified and analysed with specific reference to national and international studies.

## RESULTS

A total of 502 headache patients registered at the Headache clinic, outpatient department, Department of Neurology, Government Rajaji Hospital, Madurai Medical College, Madurai between 1<sup>st</sup> March 2009 and 28<sup>th</sup> February 2010 were included in the study. Of the total of 502 patients, 382 (76.09%) patients had migraine.

### Classification of headaches

Of the 382 case of migraine, 186 (48.69%) patients had migraine without aura, 36 (9.42%) patients had migraine with aura, 90 (23.56%) patients had migraine which presented with and without aura, 62 (16.23%) patients had complications of migraine and 8 (2.09%) patients had probable migraine as shown in Figure 1.

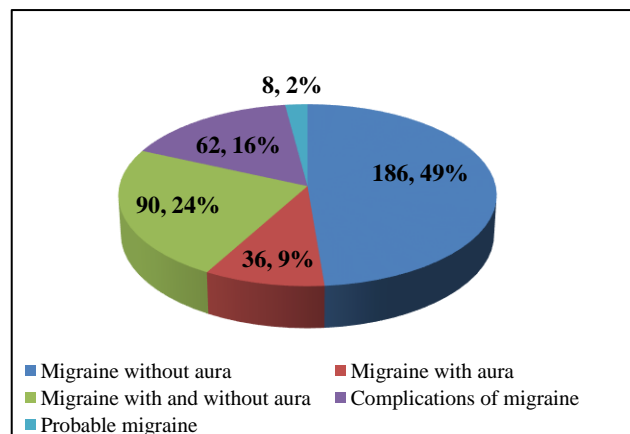
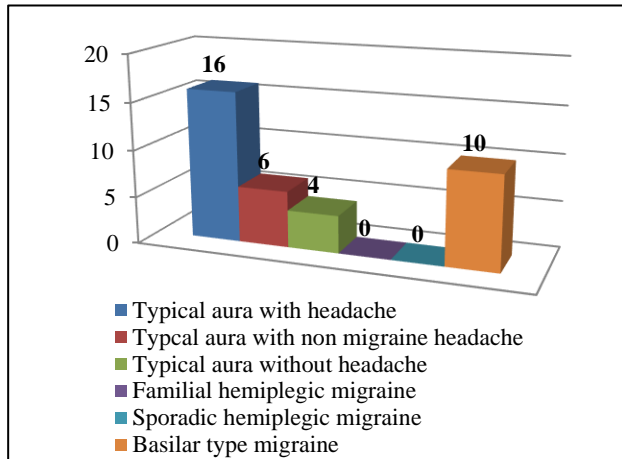


Figure 1: Types of migraine.

Of the patients migraine with aura (36 patients) the predominant subtype was typical aura with headache (16 patients). Present study also included 6 patients of typical aura with non migraine headache, 4 patients with typical aura without headache and 10 patients with basilar type migraine. Present study group did not have patients with familial hemiplegic migraine and sporadic hemiplegic migraine as shown in Figure 2.



**Figure 2: Number of types of patients with migraine with aura.**

Of the 62 patients with complications of migraine, 48 patients had chronic migraine (12 patients with chronic migraine since onset and 36 patients with episodic headache converting to chronic migraine), 1 patient had migrainous infarction (right occipital infarction) and 13 patients had migraine triggered seizures (migraine terminating as seizures - 9, migralepsy -4). In present study, authors came across 52 patients with migraine and seizures, 13 patients had migraine triggered seizures, 17 patients had post ictal migrainous headache and 22 patients had migraine and coexistent seizure. Of the 13 patients who had migraine triggered seizures 9 patients had migraine terminating as seizures and 4 patients had migralepsy.

### Age

Migraine was most common in the 2nd and 3rd decades, 249 out of 382 patients were between 11-30years of age (11-20yrs - 139 patients, 21- 30yrs - 110 patients, 31-40yrs - 89 patients). In patients with migraine triggered seizures of the total 13, 9 patients were in the age group of 11-20years. Basilar migraine was also found to be common in the age group of 11-20years (7 out of 10) patients and chronic migraine was noticed in 4<sup>th</sup> and 5<sup>th</sup> decade of life predominantly (35 out of 48).

### Gender distribution

The patients were analysed for gender distribution. Female patients dominated in the category of migraine 262 of the 402 patients. A complication of migraine was

more common in female patients. Out of the 13 patients with migraine triggered seizures 10 were female and 3 were male. Chronic migraine was predominantly seen in females (32 out of 48 patients).

### Family predilection

Family history was positive in 174 patients (45.54%) with migraine.

### Clinical presentations

Headache in patients with migraine, 286 presented with unilateral headache, of which 193 patients experienced shift of sides while 96 patients had always a unilateral headache. Most of the episodes of migrainous headache in our patients lasted more than 12 to 24 hours (251 patients). The migrainous headaches were predominantly temporal (217 patients). Most of the patients experienced a throbbing type of headache (263 patients).

### Symptoms, aggravating and relieving factors

The predominant premonitory symptom was fatigue (76 patients), followed by, sense of feeling low, irritability, yawning and over eating in few patients. Associated symptoms in order occurrence being nausea, photophobia, phonophobia, blurring of vision, vomiting and giddiness. Loss of consciousness was reported in 39 patients. Autonomic symptoms like lacrimation, redness and transient syncope were reported in few patients. The most common aggravating factor in our study group was mental stress, while physical stress, head bath, bright sunlight, lack of sleep, travel and consumption of chocolates were also commonly reported. Head bath as an aggravating factor has been observed in 116 patients. The relieving factors were mostly rest and analgesics or topical applications and sleep.

### Aura

The preponderant type of aura reported in studied migrainous patients was visual aura in 107 patients while sensory aura was reported in 17 patients and both in 2 patients. The visual aura was predominantly in the form of flickering of lights in 70 patients, while zig-zag lines, scintillating scotomas and fortification spectra was noted in 17 patients, 10 patients and 5 patients respectively. The sensory aura seen was commonly in the form of paresthesia (12 patients) as tabulated in Table1.

### Migraine triggered seizures

Of the 13 patients who had migraine triggered seizures 9 patients had migraine terminating as seizures and 4 patients had migralepsy. On analyzing the seizure pattern of these 13 patients, 7 patients had GTCS, 6 patients had CPS.

### Associated conditions

In present study of 382 patients with migraine the following clinical conditions were seen associated - namely healed granulomatous lesions on CT, seizures, hypertension, and stroke.

**Table 1: Types of aura.**

Aura	No. of patients	Type of aura	
Visual aura	102	Fortificatio spectra	5
		Scintillating scotoma	10
		Flickering lights	70
		Zig Zag lines	17
Sensory aura	17	Paresthesia	12
		Numbness	5
Visual and sensory aura	7	-	-

### Diagnostic tests

#### Electrophysiology

EEG was taken in 52 of 382 patients with migraine. EEG was taken in all the 13 patients with Migraine Triggered Seizures. Changes were seen in 8 out of 13 patients, 5 patients had spikes and sharp waves in posterior head region, 3 patients had non specific slowing in posterior regions and there were no specific changes in 5 patients. In other 39 patients, nonspecific slowing in posterior regions was seen in 30 patients and EEG was normal in 9 patients.

#### CT scan

CT scan of brain was taken in all of the 382 patients, of whom 40 had changes. The most common change reported in CT scan brain was calcified granulomas in 36 patients, gliosis in 3 patients and basal ganglia calcification in one patient. In all the 19 patients with migraine triggered seizures, CT scan brain was found to be normal in all patients.

## DISCUSSION

This study at the Headache clinic, Neurology Out Patient Department, Government Rajaji Hospital, Madurai between 1st March 2009 and 28th February 2010 encompassed a period of one year.

### Demography of migraine

#### Incidence

Of the 502 patients of primary headaches included in this study 382 (76.09%) patients had migraine. 100 (19.92) had tension type headache, 12 (2.39%) had trigeminal autonomic cephalalgia, 8 (1.57%) had other types of

primary headaches. This profile of headaches in present study was in inverse correlation with few international studies (Lipton et al).<sup>3</sup> Tension type headaches are considered the most common form of headache in the general population with a prevalence of nearly 80% while the prevalence of migraine is pegged at 16% in various international studies. In contrast, migraine is a more common form of headache reported in clinical practice. This variance is attributed to self-treatment of tension type headaches by the general population. This variation reported in present study correlates with the study of Lance et al.<sup>4</sup>

In present study of the 382 cases of migraine, 186 (48.69%) patients had migraine without aura, 36 (9.53%) patients had migraine with aura, 90 (23.09%) patients had migraine which presented with and without aura, 62 (17.37%) patients had complications of migraine and 8 (2.09%) patients had probable migraine. The ratio of migraine without aura and migraine with aura in present study is calculated approximately at 5:1 which correlates with international studies (Ropper AH).<sup>5</sup> However the ratio narrows down to 1.5:1 if migraine without aura is compared against migraine with and without aura. In present study of the 382 cases of migraine, 90 (23.56%) patients had migraine which presented with or without aura. These 90 patients were placed as a separate group. This group of patients have has been identified and given particular mention in the International Classification of Headache Disorders 2004 classification. "Many patients who have frequent attacks with aura also have attacks without aura (code as 1.2 migraine with aura and 1.1 migraine without aura)."<sup>6</sup> Hence in present study authors have placed this group of patients as a separate sub entity within the entity migraine.

### Age and gender distribution of migraine

#### Age distribution

Of the 382 patients having migraine most of them were between 11-40years of age (11-20yrs - 139 patients, 21-30yrs - 110 patients, 31-40yrs - 89 patients). In this study migraine with aura peaked around 12-17 years of age in males (5 out of 10) and around 18-22 years in females (9 out of 26). The onset and peaking in both male and female patients in this study is 8-10 years delayed in contrast to that observed in western population by Stewart et al. According to him the incidence of migraine with aura in females peaked between ages 12 and 13 (14.1/1000 person-years); and in males, migraine with aura peaked in incidence several years earlier, around 5 years of age at 6.6/1000 persons- years. Before puberty, migraine prevalence is higher in boys than in girls. The peak incidence of basilar migraine in this study was around 10-15 years which correlates with the international literature.

As adolescence approaches, incidence and prevalence increase more rapidly in girls than in boys. The

prevalence increases throughout childhood and early adult life until approximately age 40, after which it declines.<sup>7</sup> If the migraine headaches persist beyond 40 years of age there is more chance for transformation into chronic migraine.

#### *Gender distribution*

The patients analysed for gender distribution. Of the 382 patients with migraine 68.58% of them were females. Female predominance is noted in all groups including migraine with aura, migraine without aura, basilar migraine, migraine triggered seizures, migrainous infarction and chronic migraine. Menstrual related migraine was noticed in 24 patients whereas pure menstrual migraine was present in 2 patients. The American Migraine Study-1 (AMS-1) and AMS-II, collected information from 15,000 households representative of the US population in 1989 and 1999.<sup>10</sup> Yet another study, the American Migraine Prevention and Prevalence study (AMPP) replicated the methods of AMS-I and AMS-II. In these three large studies, the prevalence of migraine was about 18% in women and 6% in men (Abu-Arefeh I et al).<sup>8</sup>

#### *Family predilection*

Family history was positive in 229 patients (45.54%) with migraine. Of the 36 patients with migraine with aura 20 out of 36 patients had a first-degree relative suffering from headache. Russell MB et al, has stated that first degree relatives of patients with migraine with aura had a three -four fold increased risk of migraine and it is twofold in first degree relative's patients with migraine without aura.<sup>9</sup>

#### *Clinical presentations of migraine*

##### *Location and character*

In patient with migraine 286 presented with unilateral headache, with 193 of these patients experiencing shift of sides while 96 patients had always a unilateral headache. The headache was predominantly temporal (217 patients). Most of the patients experienced a throbbing type of headache (263 patients) with a majority of cases (145) lasting for a duration of 12-24 hours. The predominant premonitory symptom was fatigue (76patients), with nausea, photophobia, phonophobia and blurring of vision the commonest associated symptom in order of occurrence. Loss of consciousness was reported in 39 patients.

##### *Aura*

Among the several types of aura, visual aura was more common (102 of 126 cases) which is in concordance with the literature. Two patients while on treatment for migraine headaches with aura, later had only aura alone without headache. The visual aura was predominantly in

the form of flickering of lights in 70 patients, while zig zag lines, scintillating scotomas and fortification spectra was noted in 17 patients, 10 patients and 5 patients respectively. This is in correlation with most international studies (Christopher et al).<sup>10</sup> When patients with typical aura with migraine headache become older, their headache may lose migraine characteristics or disappear completely even though auras continue. Sensory aura was reported in 17 patients and both in 7 patients. The sensory aura seen was commonly in the form of paraesthesia (12 patients).

#### *Aggravating and relieving factors*

In present study the most common aggravating factors were mental stress, while physical stress and lack of sleep were also commonly reported. Head bath as an aggravating factor has been observed in 116 patients. A similar observation has been referred to by Ravishankar et al.<sup>11</sup> This prospective study analysed this unusual trigger link in 94 out of 1000 Indian patients who fulfilled the International Headache Society criteria for migraine. In 11 patients, hair wash was the only trigger; in 45 patients hair wash was one of the triggers and in 38 patients hair wash was a trigger concurrently and in combination with another common trigger. The effect of episodic and long-term prophylaxis in preventing this trigger-like headache has been analysed. The relieving factors were mostly rest and analgesic ingestion and sleep.

#### *Associated clinical conditions*

In present study of 382 patients with migraine the following clinical conditions were seen associated - namely evidence of healed granuloma, seizures hypertension and stroke.

#### *Complication of migraine*

##### *Chronic migraine*

In present study of the 382 case of migraine, 62 (16-18%) patients had complications of migraine. Of these 62 patients, 48 patients had Chronic Migraine (12 patients of chronic migraine since onset and 36 patients of episodic headache converting to migraine), 1 patient had migrainous infarction (right occipital infarction -1) and 13 patients had migraine triggered seizures (migraine terminating as seizures - 9, migralepsy - 4). In present study, the most common complication observed in patients with migraine was transformation of migraine to chronic migraine or chronic daily headache.

As the chronicity develops migraine headache lost its episodic presentation, as tabulated in Table 2.

Most of these patients with transformed migraine are patients with migraine without aura which is concordant with the studies of Siberstein SD et al.<sup>12</sup> One patient was

diagnosed to have migrainous infarction in our study. She was a female of age of 28 years. The risk of stroke may be increased two to threefold in migraine sufferers. Becker C et al, observed that migraine sufferers seem to be at risk for both thrombotic and hemorrhagic stroke as well as transient ischemic attacks (Becker C et al).<sup>13</sup> It

was also observed by Kurth T et al, that women who experience auras have been found to have twice the risk of strokes and heart attacks over non-aura migraine sufferers and women who do not have migraines (Kurth T et al).<sup>14</sup>

**Table 2: Types of complication of migraine.**

Types of complications of migraine	IHS code	Sub types	No. of patients	Total no. of patients
Chronic migraine	1.5.1	Chronic migraine since onset	12	48
		Episodic headache converting to migraine	36	
Status migrainosus	1.5.2	-	-	0
Persistent aura without infarction	1.5.3	-	-	0
Migrainous infarction	1.5.4	Right occipital infarction	1	1
Migraine triggered seizures	1.5.5	Migraine terminating as seizures	9	13
		Migraine triggered seizures	4	
Total				62

#### *Migraine triggered seizures*

In present study, authors came across 52 instances of migraine associated with seizures, 13 patients had migraine triggered seizures, 17 patients had post ictal migrainous headache and 22 patients had migraine and coexistent seizure. these observations in present study correlate with observations of Anderman F et al.<sup>15</sup> Of the 13 patients who had migraine triggered seizures, 9 patients had migraine terminating as seizures and 4 patients had migralepsy. Relationship between duration of headache and terminations as seizures was analysed. In our patients, all had a prolonged duration of migraine ranging from 2 to >12hrs duration preceding seizures. This observation in present study is in contrast to the observation of Young et al, in their epilepsy unit, where their patients had a brief duration of headache lasting for upto 20 minutes.<sup>16</sup> Headache can also be the sole or most predominant manifestation of epileptic seizures, though this is a relatively rare situation.<sup>17</sup>

#### *Diagnostic studies*

##### *Electrophysiology*

EEG was taken in 52 of the 382 patients with migraine. 33 of the 52 patients showed non specific slowing in posterior region, while 5 patients showed spikes and sharp waves in occipital region while 14 of the patients had no specific changes. The EEG features in studied patients were sharp waves and spikes in posterior occipital region mainly occipital region (5 patients of migraine triggered seizures), more during the period of aura and was normal during the interval period between attacks of migraine. This correlates with a large multicenter study by Beaumanoir A et al, which showed

the incidence of spikes and paroxysmal events in 12.5% of migraine patients compared to 0.7% in normal adult volunteers.<sup>18</sup>

##### *Radio-imaging studies*

CT scan of brain was taken in all of the 382 patients, of whom 40 had changes. The most common change reported in CT scan brain was calcified granulomas in 36 patients, gliosis in 3 patients and basal ganglia calcification in 1 patient, which were incidental. Frishberg BM et al, reviewed four CT scan studies, four MRI scan studies, and one combined MRI and CT scan study of 897 scans of patients who had migraine.<sup>19</sup> These findings are combined with more recent reports of one CT scan study of 284 patients and six studies of MRI scans of 444 patients for a total of 1625 scans of patients who had various types of migraine. Other than white matter abnormalities, the studies showed no significant pathology except for four brain tumours and one arterio-venous malformation which were all incidental.

## **CONCLUSION**

Migraine is the commonest type of headache comprising of about 76%. Migraine without aura (48%) was more common than migraine with aura (32%). Female preponderance was noticed in all subtypes of migraine, age of onset being in 2<sup>nd</sup> and 3<sup>rd</sup> decade for majority of the subgroups of migraine, except for basilar migraine which was common in 1<sup>st</sup> and 2<sup>nd</sup> decade. Migraine pain was temporal in location, unilateral, throbbing in character, lasting for 12 to 24 hours in majority of the cases. Chronic migraine, migraine triggered seizures and Migrainous infarction were the complications of migraine encountered in this study in the order of frequency of

occurrence. Transformation to chronic migraine was more common from episodic forms and in patients with onset of migraine in teens or twenties.

## ACKNOWLEDGEMENTS

Authors would like to thank Professor and Head of the department, Government Rajaji Hospital, Prof. Dr. M. Chandrasekaran, MD, DM, and Prof. Dr. N. Muthuveeran, MD, DM, for their motivation and support in this study.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Selvaraj C, Sivakumar S. A study of migraine cases in a tertiary care hospital neurology outpatient department: demography, sub classification and clinical features. Int J Res Med Sci 2018;6:3872-8.