



**ORIGINAL RESEARCH PAPER**

**Neurology**

**PRECIPITANTS OF HEADACHE IN MIGRAINE PATIENTS ATTENDING NEUROLOGY OPD IN A TERTIARY CARE CENTRE**

**KEY WORDS:** Migraine, precipitants, triggers of migraine, headache, primary headache.

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**ABSTRACT**

**Introduction:** Headache or cephalgia is one of the most common of all human physical complaints of which migraine is the most common type of primary headache. It can be triggered by many factors such as dietary, environmental, psychological, medications, change in habits. In prevention of migraine, identification and avoidance of triggering factors of migraine is of paramount importance.

**Methods:** This study included 100 patients with Migraine diagnosed according to HIS criteria who presented to the neurology department at Tirunelveli Medical College between April to June 2019. Demographic details, diagnosis, medication history and a pre-validated structured interview schedule (to collect data about the triggering factors of migraine) were captured in a preformatted data sheet and analysed using SPSS v22.0.

**Results:** Among the 100 patients (17 males, 83 females) included in this study, majority were in the age group 31-40 (28%). Majority had grade IV headache (94%, males-88.2%, females-95.25%). No statistically significant difference was present between gender and various precipitating factors. Sleep and analgesics were important relieving factors. Summer, excessive physical activity, less water intake, processed food intake and strong smell were precipitating factors among males. Salty food, shift work, caffeine intake, food additives, excessive exercise, lack of exercise, back injury and menstruation were precipitating factors among females.

**Conclusion:** Physical activity, strong smells, loud sound, stress were found to be important precipitating factors whereas sleep and analgesics were found to be important relieving factor, Migraine related to summer and excessive physical activity were more in the population studied as compared to other population.

**Introduction and Need for Study**

The commonest symptom of patients attending a neurologist's clinic is headache, of which migraine is a very common and important cause of primary headache. Migraine could be very disabling for the patient and a treatment challenge to the neurologist despite the vast advancements in the understanding of its pathophysiology and treatment. The diagnosis could range from being straightforward to complex despite definitive guidelines. Large epidemiologic studies worldwide, have found the prevalence of migraine to be about 18% in women and 6% in men.<sup>(1-3)</sup> Migraine is among the top 20 leading causes of disability as per The World Health Organization (WHO), and is estimated to lead to 2.0% years of life lost due to a disability among women of all ages. Migraine is responsible for 1.4% of total years of life lost due to a disability among both males and females.<sup>(4)</sup>

The pathophysiology of migraine has been an evolving concept. Theories of migraine have evolved from a vascular one<sup>(5)</sup> to being considered a neurovascular disorder thought to arise from the brain and the brainstem leading to activation and sensitization of the trigemino-vascular system (TGVS).<sup>(6)</sup> Activation of TGVS leads to release of neuropeptides such as calcitonin gene related peptide (CGRP) and substance P from peripheral nerve endings leading to pain.<sup>(6)</sup>

Apart from central factors leading to activation of the TGVS, peripheral stimuli could also lead to activation of these central mechanisms. Previous studies have shown that extraneous stimuli involving the nose/sinus system (weather, smoke and smell) were commonly linked to a migrainous attack.<sup>(7)</sup> Other frequently linked triggers were stress/tension, not eating on time, lack of sleep, and fatigue, the exact mechanism leading to triggering an attack being unknown.<sup>(7)</sup> This study was undertaken to study the precipitants of migraine in South Indian population so that emphasis could be laid on identification of preventable triggers during therapy of migraine.

**AIMS AND OBJECTIVES**

1. To identify the triggering factors of migraine among migraine patients.

2. To delineate gender differences between the various triggering factors if any.

**MATERIALS AND METHODS**

**Study Design and Study population**

This was a prospective observational study done in neurology department, Tirunelveli medical college for the period of three months from April to June 2019.

**Inclusion Criteria**

1. Patients diagnosed as a case of Migraine at Neurology department of Tirunelveli Medical College and who were on regular follow-up.

**Exclusion Criteria**

1. Patients below the age of 18 years.
2. Patients diagnosed as Migraine elsewhere and on treatment for the same who did not meet the criteria for Migraine as defined by the International Headache Society.
3. Patients with superimposed headache due to other causes.

**Data Collection**

Patients satisfying the inclusion and exclusion criteria were included in the study after a written informed consent. A validated structured interview schedule was used to identify the triggering factors of migraine. The questionnaire was administered in the local language and data was collected by means of a structured interview from both literate and illiterate patients. Patients demographic details, diagnosis, medication details were also collected in a pre-formatted data sheet. Collected data was then entered into Microsoft Excel and was analysed using SPSS v22.0.

**RESULTS**

A total of 100 patients from 18 to 80 years of age were included in this study of which 17 were male and 83 were female. Most of the patients belonged to the 31-40 age group (n=28, Male-7, Female-21) The age and gender distribution is as shown in Table-1.

**Table-1 Age and Gender distribution**

AGE GROUP	MALE (n=17)	FEMALE (n=83)
	FREQUENCY(%)	
18-20 YEARS	2	6
21-30 YEARS	1	9
31- 40 YEARS	7	21
41-50 YEARS	1	18
51-60 YEARS	4	19
61-70 YEARS	2	7
71-80 YEARS	0	3

Severity of migraine was graded as per the Chronic migraine

**Table – 2 Comparison of precipitating factors of migraine with gender**

VARIABLES	MALE(17)	FEMALE (83)	TOTAL	ODDS RATIO	CONFIDENCE INTERVAL	P VALUE
	FREQUENCY (%)		FREQUENCY (%)			
Bright light/ light glare	7(41.2%)	47(56.6%)	54	0.54	0.19 to 1.55	0.24
Caffeine intake or withdrawal	0	8(9.76%)	8			
Excessive excitement	1(5.88%)	10(12.2%)	11	0.45	0.45 to 3.8	0.45
Excessive exercise	0	3(3.6%)	3			
Excessive physical activity	1(5.88%)	7(8.43%)	8	0.68	0.07 to 5.9	0.72
Excessive sleep	3(17.6%)	10(12.05%)	13	1.6	0.4 to 6.4	0.54
Exposure to excessive sunlight	6(35.3%)	60(72.3%)	66	0.2	0.06 to 0.6	<b>0.003</b>
Head injury	4(23.5%)	23(27.7%)	27	0.8	0.23 to 2.7	0.72
Journey	2(11.8%)	38(45.8%)	40	0.16	0.03 to 0.73	<b>0.009</b>
Lack of exercise	0	1(1.2%)	1			
Lack of sleep	8(47.06%)	44(53.01%)	52	0.79	0.28 to 2.24	0.65
Less water intake	3(17.65%)	7(8.43%)	10	2.3	0.5 to 10.09	0.25
Loud sounds	8(47.06%)	53(63.86%)	61	0.5	0.18 to 1.4	0.2
Processed foods	2(11.8%)	2(2.4%)	4	5.4	0.7 to 41.3	0.07
Salty food	0	2(2.4%)	2			
Shift of work	0	1(1.2%)	1			
Skipping meal	1(5.88%)	7(8.43%)	8	0.7	0.07 to 5.8	0.7
Stress	7(41.2%)	39(46.99%)	46	0.8	0.3 to 2.8	0.7
Strong smells	9(52.9%)	41(49.4%)	50	1.15	0.4 to 3.2	0.79
Usage of food additives	0	1(1.2%)	1			
Weather change	0	0	0			
Alcohol intake	1(5.88%)	0	1			
Smoking	2(11.8%)	0	2			
Menstruation	0	2(2.4%)	2			
Usage of hormone replacement tablets	0	2(2.4%)	2			
Usage of oral contraceptive pills	0	0	0			

Males with history of processed foods consumption (OR – 5.4) and less water intake (OR- 2.3) had a higher risk of precipitating a migraine attack as compared to their female counterparts though this difference was not statistically significant. Salty food, shift work, caffeine intake, usage of food additives, excessive exercise, lack of exercise and back injury were reported as precipitants only among females. Smoking and alcohol were reported as precipitating factors only among males. Sleep and analgesics were found to be important relieving factors of migraine in this study.

**DISCUSSION**

Migraine is a chronic debilitating condition with a high prevalence between 25 to 55 years of age.<sup>(6)</sup> The prevalence is found to be higher among boys before puberty than girls. Migraine can affect all age groups but more than 50% have onset before the age of 20 years. The incidence and prevalence increase from puberty till adolescence and shows a steady decline after the age of 40 years.<sup>(9,10)</sup> Forty-four percent of the patients included in his study belonged to the age group of 18 to 40 years, but most of the subjects were females possible suggesting a change in the trend of incidence in the population studied due to various genetic, ethnic, cultural, social differences.

Precipitants of migraine could be identified in 81% of the

severity scale. Majority (94%) of the patients reported Grade IV (very severe) headache, whereas only 4% and 2% of the patients reported Grade I and Grade III headache respectively. There was no significant statistical difference between gender and severity of headache.

Various triggering factors of migraine are as shown in Table-2. Strong smells, lack of sleep, stress, exposure to bright light and loud sound were precipitating factors with a high frequency in males. Similar precipitating factors were present in females with exposure to excessive sunlight (p=0.003, Odds ratio (OR) -0.2) and travel (p=0.009, OR=0.16) being observed as a significant precipitant of migraine attacks among females as compared to males.

population studied. Strong smells, loud sounds, lack of sleep and stress were among the most common triggering factors in males in this study. Among females, travel and exposure to excessive sunlight were seen in a significantly more number of patients along with other triggers as in males. Stress, hormones, menstruation, change in weather, strong smells, changes in light were among the most common precipitants seen in previous studies done in different population groups.<sup>(11,12)</sup> Kelman I in a questionnaire based study done on 1750 migraine patients in Atlanta, USA also found alcohol (37.8%) and smoking (35.7%) to be a significant precipitating factor.<sup>(11)</sup> Among females, menstruation (37.2%) was found to be an important precipitating factor in a study done by Siberstein SD which was not found in this study. These differences in precipitating factors in various population groups highlights the possible interplay of genetics with extraneous factors in triggering a migraine attack.

In previous studies, female patients with migraine had weather, perfume/odour and heat as triggers than male patients with migraine.<sup>(11, 12)</sup> The present study did not show gender differences in these triggers. Exposure to sunlight and travel were triggers which were significantly more in females as compared to males in this study unlike previous studies. Also males with processed foods consumption and

less water intake had a higher odds of developing an acute migraine attack as compared to females. This shows that precipitants of migraine attacks can vary across populations and no single external precipitating factor can be labelled as 'most likely' to precipitate an attack.

Triggers may at times be difficult to distinguish from premonitory symptoms for e.g exposure to light may also be a part of the migraine attack i.e. photophobia. Also multiple triggers may play a role simultaneously leading to an acute migraine attack leading to difficulties in exact delineation of a particular trigger. Medication use can alter the triggering factors leading to suppression of old triggers and at times causing the development of new triggers. These factors could lead to gross differences in reporting of a trigger by migraine patients possibly leading to the differences observed in this study as compared to previous studies.

### CONCLUSION

Precipitants of migraine can vary across various populations. Stress, strong smells, changes in light, loud sound are common triggers that are seen across various population groups. Migraine attacks in a single patient could be triggered by multiple factors. Sleep and analgesics were found to be important relieving factors, whereas physical activity, strong smells, loud sound were found to be important precipitating factors. Migraine related to summer and excessive physical activity were more in the population studied as compared to other population.

### CONFLICTS OF INTEREST

- Authors have not received any grants from funding agencies.

### DISCLOSURE

- Nil

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