Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i2.4487

THE STUDY OF THE PATTERN OF MIGRAINE AND ITS TRIGGERS AMONG WOMEN: A CROSS-SECTIONAL STUDY FROM NORTHERN INDIA

Dr.Pradeep Kumar Yadav[1*], Dr.Priyanka Yadav[2], Dr.Abbas Mehdi[3]

[1*]Associate Professor, Department of Psychiatry Rajarshi Dasrath Autonomous State Medical College, Ayodhya, UP, India Email: pkyalygdp@gmail.com
[2]Consultant Gynecologist, Community Health Centre, Rudauli, Ayodhya, UP, India Email: drpriyanka.yadav247@gmail.com
[3]Professor, Department of Psychiatry, Career Institute of Medical Sciences, Lucknow, UP, India Email: abbas_georgian@yahoo.co.in

***Corresponding author:** Dr.Pradeep Kumar Yadav
*Email: pkyalygdp@gmail.com

Abstract

Introduction: The peak prevalence of migraine occurs during the childbearing years; however migraine symptomatology often worsens in midlife due to the hormonal fluctuations of the menopause transition, often with an increase in the number of headache days per month. This study aims to assess the pattern, sociodemographic factors, and triggers of migraine in women in Northern India.

Material & Methods: This cross-sectional study was conducted in the Department of Psychiatry, Rajarshi Dasrath Autonomous State Medical College and Community Health Centre, Ayodhya. Females aged 20 to 40 years who fulfill the diagnostic criteria of migraine under the ICHD-3 Classification were included. A questionnaire was used to collect the data based on the Hamilton anxiety rating scale, Beck depression inventory, Pretreatment Migraine headache questionnaire, and Migraine screen questionnaire. Data was analyzed using Statistical Package for Social Sciences, version 16 (SPSS, Inc., 89 Chicago, IL, USA).

Results: The mean age of migraine aura patients was 29.97 years and patients without aura were 27.10 years. Patients experiencing migraine aura reported a significantly higher frequency of headaches (13.00 episodes) compared to those without aura (7.15 episodes) (p=0.002). A significantly higher proportion of patients with migraine aura exhibit moderate to severe levels of depression (87.5%) compared to those without aura (12.5%), (p-value=0.007). Similarly, a higher prevalence of moderate to severe anxiety is observed among aura sufferers (85.7%) compared to non-aura individuals (14.3%), (p-value=0.021). A higher proportion of patients with aura report severe headaches (71.4%) compared to those without aura (28.6%), (p-value=0.013). Noise emerged as the most common trigger, with 37 patients mentioning it as a factor precipitating migraine attacks.

Conclusion: The findings of our study emphasize the need for early detection through screening of migraine in the study population and necessary lifestyle measures to minimize its burden.

Keywords: Prevalence, triggers, co-morbidity, migraine, women, northern India

Introduction

Migraine is a complex central nervous system disorder that is primarily characterized by headaches of long duration, with moderate to severe pain and associated symptoms such as light and sound sensitivity (photo- and phonophobia), nausea, and vomiting [1]. More than "just a headache" it is a disorder of central nervous system dysregulation that is three times more prevalent among women than men, with accumulative lifetime prevalence among women of 43% [2, 3]. It has long been recognized that migraine in women fluctuates with both monthly and life-stage dependent natural hormonal changes [4–6]. Though the peak prevalence of migraine occurs during the childbearing years, migraine symptomatology often worsens in midlife due to the hormonal fluctuations of the menopause transition, often with an increase in the number of headache days per month [7, 8]. According to the Global Burden of Disease study, migraine is the 2nd most globally disabling condition after low back pain [9]. The two primary types of migraine are migraine without aura which accounts for the majority of cases (approximately 80%) and migraine with aura which accounts for about 20% [1, 10]. Of the two, migraine without aura is the type primarily associated with hormonal fluctuations, and thus is the primary focus of this article [11, 12]. Among women, migraine can be further subdivided with respect to its relationship to menstruation [1, 13]. Peri-menstrual migraine attacks are headache attacks that occur within the 5-day window spanning the 2 days prior to the onset of menstruation to the third day of menstruation (referred to as − 2 to + 3 in the migraine literature). Women who experience only peri-menstrual migraine attacks are categorized as having Pure Menstrual Migraine (PMM). This is a relatively rare condition that affects 7–12% of women with migraine who are of reproductive age [14]. In contrast to PMM, the majority of women with migraine experience migraine attacks both peri-menstrually and at other times of the month. This condition is defined as Menstrually Related Migraine (MRM) and is estimated to affect 50–70% of reproductive-age women [13, 14]. Clinically, distinguishing PMM from MRM requires that the peri-menstrual headache attacks occurred during at least 2 out of the last 3 periods [1]. Finally, women who do not experience attacks in relation to menstruation are classified as non-menstrual Migraine. The studies on this issue are scarce and the study findings would fill the gap in the literature. This study aims to assess the pattern of migraine, its triggers, and associated sociodemographic factors of migraine in women in Northern India.

Material and Methods

Study Participants

This cross-sectional study was conducted in the Department of Psychiatry, Rajarshi Dasrath Autonomous State Medical College, Ayodhya, and Community Health Centre, Rudauli, Ayodhya. Participants are enrolled in the study from April 2023 to June 2023. The inclusion criteria for this study were females of age 20 years to 40 years who fulfill the diagnostic criteria of migraine under the ICHD-3 Classification, exclusion criteria free from any major medical illness, No history of significant head trauma with residual deficits, recent CNS infections, recent traumatic events in the family, recent major dental procedure, organic mental disorders, psychotic disorders, intellectual disabilities, alcohol and substance abuse, symptoms of personality disorders, vision and hearing loss, other headache types (e.g., tension-type headache, secondary headache), with neurological and physical conditions, and the patients with missing data were excluded.

Scales and Instruments used in this study are as follows:

1-Sociodemographic information form: This form was developed by the researchers and included questions about the patient's age, gender, socioeconomic status, parental education level, family structure, and marital status.

2-Hamilton anxiety rating scale [HAM-A] [15]: The HAM-A was one of the first rating scales developed to measure the severity of anxiety symptoms, and is still widely used today in both clinical and research settings. The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Although the HAM-A remains widely used as an outcome measure in clinical trials, it has been criticized for its sometimes poor ability to discriminate between anxiolytic and antidepressant effects and somatic anxiety versus somatic side effects. The HAM-A does not provide any standardized probe questions. Despite this, the reported levels of interrater reliability for the scale appear to be acceptable. Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where less than 17 indicates mild,18-24 moderate and 25-30 indicates severe anxiety. [15]

3-Becks depression inventory

The Beck Depression Inventory (BDI) is a 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression (16). The BDI has been developed in different forms, including several computerized forms, a card form, the 13-item short form and the more recent BDI-II by Beck, Steer & Brown, 1996. (17,18) The BDI takes approximately 10 minutes to complete, although clients require a fifth – sixth-grade reading level to adequately understand the questions (18). Internal consistency for the BDI ranges from .73 to .92 with a mean of .86. (17). Similar reliabilities have been found for the 13-item short form (18). The BDI demonstrates high internal consistency, with alpha coefficients of .86 and .81 for psychiatric and non-psychiatric populations respectively (19,20).

4-Pretreatment Migraine headache questionnaire

5-Migraine screen questionnaire (MS-Q) is a brief measure of migraine screening with favorable diagnostic validity, test-retest reliability, and internal consistency as determined by Cronbach's alpha [21]. The MS-Q is based on the International Headache Society (IHS) criteria for the diagnosis of migraine and can be easily administered. The clinical usefulness of the MS-Q and its ability to detect a hidden migraine was also confirmed in a recent study [22]. The migraine screen questionnaire (MS-Q) is a five-item migraine screening questionnaire developed for use in clinical practice and research settings both in the general population and occupational medicine [23]. The questionnaire is based on the International Headache Society criteria (IHS) on migraine diagnosis [24]. Each of the five items in this structured questionnaire has a dichotomous response option of yes/no. A score of 0 is assigned for each “NO” response and of 1 for each “YES” response. The total score is 5, where a cut-off point of ≥4 was used to indicate a case of migraine [23].

Statistical analysis:

The collected data were coded and entered into the Excel software (Microsoft Office Excel 2010) database. Data was analyzed using Statistical Package for Social Sciences, version 16 (SPSS, Inc., 89 Chicago, IL, USA). The qualitative results are presented in descriptive statistics such as pie and bar diagrams and compared using Chi-square and independent tests for characteristics of participants like sociodemographic, plausible causes, and intensity of headaches with patients having Migraine aura. $P < 0.05$ were considered statistically significant

Results

Table 1: Socio-demographic characteristics associated with patients having Migraine aura.

Characteristics		**AURA**		Total	P value
		Absent (n=20)	**Present (n=29)**		
AGE	(Mean ± SD)	27.10± 7.25	29.97± 9.01	28.80±8.38	0.242
FREQUENCY OF HEADACHE	(Mean ± SD)	7.15 ±5.62	13.00 ±6.23	10.61±6.60	0.002
DURATION OF HEADACHE	(Mean ± SD)	13.65± 10.38	28.34 ±17.55	22.35±16.58	0.001
SEX	FEMALE	15(36.6%)	26(63.4%)	41(100.0%)	0.173
	MALE	5(62.5%)	3(37.5%)	8(100.0%)	
	SINGLE	8(42.1%)	11(57.9%)	19(100.0%)	0.884

MARITAL STATUS	MARRIED	12(40.0%)	18(60.0%)	30(100.0%)	
RELIGION	HINDU	19(43.2%)	25(56.8%)	44(100.0%)	0.318
	MUSLIM	1(20.0%)	4(80.0%)	5(100.0%)	
EDUCATION	HIGHSCHOOL	3(30.0%)	7(70.0%)	10(100.0%)	0.795
	ILLITERATE	2(33.3%)	4(66.7%)	6(100.0%)	
	INTERMIDIATE	4(44.4%)	5(55.6%)	9(100.0%)	
	PG	4(36.4%)	7(63.6%)	11(100.0%)	
	UG	7(53.8%)	6(46.2%)	13(100.0%)	
RESIDENCE	RURAL	13(37.1%)	22(62.9%)	35(100.0%)	0.408
	URBAN	7(50.0%)	7(50.0%)	14(100.0%)	
FAMILY HX	NO	13(36.1%)	23(63.9%)	36(100.0%)	0.265
	YES	7(53.8%)	6(46.2%)	13(100.0%)	
TYPES OF FAMILY	COMBINED	10(33.3%)	20(66.7%)	30(100.0%)	0.181
	NUCLEAR	10(52.6%)	9(47.4%)	19(100.0%)	
OCCUPATION	AGRICULTURE	1(100.0%)	0(0.0%)	1(100.0%)	0.545
	BUISINESS	0(0.0%)	1(100.0%)	1(100.0%)	
	HOMEMAKER	8(42.1%)	11(57.9%)	19(100.0%)	
	LAB TECH	0(0.0%)	1(100.0%)	1(100.0%)	
	PVT JOB	0(0.0%)	1(100.0%)	1(100.0%)	
	STUDENT	9(50.0%)	9(50.0%)	18(100.0%)	
	TEACHER	2(25.0%)	6(75.0%)	8(100.0%)	
INCOME	LOWER MIDDLE	6(31.6%)	13(68.4%)	19(100.0%)	0.003
	LOWER	1(50.0%)	1(50.0%)	2(100.0%)	
	MIDDLE	12(75.0%)	4(25.0%)	16(100.0%)	
	UPPER MIDDLE	1(8.3%)	11(91.7%)	12(100.0%)	

Table 1 shows a comparative analysis of socio-demographic characteristics among patients with and without migraine aura, revealing significant differences in certain parameters. While the mean age of patients with migraine aura (29.97 years) slightly exceeds that of patients without aura (27.10 years), the difference is not statistically significant ($p = 0.242$). However, patients experiencing migraine aura report a significantly higher frequency of headaches (13.00 episodes) compared to those without aura (7.15 episodes), with a p-value of 0.002. Additionally, the duration of headache episodes is markedly longer among aura sufferers (28.34 hours) compared to non-aura individuals (13.65 hours), demonstrating statistical significance with a p-value of 0.001. Notably, gender distribution, marital status, religion, education level, residence type, family history of migraine, family types, and occupation show no significant association with the presence of migraine aura. However, a prominent finding is the significantly higher representation of patients from the lower-middle income group among those experiencing migraine aura (68.4%) compared to those without aura (31.6%), with a p-value of 0.003.

Table 2: Plausible causes and intensity of headaches associated with patients having Migraine aura.

Causes		AURA		Total	P value
		Absent (n=20)	Present (n=29)		
DEPRESSION	MILD	9(56.2%)	7(43.8%)	16(100.0%)	0.007
	MODERATE	2(12.5%)	14(87.5%)	16(100.0%)	
	NO	9(64.3%)	5(35.7%)	14(100.0%)	
	SEVERE	0(0.0%)	3(100.0%)	3(100.0%)	
ANXIETY	MILD	11(52.4%)	10(47.6%)	21(100.0%)	0.021
	MODERATE	2(14.3%)	12(85.7%)	14(100.0%)	
	NO	7(63.6%)	4(36.4%)	11(100.0%)	
	SEVERE	0(0.0%)	3(100.0%)	3(100.0%)	
DISABILITY	MILD	7(77.8%)	2(22.2%)	9(100.0%)	0.003
	MODERATE	11(47.8%)	12(52.2%)	23(100.0%)	
	SEVERE	2(11.8%)	15(88.2%)	17(100.0%)	
INTENSITY OF HEADACHE	MILD	2(50.0%)	2(50.0%)	4(100.0%)	0.013
	MODERATE	8(80.0%)	2(20.0%)	10(100.0%)	
	SEVERE	10 (28.6%)	25(71.4%)	35(100.0%)	

Table 2 presents an analysis of plausible causes and the intensity of headaches among patients with and without migraine aura, revealing notable associations. Significantly higher proportions of patients with migraine aura exhibit moderate to severe levels of depression (87.5%) compared to those without aura (12.5%), with a p-value of 0.007. Similarly, a higher prevalence of moderate to severe anxiety is observed among aura sufferers (85.7%) compared to non-aura individuals (14.3%), demonstrating statistical significance with a p-value of 0.021. Additionally, disability due to headaches is more pronounced among patients with aura, particularly those experiencing severe disability (88.2%), compared to non-aura patients (11.8%), with a p-value of 0.003. Regarding headache intensity, a higher proportion of patients with aura report severe headaches (71.4%) compared to those without aura (28.6%), with a significant p-value of 0.013.

Figure 1 illustrates the frequency distribution of patients with and without migraine auras concerning various relieving factors. Among the patients without aura, eating sweets was reported as a relieving factor by one individual, while none of the patients with aura cited this factor. The use of medicine emerged as a prevalent relieving factor, with 20 out of 29 patients with aura (69%) and 14 out of 20 patients without aura (70%) indicating its effectiveness. Rest was mentioned by one patient with aura and four patients without aura as a relieving factor. Additionally, a combination of rest and medicine was reported by two patients with aura, while none of the patients without aura mentioned this combination. Notably, sleep was identified as a significant relieving factor, with six out of seven patients with aura (86%) and one out of one patient without aura reporting its efficacy.

Figure 1: Frequency distribution of patients having migraine auras related to relieving factors.

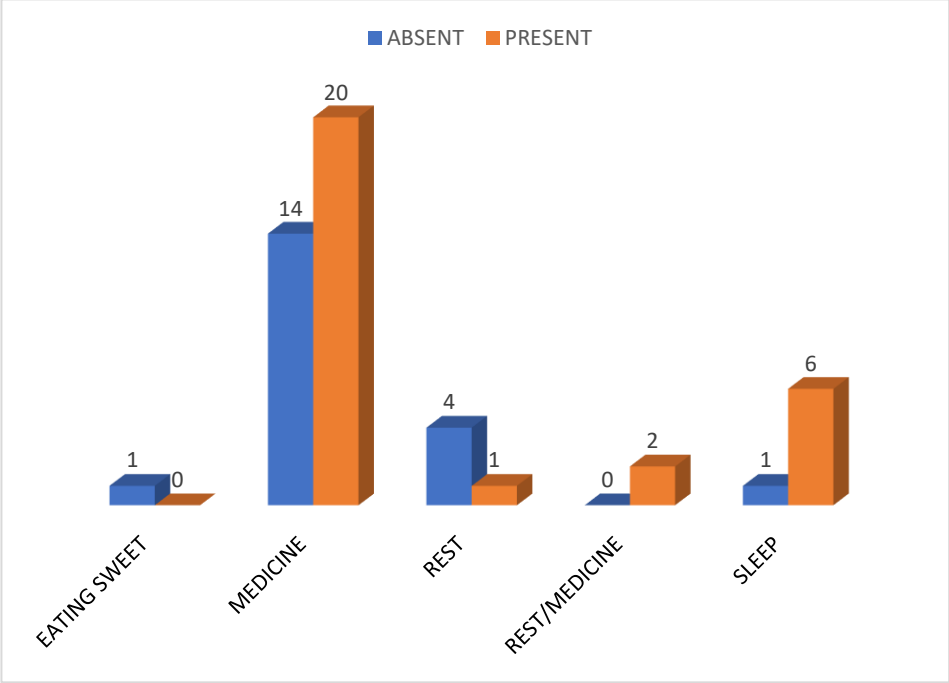


Figure 2 depicts the linear regression analysis between the frequency and duration of headaches among the study participants. The scatter plot indicates a positive correlation (r=0.59) between the frequency of headaches, measured in days per month, and the duration of headaches, expressed in hours per episode. As the frequency of headaches increases, there is a corresponding trend of longer durations for each headache episode. This is evidenced by the regression line, which shows a positive slope, indicating that as the frequency of headaches rises, the duration of each headache episode tends to increase as well. R square value of 0.3571 indicates that approximately 35.71% of the variability in the duration of headache episodes can be explained by the frequency of headaches.

Figure 2: Linear regression between frequency of headache and duration of headache

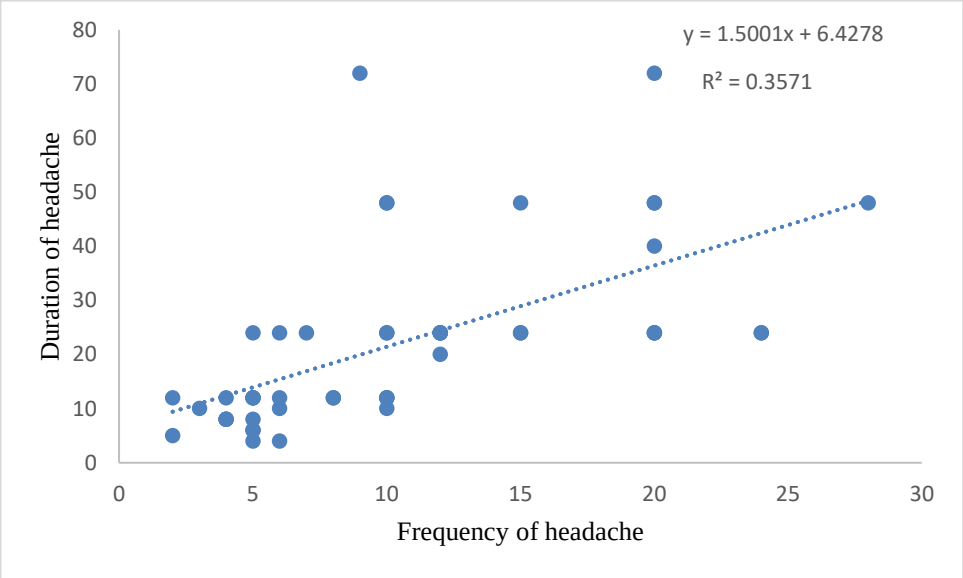


Figure 3 displays the frequency distribution of plausible causes associated with patients experiencing migraine auras, categorized by the severity levels of depression, anxiety, and disability. The data shows that the most prevalent level of depression is categorized as mild, with 16 individuals falling into this group. For anxiety, the distribution is relatively similar, with the mild category again being the most common, comprising 21 patients. Conversely, disability severity shows a different trend, with moderate disability being the most prevalent, encompassing 23 patients. The distribution also highlights that severe levels of depression, anxiety, and disability are observed in 3, 3, and 17 patients, respectively.

Figure 3: Frequency distribution of plausible causes associated with patients having Migraine auras.

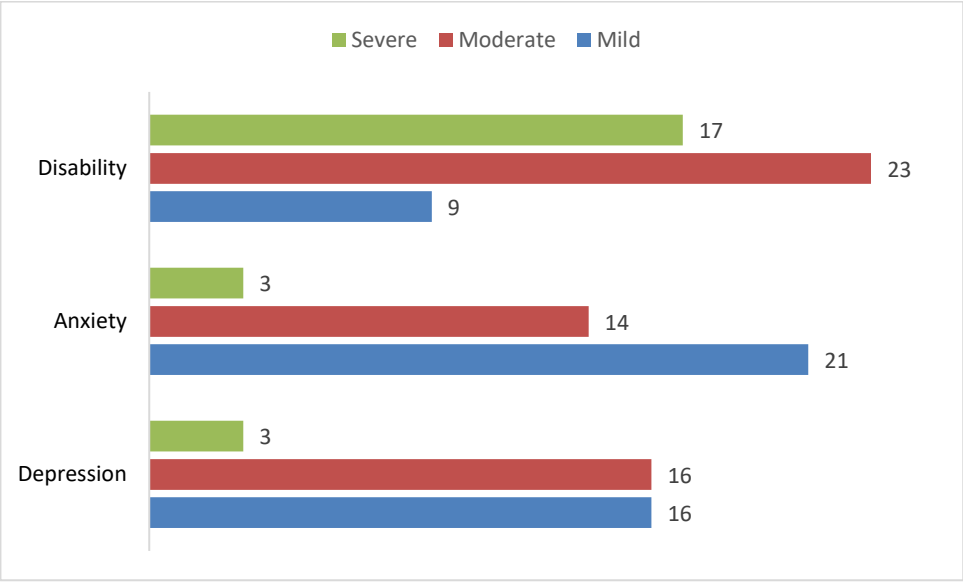
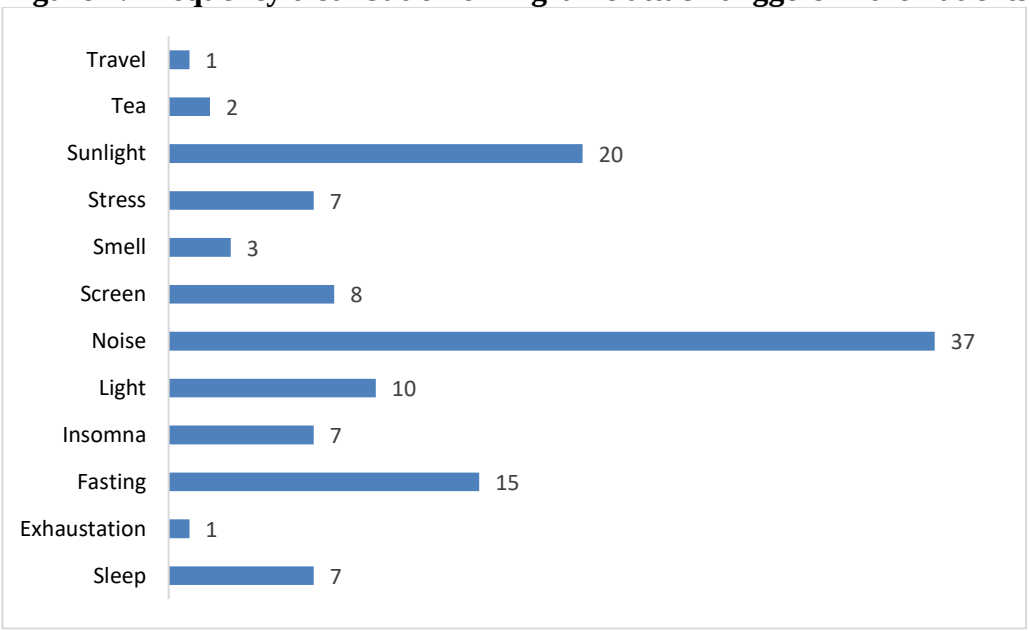


Figure 4 illustrates the frequency distribution of migraine attack triggers among the patients. Noise emerges as the most common trigger, with 37 patients mentioning it as a factor precipitating migraine attacks. Sunlight and fasting follow closely behind, with 20 and 15 patients respectively reporting them as triggers. Light, another environmental factor, is noted by 10 patients. Additionally, sleep and insomnia are identified triggers, with 7 patients experiencing migraines due to each. Other triggers such as screen exposure, stress, and smell are reported by 8, 7, and 3 patients

respectively. Interestingly, exhaustion, tea consumption, and travel are less commonly reported triggers, mentioned by only 1 or 2 patients each.

Figure 4: Frequency distribution of migraine attack triggers in the Patients



Discussion

Migraine and tension-type headaches (TTH) are the two most prevalent neurological disorders associated with primary headaches (25). In our study, patients experiencing migraine aura report a significantly higher frequency of headaches (13.00 episodes) compared to those without aura (7.15 episodes), the difference being statistically different. Additionally, the duration of headache episodes is markedly longer among aura sufferers (28.34 hours) compared to non-aura individuals (13.65 hours), demonstrating statistical significance with a p-value of 0.001. Migraine auras are the sensory symptoms (neurologic, gastrointestinal, and autonomic) that can occur before or during a migraine episode. These symptoms can include flashes of light, blind spots, or tingling in the hands or face. Migraine without aura accounts for 70% of patients with migraine headaches (26).

In a recent study, as regards the type of headache, migraine was found to be the more prevalent (33.25%) type than tension-type headache (TTH) (20.58%). Females suffering from migraine showed the highest prevalence (25.28%), in contrast to females suffering from the TTH (25). The prevalence of migraine has gone up in recent years. The increase in the prevalence of migraine could be due to reasons like increased stress [27], or unhealthy lifestyle habits such as low physical activity and obesity[28].

Significantly higher proportions of patients with migraine aura exhibit moderate to severe levels of depression (87.5%) compared to those without aura (12.5%), with a p-value of 0.007. Similarly, a higher prevalence of moderate to severe anxiety is observed among aura sufferers (85.7%) compared to non-aura individuals (14.3%), demonstrating statistical significance with a p-value of 0.021. Additionally, disability due to headaches is more pronounced among patients with aura, particularly those experiencing severe disability (88.2%), compared to non-aura patients (11.8%), with a p-value of 0.003. Regarding headache intensity, a higher proportion of patients with aura report severe headaches (71.4%) compared to those without aura (28.6%), with a significant p-value of 0.013.

Noise emerges as the most common trigger, with 37 patients mentioning it as a factor precipitating migraine attacks. Sunlight and fasting follow closely behind, with 20 and 15 patients respectively reporting them as triggers. Light, another environmental factor, is noted by 10 patients. Additionally, sleep and insomnia are identified triggers, with 7 patients experiencing migraines due to each. Other triggers such as screen exposure, stress, and smell are reported by 8, 7, and 3 patients

respectively. Interestingly, exhaustion, tea consumption, and travel are less commonly reported triggers, mentioned by only 1 or 2 patients each. Stress was the most common trigger impacting 44.9% of the patient population, followed by noise in 44.3% of cases in a study from Northern India [29]. According to the individuals' experience from an Irani study, certain food types such as onion (42.6%), Sour food (39.3%), pepper (31.9%), and cheese (15.9%) intensified migraine headaches [30].

Conclusion: The findings of our study emphasize the need for early detection through screening of migraine in the study population and necessary lifestyle measures to minimize its burden.

References

1. The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia [Internet]. 2013;33(9):629–808.
2. Charles A. The pathophysiology of migraine: implications for clinical management. Lancet Neurol. 2018;17(2):174–82.
3. Stewart WF, Wood C, Reed ML, Roy J, Lipton RB. Cumulative lifetime migraine incidence in women and men. Cephalalgia. 2008;28(11):1170–8.
4. Somerville BW. The influence of progesterone and estradiol upon migraine.Headache. 1972;12(3):93–102.
5. Somerville BW. A study of migraine in pregnancy. Neurology. 1972;22(8):824–8.
6. MacGregor EA, Frith A, Ellis J, Aspinall L, Hackshaw A. Incidence of migraine relative to menstrual cycle phases of rising and falling estrogen. Neurology. 2006;67(12):2154–8.
7. Martin VT, Pavlovic J, Fanning KM, Buse DC, Reed ML, Lipton RB. Perimenopause and Menopause Are Associated with High Frequency Headache in Women with Migraine: Results of the American Migraine Prevalence and Prevention Study. Headache. 2016;56(2):292–305.
8. Ripa P, Ornello R, Degan D, Tiseo C, Stewart J, Pistoia F, et al. Migraine in menopausal women: a systematic review. Int J Womens Health. 2015;7:773–82.
9. Stovner LJ, Nichols E, Steiner TJ, Abd-Allah F, Abdelalim A, Al-Raddadi RM, et al. Global, regional, and national burden of migraine and tension-type headache, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Neurol. 2018;17(11):954–76.
10. Russell MB, Rasmussen BK, Thorvaldsen P, Olesen J. Prevalence and sex-ratio of the subtypes of migraine. Int J Epidemiol. 1995;24(3):612–8.
11. MacGregor EA. Classification of perimenstrual headache: clinical relevance. Curr Pain Headache Rep. 2012;16(5):452–60.
12. Loder EW. Menstrual migraine: pathophysiology, diagnosis, and impact. Headache. 2006;46(Suppl 2):S55–60
13. Vetvik KG, Macgregor EA, Lundqvist C, Russell MB. Prevalence of menstrual migraine: a population-based study. Cephalalgia. 2014;34(4):280–8.
14. Macgregor EA. Menstrual migraine: therapeutic approaches. Ther Adv Neurol Disord. 2009;2(5):327–36
15. Hamilton M.The assessment of anxiety states by rating. Br J Med Psychol 1959; 32:50–55.
16. Beck, A.T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961) An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.
17. Beck, A. T., Steer, R.A., & Garbin, M.G. (1988) Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clinical Psychology Review, 8(1), 77-100.
18. Groth-Marnat G. (1990). The handbook of psychological assessment (2nd ed.). New York: John Wiley & Sons.
19. Hojat, M., Shapurian, R., Mehrya, A.H., (1986). Psychometric properties of a Persian version of the short form of the Beck Depression Inventory for Iranian college students, Psychological Reports, 59(1), 331-338.

20. Steer, R. A., Rissmiller, D. J.& Beck, A.T., (2000) Use of the Beck Depression Inventory with depressed geriatric patients. Behaviour Research and Therapy, 38(3), 311-318.
21. Lainez MJ, Dominguez M, Rejas J, Palacios G, Arriaza E, Garcia-Garcia M, et al. Development and validation of the migraine screen questionnaire (MS-Q). Headache. 2005;45(10):1328–38. https://doi.org/10.1111/j.1526-4610. 2005.00265.x.
22. Lainez MJ, Castillo J, Dominguez M, Palacios G, Diaz S, Rejas J. New uses of the migraine screen questionnaire (MS-Q): validation in the primary care setting and ability to detect hidden migraine. MS-Q in primary care. BMC Neurol. 2010;10:39. https://doi.org/10.1186/1471-2377-10-39.
23. Williams B, Onsman A, Brown T. Exploratory factor analysis: a five-step guide for novices. Austr J Paramed. 2010;8:3.
24. Olesen J, Lipton RB. Migraine classification and diagnosis. International headache society criteria. Neurology. 1994;44(6 Suppl 4):S6–10.
25. Gupta R, Bhatia MS. Comparison of clinical characteristics of migraine and tension type headache. Indian J Psychiatry. 2011 Apr;53(2):134-9. doi: 10.4103/0019-5545.82538. PMID: 21772645; PMCID: PMC3136015.
25. Sudershan A, Pushap AC, Younis M, Sudershan S, Bhagat S, Kumar H, Panjalyia RK and Kumar P (2023) Neuroepidemiology study of headache in the region of Jammu of north Indian population: A cross-sectional study. Front. Neurol. 13:1030940. doi: 10.3389/fneur.2022.1030940
26. Sauro KM, Becker WJ (2009) The stress and migraine interaction. Headache 49(9):1378–138
27. Shankar Kikkeri N, Nagalli S. Migraine With Aura. [Updated 2022 Dec 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK554611/
28. Robberstad L, Dyb G, Hagen K, Stovner L, Holmen T, Zwart J-A (2010) An unfavorable lifestyle and recurrent headaches among adolescents: the HUNT study. Neurology 75(8):712–717
29. Sulena, Singla M, Brar J, Kale R, Kale S. Clinical Profile of Migraine in a Rural Population Presenting to Tertiary Care Hospital in North India. Ann Indian Acad Neurol. 2020 Nov-Dec;23(6):781-786. doi: 10.4103/aian.AIAN_671_19. Epub 2020 Jun 29. PMID: 33688127; PMCID: PMC7900733.
30. Negar Gorjizadeh, Saeed Irian, Ansar Karimian , Payam Saadat. Trigger factors associated with migraine headache among Northern Iranian population. Ref: Ro J Neurol. 2021;20(2) DOI: 10.37897/RJN.2021.2.7 169-175