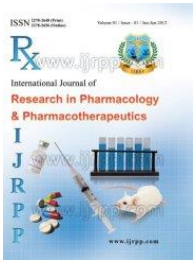
International Journal of Research in Pharmacology & Pharmacotherapeutics



ISSN Print: 2278-2648 IJRPP |Vol.6 | Issue 3 | July - Sep - 2017
ISSN Online: 2278-2656 Journal Home page: www.ijrpp.com

Research article Open Access

# Migraine: prevalence, body mass index, blood group and comorbidities; a prospective observational study

**Kirsha K S*, C I Sajeeth[1], Sona Mohandas[2], Sharafudheen PK[3], Prasanth Parameswaran[4], Bijiraj V[5], Mohammad Mazharudheen[5]**

*[*1]Department of Pharmacy Practice, Grace College of Pharmacy, Palakkad-678004, India.*
*[2]Palakkad District Co-Operative Hospital, Court Road, Palakkad, Kerala 678001.*
*[3,4,5]Ascent ENT Hospital, Harikkara Street, Court Road, Palakkad, Kerala 678001.*
*[6]Welcare Hospital, Welcare Junction, Palakkad, Kerala 678006.*

***Corresponding author: Kirsha K S**
**Email: chinoos.chinoos6@gmail.com**

## ABSTRACT

Migraine is the most common neurological condition in the world affecting about 1 in 10 people. It is 3 times more common in women. Several studies suggest an association of migraine with the body mass index, blood group and comorbidities. The aim of this study is to determine a possible relationship between the prevalence, symptoms, triggers and comorbidities of migraine as well as its association with obesity and blood group.

### Design

A prospective observational study

### Subject and Methods

A total of 204 patients with migraine were included whose age ranged between 18 to 65 years of both gender. The prevalence of migraine and its relation to body mass index and blood group were analyzed.

### Results

The study included 83.82% females and 16.18% males. 36.6% of the included patients have a normal body weight and the study concluded that majority (90%) have O positive blood group. Symptoms are experienced mostly during the attack stage and the major trigger was emotional stress affecting 53% of study population.

### Conclusion

Prevalence of migraine is high among females. Younger age and female sex are other contributory factors as prevalence of migraine. Emotional stress is mediating as the major trigger of migraine and excluding the normal eight subjects, pre-obese patients have higher risk for migraine. The co-morbidities didn't suggest any apparent relation with migraine, though hypothyroidism was observed in a few populations.

**Keywords:** Migraine; Prevalence; Body Mass Index; Symptoms; Triggers: Comorbidities

## INTRODUCTION

Migraine is a common and often debilitating neurologic condition characterized by primary recurrent headaches lasting 4 to 72 h with at least two of the following pain characteristics: unilateral, pulsating, moderate or severe intensity, or aggravated by routine physical activity. In addition, migraine attacks are often accompanied by nausea, vomiting, and sensitivity to light (photophobia) and sound (phonophobia) [1]. Migraine has been placed 19th in the world health organization (WHO)'s list of diseases ranked by years lived with disability [2,3].

Headache is one of the commonest symptoms, and primary headache disorders are among the most ubiquitous disorders, affecting people in all countries. India appears to be no exception. The Global Burden of Disease Study 2010 (GBD2010) found tension-type headache (TTH) and migraine to be the 2 and 3$^{rd}$ most prevalent disease worldwide [4].

Several studies have assessed the associations between migraine and underweight, pre-obesity or obesity, with conflicting results [5]. Obesity and headache are both associated with a substantial personal and societal impact, and epidemiologic studies have consistently identified a positive association between obesity and headache in general, as well as obesity and migraine specifically [6].

The ABO blood type, an easily accessible factor in patient's genetic make-up has been associated with many diseases, though the explanation for the association between ABO blood groups and some diseases is still unclear. Blood cellular genes and gene aberrations may be associated with the diseases. The frequency of occurrence of migraine was found to be highest in group O. The incidence for migraine was highest in group B in case of Rh+ve individuals and lowest in group AB. In case of Rh-ve individuals maximum incidence for the disease was found in group A and minimum were in group AB. The absence of both the antigens and presence of both A and B antibodies may be responsible for higher incidence of migraine. When any of the two antigens or antibodies is absent the chances for the occurrence of the disease may decrease. As both the antigens are present or both the antibodies become absent the chances for the disease may decrease. Thus, both the antibodies i.e. A and B antibodies may have a cumulative effect on the occurrence of migraine [7].

Migraine is known to be associated with psychiatric comorbidities, with reported prevalence of 20-40% for anxiety and 10-15% for depression [8]. Migraine has been reported to be associated with psychiatric comorbidities such as depression, anxiety, bipolar disorder, panic disorder, and suicide. A recent large, population-based, cross-sectional study reported a higher prevalence of headache, including migraine, in individuals with reflux symptoms, diarrhoea, constipation, or nausea than in individuals without such complaints [9]. Hypothyroidism may exacerbate primary headaches in some of the patients and it can be a risk factor for the occurrence of new daily persistent headache. Based on the second edition of the International Classification of Headache Disorders, it is considered as a headache related to homeostasis.

A number of intrinsic or extrinsic factors can trigger migraine attack. The important triggers are stress, weather changes, fatigue, food and beverages, sleeplessness, hunger, and menstruation. Social and cultural factors in different regions can vary thereby influencing the significance of triggering factors. The knowledge about migraine triggers is important for proper management of the patients [10].

## MATERIALS AND METHODS

The study was conducted at the in-patient and out-patient departments of District Co-operative Hospital, Ascent ENT Hospital and Welcare Hospital, Palakkad, Kerala. Ethical clearance was obtained from the institutional ethics committee. All participants provided written informed consent. The identity of the patients and their family was concealed.

A total of 204 patients of both genders are selected. Patients who were presented with migraine of age 18-65 and of both gender included for this study. And Patient who are not willing to give inform consent and not interested to participate in the study and Patient with malignancies are excluded. Consecutive patients from the outpatient and inpatient department, fulfilling the diagnostic criteria for migraine, were recruited for the study from December 2016 to May 2017.

Patients demographics, social history, educational level, past medical history and known allergies were collected from patients prescriptions, interviews with patient and/or their care takers in a pre-designed data entry form. All patients fulfilling the diagnostic criteria for migraine were enrolled and their characteristics noted. The migraine triggers were

inquired by evaluating endogenous (menstruation, emotional stress) and exogenous (fasting, physical strain, sleep deprivation, change in weather, specific foods and drinks) triggers during the interview.

### Statistics

Statistical Analysis was conducted using SPSS for windows.

## RESULTS

A total of 204 subjects with diagnosis of migraine were enrolled in the study. Our results are based patients with migraine whose mean age was 35.2 (range 18-65) years and 171 were females. The demographic features of the study population are given in Table 1.

**Table 1. Prevalence of migraine**

| Variable | Male | Female |
|---|---|---|
| **Gender (%)** | 33(16%) | 171(84%) |
| **Mean age (±SD, year)** | 36.27±10.935 | 33.46±11.287 |

### Body Mass Index distribution in study population

Body Mass Index wise distribution of the enrolled study population is included in Table 2. The study shows a greater prevalence of migraine in normal weight groups 75(36.6%) followed by pre-obese 66(32.55), obese 33(16.4%) and under-weight 30(14.6%).

**Table 2. BMI distribution among study population**

| | BMI_CLASS | |
|---|---|---|
| **Variable** | **Frequency** | **Prevalence** |
| Under weight | 30 | 14.6 |
| Normal weight | 75 | 36.6 |
| Pre-obese | 66 | 32.5 |
| Obese | 33 | 16.4 |
| Total | 204 | 100 |

### Blood group prevalence

Table 3 shows that in migraine patient's maximum incidence were found in blood group O and minimum in Rhesus negative patients. Among all the Rhesus positive patients, the trend for prevalence was O (43.9 %)>B (31.7 %)>A (17.6 %)>AB (4.9%).

**Table 3. Blood group prevalence in migraine**

| BLOOD GROUP | | |
|---|---|---|
| **Variable** | **Frequency** | **Prevalence** |
| A+ | 36 | 17.6 |
| B+ | 65 | 31.7 |
| AB+ | 10 | 4.9 |
| O+ | 90 | 43.9 |
| A- | 1 | 0.5 |
| B- | 1 | 0.56 |
| AB- | 1 | 0.56 |
| Total | 204 | 100 |

## Symptoms of migraine

The symptoms of migraine were grouped according to the stages of migraine symptoms. The Prodrome symptoms include neck stiffness 127(62.25%), increased thirst 72(35.29%), mood changes 31(15.19%), increased urination 25(12.25%) and constipation 26 (12.74%) as described in Table 4.

**Table 4. Prodrome symptoms of migraine**

| Prodrome symptoms | Frequency |
|---|---|
| Constipation | 26 |
| Mood changes | 31 |
| Neck stiffness | 127 |
| Increased thirst | 72 |
| Increased urination | 25 |

Needle sensation 139(68.14%), weakness 100 (49.01%) and visual auras 70(34.31%) were the aura symptoms [Table 5].

**Table 5. Symptoms just before attack**

| Aura symptoms | Frequency |
|---|---|
| Needle sensation | 139 |
| Weakness | 100 |
| Visual phenomenon | 70 |

In our study the majority of patients had photophobia [145(71.07%)] and phonophobia [148 (72.54%)] as their attack symptoms. Patients also experienced symptoms like nausea (50), vomiting (50), fainting (68) and blurred vision (23). The details of the symptoms experienced by the study population during headache attack are presented in the Table 6.

**Table 6. Symptoms during headache attack**

| Symptoms during attack | Frequency |
|---|---|
| Pain on one side | 92 |
| Alternating Pain | 135 |
| Photophobia | 145 |
| Phonophobia | 148 |
| Blurred vision | 23 |
| Nausea | 58 |
| Vomiting | 50 |
| Fainting | 68 |

The major Prodrome symptoms includes generalized weakness 129 (63.23%), moodiness 73(35.78%), sensitivity to light 23(11.27%) and sound 19(9.31%) as described in Table 7.

**Table 7. Symptoms after headache attack**

| Post drome symptoms | Frequency |
|---|---|
| Moodiness | 73 |
| Weakness | 129 |
| Sensitivity to light | 23 |
| Sensitivity to sound | 19 |

## Triggering factors of migraine in study population

A number of precipitating factors were observed in the patients (Table 8). Triggers were found in 198(97.01%) patients, which included emotional stress in 113 (55.39%), fasting in 68 (33.3%),

**Table 8. Major triggers of migraine**

| Triggers | Frequency | Prevalence |
|---|---|---|
| Travel | 109 | 53.43 |
| Smell | 64 | 31.37 |
| Fasting | 68 | 33.33 |
| Weather changes | 106 | 51.96 |
| Sleep deprivation | 64 | 31.37 |
| Stress | 113 | 55.39 |
| Hormonal changes | 57 | 27.94 |
| Crowd/sound | 16 | 7.84 |
| Food | 12 | 5.88 |
| System usage | 10 | 4.9 |

Physical exhaustion or traveling in 109(53.43%), menstruation in 57(27.94%), sleep deprivation in 64 (31.37%), food in 12(5.88%), smell in 64 (31.37%), excess noise in 16(7.84%), and change in weather in 106 (51.96%) patients. Majority of the patients had multiple triggers.

## Co-morbidities of migraine

Smaller groups of patient population are presented with co-morbidities [Table 9]. Majority of patients in our study are presented with gastrointestinal co-morbidities 70(34.30%), hypothyroidism 24(11.76%), diabetes 11(5.39%), hypertension 19 (9.31%), cholesterol 29(9.8%), urinary infections 16(7.84%), neurologic diseases like epilepsy, stroke, psychological co-morbidities like depression, anxiety and the other observed co-morbidities are anemia, otitis, rhinitis, arthritis etc.

**Table 9. Comorbidities of migraine**

| Co-morbidities | Frequency | Prevalence |
|---|---|---|
| Hypothyroidism | 24 | 11.76 |
| Hypertension | 19 | 9.31 |
| Diabetes | 11 | 5.39 |
| Cholesterol | 20 | 9.8 |
| Gastric problems | 70 | 34.31 |
| Neurological problems | 7 | 3.43 |
| Psychologic co-morbidities | 37 | 18.14 |
| Urinary problems | 16 | 7.84 |
| Other | 25 | 12.25 |

# DISCUSSION

Migraine is described by unilateral pulsating headache associated with nausea, vomiting, and photophobia. World Health Report 2001 by World Health Organization ranked headache among the top 20 causes of healthy life lost to disability. In India, given the population load, headache has been and continues to be underestimated in scope and scale,

and remains under-recognized and under-treated everywhere. TTH and migraine ranked respectively as second and third most common diseases in the world (behind dental caries) in both males and females. The Global Burden of Disease Study which was updated in 2004 found that migraine account for 1.3% of years lost due to disability (YLD) [11].

Migraine is a common disorder with overall prevalence of 5–15%. The prevalence of migraine in females is higher (6–22%) compared to males (3–7%) [12]. Younger age and female sex are contributory factors as prevalence of both allergic rhinitis and migraine is higher in these groups [13]. In a population-based study on obesity and migraine evaluating 30,215 participants whose mean age was 38.4 years including 65% females, revealed lack of association of BMI with the prevalence of migraine but was associated with the frequency of headache attacks. In the normal weight group, 4.4% had 10–15 headache days per month increasing to 5.8% in the overweight and 20.7% in the morbidly obese [14]. Increased waist circumference and body mass index (BMI) were more frequent in migraine patients compared to those without migraine.

A study conducted by Mayo Clinic showed that the common triggers for migraine are hormonal changes in women, foods like cheese, salty foods and processed foods, skipping meals or fasting, alcohol, especially wine, stress, changes in wake-sleep pattern, physical exertion, weather changes[15].

Rist et al. Al in their study confirmed the link of migraine with increased levels of cholesterol and extends these findings to triglycerides and demonstrates that this association is still apparent among the elderly and limited to patients with migraine with aura [16]. In our study, 29 out of the 204 patients have a higher cholesterol level as concluded in the study conducted by Rist et al. Grebe et al. retrospectively analyzed 64 files of headache outpatient clinic (Coimbra, Portugal), chosen randomly among patients suffering from migraine or tension headache. The authors found that the prevalence of hypertension was 35.9%. Among all patients (Migrainous and non-Migrainous headache), 28.5% among migraine patients and 44.8% among patients with tension headache [17]. Our study found an association of only 9.31% prevalence of hypertension among the Migraineurs. Only a very less prevalence of diabetes (5.39%) was observed in our study group which coincides with the study conducted by Cook NR et al. which illustrated lower prevalence of migraine in patients with diabetes [18]. The prevalence of probable anxiety and depression (score ≥ 11) in a migraine clinic study by Jarman et al. [19] was 20% and 8% as compared to our study with 18.14% prevalence of psychological co-morbidities, anxiety and depression contributing the most. The prevalence of headache in patients with hypothyroidism differs from 14 to 73 percent in different studies [20] as stated by Hagen K et al., our study shows a higher prevalence of hypothyroidism 24 (11.76%) as comorbidity compared to others.

## CONCLUSION

Our data suggest that migraine prevalence was observed higher in females compared to males. Many factor like emotional stress, travel and weather changes may trigger or worsen migraine and self-management of these triggers can probably reduce the prevalence or severity of migraine. The symptoms presented during each stage may vary on patients, though photophobia and phonophobia are mostly experienced during the attack stage of migraine in major study population. Apart from the normal body mass index group, pre-obese patients have more prevalent migraine. The study suggests a prevalence of O blood group among the study population. Though the study implicates acidity as the major comorbidity followed by anxiety and depression, a vast observational study can be recommended to seek out the association of gastrointestinal diseases with Migraine as detailed by several studies.

### Acknowledgement

The authors are gratefully thankful to all the subjects for their cooperation and patience. We sincerely thank the Management of Grace College of Pharmacy, Palakkad for providing facilities and Mr. Jobin KV, Assistant Professor, Grace College of Pharmacy for the help and continuous encouragement to publish this article. We are also grateful to the management of Ascent ENT Hospital, Palakkad District Co-Operative Hospital and Welcare Hospital, Palakkad for their co-operation and support for conducting this work. The authors are expressing their gratitude to all the Doctors and staffs of the hospitals for their help and support.

## REFERENCES


[1]. Headache classification committee of the international headache s. The international classification of headache disorders, 3rd edition (beta version). Cephalalgia.33, 2013, 629–808

[2]. The world health report 2001: mental health: new understanding, new hope. Geneva: world health organization; 2001.

[3]. Kartavya Sharma et al. Quality of life and psychiatric co‐morbidity in Indian migraine patients: A headache clinic sample, Neurology India | 61(4), 2013.

[4]. Kulkarni et al. Headache disorders and public ill-health in India: prevalence estimates in Karnataka State; The Journal of Headache and Pain 16, 2015, 67; DOI 10.1186/s10194-015-0549-x

[5]. Ornello et al. Migraine and body mass index categories: a systematic review and meta-analysis of observational studies; The Journal of Headache and Pain 16, 2015, 27

[6]. Chai et al. Obesity and Headache: Part I – A Systematic Review of the Epidemiology of Obesity and Headache; Headache. 54(2), 2014, 219–234. doi:10.1111/head.12296.

[7]. Nishi K et al. Study on the Incidence of Hypertension and Migraine in ABO Blood Groups; ISCA J. Biological Sci. 1(2), 2012, 12-16.

[8]. Rao GN et al. The burden of headache disorders in India: methodology and questionnaire validation for a community‐based survey in Karnataka state. J headache pain 13, 2012, 543‐50

[9]. Aamodt AH et al. Comorbidity of headache and gastrointestinal complaints. The head-hunt study. Cephalalgia 28, 2008, 144-151.

[10]. Yadav et al. A Study of Triggers of Migraine in India; Pain Medicine 11, 2010, 44–47

[11]. Gowri et al., Prevalence and impact of primary headache disorders among students and working population in 18-25 years age group; Int J Med Res Health Sci. 3(2), 2014, 416-419

[12]. Sanjeev K. Bhoi et al. Metabolic syndrome and insulin resistance in migraine; J Headache Pain 13, 2012, 321–326; DOI 10.1007/s10194-012-0416-y

[13]. Rosario D et al. Role of Gender and Serum Immunoglobulin E (IGE) levels; Journal of Clinical and Diagnostic Research. 8(2), 2014, 57-58

[14]. Bigal E et al. Obesity and migraine: a population study. Neurology 66, 2006, 545–550

[15]. Mayo Clinic Staff. Mayo Clinic Guide to Pain Relief. http://www.mayoclinic.com/health/ migraine headache/DS00120/D section=causes

[16]. Rist et al. Associations Between Lipid Levels and Migraine: Crosssectional Analysis in the EVA Study; Cephalalgia . 31(14), 2011, 1459–1465. doi:10.1177/0333102411421682.

[17]. Grebe HP etal.Role of arterial hypertension in comorbidity of chronic headaches. Rev Neurol 33(2), 2001, 119-122.

[18]. Cook NR et al. Migraine and coronary heart disease in women and men. Headache. 42(8), 2002, 715–27. Epub 2002/10/23. eng.

[19]. Jarman J et al. High incidence of endogenous depression in migraine: Confirmation by tyramine test. J Neurol Neurosurg Psychiatry 53, 1990, 573‐5.

[20]. Hagen K et al. Low headache prevalence amongst women with high TSH values. Eur J Neurol. 8(6), 2001, 693-9.