Ibrahim Card Med J 2012; 2(1): 12-16

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Precipitating and Relieving Factors of Migraine in Adults

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ABSTRACT

Background & objective: To observe the factors precipitating migraine attack and factors that help relieving an acute migraine attack in adults.

Materials & Methods: This cross-sectional study was conducted in the Department of Medicine and Neuromedicine, BSMMU, Dhaka over a period of 6 months. Clinically diagnosed cases of migraine (history of recurrent episodic headache with or without aura), ranging from 18 years onwards, irrespective of sexes were the study population. However, patients with headache too severe to give interview were excluded. A total of 87 migraine patients who met the eligibility criteria were included in the study as sample. The primary variables under study were stimulating and relieving factors of migraine attack.

Result: The demographic characteristics showed that the peak age incidence of migraine patients was between 20 - 30 years with mean age being 25.6 years. The patients were predominantly female (71.3%), middle class (65.5%), married (60.9%) and urban resident (57.7%). Housewives and students together comprised nearly 80% of the patients. Over one-third (36.8%) of the patients were overweight or obese. About 14% had smoking habit and 8% had habit of betel-nut chewing with tobacco leaf. Pain was exclusively throbbing in nature (97.7%) and mostly was of moderate severity and unilateral (74.7%). In more than three-quarters (78.1%) of the cases, each episode of pain lasted for 4-72 hours. Majority (95%) complained of nausea, 77% vomiting, and 28.7% photophobia. The attack was primarily precipitated by weather change (88.5%) followed by journey (78.2%), physical exertion (58.6%), menstrual trigger (16%) and less commonly by mental exertion (8%), sitting at computer (4.6%) and study (3.4%). Pain was invariably relieved by taking analgesics (99%), rest (80%) and adequate sleep (70%).

Conclusion: Stimulating factors for migraine attack vary from individual to individual, but relieving factors remain almost same everywhere.

Key words: *Provoking factors, relieving factors, migraine.*

INTRODUCTION

Migraine is a disorder characterized by recurrent attacks of headache, widely variable in intensity, frequency and duration. Attacks are commonly unilateral and are usually accopanied by anorexia, nausea and vomiting. Migraine constitutes 16% of primary headaches and affects 10-20% of general population.[1] The disease affects millions of individuals worldwide, generally during the most productive years of a person's life. Studies show that migraineurs are underdiagnosed, undertreated, and experience substantial decreases in functioning and productivity, which in turn translates into diminished quality of life for individuals, and financial burdens to both health-care systems and employers.[2,3] A cross-sectional study conducted in a tertiary hospital of Bangladesh among patients with headache demonstrated that 16% had migraine and 12.3% had migraine co-existing with tension type headache (TTHA).[4] Certain foods, medications, stress factors are believed to precipitate migraine attack. The commonly reported precipitating factors are dairy products, red wine, stress, nuts, shellfish, caffeine, withdrawal of vasodilators, head

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trauma/surgery, perfumes or strong odors, irregular diet or sleep, head and neck infection and dazzling light.

Repeated attacks of migraine carry the risk of inflammatory arteriopathy of the cranial vessels, which in turn, impairs the vascular endothelial function and structure predisposing the patients to increased risk of ischemic stroke.[5,6] Young women suffering from migraine with aura are at particular risk of stroke.[7] Migraine is also associated with silent brain infarcts and deep white matter lesions detected by magnetic resonance imaging.[8] Both types of brain lesions have been shown to increase the risk of stroke in the general population.[9] As stroke is the most disabling of all the neurological diseases and treatment is often frustrating and rehabilitation is not expectedly available, reducing the frequency of migraine attack is the best option to reduce the incidence of stroke.

Preventing the frequent attacks of migraine by avoiding the triggering factors and early relief from the attack (if it already has had occurred) by adopting the relieving factors will expectedly reduce the incidence of ischemic stroke. The present study was, therefore, intended to find the stimulating and relieving factors of migraine in adults attending in a tertiary level hospital. The study also investigated the demographic characteristics, pattern and frequency of headache in adult migrainures.

METHODS

This cross-sectional study was carried out at the Department of Medicine and Neuromedicine, BSMMU, Dhaka over a period of 6 months. Keeping compliance with Helsinki Declaration for Medical Research Involving Human Subjects 1964, informed consent was obtained from the study subjects. A total of 87 clinically diagnosed cases of migraine were included in the study. There were no laboratory criteria for diagnosis. A full neurological examination, including fundoscopic examination was done by an independent physician having specialization in Neuromedicine to rule out any secondary headache. CT scan of brain, MRI or X-ray PNS were performed in suspected cases for the same reason. Diagnostic criteria of migraine were set according to International Classification of Headache Disorders.[10] The diagnostic criteria of most common varieties of migraine (e.g. migraine without aura and with aura) are mentioned here as the present study was based on them.

TABLE I-A : Diagnostic criteria of migraine without aura.[22]

A. At least 5 attacks fulfilling criteria B-D

B. Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated)

C. Headache has at least two of the following characteristics:

1. Unilateral location
2. Pulsating quality
3. Moderate or severe pain intensity
4. Aggravation by or causing avoidance of routine physical activity (e.g. walking or climbing stairs)

D. During headache at least one of the following:

1. Nausea and/or vomiting
2. Photophobia and phonophobia

E. Not attributed to another disorder

TABLE I-B : Diagnostic criteria of migraine with aura.[22]

A. At least 2 attacks fulfilling criteria B-D

B. Aura consisting of at least one of the following but no motor weakness:

1. Fully reversible visual symptoms, including positive features (e.g. flickering lights, spots or lines) and/or negative features (i.e. loss of vision)
2. Fully reversible sensory symptoms, including positive features (i.e. pins and needles) and/or negative features (i.e. numbness)
3. Fully reversible dysphasic speech disturbance

C. At least two of the following

1. Homonymous visual symptoms and / or unilateral sensory symptoms
2. At least one aura symptom develops gradually over >5 minutes and/or different aura symptoms occur in succession over >5 minutes
3. Each symptom lasts > 5 and < 60 minutes

D. Headache fulfilling criteria B-D for 1.1 Migraine without aura, begins during the aura or follows aura within 60 minutes

E. Not attributed to another disorder

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RESULTS

The peak incidence of migraine was observed in 2nd decade of life (62.1%) with mean age of the patients being 25.6 years. A female preponderance was observed in the series. Nearly two-thirds of the patients were middle class (65.5%), 60.9% married and 57.7% urban resident. Housewife and student together comprised about 80% of the patients. Overweight or obese patients formed over one-third (36.8%) of the cases (table I). About 14% of the patients had smoking habit and 8% had habit of betel-nut chewing with tobacco leaf (table II).

TABLE I : Distribution of patients by demographic characteristics (n = 87).

Demographic characteristics	Frequency	Percentage
Age* (years)		
< 20	12	13.8
20-30	54	62.1
30-40	14	16.1
≥ 40	7	8.0
Sex		
Male	25	28.7
Female	62	71.3
Marital status		
Married	53	60.9
Unmarried	34	39.1
Residence		
Urban	50	57.7
Rural	37	42.3
Occupation		
Business	9	10.3
Service	8	9.2
Housewife	38	43.7
Student	30	36.8
Social status		
Upper-middle class	8	9.2
Middle class	57	65.5
Lower-middle class	22	25.3
BMI** (kg/m²)		
< 25 (Normal or underweight)	55	63.2
≥ 25 (Overweight or obese)	32	36.8

**Mean SD = 25.6 ± 6.7 years; range = 18-46 years.*
***Mean SD = 23.9 ± 3.6 kg/m²; range = 17.0-38.3 kg/m².*

TABLE II : Distribution of patients by their behavioral characteristics (n = 87).

Behavioral factors	Frequency	Percentage
Smoking	12	13.8
Betel-nut chewing with tobacco leaf	07	8.0
None	68	78.2

Majority (97.7%) of the patients experienced throbbing pain and only 2.3% had dull-aching pain. Nearly three-quarters (74.7%) of patients felt pain of moderate severity and 23% of mild severity. Severe pain was rare. In more than three-quarter (78.1%) of the cases, each episode of pain lasted for 4-72 hours and in 21.8% cases it persisted for < 4 hours. Pain was mainly unilateral (74.7%) followed by bilateral (24.1%) and generalized (1.1%) (Table III). Of the associated symptoms, over 95% complained of nausea, 77% vomiting and 28.7% photophobia. Phonophobia, vertigo, insomnia and one-sided weakness were seldom complained. Seven (8%) cases have had aura during an attack (table IV). Of them 6 had visual aura and 1 had sensory aura.

TABLE III : Distribution of patients by detailed history of migraine (n = 87).

History of migraine	Frequency	Percentage
Nature of pain		
Throbbing	85	97.7
Dull-aching	02	2.3
Severity of pain		
Mild	20	23.0
Moderate	65	74.7
Severe	02	2.3
Duration of each episode		
Up to 4 hours	19	21.8
4 - 72 hours	68	78.1
Location		
Unilateral	65	74.7
Bilateral	21	24.1
Generalized	01	1.1

TABLE IV : Distribution of patients by associated symptoms (n = 87*).

Associated symptoms	Frequency	Percentage
Nausea	83	95.4
Vomiting	67	77.0
Photophobia	25	28.7
Aura	07	8.0
Phonophobia	03	3.4
Vertigo	02	2.3
Weakness (one-sided)	01	1.1
Insomnia	01	1.1

** Total will not correspond to 100%, for multiple symptoms in same individuals.*

Migraine attack was predominantly precipitated by weather change (88.5%) like extreme cold or hot and change in humidity followed by journey (78.2%), physical exertion (58.6%), impending menstruation in female (16%), mental exertion (8%), prolonged sitting at computer (4.6%) and study (3.4%) (Fig. 1). Analgesics (aspirin or paracetamol or NSAIDs etc.) relieved pain in 99% cases, bed-rest in 80% and adequate sleep in 70% cases (Fig. 2). Tryptans was found effective in acute cases of migraine. In some cases antiemetics and sedatives were used as adjunctive therapy.

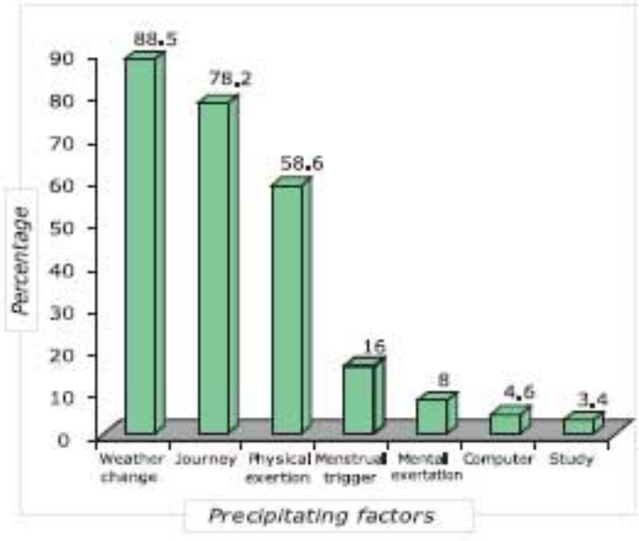

FIGURE 1 : *Factors that precipitate an attack of migraine (n = 87).*

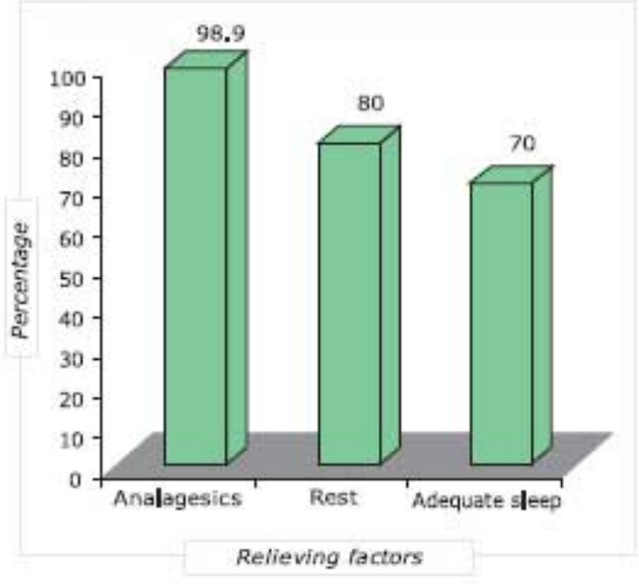

FIGURE 2 : *Factors that relieve patients from migraine attack (n = 87).*

DISCUSSION

In the present study the peak age incidence of migraine patients was between 20-30 years with mean age being 25.6 years. The patients were predominantly female (71.3%), middle class (65.5%), married (60.9%) and urban resident (57.7%). Over one-third (36.8%) of the patients were overweight or obese with mean BMI being 23.9±3.6 kg/m^2. About 14% of the patients had smoking habit and 8% had habit of betel-nut chewing with tobacco leaf. Vanmolkot and de Hoon[11] in a similar study reported a mean age of 24.6 years and mean of BMI 21.6 kg/m^2 with a female predominance (78%) bearing consistency with findings of the present study.

Available literatures, in general, claim that there are certain foods, medications, stress factors that precipitate migraine. The commonly reported precipitating factors are dairy products, red wine, stress, nuts, shellfish, caffeine, withdrawal of vasodilators, head trauma/surgery, perfumes/ strong odors, irregular diet/sleep, head and neck infection and intense light. In the present study majority of migraineurs told that major precipitating factors were sunlight (88.5%), journey (78.2%) or physical exertion (58.6%). Other minor factors were mental exertion, sitting at computer and study. Relieving factors as described by the migraineurs were rest (100%), receiving an analgesic (98.9%) and sleep (70%). Al-Shimmery[12] in an attempt to study the precipitating and relieving factors of migraine headache included 200 Iraqi Kurdish patients, where stress or psychological upset was found to be the commonest triggering factor (80%), followed by increasing physical activity (68%), change in weather (65.5%) and fasting (65%). Fasting in Ramadan was also a triggering factor for headaches in 65% of patients. However, there was no significant association between the triggering factors with regards to sex difference. Relief of migraine in the studied sample was achieved using NSAIDs in 50% and sleep in 45.5% patients. Although the triggering factors in the present study population were somewhat different from those of Iraqi Kurdish patients, the relieving factors were almost similar (analgesics and adequate sleep).

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Kelman[13] evaluated 1207 patients of International Classification of Headache Disorders-2 to find the triggers of acute migraine attack. Over three-quarters (75.9%) reported that some factors precipitate an acute attack. The triggering factors were stress (79.7%), hormonal contraceptives in women (65.1%), fasting (57.3%), weather (53.2%), sleep disturbance (49.8%), use of perfume (43.7%), neck pain (38.4%), light (38.1%), alcohol (37.8%), smoke (35.7%), sleeping late (32%), heat (30.3%), food (26.9%), exercise (22.1%) and sexual activity (5.2%). Triggers were more likely to be associated with a more florid acute migraine attack. Differences in factors were seen between women and men, migraine with aura and without aura, episodic and chronic migraine, and between migraine and probable migraine.

The link between migraine and weather remains obscure. While some migraineurs convincingly report weather as a reliable exogenous trigger factor for their attacks, others strictly rule out any weather influence. Clinical studies support these contradicting observations.[13]

Cooke *et al*[14] found a higher probability for the start of a migraine attack on pre-Chinook and Chinook wind days in different patient subgroups in western Canada. In addition, 50% of subjects were found to be weather sensitive in a North American prospective study.[15] Allais and colleagues[16] demonstrated that in some females, migraine attack may be precipitated with onset of menstruation which can be prevented by a variety of hormonal manipulations, including oral contraceptives administered with an extended-dosing strategy.

Thus from the findings of the present study and discussion hitherto, it is evident that a wide spectrum of factors may precipitate migraine attack which may vary based on geographical location and demographic characteristics of the migraineurs. But relieving factors are more or less same everywhere (rest, sleep and analgesic). However, like any other scientific study, the present study is not without limitations. The following limitations deserve mention.

1. The study was a hospital-based study and, therefore the findings may not reflect the actual situation prevailing in the community.
2. As there is a wide range of precipitating factors, the sample size was considered small to generalize the findings to reference population. A community-based study with larger sample is, therefore, recommended in order to generalize the findings to reference population as well as to formulate plan for reducing the frequency of migraine attack.

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