

Frequency, character and predisposing factor of headache among students of medical college of Karachi

Tooba Noor,¹ Ali Sajjad,² Anoosha Asma³

Abstract

Objective: To evaluate the frequency, predisposing factors and symptomatology of headache among medical students.

Methods: The cross-sectional study was conducted from September to December 2013 and comprised students of two medical colleges of Karachi. International Classification of Headache Disorder-II criterion was used to diagnose and classify headache. SPSS 17 was used for statistical analysis.

Results: Of the 413 medical students studied, 326 (79%) had tension type headache, and 87 (21%) had migraine. Headache was more frequent among females than males, with a ratio of 6.5:1. Both types of headache were significantly associated with self-reported disturbed sleep pattern, stress and various triggering factors ($p < 0.05$ each). Both types greatly influenced individual's daily life with significant association with avoiding academics, extra-curricular activities, family and friends ($p < 0.05$ each). High self-medication rate of 400 (96.9%) was observed.

Conclusion: The prevalence of headache among medical students was high with female predominance. Infrequent consultation needs to be addressed through awareness programmes.

Keywords: Headache, Migraine, Medical students, Tension-type headache, Frequency. (JPMA 66: 159; 2016)

Introduction

Headache, or its medical term "cephalgia", is one of the common medical ailments that is not only considered a nuisance but also has a negative impact on the quality of life, making the person too ill to perform his routine daily activities properly.¹ World Health Organisation (WHO) has ranked headache among the top 10 disabling conditions, worldwide. The global prevalence of active headache disorder is 47% with Tension Type Headache (TTH) contributing 38%, migraine 10% and chronic headache 3%.² Moreover, headache is the leading neurological complaint presented by patients to general practitioner and neurologists.³

Although headache is a prevalent disorder, especially among adolescents and young adults,⁴ but it is also counted as the most common presenting complaints of medical students, predictably due to various physical and psychological stress factors which medical students are more prone to facing as opposed to general population and other groups of specific population.⁵ Considering this fact, medical students have been the target of several epidemiological surveys dealing with headache and its high prevalence among the population. The estimated prevalence rate for migraine ranged from 12.2%⁶ to

40.17%⁷ with the prevalence of TTH ranging from 12.2%⁶ to 44.16%.⁸

As the mechanisms of migraine and TTH are still ill-defined, epidemiological studies on specific populations are needed to help clinicians and researchers find the origin, several associated factors, characteristics and pattern influencing the frequency of headache as well as various options of management.⁵ In addition, a high level of self-medication with small percentage of patients visiting consultants is also found among headache patients, particularly younger generation in several studies.⁴

Severe and frequent episodes of headache have a greater impact on academic performance and quality of life, thus bringing about limitation to daily activities and work, as well as significantly influencing students' personal and professional behaviour and ultimately academic records.⁹ Therefore, some studies have been conducted suggesting the contribution of headache in reducing student's academic performance, but many factors co-exist, interfering with student's academic performance at professional level. However, it is important to rule out if headache is associated with worse academic performance due to widespread prevalence in this population.¹⁰

Though distribution of different types of headache varies with environmental, socio-demographic, lifestyle and genetic aspects, very little data is available on headache

.....
^{1,2}Civil Hospital Karachi, Dow University of Health Sciences, ³Medical Student, Sind Medical College, Jinnah Sindh Medical University, Karachi.

Correspondence: Tooba Noor. Email: dr.toobanoor@gmail.com

epidemiology in Pakistan, especially in the light of recent classifications and definitions of International Headache Society (IHS). Thus, the current study was planned as an epidemiological survey with the aim of evaluating the frequency of TTH and migraine headache among medical students with comparison in predisposing factors, symptomatology, health seeking behaviour and relation with studies.

Subjects and Methods

The cross-sectional study was conducted from September to December 2013 and comprised medical students at two medical colleges of Karachi; Dow Medical College (DMS) and Sindh Medical College (SMC). The sample size was estimated through Open Epi Version 2.3.1, keeping anticipated frequency 61% and was found to be 366 at 95% Confidence Interval (CI).¹¹ Study population was raised using convenient sampling technique, from medical students of First to Final year who had at least one episode of headache during the preceding six months.

A semi-structured questionnaire was developed to record demographic details, headache pattern, associated factors, family history, prior illness, relation with studies and management. The International Classification of Headache Disorder (ICHD) Version 2 for TTH and migraine was used for diagnosis.¹² Subjects who did not fall under one of the two categories were excluded. Diagnoses were based on headache characteristics. No physical

examination or imaging was done.

Data collected was managed and analyzed using SPSS 17. Mean and Standard deviation were evaluated for continuous data, and for categorical data frequency and percentage were calculated. Correlations among variables were explored using Chi square test. Multiple response analysis was used in some variables due to multiple choice queries (MCQs) in the questionnaire. Threshold of significance was set at 0.05.

Results

Initially, 430 medical students were enrolled. There were 372(86.5%) females and 58(13.4%) males with a female-to-male ratio of 6.5:1. The overall mean age was 20.64±1.68 years (range: 17-26 years). Applying ICHD-2 criteria, 326(79%) were diagnosed as TTH and 87(21%) as migraine. Of the total, 17(4%) were atypical and could not be classified as either TTH or migraine, and were excluded, leaving the final study sample to be 413(96%); 238(57.6%) from SMC and 175(42.4%) from DMC; and 111(26.9%), 43(10.4%), 63(15.25%), 93(22.5%) and 103(24.9%) students from First, Second, Third and Final years. Overall, 118(28.57%) students had suffered recurrent headache i.e. more the 5 episodes in the preceding six months.

Both types of headache were found more frequent in females with 280(85.9%) having TTH and 77(89.5%) migraine. Gender and age, however, had statistically

Table-1: Headache Characteristics.

Variables		Overall (n = 413)	Tension (n = 326)	Migraine (n = 86)
Gender	Male	55 (13.3%)	46 (14.1%)	9 (10.5%)
	Female	358 (86.7%)	280 (85.9%)	77 (89.5%)
Symmetry	Unilateral	272 (65.9%)	220 (67.5%)	53 (61%)
	Bilateral	141 (34.1%)	106 (32.5%)	34 (39%)
Nature	Persistent	73 (17.7%)	35 (10.8%)	38 (43.2%)
	Temporary	340 (82.3%)	290 (89.2%)	50 (57.8%)
Severity	Mild	107 (26%)	97 (30.7%)	10 (13.7%)
	Moderate	237 (57.4%)	194 (61.4%)	34 (46.6%)
	Severe	69 (16.7%)	25 (8.3%)	29 (39.7%)
Location*	Right temporal	150 (20.3%)	110 (34.2%)	36 (41.9%)
	Left temporal	133 (18%)	98 (30.4%)	31 (36.0%)
	Parietal	97 (13.1%)	78 (24.2%)	18 (20.9%)
	Frontal	247 (33.4%)	180 (55.9%)	55 (64.0%)
	Occipital	67 (9.1%)	50 (15.5%)	12 (14.0%)
	Face jaw	23 (3.1%)	17 (5.3%)	4 (4.7%)
	Cervical	22 (3.0%)	17 (5.3%)	4 (4.7%)
	Throbbing	112 (26.2%)	72 (22.1%)	37 (43.0%)
Quality*	Aching	84 (19.8%)	70 (21.5%)	13 (15.1%)
	Dull	135 (31.7%)	121 (37.1%)	14 (16.3%)
	Sharp	42 (9.9%)	27 (8.2%)	6 (7.0%)
	Tight band	53 (12.4%)	36 (11.0%)	16 (18.6%)

*Multiple response analysis used - individual response may not sum up to actual sample size.

Table-2: Risk factors.

Variables		Tension N (%)	Migraine N (%)	p-value
Sleep disturbed	Yes	33 (10.12%)	19 (22.1%)	0.003
	No	293 (89.88%)	67 (77.9%)	
Stress	Yes	173 (53.6%)	35 (40.7%)	0.03
	No	150 (46.4%)	51 (59.3%)	
Weakness in eyesight	Yes	167 (51.2%)	52 (60.5%)	0.126
	No	159 (48.8%)	34 (39.5%)	
Family history	Yes	73 (22.5%)	27 (31.4%)	0.08
	No	252 77.5%	59 68.6%	

Table-3: Triggering factors.

Variables		Tension N (%)	Migraine N (%)	p-value
Loud Noise	Yes	79 (24.2%)	34 (39.5%)	0.004
	No	247 (75.8%)	52 (60.5%)	
Bright light	Yes	31 (9.5%)	18 (20.9%)	0.003
	No	295 (90.5%)	68 (79.1%)	
Anxiety	Yes	105 (32.2%)	38 (44.2%)	0.037
	No	221 (67.8%)	48 (55.8%)	
Hot weather	Yes	123 (37.7%)	36 (41.9%)	0.484
	No	203 (62.3%)	50 (58.1%)	
Exams	Yes	107 (32.8%)	32 (37.2%)	0.440
	No	219 (67.2%)	54 (62.8%)	
Menstrual cycle (females only)	Yes	28 (10.0%)	7 (9.1%)	0.812
	No	252 (90.0%)	70 (90.9%)	

Table-4: Social factors.

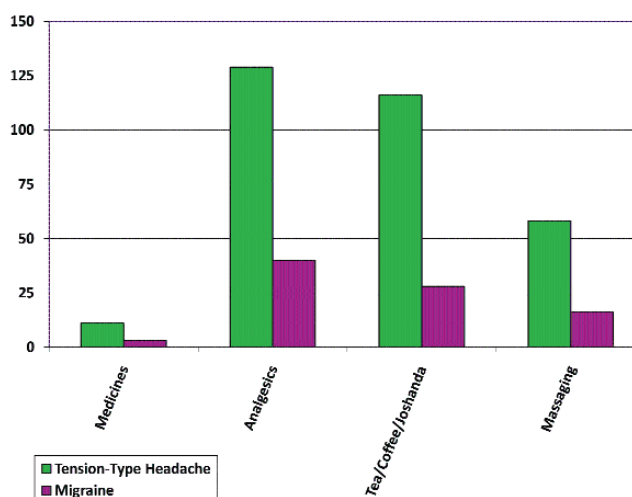
Variables		Tension N (%)	Migraine N (%)	p-value
Social / extracurricular activity affected	Yes	61 (18.7%)	39 (45.3%)	<0.001
	No	265 (81.3%)	47 (54.7%)	
Avoid extracurricular activities	Yes	14 (4.3%)	11 (12.8%)	0.003
	No	312 (95.7%)	75 (87.2%)	
Avoid family and friends	Yes	15 (4.6%)	10 (11.6%)	0.015
	No	311 (95.4%)	76 (88.4%)	
Want to stay alone	Yes	42 (12.9%)	29 (38.2%)	< 0.001
	No	284 (87.1%)	57 (66.3%)	
Avoid parties	Yes	18 (5.5%)	7 (8.1%)	0.365
	No	308 (94.5%)	79 (91.9%)	

insignificant associations with the types of headache ($p > 0.05$ each). Most frequent attributes of headache were unilateral 272(65.9%), temporary in nature 340(82.3%) and moderate in intensity 237(57.4%). Using multiple response analysis (due to overlapping response) results also yielded headaches to be more frequently dull in 135(31.7%) students, frontal in location 247(33.4%). Students with migraine had more commonly throbbing

Table-5: Academic problems.

Variables		Tension N (%)	Migraine N (%)	p-value
Feel absent minded in class	Yes	189 (58.0%)	63 (73.3%)	0.009
	No	137 (42.0%)	23 (26.7%)	
Bunk class due to headache	Yes	63 (19.3%)	28 (32.6%)	0.008
	No	263 (80.7%)	58 (67.4%)	
Academic performance towards downfall	Yes	45 (13.8%)	21 (24.4%)	0.017
	No	280 (86.2%)	65 (75.6%)	
Avoid Extracurricular activities	Yes	14 (4.3%)	11 (12.8%)	0.003
	No	312 (95.7%)	75 (87.2%)	
Retake exam due to headache	Yes	15 (4.6%)	6 (7.0%)	0.519*
	No	311 (95.4%)	80 (93%)	

*Via Fischer exact test, but insignificant.

**Figure:** Treatment preferences.

or pulsating type of pain 37(43%) and severe in intensity 29(39.7%) (Table-1).

While estimating predisposing factors, statistically significant association of type of headache was found with disturbed sleep pattern and social stress ($p < 0.05$ each) but not in terms of family history and eyesight weakness ($p > 0.05$ each) (Table-2). Several triggering and social factors related to headache were also analysed and significant association was found in relation to noise, light, anxiety, and extra-curricular activities ($p < 0.05$ each) (Table-3)

In terms of quality of social life, significant association was found between headache type and all the parameters evaluated ($p < 0.05$ each) except when it came to avoiding parties ($p > 0.05$) (Table-4).

When analyzing the relation of headache with studies, 191(46.2%) students reported that their headache got worse after admission to medical school, while 182(44.1%) reported an increase in the frequency of headache during exams. Duration of studying hours did not yield any significant association with either frequency of headache or type of headache ($p>0.05$ each).

When it came to quality of academic life, statistically significant relationship was in almost all variables ($p<0.05$ each) except exam retake due to headache ($p>0.05$) (Table-5).

Overall therapeutic aspect seemed to be very disappointing with high self-medication rate. Only 13 (3.1%) of them sought medical advice and visited consultants of the field, while 400 (96.9%) did not. None of them sought emergency treatment (Figure). Analgesics remained the most preferable therapeutic choice in 169(41.0%) cases, followed by tea/coffee/joshanda 144(34.8%), massaging 74(18%) and specific medicine 14(3.5%).

Discussion

Headache disorder is a common complaint among all age groups and recurrent headaches cause significant problems to individual's life as well represent a burden on society. It also affects student's social and academic life. This is the first detailed study of frequency, characteristics and pattern of headache disorder in Pakistan with its characteristics classified and diagnosed under ICHD-2 among medical students.

Regarding estimated frequency of headache in local literature, prevalence of headache in the study population was 85.5%¹¹ and 76.1%¹³ in earlier studies. Similarly, neighbouring countries reported the same result ranging from 43.8%¹⁴ to 68%.¹⁵ Several studies that have chosen medical students as a target population represented similar observations of high prevalence of headache ranging from 46.0% to 96.8%.¹⁶⁻¹⁹

As reported in most of the studies, a general as well as classification-based high frequency of headache among women is also reported in our study compared to their male counterparts.¹⁸⁻²⁰ TTH was found to be the more common type of headache compared to migraine, again supported by many national and international studies. In the current study, TTH accounted for 76%, which is comparatively higher than those in the majority of similar studies^{20,21} but comparable with the reported rates of 56.3%¹³ and 64.7%²² among Brazilian medical students. A study at Kenyatta National Hospital, Nairobi, reported it to be 50%.¹⁶

This might be due to the fact that prevalence of stress seemed to be high among medical students. Academic burden, workload, sleep deprivation and increased psychological pressure are assumed to be major "stress factors" for medical students which not only affect their medical performances, but also all aspects of health. Studies suggest that amount of disability associated with TTH on a social level is much greater than that of migraine, especially when measured as absence from work.²³ This might be the possibility that social stress and sleep deprivation were found to be the most common triggering factors with significant association in our study comparing it with other studies that also have similar associations.^{13,14} Minimising stress, getting enough sleep, regular exercise, increasing awareness and improving the quality of care are proved to be helpful for patients with TTH. Several triggering and social factors which a common man is readily exposed to in his routine life were also analysed and found significant, but, surprisingly we failed to find any comparable literature as most of studies have not highlighted the other side of the picture.

Our study demonstrated female students to have higher frequency of TTH compared to male.^{5,17} A large part of female students' contribution in the sample size could be the possible reason for this. However, the prevalence of migraine is compatible and supported by other studies^{14,18,21} and equally common among females as that of TTH.

The study was unable to find any significant linkage of headache with family history compared to other studies reporting strong association and high prevalence of headache in family especially those of migraine.^{1,17} A higher prevalence of family history among migraine patients highlights the role of genetics. Migraine is a polygenic disease i.e. several genes have minor contributions to its pathophysiology and genetic predisposition combines with environmental triggers to cause clinical symptoms. The search for genes that predispose to migraine has not yielded uniform results to date most likely due to heterogeneity of patients studied and lack of a reliable endophenotype to classify the disease.²⁴ A probable reason for insignificant association and relatively lower frequency of positive family history could be the higher prevalence of TTH which is actually associated with certain personal, psychological, social and environmental conditions. A wide-spectrum, multi-centred general population-based study is needed to explain any definite racial or genetic association.

An overall character of headache found in our study is comparable to that reported earlier,¹¹ both having

moderate pain on frontal location and less than 3 episodes of headache as a leading presentation. As defined by IHS, migraine is commonly unilateral, pulsating and moderate to severe in intensity and is associated with nausea and photophobia and phonophobia. TTH is characterised as bilateral, pressing/tightening in quality, mild or moderate in intensity and is usually not aggravated by routine physical activities. Almost, two-third of patients (60.5%) of migraine in our study reported unilateral headache, with 43% of them having throbbing pain with moderate to severe intensity almost parallel with IHS criteria and supported by one study.¹⁴ Similarly, dull pain with moderate intensity of TTH patients in our study was according to IHS, but unilateral location in two-third of patients is contrary to ICHD-2. The finding, however, is supported by prior studies.^{1,14} Hence, variations are expected irrespective of target population, sample size and place of study.

Several studies suggest that there is a reduction in academic performance with headache. We found comparable results with regard to absenteeism, academic performance and headache interfering with daily/extracurricular activities with significant relation with absenteeism and academic performance as proposed earlier.¹⁰ But, we could not find any significant association with number of failures or retake exams due to headache as found by an earlier study.¹⁰ What were actually associated in our study with student's academic problems were the type, intensity and frequency of headache, not the repercussions which is contrary to the earlier study¹⁰ which reported, "the greater is the repercussions, the greater is the absenteeism". As a matter of fact, information about headache and student's academic problems in our study were collected in a single moment in time. Therefore, it is not logical to affirm a causal relation between headache and student's worse academic performance, but still further work-up in the subject is needed to be done. The study also demonstrates that despite high frequency of headaches, daily life activities continued, but the reasons for continuation of activities were not evaluated and could not be established. The reason may be higher proportion of TTH which had moderate severity and high use of analgesic to relieve the headaches.

With high prevalence and high rate of disability due to headache, a very high rate of self-medication is also prevalent. A very little portion i.e. 3.1% visited consultants for medical advice. It was comparable to 2%¹³ and 5%¹ prevalence of medical assistance for headache reported, but much lower than 23.3% students of Oman.¹⁷ This is

despite the fact that each medical school is affiliated with a teaching hospital that runs a daily outpatient department. A relatively light severity of headache could be the possible reason for this as most of the students experienced headache of mild to moderate intensity. Also, analgesics and over-the-counter drugs are very easily available and frequently self-abused by amateur doctors. Likewise, in other studies,^{1,17} analgesics remained the most preferable choice amongst medical students (42.0%) followed by non-medical therapeutics. Less than 4% participants used specific drugs for headache. The rare usage of specific medicines or analgesics and rare consultation visits among one of the most educated classed of society point to a non-serious and careless attitude towards health and inadequacies in the management of headache in our study population. Similar observations are expected in different specific populations of society. Educational programmes are, therefore, required for patients to recognise the importance of effective migraine treatment.

Headache disorders deserve more attention. Adequate primary prevention, timely diagnosis and appropriate treatment would be helpful to reduce the burden. These strategies can be assessed by examining frequency distribution, identifying probable predisposing factors, duration, intensity and headache-related disability.

Apart from possible cultural, regional and genetic differences in the prevalence of headache, the study design and methodology affected its reported prevalence. One of the limitations of our study was the self-reported questionnaire-based survey strictly using diagnostic criteria of IHS without physical examination and imaging. Moreover, the questionnaire did not take into account headaches other than migraine and TTH and those with more than one form of headache. This could be the reason of high frequency of TTH in the study population. Also, the migraine was not further classified as defined by IHS and represented the data of both probable and definite migraine combined.

Our study represents the headache frequency of only two large medical schools of Pakistan and may not represent the entire community. Further epidemiological studies on small and specific populations as well as general population surveys are recommended.

Conclusion

There was a high frequency of headache among the medical students. TTH was more common than migraine. Social stress and sleep deprivation were significant factors. A large majority of students indulged in self-medication. The results of the study should be used to

improve the knowledge of treating headache in medical schools.

References

- Ojini FI, Okubadejo NU, Danesi MA. Prevalence and clinical characteristics of headache in medical students of the University of Lagos, Nigeria. *Cephalalgia*. 2009; 29:472-7.
- Stovner LJ, Hagen K, Jensen R, Katsarava Z, Lipton R, Scher A, et al. The global burden of headache: a documentation of headache prevalence and disability worldwide. *Cephalalgia*. 2007; 27:193-210.
- Patterson VH, Esmonde TF. Comparison of the handling of neurological outpatient referrals by general physicians and a neurologist. *J Neurol Neurosurg Psychiatry*. 1993; 56:830.
- Galinovic I, Vukovic V, Troselj M, Antic S, Demarin V. Migraine and Tension-Type Headache in Medical Students: A Questionnaire Study. *Coll Antropol*. 2009; 33:169-73.
- Ghorbani A, Abtahi SM, Fereidan-E M, Abtahi SH, Shemshaki H, Akbari M, et al. Prevalence and clinical characteristics of headache among medical students, Isfahan, Iran. *J Res Med Sci*. 2013; 18:S24-7.
- Deleu D, Khan MA, Humaidan H, Al Mantheri Z, Al Hashami S. Prevalence and clinical characteristics of headache in medical students in Oman. *Headache*. 2001; 41:798-804.
- Sanvito WL, Monzillo PH, Peres MF, Martinelli MO, Fera MP, Gouveia DA, et al. The epidemiology of migraine in medical students. *Headache*. 1996; 36:316-9.
- Amayo EO, Jowi JO, Njeru EK. Headache associated disability in medical students at the Kenyatta National Hospital, Nairobi. *East Afr Med J*. 2002; 79:519-23.
- Smitherman TA, McDermott MJ, Buchanan EM. Negative impact of episodic migraine on a university population: Quality of life, functional impairment, and comorbid psychiatric symptoms. *Headache*. 2011; 51:581-9.
- Souza-e-Silva HR, Rocha-Filho PA. Headache and academic performance in university students: a cross-sectional study. *Headache*. 2011; 51:1493-502.
- Tahir MU, Naeem NK, Usman A, Iqbal H, Navied U, Erum S. Headache Prevalence, Patterns and Symptoms Amongst Medical Students at Fatima Memorial College, Lahore Pak. *J Med Health Sci*. 2010; 4: 542-3.
- Headache Classification Subcommittee of the International Headache Society. The international classification of headache disorders, 2nd edition. *Cephalalgia* 2004; 24 (Suppl. 1):9-160.
- Aurangzeb S, Tariq M, Gul A, Hameed M. Frequency of various types of Headache in postgraduate Medical Students of a tertiary care hospital. *Pak J Neurol Sci* 2008; 3: 1-5.
- M.Taghi AS, Leyla S, Afshin BH. Epidemiologic and Clinical Characteristics of Migraine and Tension-Type Headaches among Hospitals Staffs of Shiraz (Iran). *Acta Medica Iranica*. 2009; 47:115-20.
- Menon B, Kinnera N. Prevalence and characteristics of migraine in medical students and its impact on their daily activities. *Ann Indian Acad Neurol*. 2013; 16:221-5.
- Amayo EO, Jowi JO, Njeru EK. Headache associated disability in medical students at the Kenyatta National Hospital, Nairobi. *East Afr Med J*. 2002; 79:519-23.
- Deleu D, Khan MA, Humaidan H, Al Mantheri Z, Al Hashami S. Prevalence and clinical characteristics of headache in medical students in Oman. *Headache*. 2001; 41:798-804.
- Mitsikostas DD, Gatzonis S, Thomas A, Kalfakis N, Ilias A, Papageorgiou C. An epidemiological study of headaches among medical students in Athens. *Headache*. 1996; 36:561-4.
- Bahrami P, Zebardast H, Zibaei M, Mohammadzadeh M, Zabandan N. Prevalence and characteristics of headache in Khoramabad, Iran. *Pain Physician*. 2012; 15:327-32.
- Abduljabbar M, Ogunniyi A, al Balla S, Alballaa S, al-Dalaan A. Prevalence of primary headache syndrome in adults in the Qassim region of Saudi Arabia. *Headache*. 1996; 36:385-8.
- Kurt S, Kaplan Y. Epidemiological and clinical characteristics of headache in university students. *Clin Neurol Neurosurg*. 2008; 110:46-50.
- Ferri-de-Barros JE, Alencar MJ, Berchielli LF, Castelhana LC. Junior Headache among medical and psychology students. *Arq Neuro-Psiquiatr*. 2011; 69.
- Rasmussen BK, Jensen R, Olesen J. Impact of headache on sickness absence and utilisation of medical services: a Danish population study. *J Epidemiol Community Health*. 1992; 46:443-6.
- Wessman M, Terwindt GM, Kaunisto MA, Palotie A, Ophoff RA. Migraine: a complex genetic disorder. *Lancet Neurol*. 2007; 6:521-32.