

Prevalence and clinical characteristics of headache among medical students, Isfahan, Iran

Abbas Ghorbani, Seyed-Mojtaba Abtahi¹, Mahboobeh Fereidan-Esfahani², Seyed-Hossein Abtahi², Hamidreza Shemshaki³, Mojtaba Akbari⁴, Ali Mehrabi-Koushki⁴

Isfahan Neurosciences Research Center, ¹Department of Otolaryngology, School of Medicine, ²Medical Students Research Center, ⁴Department of Epidemiology, Medical School, Isfahan University of Medical Sciences, Isfahan, ³Neuroscience Research Center, Kerman University of Medical Sciences, Kerman, Iran

Background: Headache is one of the most common complaints during medical curriculum and it occurs due to numerous psychological and physical stressors, which are more common in medical students than general population. The purpose of this study was to evaluate the frequency of different types of headache and associated factors. **Materials and Methods:** This cross-sectional study was conducted in Isfahan University of Medical Sciences, from September 2011 to January 2012. First- to seven-year medical students who have experienced some forms of headache in their life and had headache attacks during the past 6 months were included in this study. All medical students completed a structured check list, which consisted of demographics data, associated factors, and headache characteristics. **Results:** A total of 480 (258 [53.8%] males and 222 [46.2%] females) students (93.7%) were evaluated. The prevalence of headache was 58.7%, the prevalence of migraine, and tension-type headache was 14.2% (10.5% in male vs. 18.5% in female, $P = 0.08$) and 44.2% (49.2% in male vs. 39.2% in female, $P = 0.006$), respectively. A family positive history was found in 9.5% of students with headache. The lower socio-economic status, year of study (3rd and 5th year students), was seemed to had higher prevalence in students with headache. There was no significant difference between headache and concomitant disease. **Conclusion:** The results demonstrate that prevalence of headache is high among medical student. Socio-economic and the year of study might be significant factors in the prevalence of headache. Further multicenter studies would be necessary to evaluate headache epidemiology among medical students in the whole country.

Key words: Headache, Iran, Isfahan, medical students, prevalence

INTRODUCTION

Headache is one of the most common complaints during medical curriculum and it occurs due to numerous psychological and physical stressors, which are more common in medical students than general population.^[1] Frequent and severe headache have a major impact on academic performance and quality of life, and may bring about limitation in daily activities and work.^[2-5] The problem may also influence the students' future job performance, causing a large burden for individual and the society, considering the role of medical students in improving the community's health.^[5] On the other hand, since the mechanisms of migraine and tension-type headache (TTH) are still elusive,^[6,7] epidemiological studies on specific populations are needed to help clinicians and researchers find the origin of pain and the factors influencing the frequency of headache.^[8]

Several epidemiological studies have shown a high prevalence of headache among medical students. The prevalence rates of migraine and TTH have been reported in the range of 11-40% and 5.6-40.8% in different countries, respectively.^[2-4,9-13] As mentioned,

several studies have been performed on medical students as the target population. Considering this and also scarcity of the data on headache epidemiology in our society, the current study was conducted as the first epidemiological study to evaluate the frequency of different types of headache and its associated factors among medical students in Iran.

MATERIALS AND METHODS

This cross-sectional study was conducted in Isfahan University of Medical Sciences, Isfahan, Iran from September 2011 to January 2012. First- to seven-year medical students who have experienced some forms of headache in their life and had headache attacks during the past 6 months were included in this study. Prior to the study, all participants signed an informed written consent. Exclusion criteria were as follows: (1) Students who completed less than half of the structured questionnaire; (2) having headache not classified according to the criteria of the International Headache Society (IHS);^[14] (3) short-term headache; and (4) those in which the diagnosis was not confirmed by the neurologist. The study protocol was approved by the Ethics Committee of Isfahan University of Medical

Address for correspondence: Dr. Mahboobeh Fereidan-Esfahani, Isfahan MS Society, No. 2, Behesht Building, Bozorgmehr Ave., Isfahan, Iran.
E-mail: mf.esfahani@yahoo.com

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Sciences. The informed consent was prepared by the local Scientific Ethical Committee of Isfahan University of Medical Sciences in accordance with the ethical standards of the 2000 revision of the Declaration of Helsinki.

The data was collected using a structured check list, which was designed in two parts. The first part consisted of demographic data such as age, gender, medical curriculum, family socio-economic condition, medical history, and family history of headache. The second part included items on headache characteristics to determine the headache type according to the second edition of the IHS criteria. In addition, a neurologist performed a complete neurological evaluation for students who reported migraine or TTH in their questionnaires to confirm the type of headache diagnosis. The students with migraine were sub-classified into migraine with aura and migraine without aura. However, episodic and chronic TTH were not differentiated. The statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software, version 20.0 (SPSS, Inc., Chicago, IL, USA).

The differences among groups were assessed using Chi-square and *t*-test. *P* value less than 0.05 were considered statistically significant.

RESULTS

On a total of the 512 students, who were included in the study, 498 students completed the questionnaire. The neurologist did not confirm the diagnosis for 18 participants who reported migraine and TTH in their questionnaires and they were excluded from study. A total of 480 (93.7%) students were included in the final analysis. 258 males (53.8%) and 222 females (46.2%) (male-to-female ratio, 1.2:1) were enrolled. The mean age of students was 23.9 ± 3.6 years, ranging from 18 to 31 years.

On a total of the participants, 50 (10.4%), 54 (11.3%), 70 (14.6%), 76 (15.8%), 66 (13.8%), 72 (15%), and 92 (19.2%) were 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th year students, respectively.

Among the participants, 58.7% had headache (male-to-female ratio, 1.2:1). The mean age of headache sufferers and non-sufferers were 24.1 ± 3.8 and 24 ± 3.7 years, respectively, and two groups were not significantly different in this respect ($P = 0.77$) (confidence interval 95% = -0.58 to 0.78).

Table 1 shows distribution of headache type by gender. Women had a higher frequency of migraine than the men (18.5% vs. 10.5%), while TTH was more common in men (49.2% vs. 39.2%). In addition, 41.2% of migraine cases were with aura and 58.8% were without aura. According to the Chi-square test, there was statistical difference between the gender and type of headache ($P = 0.004$).

The difference between socio-economic condition of those students with headache and those without was statistically significant [Table 2] ($P < 0.001$).

The highest frequency of TTH was observed among 5th year students, while the highest frequency of migraine was among 3rd year students and there was significant difference in distribution of headache based on the year of study ($P = 0.001$).

A positive family history of headache was found in 0.5%, 20.6%, and 6.1% of students without headache, with migraine, and with TTH, respectively, and there was statistically significant association between positive family history and the type of headache ($P < 0.001$).

We found no concomitant disease in 419 (87.3%) students. In contrast, we found 61 (12.7%) participants with concomitant diseases such as psychological disorders (11 cases), anemia (7 cases), arthritis (7 cases), thyroid disorders (5 cases), weight loss (7 cases), trauma (6 cases), gastrointestinal disorders (9 cases), and other disease (9 cases). There was no statistically difference between headache and concomitant disease ($P = 0.25$).

DISCUSSION

Here, in this report, headache was found to be common in medical students of Isfahan University of Medical Sciences with the overall prevalence of 58.7%. A number of studies on medical students have similarly shown high prevalence of headache.^[8,9,15] The generally believed higher prevalence rate of headache among women, reflected by several studies, was not observed in our subjected population. This may be due to the higher number of male student included in the study (male-to-female ratio, 1.2:1).

The prevalence of 14.2% for migraine in our study is similar to that (12.6%) reported by Balaban *et al.*^[13] among medical

Table 1: Prevalence of different type of headache according to gender

Diagnosis	Male (%)	Female (%)	Total (%)	<i>P</i> value*
Migraine	27 (10.5)	41 (18.5)	68 (14.2)	0.08
Tension-type headache	127 (49.2)	87 (39.2)	214 (44.6)	0.006
Never had headache	104 (40.3)	94 (42.3)	198 (41.3)	0.47
Total	258 (100)	222 (100)	222 (100)	0.016

*Chi-square test

Table 2: Prevalence of different type of headache according to socio-economic condition

Diagnosis	Lower (%)	Middle (%)	Upper (%)
Migraine	12 (12.8)	38 (44.1)	18 (15.5)
Tension-type headache	53 (56.4)	127 (47)	34 (29.3)
Never had headache	29 (30.9)	105 (38.9)	64 (55.2)
Total	53 (56.4)	127 (47)	116 (29.3)

students of Sivas university, Turkey. Nevertheless, the rate was higher than that of 2.4% reported by Mitsikostas *et al.*^[8] among medical students in Athens and 6.4% by Ojini *et al.*^[9] from the University of Lagos in Nigeria. The females are more affected by migraine in our study (male-to-female ratio, 1:1.5) as published, previously.^[2,4,8-10,12]

In the current study, TTH was more frequent than migraine in both sexes. Different prevalence rates of TTH have been obtained in several epidemiological studies, ranging from 5.9% to 34.5% in males and from 11.1% to 40.8% in females.^[8,12,16] In our experience, TTH accounted for 44.2% of the subjects. The prevalence rate of TTH was higher than those in the majority of similar studies,^[8,9,11,12,17] except the recent work by Ferri-de-Barros *et al.*,^[10] with the rate of 64.7% among Brazilian medical students. This might be due to the socio-economic condition in the developing countries especially, for those of medical students who have no certain income for 7 years. In their earlier study on headache in Khoramabad, Iran, Bahrami *et al.*^[18] reported a prevalence figure of 31.6% for TTH in the general population. However, since the target population and age coverage was thoroughly different from the current study, the results could not be compared. Although, most studies supported the female predominance of TTH,^[19-21] in our experience it was more frequent among males. This is in agreement with the findings of the study carried out in Oman^[12] reporting a female-to-male ratio of 1:1.3. In our society, men play the pivotal role to provide the financial outcome of the family, so the concern of male students about their occupation can be associated with higher TTH rates than that in females. These inter-study differences in the prevalence of migraine and TTH may be due to differences of ethnicities, genetic/individual backgrounds, and study designs.

Taking all the results together, Stovner^[22] estimated the frequency of migraine (with or without aura) and TTH as 11% and 42%, respectively, which is in line with our results.

Several studies have reported the effect of age on different types of headache.^[23] Considering the limited age range in this study; we did not observe any effect of age among sufferers from migraine and TTH.

Association between socio-economic status and headache has been reported in various studies. Our data are in agreement with Hagen *et al.*^[24] that reported an association between lower socio-economic status and the risk of headache. Nevertheless, this needs further research to seek for any association between this factor and headache. Owing to the cultural differences among various societies, this item should be cautiously applied to other populations.

Our results show that the prevalence of headache in 3rd year students is significantly higher than that in other students. This might be explained by the fact that in our educational

system, 3rd year medical students prepare themselves for basic-science exam, causing stress in this year of medical curriculum.

Total students with headache, 12.7% reported concomitant diseases and the frequency of some diseases, e.g., psychological disorders and anemia were increased in students with headache.

Most of the studies showed that a high-percentage of students had a positive family history of headache. Consistently in our report, 10% of students with headache had a positive family history being less than that reported by Ojini *et al.* (22%).^[9] A significant linkage was found between migraineurs and positive family history of headache. This highlights the role of genetics in this regard. In the current study, 20.6% and 6.1% of students with migraine and TTH had positive family history of headache, respectively. This is less than those reported previously.^[12,15,19] The reason for a relatively lower frequency of positive family history of headache in our study is elusive, though, the high prevalence of TTH, which is actually associated with certain individual, psychosocial, and environmental conditions, might be regarded as an explanation.

One of the strengths of our study is that our participants were directly examined by a neurologist so that inaccurate diagnosis could be minimized.

CONCLUSIONS

In conclusion, the results of this study suggest that prevalence of headache is high among medical students in Isfahan and TTH is its most common type. Migraine was found more among females and TTH more among males. Socio-economic and the year of study might be significant factors in the prevalence of headache. Of note, our study population was not completely representative of the all the medical students of Iran. Hence, further multicenter studies are necessary to evaluate the epidemiology of headache among medical students of the country.

REFERENCES

1. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med* 2006;81:354-73.
2. Kurt S, Kaplan Y. Epidemiological and clinical characteristics of headache in university students. *Clin Neurol Neurosurg* 2008;110:46-50.
3. Demirkirkan MK, Ellidokuz H, Boluk A. Prevalence and clinical characteristics of migraine in university students in Turkey. *Tohoku J Exp Med* 2006;208:87-92.
4. Bicakci S, Bozdemir N, Over F, Saatci E, Sarica Y. Prevalence of migraine diagnosis using ID Migraine among university students

- in southern Turkey. *J Headache Pain* 2008;9:159-63.
5. 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.
 6. Geppetti P, Rossi E, Chiarugi A, Benemei S. Antidromic vasodilatation and the migraine mechanism. *J Headache Pain* 2012;13:103-11.
 7. Millea PJ, Brodie JJ. Tension-type headache. *Am Fam Physician* 2002;66:797-804.
 8. 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.
 9. 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.
 10. Ferri-de-Barros JE, Alencar MJ, Berchielli LF, Castelhana Junior LC. Headache among medical and psychology students. *Arq Neuropsiquiatr* 2011;69:502-8.
 11. 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.
 12. 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.
 13. Balaban H, Semiz M, Şentürk IA, Kavakçı Ö, Cınar Z, Dikici A, *et al.* Migraine prevalence, alexithymia, and post-traumatic stress disorder among medical students in Turkey. *J Headache Pain* 2012;13:459-67.
 14. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. *Cephalalgia* 2004;24:9-160.
 15. 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.
 16. 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.
 17. da Costa MZ, Soares CB, Heinisch LM, Heinisch RH. Frequency of headache in the medical students of Santa Catarina's Federal University. *Headache* 2000;40:740-4.
 18. Bahrami P, Zebardast H, Zibaei M, Mohammadzadeh M, Zabandan N. Prevalence and characteristics of headache in Khoramabad, Iran. *Pain Physician* 2012;15:327-32.
 19. Kaynak Key FN, Donmez S, Tuzun U. Epidemiological and clinical characteristics with psychosocial aspects of tension-type headache in Turkish college students. *Cephalalgia* 2004;24:669-74.
 20. Rasmussen BK. Epidemiology of headache. *Cephalalgia* 2001;21:774-7.
 21. Lavados PM, Tenhamm E. Epidemiology of tension-type headache in Santiago, Chile: A prevalence study. *Cephalalgia* 1998;18:552-8.
 22. Stovner LJ. Headache epidemiology: How and why? *J Headache Pain* 2006;7:141-4.
 23. Amayo EO, Jowi JO, Njeru EK. Migraine headaches in a group of medical students at the Kenyatta National Hospital, Nairobi. *East Afr Med J* 1996;73:594-7.
 24. Hagen K, Vatten L, Stovner LJ, Zwart JA, Krokstad S, Bovim G. Low socio-economic status is associated with increased risk of frequent headache: A prospective study of 22718 adults in Norway. *Cephalalgia* 2002;22:672-9.

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