

Prevalence and characteristics of migraine in medical students and its impact on their daily activities

Bindu Menon, Neeharika Kinnera¹

Department of Neurology, Narayana Medical College and Superspeciality Hospital, ¹MBBS Student, Narayana Medical College, Nellore, Andhra Pradesh, India

Abstract

Background: Migraine is a common neurological disorder with significant impact on quality of life. The aim of this study was to investigate the prevalence and characteristics of migraine headaches in medical students, to measure its impact on their life, and to assess their knowledge about the ailment. Information about lifestyle variables was also collected. **Materials and Methods:** All medical students who confirmed of having headache for more than 1 year formed the study group. Students filled a detailed questionnaire focusing on demographics, pain characteristics, accompanying factors, triggers, and family history of migraine. Lifestyle variables were enquired and migraine associated disability was assessed by MIDAS (Migraine Disability Assessment). The diagnosis of migraine was made according to the International Headache Society criteria. Results are expressed in n = numbers and percentage. **Results:** Sixty-eight percent of medical students had headache. The prevalence of migraine in the whole cohort was 28%; however, of the headache group, migraine constituted 42%. There was a female preponderance. One-fourth of the students had weekly or daily attacks with 31% students reporting increase in their headache intensity and frequency. Forty-four percent of students had severe headaches. Dizziness, allodynia, and neck stiffness were reported as accompanying symptoms. Trigger factors were identified in 99% students, predominant of which were poor sleep hygiene, environmental changes, head movements, and mental stress. Only 4% of students did regular exercise. Twenty-seven percent of students reported self-medication use of analgesics. One-fourth of the students had migraine-associated disability but only 6% realized that they had migraine. **Conclusion:** Our study found a high prevalence of headache with migraine in medical students. The students' awareness of the disease was very low with one-fourth of the students resorting to self-medication. Our study identified previously less-recognized triggers like head movement and accompanying symptoms like neck stiffness. Migraine-attributed burden was high in medical students.

Key Words

Impact on life, medical students, migraine

For correspondence:

Dr. Bindu Menon, Department of Neurology, Narayana Medical College and Superspeciality Hospital, Chintareddyapalem, Nellore-2, Andhra Pradesh, India. E-mail: bneuro_5@rediffmail.com

Ann Indian Acad Neurol 2013;16:221-5

Introduction

Headache is a common neurological disorder, which is associated with a significant disease burden. Headache affects work, social and leisure activities and has a tremendous impact on a person's life.^[1,2] The unpredictable nature of the disease leads to frequent absenteeism or decreased productivity at work.^[3] The episodic form of migraine if not treated can transform to chronic form. Chronic pain affects the quality of life (QOL).^[4] Students frequently use analgesics rather than specific anti-headache treatment, which leads to analgesic

abuse headache further impairing QOL.^[4,5] Prevalence of migraine in university students has varied between 12.6% and 48%.^[3,5-7] This difference could possibly be attributed to differences in environmental, socio-demographic, lifestyle, and genetic aspects.

Targeted population studies for any disease will help us in identifying the high-risk group in the sample studied, identifying the trigger factors, and also in knowing its impact on their QOL. Medical college lasts for 5 years. Prevalence of migraine has not been a subject of investigation in medical students in India. In this study, we aimed to investigate the prevalence and characteristics of migraine headaches in medical students, to identify trigger factors, and to know its impact on the activities of daily living and to assess their awareness about the disease.

Materials and Methods

The study was conducted in a medical college, which is attached to a superspeciality hospital in South India. This was

Access this article online

Quick Response Code:



Website:

www.annalsofian.org

DOI:

10.4103/0972-2327.112472

a questionnaire-based study conducted between 1st July 2011 and 31st August 2011. The target population was the MBBS students. All medical students from first year to final year who confirmed having headache for more than 1 year were included in the study. Students unwilling to participate and diagnosed cases of secondary headaches were excluded.

Subjects included both male and female students from all ethnic backgrounds. All students were distributed a uniform headache questionnaire and students who confirmed having headache completed the proforma. The purpose of the study was informed by the primary author to all the students before distribution of the questionnaire. The questionnaire was distributed to the students during their working hours in the college and the completed responses were collected on the spot. No names were requested from the students. Both the authors were present in the classroom for any clarification.

The questionnaire covered areas of demographics, character of pain, frequency, duration and intensity of the attacks, accompanying factors, trigger factors, family history of migraine or any other illness, and to know migraine-related disability, their knowledge about the ailment. The questionnaire also included their general lifestyle. Pain intensity was assessed by the visual analogue scale (VAS). MIDAS (Migraine Disability Assessment) was used to know the impact of headache. Each questionnaire was duly studied and the diagnosis of migraine was made according to the International Headache Society criteria.^[8] Data was tabulated and analyzed. Results are expressed in n = numbers and percentage. The study was approved by the Institutional Ethical Committee.

Observations and Results

A total of 500 students were included in the study; 422 students confirmed of having headache and agreed to fill the questionnaire. Eight-two students were excluded after evaluating their questionnaire. They had reported a single episode of headache lasting for a few seconds to minutes, triggered by a vague daily event. Hence 340 students (68%) had headache. Of the 340 students, 144 (42%) fulfilled the criteria for migraine according to the IHS criteria. The rest (57%) had other forms of headaches. [Figure 1]

Migraine was seen in 28% of medical students. In the subgroup of students having headache, migraine constituted 42%. There

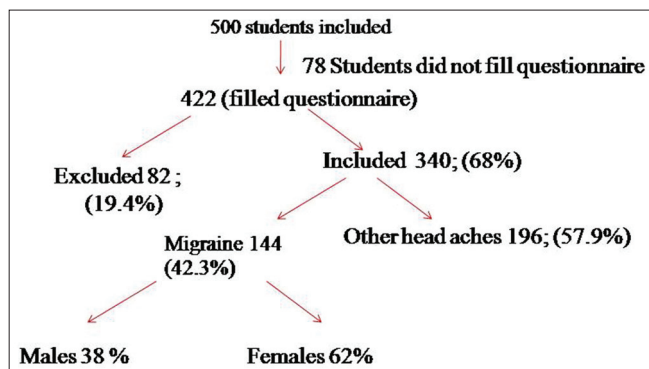


Figure 1: Flow chart showing an overview of students included in the study

was a female preponderance of 62%. The frequency of attacks were one per month in 40% of students and once in three months in 28%, while weekly and daily attacks were seen in 19% and 6% students, respectively. The remaining 7% could not report any fixed frequency. Of these, 91% students felt that their headaches lasted for hours while for 9% it lasted for days.

Thirty-one percent of students felt that their headache had increased in intensity and frequency since the beginning. Forty-four percent of migraine headaches were more than 5 VAS. None had pain severity of VAS 10. However, only 14% students went to emergency services because of the severe headache. Photophobia, phonophobia, nausea, and vomiting were the most common accompanying symptoms. Vertigo along with headache was seen in 30% of students; however, whether this was vestibular migraine could not be ascertained as this was a questionnaire-based study. The other accompanying factors are shown in Figure 2. "Others" included in the figure were drooping of eyelids, diarrhea, feverishness, drowsiness, speech disturbance, swelling of ankles, tearing of eyes, etc. Nine percent of students had history of motion sickness in the past. Trigger factors could be identified in all except one student; 79% students had more than one identifiable trigger factor. Table 1 depicts the trigger factors of which the prominent were poor sleep hygiene, environmental changes, head movements, and mental stress. Other less common identified factors were missing meals, exertion, and journey. Students experienced relief from migraine after sleep (68%), vomiting (11%), and with food intake (6%). Responses about lifestyle revealed that one-fourth of the students slept for less than 6 hours. Level of physical activity assessment showed that only 4% of students did daily exercise, 33% did not have any form of exercise; and the rest did mild to moderate form of exercise infrequently. The most common exercise was walking followed by running and yoga. Forty-six percent of students frequently missed meals. One-fourth of students used analgesics. Type and frequency of analgesic use was not part of the questionnaire. None were on triptans or prophylactic medicines. Family history of migraine was seen in 31%. A neurologist was consulted by only 11% students, while a large proportion of students (41%) did not feel the need for any consultation. Thirty percent of students attributed their headache to stress, while only a small proportion (6%) attributed it to migraine. Headache

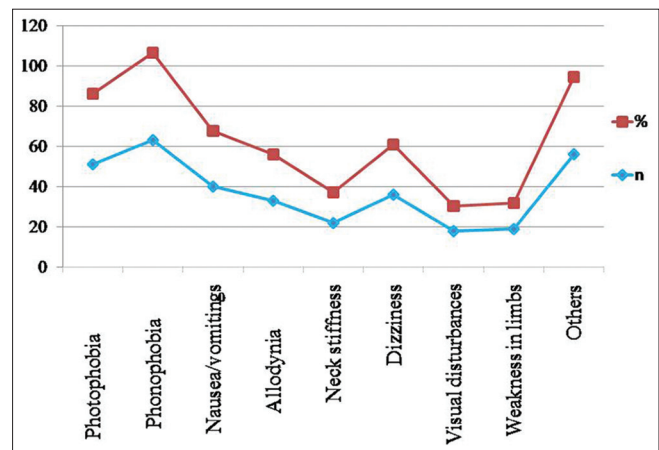


Figure 2: The accompanying factors of migraine in the medical students

Table 1: The trigger factors in medical students with migraine

Triggers	N	%
Sleep disturbance	77	53.4
Weather/Climate	71	49.3
Head movements	62	43.0
Mental stress	61	42.3
Missing a meal	51	35.4
Journey	40	27.6
Exertion	36	25.0
Prolonged computer use	29	20.0
Strong odors	26	18.0
Hair wash	21	14.5
Menstrual periods	13	9
Caffeinated beverage	12	8.3
Certain foods	8	5.0

aggravated by routine activities was seen in 84% of students. MIDAS questionnaire addressed the impact of migraine. College absenteeism was documented in 22% students with days ranging between 1 and 20 days, while 23% had decreased productivity of their work by half. Eighteen percent of students had to miss family, social, and leisure activities.

Discussion

Headache is a common complaint across all age groups and recurrent headaches causes a considerable burden on the individual as well as the society. Headache affects the student's academic and social life. A population-based study showed that 46% of adult population had active headache with 11% being migraine.^[9] Our study showed that 68% of medical students suffered from headache. Previous studies in university and medical students have shown headache prevalence between 33% and 98%.^[10-12] 42% of the students complaining of headache in our study group conformed to the diagnosis of migraine. There have been earlier studies reporting similar prevalence in the same population.^[10,11] Migraine was twice as frequent in females being 62% as compared with 38% of male students as reported in earlier studies.^[5,13]

The most characteristic headache was pulsatile or the throbbing headache, which was seen in 80% of students as seen in previous studies.^[13] The impact of migraine on a person can be assessed by the frequency of pain, severity, and the accompanying factors. Frequency and severity of migraine was high in the students. However, only one-fourth of them approached health services for treatment. A previous study in medical students also demonstrated that only 4.6% sought medical assistance with a substantial (68.2%) number taking simple analgesics for pain relief.^[5] One possible explanation could be that the accompanying symptoms are so prominent, which make the person approach other specialties. This scenario is especially alarming given the fact that they being medical students probably have knowledge of illness and easy access to health services. Episodic migraine if not addressed in time may likely evolve to chronic migraine.^[13,14] Indeed, this was reflected in our students where one-third of the students reported increased headache frequency and severity. None of the patients were on migraine-specific treatment or on prophylaxis. However

one-fourth of the students resorted to analgesics for pain relief. Whether these students had analgesic abuse could not be ascertained from the questionnaire.

In addition to pain, associated symptoms were common. Our study showed photophobia, phonophobia, nausea, and vomiting as the most common accompanying symptoms reported previously.^[15] Other reported symptoms were dizziness, allodynia, and neck stiffness. These accompanying symptoms increase the disability of the patient and are occasionally more troublesome for the patient. Indeed, if accompanying symptoms are more prominent than headache, known as migraine variant, the diagnosis can be difficult, delaying the treatment. Bad posture may be a possible reason for neck pain in 15% of the students. This leads to delay in treatment, increasing the pain burden.^[16] In fact, a recent study found that 63% of individuals with migraine and tension-type headache had muscular pain around the neck and shoulder region.^[17] Neck pain was found to be a commoner symptom than the habitual nausea, and perhaps awareness of this symptom will definitely increase the diagnostic accuracy.^[16] One-fourth of the students also had vertigo with migraine, raising the possibility of vertiginous migraine. However, as ours was a questionnaire-based study, we could not be definite whether it was a co-morbid phenomenon given the fact that both symptoms are very common in the general population. Vestibular migraine is the second common cause of vertigo and a common cause of spontaneous vertigo. The presence of vertigo is a diagnostic challenge, as occasionally vestibular migraine can present with vertigo and other features without headache.^[18] Allodynia, i.e. perception of non-painful stimuli as painful was reported by 23% of students. We determined only the acute allodynia and not the interictal form. Students reported scalp tenderness while combing hair and facial tenderness during migraine attacks. The presence of allodynia has been associated with more frequent, severe, and disabling headaches.^[13] Presence of allodynia is a clinical correlate to central sensitization. Hence, the recognition of allodynia by the patient and the treating physician is crucial as these patients respond to triptans before or soon after the onset of allodynia.^[19,20]

Nine percent of the students had history of motion sickness in the past. There is evidence of motion sickness being a co-morbid phenomenon in migraine. Whether individuals with motions sickness have heightened susceptibility to develop migraine later in life, however, is questionable.^[21]

Trigger factors are common in migraine patients. The population under study is subject to various stress factors, and recognition of trigger factors will achieve headache remission in a vast majority of students. Trigger factors in our study group were poor sleep hygiene, emotional stress, weather changes, and head movements. In fact, 68% students did feel relieved of their headaches after sleep. Previous studies have reported sleep disturbance and emotional stress as triggers for migraine.^[11,22] However, weather changes and head movement were not as prominent as in our study. This could partly be due to climatic variations in the study group. Study area is situated 14° 27' N and 80° 02' E with a generally hot and humid climate all through the year. A few other studies have shown weather and barometric

change as trigger factors.^[23,24] Head movement has not been cited as a common migraine trigger factor.^[25] Head and neck movement could be categorized as cervical triggers, which increase the peripheral sensitization from the cervical afferents. The type of head movement was not elucidated in the format due to time constraints. There are recent studies, however, which enlighten the fact that active trigger points in the head and neck areas can be involved in the initiation and propagation of migraine.^[26] This factor probably needs more elaboration in further studies. Apart from being trigger factors, head and neck movements have also been shown to aggravate migraine headaches.^[27] Although movements as aggravating factors of headache were not listed in our study, our patients did have neck pain/stiffness. Hence, we believe that neck/head movement can act as a trigger and also be a part of migraine diathesis. Odors as a trigger factor were seen in 18% of students which has been described in the past.^[28-30] Olfactory hallucination or osmophobia can occur as a symptom complex in migraine. Indeed, a study did address this issue and they found that migraine may induce olfactory symptoms; olfactory pathology can trigger migraine or a common pathogen may induce both olfactory dysfunction and migraine.^[31,32] However, our questionnaire did not address olfaction as a symptom complex but as a trigger factor only. Our study also documented a previously reported head bath as a trigger factor in the Indian population in 14.5% of our students.^[33] Bath-related headache (BRH) is a rare primary headache syndrome described in the past.^[34] Triggers are subject to regional variations. In India "hair wash" or "head bath" has been found as an unusual trigger for migraine. However, the pathophysiology behind the trigger has not been identified.^[35] Commonly cited trigger factors like cheese, chocolate, and pizza were not significant in our population, but this could be due to the different dietary habits in this area. Previous studies have also observed that dietary factors have not been a significant trigger factor for migraine in India.^[23]

Trigger factors vary with type of population under study and the geographical area, and one needs to be aware of them for effective counseling for migraine patients. The modifiable trigger factors in the study group were sleep pattern, emotional stress, head movements, and resorting to timely food intake; non-modifiable triggers were weather changes, menstrual cycles, hair wash, and journey. Occasionally, severe lifestyle restriction may lead to more stress. The same may be with the custom of hair wash in India, which probably may be difficult to modify. However, one can prevent it by taking prophylactic medications. Moreover, our study showed that there was clustering of trigger factors seen in students and addressing each trigger could considerably reduce the frequency of attacks.

Family history of headache was seen in 31% students, previous studies reporting between 22.0% and 80%.^[5,11] A section of the questionnaire was regarding the lifestyle of the students. We found an alarmingly low 8% students only did exercise on a daily basis. Students with low physical activity are at risk of recurrent headaches.^[36] In fact, a recent study also concluded exercise as an alternative to prophylactic treatment of migraine.^[37] Hence, it may probably be worthwhile to have the educational curriculum include physical exercise or games, which will help prevent headaches and also other fatal diseases.

Migraine-related disability was high in medical students. Studies have confirmed the burden of migraine on the person, family,^[38,39] and work output.^[7] Our study had a few limitations. We did not address the aura component and did not sub-classify the migraine forms. However, these shortcomings do not affect the main purpose of the study. The strength of the study was that it was a self-reported blinded study with a good response rate.

Our study reports a high prevalence of headache and migraine in medical students, which has not yet been addressed in this country. Although the migraine-related disability was very high, the awareness of the disease was very low. There were identifiable triggers in the population, which can be tailored for the treatment. This pilot study will further help primary care providers to address patient education in this population as well as to assist patients in properly managing their headaches. Further larger studies should be planned to have more in-depth knowledge of migraine in the student population.

References

- Leonardi M. The global burden of migraine: Measuring disability in headache disorders with WHO's Classification of Functioning, Disability and Health (ICF). *J Headache Pain* 2005;6:429-40.
- Linde M. Attitudes and burden of disease among self-considered migraineurs: A nation-wide population-based survey in Sweden. *Cephalalgia* 2004;24:455-65.
- 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.
- Muñoz P, Castillo J, Pascual J. Quality of life in chronic daily headache: A study in a general population. *Neurology* 2002;58:1062-5.
- 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.
- Balaban H, Semiz M, Sentürk IA, Kavakçı O, 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.
- Souza-e-Silva HR, Rocha-Filho PA. Headaches and academic performance in university students: A cross-sectional study. *Headache* 2011;51:1493-502.
- Headache Classification Subcommittee of the International Headache Society. "The International Classification of Headache Disorders: 2nd edition". *Cephalalgia* 2004;24 Suppl 1:9-160.
- 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.
- 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.
- 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.
- 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.
- Lipton RB, Bigal ME. The classification of migraine. In: Olesen J, editor. *Classification and diagnosis of headache disorders*. New Delhi: Oxford University Press; 2006. p. 53-61.
- Chakravarty A. Chronic daily headache: Clinical profile of Indian patients. *Cephalalgia* 2003;23:348-53.
- Bokhari FA, Sami W, Shakoori TA, Ali SA, Qureshi GA. Clinical

- characteristics of 226 college-going female migraineurs in Lahore, Pakistan - putting ICHD-2 to the road test. *NeuroEndocrinol Lett* 2008;29:965-70.
16. Calhoun AH, Ford S, Pruitt AP. Presence of neck pain may delay migraine treatment. *Postgrad Med* 2011;123:163-8.
 17. Blaschek A, Milde-Busch A, Straube A, Schankin C, Langhagen T, Jahn K, *et al.* Self-reported muscle pain in adolescents with migraine and tension-type headache. *Cephalalgia* 2012;32:241-9.
 18. Neuhauser H, Lempert T. Vestibular migraine. *Neurol Clin* 2009;27:379-91.
 19. Burstein R, Jakubowski M. Managing migraine associated with sensitization. *Handb Clin Neurol* 2010;97:207-15.
 20. Landy S, Rice K, Lobo B. Central sensitisation and cutaneous allodynia in migraine: Implications for treatment. *CNS Drugs* 2004;18:337-42.
 21. Lateef TM, Cui L, Nelson KB, Nakamura EF, Merikangas KR. Physical Comorbidity of Migraine and Other Headaches in US Adolescents. *J Pediatr* 2012;161:308-13.e1.
 22. Andress-Rothrock D, King W, Rothrock J. An analysis of migraine triggers in a clinic-based population. *Headache* 2010;50:1366-70.
 23. Yadav RK, Kalita J, Misra UK. A study of triggers of migraine in India. *Pain Med* 2010;11:44-7.
 24. Kimoto K, Aiba S, Takashima R, Suzuki K, Takekawa H, Watanabe Y, *et al.* Influence of barometric pressure in patients with migraine headache. *Intern Med* 2011;18:1923-8.
 25. Ierusalimschy R, Moreira Filho PF. Precipitating factors of migraine attacks in patients with migraine without aura. *Arq Neuropsiquiatr* 2002;60:609-13.
 26. Fernández-de-Las-Peñas C, Cuadrado ML, Pareja JA. Myofascial trigger points, neck mobility and forward head posture in unilateral migraine. *Cephalalgia* 2006;26:1061-70.
 27. Martins IP, Gouveia RG, Parreira E. Kinesiophobia in migraine. *J Pain* 2006;7:445-51.
 28. Carod-Artal FJ, Ezpeleta D, Martín-Barriga ML, Guerrero AL. Triggers, symptoms, and treatment in two populations of migraineurs in Brazil and Spain. A cross-cultural study. *J Neurol Sci* 2011;304:25-8.
 29. Karli N, Zarifoglu M, Calisir N, Akgoz S. Comparison of pre-headache phases and trigger factors of migraine and episodic tension-type headache: Do they share similar clinical pathophysiology? *Cephalalgia* 2005;25:444-51.
 30. Lima AM, Sapienza GB, Giraud Vde O, Fragoso YD. Odors as triggering and worsening factors for migraine in men. *Arq Neuropsiquiatr* 2011;69:324-7.
 31. Hirsch AR. Olfaction in migraineurs. *Headache* 1992;32:233-6.
 32. Zanchin G, Dainese F, Mainardi F, Mampreso E, Perin C, Maggioni F. Osmophobia in primary headaches. *J Headache Pain* 2005;6:213-5.
 33. Ravishankar K. 'Hair wash' or 'head bath' triggering migraine - observations in 94 Indian patients. *Cephalalgia* 2006;26:1330-4.
 34. Mak W, Tsang KL, Tsoi TH, Au Yeung KM, Chan KH, Cheng TS, *et al.* Bath-related headache. *Cephalalgia* 2005;25:191-8.
 35. Ravishankar K. Hair-wash headache'-an unusual trigger for migraine in Indian patients. *Cephalalgia* 2005;25:1184-5.
 36. Robberstad L, Dyb G, Hagen K, Stovner LJ, Holmen TL, Zwart JA. An unfavorable lifestyle and recurrent headaches among adolescents: The HUNT study. *Neurology* 2010;75:712-7.
 37. Varkey E, Cider A, Carlsson J, Linde M. Exercise as migraine prophylaxis: A randomized study using relaxation and topiramate as controls. *Cephalalgia* 2011;31:1428-38.
 38. MacGregor EA, Brandes J, Eikermann A, Giammarco R. Impact of migraine on patients and their families: The Migraine and Zolmitriptan Evaluation (MAZE) survey-Phase III. *Curr Med Res Opin* 2004;20:1143-50.
 39. 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.

How to cite this article: 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.

Received: 10-05-12, **Revised:** 10-06-12, **Accepted:** 31-08-12

Source of Support: This study has been conducted under the STS (short term studentship) project under the Indian Council of Medical Research., **Conflict of Interest:** Nil