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Original Article

Exploring the Prevalence and Pattern of Migraine and Tension Headache and Its Association with Depression among Medical Students

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Abstract

Background: *A migraine is a headache that can cause intense throbbing pain or a pulsing feeling usually on one side of the head and Tension Type Headache (TTH) is a neurological characterized by headache attacks ranging in severity from mild to moderate dull aching bitalteral pain around the temporal region feeling not onlike a pressing or tightening band around the forehad, neck, shoulder and sometimes behind the eyes. The purpose of the study was to explore prevalence and pattern of migraine and Tension Type of Headache (TTH) and its' association with depression among medical students at Chattagram Maa-O-Shishu Hospital Medical College.*

Materials and methods: *This cross sectional study included students of 1st year to 5th year which comprises 560 students. Among them 500 students answered a questionnaire from January to July 2024. The Students'' symptoms were classified as migraine or tension-type headache by the principal author according to the 2nd Edition of International Classification of Headache Disorders II criteria and students' depression was identified by PHQ questionnaire.*

Results: *The prevalence of headache among students was 71.6%. The prevalence of Migraine, and both migraine and TTH were 26.81%, 20.25% and 12.29% respectively. Compared to male students (42.45%), female students (57.54%) experienced headache much more frequently. Stress (74.86%) and lack of sleep (75.13%) were the leading triggering factors. About half of the students (54.6%) had mild to severe degree of depression and this depression is statistically significant with headache (p=0.000)*

Conclusion: *Our study has shown that relatively large percentage of medical students suffer from headache which was more frequent among female. Migraine and Tension Type of Headache (TTH) were more prevalent than other types. Mild to severe degree of depression was observed among the students. There is a strong association between depression and migraine and TTH.*

Key word: Depression; Migraine headache; Tension type of headache.

INTRODUCTION

Headache is the most common nervous system illness and represent a significant public health concern since they are the main cause of medical treatment sought by patients.[1,2] Individuals experiencing headaches frequently encounter reduced functionality in their daily tasks, commonly observed in domestic, professional, and educational settings.[3] Headaches pose considerable adverse impacts on the economic and societal structures of a nation.[4] Nearly half of the worldwide adult population experienced episodes of headaches within the past year, with these incidents classified into primary and secondary categories. Secondary headaches are linked to underlying medical etiologies, while primary headaches encompass cluster

headaches, migraines and Tension-Type Headaches (TTHs).[5] Cluster headache is not very common, affecting only 0.1% of the population.[6] Headaches are one of the most frequent concerns among medical students.[7] In south India, around 68% medical students suffered from headache.[8] In Bangladesh, prevalence of migraine among medical students is 19%.[9] Tension type of headache is also common in medical students. In Nepal, around 27% medical students suffered from tension type of headache. Headache among medical students has potential impact on academic performance and quality of life.[10] A research conducted in Dhaka, Bangladesh, indicated that 62.7% of individuals experiencing headaches manifested at least one psychiatric issue.[11] There is empirical evidence indicating a correlation exists between tension-type headache sufferers and the presence of concurrent conditions such as anxiety and depression.[12] In a review article by Amoozeger F stated that individuals diagnosed with migraines have an increased likelihood, ranging from 2 to 4 times, of developing Major Depressive Disorder (MDD) over their lifetime. This propensity primarily arises from shared underlying pathophysiological and genetic mechanisms between these conditions.[13] In Bangladesh, it was observed that 39.1% of students exhibited varying degrees of depression, with a higher prevalence among female students (45.6%) compared to male students (31.3%). Additionally, an inclination toward suicidal tendencies was identified in 18.8% of the student population.[14] Females exhibit a higher prevalence of depression compared to males and their experience of more severe pain attacks leads to evident disability. Consequently, women endure a greater comorbidity of headache and depression.[15] Depression is correlated with amplified disability linked to headaches, encompassing heightened frequency, severity, and susceptibility to chronicity. Moreover, this condition adversely impacts the overall quality of life among individuals affected by headaches.[16]

While numerous studies have established correlations between depression and both migraine and tension-type headaches, there is a lack of specific research conducted within the Chattogram Division of Bangladesh regarding this association. So, this study aims to find out the association between depression and both migraine and tension type of headache among medical students along with their prevalence.

MATERIALS AND METHODS

This cross sectional study was carried out in Chattagram Maa-O-Shishu Hospital Medical College from January 2024 to July 2024. Data was collected from medical students by using a structured pretested questionnaire (Research Instrument) containing all the variables of interest after taking consent from them. A sample comprising all medical students has been selected for the study. Those who gave consent were included under the study. The ethical clearance of the study was taken from the above institution. A total of 500 students answered the questionnaire.

The questionnaire was divided in three (3) sections. The first part of the questionnaire comprises demographic profiles of the students. The second section was about the pattern and characteristics of headache. The students' symptoms were classified as migraine or tension-type headache by the first author according to the 2004 International Classification of Headache

Disorders II criteria (Table I) and associated factors were evaluated.[17] Following that, participants were asked to complete the third part of the questionnaire, which comprises measurement of prevalence of depression using scales that have been validated (PHQ-9).[18] The PHQ-9 scale is a nine-item test that evaluates the presence andseverity of depression during the last two weeks. The PHQ-9 items are graded on a Likert scale of 0 (Not at all) to 3 (Nearly every day) for each item. According to the PHQ-9, depression scores were divided into fivegroups: Little or no depression (0-4) mild depression (5-9) moderate depression (10-14) moderate-severedepression (15-19) and severe depression (20-27).

The data were collected, reviewed, and then processed by Statistical Package for Social Sciences version 21 (SPSS 21). The categorical variables were analyzed by frequencies and percentage. A chi square test was used to find out the association between demographics and migraine, demographics with tension type of headache, depression with migraine and depression with tension type of headache.

RESULTS

Out of the total 560 students, 500 completed the questionnaire. The response rate was 89.28%.

Among 500 students, 211 (42.2%) were male and 289 (57.8%) were female. The rate of headache was 358 (71.6%) in which 152 (42.45%) were male and 206 (57.54%) were female. Among those with prevalence of headache (358), 86 (24.02%) were 1st year, 53(14.80%) were 2nd year,65 (18.15%) were 3rd year, 79 (22.06%) were 4th year and 75 (20.94%) were 5th year. Among 500 students, 178(35.6%) had positive family history (Table I)

The chi square test showed a statistically relationship between the sex of the students and the types of headache diagnosed. Female were more frequently diagnosed with migraines while male had a higher frequency of diagnosis in the "other" category (Table II).

There is also statistically significant association between the academic year and types of headache diagnosed. Students of 1sy year were more frequently diagnosed with TTH type of headache (29.48%). 2nd year were frequently diagnosed with migraine (68.75%). The 3rd and 5th year students had migraine with TTH 22.72% and 56.81 % respectively (Table II). The participants with positive family history of headache were more likely to be diagnosed with migraine (53.12%) and migraine with TTH (61.36%) compared to those without a family history.

Table I The demographic pattern of medical students (n=500)

Variables	Frequency	Percentage (%)
Gender		
• Male	211	42.2%
• Female	289	57.8%
Headache		
• Present	358	71.6%
A. Migraine	96	26.81%
B. TTH	78	20.25%
C. Migraine+ TTH	44	12.29%
D. Others	140	39.10%
• Absent	142	28.4%
Headache present	n= 358	
• Male	152	42.45%
• Female	206	57.54%

*Others refers to cluster type of headache, sinusitis, cold related headache, exertional headache.

Table II Association of type of headaches with gender, academic year and family history

Characteristics	Migraine n (%) n= 96	Tension Type Headache n (%) n= 78	Migraine+ Tension Type Headache n (%) n= 44	Others n= 140 (%)	Chi square	p value
Gender						
• Male	30 (31.25)	28 (35.89)	23 (52.27)	71 (50.71)	12.005	0.017
• Female	66 (68.75)	50 (64.10)	21 (47.72)	69 (49.28)		
Academic year						
• 1st	27 (28.12)	23 (29.48)	0 (0)	36 (27.71)	119.217	0.000
• 2nd	7 (68.75)	8 (10.25)	7 (15.90)	31 (22.14)		
• 3rd	14 (14.58)	14 (17.94)	10 (22.72)	27 (19.28)		
• 4th	23 (23.95)	13 (16.66)	2 (4.5)	41 (29.28)		
• 5th	25 (26.04)	20 (26.04)	25 (56.81)	5 (3.5)		
Family history						
• Yes	51 (53.12)	31 (39.74)	27 (61.36)	67 (47.85)	388.711	0.000
• No	45 (46.87)	47 (60.25)	17 (38.63)	73 (52.14)		

Among 358, a total of 96 (26.81 %) participants were diagnosed with migraine, 78 (20.25%) with TTH, 44 (12.29%) with migraine and TTH and 140 (39.10%) had headache due to other cause according to International Classification of Headache Disorders (2004) criteria. Though there were various triggering factors, stress 268 (74.85%), lack of sleep 269 (75.13%), sun exposure 181(50.55%), anxiety 133 (37.15%), excessive reading before examination 139 (38.82%) were the leading factors (Table III)

Table III Triggering factors associated with headache

Triggering factors	n= 358	Percentage (%)
• Stress	268	74.86%
• Anxiety	133	37.15%
• Lack of sleep	269	75.13%
• Excessive reading prior to examinations	139	38.82%
• Menstruation	35	9.77%
• Sun exposure	181	50.55%
• Noise	129	36.03%
• Weather changes	87	24.30%
• Coffee intake	7	1.9%
• Other factors	7	1.9%

Regarding the pattern of headache with Migraine (96), TTH (78) and Migraine with TTH (44), 111 (50.91) had unilateral and 73 (33.48%) had bilateral, 97 (44.49%) had pulsating, 54 (24.77%) had pressing type of headache. 47 (21.55) had headache that aggravated by climbing stairs or similar routine physical activities. Mild to moderate intensity of headache was present among 99 (45.41%) students and 126 (57.79%) had moderate to severe intensity of headache. 62 (28.44%) students had headache accompanied by nausea or vomiting or both and 116 (53.21%) had photophobia or phonophobia (Table IV).

Table IV Characteristics of headache among participants

Headache characteristics	Migraine n(%) n= 96	TTH n(%) n= 78	Migraine+ TTH n(%) n= 44	N (%) Total n=218
• Unilateral	55 (57.29)	26 (33.33)	30 (68.18)	111 (50.91)
• Bilateral	2 (2.08)	44 (56.41)	27 (61.36)	73 (33.48)
• Pulsating	71 (73.95)	6 (7.69)	20 (45.45)	97 (44.49)
• Pressing	6 (6.25)	36 (46.15)	12 (27.27)	54 (24.77)
• Mild to moderate intensity	10 (10.41)	56 (71.79)	33 (75)	99 (45.41)
• Moderate to severe intensity	72 (75)	22 (28.20)	32 (72.72)	126 (57.79)
• Nausea or vomiting or both	43 (44.79)	6 (7.69)	13 (29.54)	62 28.44)
• Photophobia or Phonophobia	73 ((76.04)	20 (25.64)	23 (52.27)	116 (53.21)
• Aggravated by climbing stairs or physical activities	32 (33.33)	5 (6.41)	10 (22.72)	47 (21.55)

259 (72.34%) participants consumed analgesics for headache. 204 (78.76%) preferred Paracetamol, 13 (5.01%) Aspirin, 10 (3.8%) Diclofenac, 13 ((5.01%) Ibuprofen, 14 (5.45%) Tolfenamic acid and 5 (1.9%) took Triptan. 143 (55.21%) self administered analgesics, 73 (28.18%) consumed analgesics prescribed by physicians.

Degree of depression among study participants was measured. Among 500 students, 273 (54.6%) had depression and 227 (45.4%) had minimal or no depression.

Considering the relation between depression and headache diagnosis, the result of chi square test indicated a statistically

significant association between headache and presence of depression. Individuals diagnosed with headache particularly Migraine and TTH are more likely to experience depression compared to those without thesediagnosis. Depression was most prevalent among "Other" headache types (63.57%) and least prevalent among those with absent headache (81.42%) (Table V).

Table V Association of headache with depression

Diagnosis	Depression		Chi square	p value
	Present n (%)	Absent n (%)		
No headache	28 (10.25)	114 (50.22)		
Migraine	72 (26.37)	24 (10.57)		
TTH	58 (21.24)	20 (8.81)	103.006	0.001
Migraine + TTH	26 (9.5)	18 (7.92)		
Others	89 (32.60)	51 (22.46)		
Total	273	227		

DISCUSSION

The current study was conducted to explore the prevalence and pattern of migraine and tension type headaches in MBBS students and to detect its association with depression.

The prevalence of headache was higher in females compared to male students. Al Ghadeer et al, revealed in his study that females suffered more from headache in comparison to males.[19] Migraine was more in 2nd year students, TTH was more in 1st year and migraine combined to TTH was prevalent in 5th year.

Prevalence of headache was triggered by stress (74.86%), lack of sleep (75.13%), anxiety (37.15%) followed by other various factors. Rafique N et al. of Saudi Arabia described in his research that high stress was significantly related with migraine in young adult females.[20] Pelzer N et, revealed in his study that stronger family history was associated with migraine lower age at al. onset.[21] Migraine combined with TTH had prevalent positive family history (53.12%) in contrast to those with migraine (53.12%) and TTH (39.74%) alone.

Use of Paracetamol (78.76%) was prevalent in comparison to other Analgesics among students. Pope C et al. mentioned in her article that Aspirin, Acetaminophen, Ibuprofen, Naproxen are first line treatments for headache.[22] In this study 55.21% consumed self-administered analgesics whereas in a study in India, 27% self-administered analgesics for headache.[23]

In our study, the prevalence of migraine, tension-type headache, migraine with TTH and other headaches were 26.81%, 20.25%, 12.29%, 39.10% respectively. Shrestha et al. at Nepal found that prevalence of migraine and TTH was found to be 15.3% and 40.3% respectively.[24]

In our study, unilateral localization 50.91% was observed more compared to Bilateral localization 33.48%. Unilateral headache was prevalent in those with migraine with TTH. Evans R.W. mentioned that bilateral migraine was predominant over unilateral.[25]

Pulsating (44.49%) was dominant over pressing (24.77%) type headache.Pulsating headache was more in those with migraine. Moderate to severe intensity (75%) of headache was more in migraine compared to others. Mild to moderate intensity (75%) of headache was prevalent in those with migraine combined with TTH.

Nausea or vomiting or both (44.79%), Photophobia or Phonophobia (76.04%), aggravation of headache on climbing or physical exertion (33.33) was prevalent among those with migraine in comparison to TTH or migraine with TTH. During the premonitory stage of a migraine attack, photophobia may start and continue. During an episode, up to 80% of migraine sufferers report having photophobia stated by Choi JY et al.[26]

Most of the medical students (54.6%) suffer from depression of mild to severe degree in this study. Research indicates that medical students are a unique cohort at risk for depression, with an average frequency of at least moderate depressive symptoms of 27.2% considerably higher than the general population.[27-29] Significant association of depression and headache (Migraine, TTH and both migraine and TTH) was found in this study which is more or less similar to that of a study done in Norway.[30]

LIMITATION

There are various limitations on this study. It is more difficult to determine the causal relationships between headaches and depression because of the cross-sectional design. The use of self-reported data may induce bias, and the lack of clinical confirmation in the headache type diagnosis could result in incorrect classification. Furthermore, it's possible that the study's conclusions are only applicable in the context of one medical college. The reliance on recollection may add bias, and confounding factors such as other medical diseases and psychiatric problems other than depression were not adjusted for. Lastly, even though the PHQ-9 was used to evaluate depression, it might not adequately convey the complexity of depressive symptoms, especially when they coexist with headache symptoms.

CONCLUSION

The study concludes that a considerable number of medical students experience tension-type and migraine headaches, and that there are strong correlations between the two types of headaches and variables including gender, academic year, family history, and stress and sleep deprivation that might trigger headaches. The study also discovered a significant correlation between headache disorders and depression, suggesting that students who experience tension-type headaches or migraines are at a higher risk of developing depression. These results highlight the need for focused interventions to address headache and mental health problems in medical students in order to enhance their general wellbeing and academic achievement. Nevertheless, more investigations utilizing clinical assessments and longitudinal frameworks are imperative to validate these correlations and investigate plausible causality.

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DISCLOSURE

All the authors declared no competing interest.

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