

Prevalence of Irritable Bowel Syndrome (IBS), Migraine and Co-Existing IBS-Migraine in Medical Students

IRIN PERVEEN¹, RUKHSANA PARVIN², MADHUSUDAN SAHA³, MD. SHAFIQU L BARI⁴,
MD. NAZMUL HUDA⁵, MRIDUL KANTI GHOSH⁶

ABSTRACT

Introduction: Irritable Bowel Syndrome (IBS) and migraine frequently co-exist. Stress is a major contributing factor for both. Our medical students are subjected to stress related to the implicit responsibility of courses. But the prevalence of IBS, migraine and co-existing migraine in medical students is not known.

Aim: To estimate the prevalence of migraine, IBS and co-existing IBS and migraine among medical students. A Cross-Sectional Survey.

Materials and Methods: Self-reported questionnaire based study, was conducted in which migraine was defined according to International Headache Society (IHS) criteria while IBS by both Asian criteria and Rome III criteria. Both preclinical (n=142) and clinical students (n=151) of four medical colleges (government and private) of Dhaka and Sylhet district participated in the study.

Statistical Analysis: Student's t-test and chi-square test were used to compare the distributions of continuous data and categorical data respectively with significance level set at 0.05 or less.

Results: Among the 293 students (mean age 21.09 ± 2.24 years) volunteered in the study (Males= 177), 14 (4.8%, 11 males, 3 females, $p = 0.175$) met the criteria for IBS with comparable prevalence among preclinical and clinical (4.2% vs. 5.3%, $p = 0.787$) students from both private and government institutions (2.1% vs. 7.2%, $p = 0.055$). IBS-D was the most prevalent subtype ($n = 8$, $M = 6$) and abdominal pain relieved by defecation ($n = 11$), was the most prevalent symptom. Fifty percent ($n = 7$) of IBS patients considered their bowel habit as normal. Among the 221 (75.4%) students with headache, only 51 (17.4%, 20 males and 31 females, $p = 0.001$) were diagnosed of migraine, with comparable prevalence among preclinical and clinical students (16.2% vs. 18.5%, $p = 0.645$). Only 17 (33%) subjects with migraine had accompanying aura. Common triggers were stress ($n = 43$), lack of sleep ($n = 42$), and daily life events. Twelve (23.5%) subjects with migraine had migraine-associated frequent disability. Only two female students with IBS-D (14.3%) had concomitant IBS and migraine.

Conclusion: IBS and concomitant migraine - IBS prevalence was found to be low in our medical students, but migraine prevalence corresponds to other countries as well as in medical students.

Keywords: International headache society criteria, Rome III, Stress

INTRODUCTION

Migraine and Irritable Bowel Syndrome (IBS) are chronic disorders. These pain related disorders apparently share many similarities like recurrent nature, female preponderance, familial association [1] and frequent association with many somatic and psychiatric co-morbidities such as fibromyalgia, chronic fatigue syndrome, depression etc., [2]. Both disorders are diagnosed according to the symptom based criteria. IBS and migraine both limit the daily life activities. IBS and migraine share similar diagnostic features. So an alternative diagnosis of fibromyalgia or migraine can be made if an IBS patient is seen by a rheumatologist or neurologist instead of a gastroenterologist [2].

IBS and migraine affect approximately 10-20% of the general population [3-8] usually young adults. IBS is more common in the west than east. IBS and other functional gastrointestinal disorders are found in migraine patients even in between attacks [5]. On the other hand 25-50% of IBS patients have either migraine or headache, whereas those of controls have only 4-19% [2]. Overall, IBS subjects are at risk of having co-existing migraine/ headache with an estimated Odds Ratio (OR) of 2.66 [2].

Migraine is famous for its prodromal symptoms in terms of tiredness, difficulty in concentrating, stiff neck, mood changes and gastrointestinal (GI) symptoms of nausea, vomiting, abdominal pain and diarrhoea preceding the typical headache occurrence [9,10]. Controversy exists regarding labeling subjects GI symptoms as the prodrome or as concomitant IBS [11]. Aura symptoms like

nausea, osmophobia, phonophobia and photophobia also found to occur prior to headache in many subjects with migraine. On the other hand no prodromal symptoms were reported prior to attacks of IBS [11].

Apart from abdominal pain/discomfort IBS symptoms vary between constipation, diarrhea and altered act of defecation [3,12]. The IBS symptoms are characteristically recurrent with waxing and waning of symptoms [3,12]. Migraine similarly displays the recurrent character [8,13].

Researches show that stress, sleeplessness, eating habits, menstrual cycle, changes in weather conditions and temperature, frequent traveling, food items, oral contraceptives and physical activities are the factors that mostly trigger migraine headaches [14,15]. Stress, specific food items and female sex hormones also trigger IBS.

A number of studies showed that migraine is prevalent among medical students [16-20]. IBS is a disorder of the youth with most new cases appearing prior to the age of 45 [21]. Studies reported a variable prevalence (12.6%-33.6%) of IBS among medical students [22-25]. Reported prevalence of IBS in our general population varies from 7.7% to 12.4% [26, 27]. But no study so far has been conducted among our medical students. Besides data on concomitant IBS and migraine among medical students are lacking. Stress affects the precipitation and outcome of both the disorders. Medical students are young adults and are subjected to stress and also the implicit responsibility of courses. Therefore,

this symptom-based cross-sectional study was designed to find out prevalence of IBS, migraine and co-existing IBS and migraine among medical students of four medical colleges.

MATERIALS AND METHODS

Design: This cross-sectional questionnaire based study was conducted on 293 medical students in four medical colleges. After getting verbal informed consent, participants were asked to fill-up a self-reported questionnaire. The study was carried out over a period of 6 months starting from July 2013 to December 2013. The study was approved by the Ethical Review Committee of Enam Medical College.

Questionnaire: A self report questionnaire based on symptoms of migraine and IBS was used. Questionnaire included demographic data and students' latest different kinds of headache, specifically pertaining to the previous year. Also, different characteristics of headaches such as: frequency, duration, location, quality, accompanying factors, trigger factors and intensity of pain were questioned. In each institute one doctor was assigned for data collection and to answer the queries of the students regarding the questionnaire. The diagnosis of migraine was made according to the IHS criteria. For diagnosis of IBS a part of the questionnaire included a previously validated self-reported questionnaire on bowel symptoms [28]. Those medical students who responded positively to all of the questions who were in migraine criteria, or in IBS criteria were asked to do another step in the respective hospital for more interview and physical examination by a general physician and a neurologist.

Study Definition: Migraine was diagnosed according to diagnostic criteria defined by IHS criteria (2013) [29].

IBS was defined according to Rome III criteria [30] as well as by Asian criteria [28, 31]. IBS patients were sub-typed according to their predominant stool pattern (Rome III) as: (1) IBS with constipation (IBS-C) -hard/lumpy stools (Bristol stool types 1 and 2) occurring at least 25% of defecations and loose/watery stools (Bristol stool types 6 and 7) occurring never or rarely; (2) IBS with Diarrhea (IBS-D)—loose/watery stools occurring at least 25% of defecations and hard/lumpy stools occurring never or rarely; (3) Mixed IBS (IBS-M)—alternating hard and loose stools, each occurring at least 25% of defecations; and (4) Unsubtyped IBS (IBS-U)—hard or loose stools occurring never or rarely.

According to Asian criteria Bristol stool type 1 or 2 or 3 was required for defining IBS-C, while stool type 5 or 6 or 7 was required for defining IBS-D.

STATISTICAL ANALYSIS

Sample size and power: Anticipating a prevalence of migraine and IBS in medical students not exceeding 20% and the prevalence was estimated within 5 percentage points of the true value with 95% confidence (anticipated population proportion 20%, confidence level 95% and absolute precision d [15%-25%] 5 percentage points). For $p = 0.20$ and $d = 0.05$, a sample size of 246 students would be needed for the study [32]. We included 293 students. As the students of government and non-government institutions differ in socio-cultural background and daily life stress, we intended to include 140 students from private institutions and 153 from government institutions. From the four organizations students were enrolled from both basic science departments ($n = 142$) and from clinical students ($n = 151$).

The data was processed and statistical analysis was performed with a SPSS 20.0 program (SPSS Inc., Chicago, IL, USA). The Student's t-test was used to compare the distributions of continuous data. Distributions of sex, individual symptom and subtype were compared by Pearson's chi-square test. During comparison, significance level set at 0.05 or less.

RESULTS

Out of 320 invited students, 300 returned the questionnaire (response rate - 93.7%). Seven data sheets were rejected due to incomplete information. Finally 293 questionnaires were included for analysis. These 293 students had a mean age of 21.09 ± 2.24 years (males = 177, female = 116).

Irritable Bowel Syndrome (IBS): A total of 14(4.8%) students had IBS (males = 11, 6.2%, females = 3, 2.7%, $p = 0.261$) when symptoms started six months back. This rate increased to 29 (males = 21, females = 8) when persistence of symptoms were required only for three months. Socio-demographic profile of IBS and non-IBS subjects is described in [Table/Fig-1]. Mean age of IBS and non-IBS subjects were comparable. IBS was found equally prevalent in students of government and non-government institutions and among preclinical and clinical students [Table/Fig-1].

IBS-D was the most prevalent subtype ($n = 8$, 57.14%, males = 6), next common was IBS-M ($n = 4$, 28.6%, males = 3). IBS-U and IBS-C each included only one student (7.1%). Despite having IBS, 7 (50.0%) IBS patients considered their bowel habit as normal, 3 (16.7%) as sometimes diarrhea and sometimes constipation, and four had no idea regarding their bowel habit.

Abdominal pain relieved by defecation ($n = 11$, 78.6%) was the most prevalent symptom among subjects with IBS. Next prevalent symptoms were feeling of incomplete evacuation, frequent bowel motion and bloating [Table/Fig-2]. No significant difference was noted in the different bowel symptoms among male and female IBS patients.

Nine subjects with IBS gave history of limitation of daily activities due to abdominal pain and or bowel symptoms; 2 (14.3%) seldom, 4 (28.6%) sometimes, 2 (14.3%) frequent and 1 (7.14%) always. Only 4 (28.6%) students with IBS consulted a physician for their bowel problem.

Migraine: Among the 221 (75.4%) students with headache, 83 (37.6%) had frequent attacks. A total of 51 (males = 20, females

	IBS	Non-IBS	p-value
Sex			
Male	11 (6.2%)	166	0.261
Female	3 (2.7%)	113	
Age	20.46± 3.700	21.13±2.139	0.279
Class			
Preclinical	6 (4.2%)	136 (95.8%)	0.787
Clinical	8 (5.3%)	143 (94.7%)	
Institution			
Government	11(7.2%)	142 (92.8%)	0.055
Private	3 (2.1%)	137 (97.9%)	

[Table/Fig-1]: Demographic features of subjects with IBS and without IBS.

IBS symptoms	IBS (%) (n=14)	Non-IBS (%) (n=279)	p-value
< 3 bowel motions weekly	3 (21.4%)	40 (14.3%)	0.441
Hard/lumpy stools	4 (28.6%)	67 (24.0%)	0.750
> 3 bowel motions daily	7 (50.0%)	46 (16.5%)	0.005
Loose stools	4 (28.6%)	28 (10.01%)	0.054
Straining at stool	7 (50.0%)	75 (26.9%)	0.071
Feeling of incomplete evacuation	10 (71.4%)	83 (29.7%)	0.002
Mucus with stool	2 (14.7%)	24 (8.6%)	0.358
Urgency	4 (28.6%)	43 (15.4%)	0.252
Bloating	7 (50.0%)	68 (24.4%)	0.053
Abdominal pain relieved by defecation	11 (78.6%)	64 (45.4%)	0.024

[Table/Fig-2]: Bowel symptom pattern in IBS and Non-IBS subjects.

= 31, $p = 0.001$) fulfilled the criteria for migraine, with comparable prevalence in private ($n = 24$, 15.7%) and government ($n = 27$, 19.3%) medical colleges ($p = 0.444$) and among preclinical ($n = 23$, 16.2%) and clinical ($n = 28$, 18.5%) students ($p = 0.645$). Mean age of onset of migraine was 13.3 ± 4.103 years.

The frequency of attacks in subjects with migraine were less than one per month in 19.6% ($n = 10$), 2-3 attacks monthly in 33.3% ($n = 17$), more than once weekly in 23.53% ($n = 12$). In 21(41.7%) subjects with migraine pain was of moderate intensity, in 14 (27.45%) headache was intense and in 12 (23.5%) it was very intense.

[Table/Fig-3] shows that most common site of headache in migraine patients' was temporal region. In migraine patients 29 (56.9%) had unilateral headache. Most common headache type in subjects with non-migraine headache was throbbing ($n = 69$, 31.2%), next common types were aching ($n = 29$, 13.12%), pressing ($n = 27$, 12.2%), pulsating ($n = 23$, 10.04%), heaviness ($n = 22$, 9.95%) and boring ($n = 21$, 9.5%). Four students could not describe the type of their headache. In subjects with migraine headache was throbbing in 22 (43.13%) and pulsating in 17 (33.3%). Other types were aching ($n = 2$), pressing ($n = 1$), heaviness ($n = 2$), boring ($n = 1$), burning ($n = 1$), tingling ($n = 1$) and variable ($n = 3$).

Photophobia/phonophobia, nausea/vomiting and neck stiffness were accompanying symptoms in 80.4%, 51.0% and 46% of subjects with migraine respectively. Among the triggering factors stress, lack of sleep, frequent/prolong travelling, watching TV/ listening to radio and use of computer were more common [Table/ Fig-4]. Routine activities were common aggravating factors for both migraine and non-migraine headache (94.1% vs. 85.5 %, $p =$ not significant).

	Non-Migraine Headache	Migraine	p-value
Sex Male	100 (58.23%)	20 (39.2%)	0.016
Female	70 (41.77%)	31(60.8%)	
Headache characteristics			
Unilateral headache	55 (32.4%)	29 (56.9%)	0.003
Throbbing/pulsating	92 (54.1%)	39 (76.5%)	0.005
Light/sound sensitivity	103 (60.0%)	41 (80.4%)	0.008
Headache duration > 4 hours	25 (14.7%)	51 (100%)	p<0.001
Associated aura	38 (22.5%)	17 (33.3%)	0.140
Episodic headache	44 (26.3%)	23 (46.0%)	0.014
Associated nausea &/or vomiting	54(31.8%)	26(51.0%)	0.028
Family history of headache	56 (33.1%)	30 (68.8%)	0.002
Headache aggravated /precipitated by body movement	127 (74.7%)	46 (90.2%)	0.045
Associated pain/stiffness in the neck	59 (35.3%)	23 (46.0%)	0.186
History of travel sickness	47 (27.8%)	21 (41.2%)	0.084
Attack rate, ≥2-3 times/month	54 (31.8%)	31 (60.2%)	p<0.001
Moderate to severe headache	89 (52.4%)	47 (92.2 %)	p<0.001
Significant limitation of physical/ intellectual activity	20 (11.8%)	12 (23.5%)	0.043
Site of headache : Temporal	39 (22.9%)	16 (31%)	0.214
Frontal	57 (33.5%)	12 (25.5%)	
Occipital	17 (10.0%)	2 (4.0%)	
Parietal	11 (6.5%)	6 (11.8%)	
Whole skull	39 (22.9%)	12 (25.5%)	
Variable	2 (1.2%)	2 (4.0%)	
Not specified	5 (2.9%)	1 (2.0%)	
Others	35 (20.6%)	11 (21.6%)	

[Table/Fig-3]: Demographics and characteristics of headache in patient with migraine and non-migraine headache.

Precipitating factor	Non-Migraine Headache N (%)	Migraine N (%)	p-value
Stress	137 (80.6%)	43(84.3%)	0.682
Lack of sleep	141(83.4%)	42(82.4%)	0.833
Reading	84(49.7%)	30(58.8%)	0.268
Fasting	60(35.3%)	25(49.0%)	0.100
Daily physical activity	46(27.1%)	20(39.2%)	0.117
Irritant smell	32(18.9%)	18(35.3%)	0.021
Menses (among females)	16(9.5%)	16(51.6%)	$p < 0.001$
Specific food	12(7.0%)	14(27.5%)	$p < 0.001$
Rains/gloomy weather	23(13.5%)	20(40.0%)	$p < 0.001$
Cold weather	44(26.0%)	23(46.0%)	0.009
Hot weather	67(39.6%)	25(49.0%)	0.259
Drinking cold water	26(15.1%)	21(41.2%)	$p < 0.001$
Prolonged bathing	33(19.3%)	20(40%)	0.004
Frequent/prolong travelling	76(44.4%)	33(67.3%)	0.006
Watching TV/listening Radio	69(40.4%)	28(54.9%)	0.077
Use of computer	80(46.5%)	31(60.8%)	0.081

[Table/Fig-4]: Precipitating factors for headache.

Forty two subjects with migraine gave history of limitation of physical and intellectual activity; 11 (21.6%) seldom, 19 (37.3%), Sometimes, 4 (7.8%) often, 6 (11.8%) most of the times and 2 (3.9%) always. A total of 33 (64.7%) students with migraine consulted a physician, while 67 (39.4%) of the students having non-migraine headache consulted a physician ($p < 0.001$).

Co-existing IBS and Migraine: Out of 14 IBS subjects, 10 had headache (71.43%), in 7 it was of moderate to severe intensity and in 6 attacks were frequent. But only two female students with IBS-D (14.5%) had concomitant IBS and migraine.

DISCUSSION

IBS is a disorder of young adults and stress is a major contributing factor for it. Therefore, it was speculated that IBS would be prevalent among medical students. Only 4.8% of our medical students were found to have IBS with comparable prevalence in males and females. Around 12.5-33.3% of the medical students in Asia were found to have IBS depending on definitional criteria used with higher prevalence in women [22–25]. In most Asian population based studies [33,34], females were not found to be more vulnerable to IBS. Recent Asian consensus on IBS also concludes that no obvious female predominance existed in many Asian countries [31]. Likewise no female preponderance of IBS was found in the present study. An Iranian study showed prevalence of IBS has decreased with years of study [25]. In our study prevalence was comparable among preclinical and clinical students. Surveys had suggested that IBS symptoms reduce or disappear after the relief of major stresses, whereas recent studies suggested that continuous improvement will be only gained after the acquisition of effective skills to combat stress [24,35].

IBS-D was the most prevalent subtype in our study. This data is consistent with our previous studies [26,27]. Other studies failed to show any significant preponderance of diarrhea predominant or constipation predominant IBS. IBS-C mostly affects females and this female preponderance of IBS-C is supported by a number of studies [36,37]. Subjective categorization of IBS to subtypes remains difficult in clinical practice. A large proportion of patients remained to be unclassified using a stool frequency– based criteria (Rome-III) [31]. In our study only one patient was sub-classified as IBS-U both by Rome criteria and Asian criteria. This may be due to small number of sample size. In our study 50% of subjects fulfilling the criteria for IBS thought that their bowel habit was normal.

Abdominal pain relieved by defecation ($n = 11$) and feeling of incomplete evacuation ($n = 10$) were the most frequent symptoms among IBS patients. In our past studies straining (66.6%) [26], loose stool (64.9%-74.13%) [26,27] and bloating (45.7%-60.2%) [26,27] were the more prevalent symptoms. Abdominal pain is the dominant symptom of IBS [6] and intestinal in origin. Masud et al., reported a higher prevalence of altered stool passage and abdominal distension in the rural community [33]. In Chinese medical students, abdominal pain associated with change in stool consistency was the most prevailing symptom [36].

We found that approximately 28.6% of our IBS cases had previously visited their physicians. This was similar to Masud's study in Bangladesh [33]. Many studies have shown no significant difference between male and female physician referrals, but in some studies in India and Sri Lanka, men had consulted physicians more frequently than women. This variation may be attributed to factors like gender, culture and others [25].

Migraine was found to be highly prevalent among medical students [16–20] and its frequency was found to increase during the studying education [18]. We are lacking in data regarding prevalence of migraine in our general population. In an epidemiological study 25.2% of the general population of India had migraine [38]. In our study 23% of patients with headache fulfilled the IHS criteria for migraine. In the study of Menon B 28% of medical students had migraine, however, of the headache group, migraine constituted 42% [20]. Sanvito et al., also reported that 40% of students suffered from some kind of headache and 40.2% of these headaches were migraine [16]. Prevalence of migraine in university students varied between 6.4% and 48% [17,19]. Environmental, socio-demographic, lifestyle and genetic factors may be responsible for this difference [20].

Migraine is usually more intense in women and in subjects having associated aura. Photophobia, phonophobia, and nausea were also found more in migraine associated with aura [16]. In our study severe headache (males = 55.0%, females = 51.6%, $p = 1.000$) and aura (45% vs. 25.8%, $p = 0.225$) were almost equally prevalent among male and female subjects with migraine. Subjects with migraine with aura (70.6%) and without aura (44.1%) had comparable severity of headache ($p = 0.136$). A total of 33 (64.7%) students with migraine consulted a physician. But others reported a low rate of consultation (7.1%) among students with migraine, despite having high prevalence, the high rate of disability, and the need for analgesic medication [16].

Diagnosis of migraine is based on a number of symptom criteria. But no single criterion is diagnostic of migraine [39]. Studies showed that in migraine vomiting occurs in $<1/3$ of patients, pain is bilateral in 41% cases and 50% of the time, pain is non-pulsating [40,41]. In our study headache was unilateral in 29 (56.9%), pulsating in 17 (33.3%) and symptoms of aura was present in 17 (33.3%). Although aura is a characteristic symptom of migraine it is not present in all cases. In a given year in the United States, 30.8% of female subjects with migraine and 32% of male subjects with migraine had associated aura [42]. Approximately, 81% of those, who have migraine with aura, also have attacks of migraine without aura [43]. Unilateral pain is a common characteristic of migraine and can be a key symptom in making the diagnosis. However, many migraine patients report headaches that begin bilaterally. Though pulsating or throbbing pain commonly occurs in migraine, other pain types such as penetrating, boring or stabbing pain also occur in migraine. As the migraine patients (80%) presents with other headaches and might present with more than one headache types at the same time, finding out migraine with specific headache type is difficult. According to headache specialists moderate to severe headache should be considered as migraine until proved otherwise [40].

Common premonitory symptoms of migraine are: Tiredness, stiff neck, mood change, GI symptoms, craving for sweets, and yawning [9,10]. Twenty three of our subjects with migraine complained of neck stiffness, 41 (80.5%) had light/sound sensitivity and 26 (51%) had associated nausea and/or vomiting.

Headache affects quality of life substantially and therefore affects daily work, social activities and recreational activities [20]. In our study 42 subjects with migraine gave history of limitation of physical and intellectual activity and 12 had frequent disability.

Frequent association of IBS and migraine is supported by many clinical observations and epidemiological studies [2,5]. A total of 10 out of 14 IBS subjects had different sorts of headache in our study and 14.5% IBS patients had concomitant migraine. Only two female students with IBS-D fulfilled the IHS criteria for migraine in our study. IBS is seen in migraine patients even in between attacks [5]. Migraine or headache is also reported in 25%-50% cases of IBS [2].

Stress is a major contributing factor to both IBS and migraine and both the disorders frequently co-exist [2,5]. As medical students are subjected to stress it is speculated that, a significant proportion of medical students might have concomitant disorders with eventual disruption of their daily life and academic performance. Though migraine was highly prevalent among our medical students, concomitant IBS is rare. On the other hand a good proportion (14.3%) of IBS patients had co-existing migraine. Hyperactivity of the hypothalamic-pituitary-adrenal axis may be responsible for stress induced occurrence and severity of symptoms. The pathogenic link between IBS and migraine may be mediated through enteric nervous system and its principal neurotransmitter serotonin [5].

GI symptoms of nausea, vomiting, abdominal pain and diarrhea may precede the typical headache symptom (prodromal symptoms) [9,10]. Nausea may occur as part of aura. It remains controversial whether these GI symptoms occur as prodrome or as features of concomitant IBS [9,10]. In our study 26 (51.0%) subjects with migraine had associated nausea and/or vomiting. IHS criteria do not require GI symptoms for diagnosis of migraine. Although nausea is common in migraine patients, vomiting occurs much less frequently. Vomiting never occur in many migraine patients during headache attacks [40].

LIMITATION

The present study has several limitations. This study tried to find out the overlapping symptoms of migraine and IBS in medical students. So the result of our study may not represent the picture of general population. Diagnoses were made on the basis of symptom-based criteria, as relevant investigations were not feasible due to resource constraint. But the students fulfilling the criteria underwent thorough physical examinations to exclude organic or other causes. We might have missed to identify a good number of students with migraine. As a good proportion of patient with non-migraine headache had features that were suggestive of migraine such as unilateral headache, throbbing pain, photosensitivity and so on. These patients may have milder symptoms and or fewer symptoms that had escaped recognition by symptom-based criteria.

Despite several limitations it was a good attempt to find out concomitant migraine and IBS in university students who were subjected to implicit stress of their courses.

CONCLUSION

In conclusion, migraine and other headache disorders were fairly common among our medical students. Prevalence of IBS was low in medical students in comparison to general population. Concomitant headache and or migraine was frequent among

medical students with IBS. Women particularly IBS-D variant were particularly prone to have concomitant migraine in our study. Further studies are warranted with large sample size involving general population and including appropriate investigations to find out the true prevalence of these disorders and their overlap.

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PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Gastroenterology, Enam Medical College, Dhaka, Bangladesh.
2. Associate Professor, Department of Medicine, Enam Medical College, Dhaka, Bangladesh.
3. Associate Professor, Department of Gastroenterology, North East Medical College, Sylhet, Bangladesh.
4. Associate Professor, Department of Medicine, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh.
5. Associate Professor, Department of Neuro-medicine, Enam Medical College, Dhaka, Bangladesh.
6. Research Medical Officer, UChicago Research, Bangladesh.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Irin Perveen,
B-11, Tropical kader Garden, 335 Tongi Diversion Road, Bara Magh Bazar, Dhaka-1217, Bangladesh.
E-mail: irinperveen@yahoo.com

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