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Precipitating Factors of Headache in Patients Attending a Tertiary Care Hospital

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Abstract
Background: *Headache disorders are one of the most prevalent neurological disorders worldwide, causing much disability and impairment in quality of life. Understanding the contributing factors is crucial for developing proper management strategies. The goal of the study is to assess multiple contributing factors of headache among patients who seek care at a tertiary hospital in Bangladesh.*
Methods: *The hospital-based observational study was conducted in the Department of Neurology, Dhaka Medical College Hospital, between July and December 2013. One hundred patients aged 18 years or more presenting with headache as the presenting symptoms were purposively sampled. Patients with severe mental illness, active stroke, fever, sinusitis, or significant co-morbidities were not included in this study. Data were collected with a standard questionnaire and analyzed using SPSS software.*
Results: *The patient group included 75% females and 25% males, 50% in the age group 21-30, the majority (57%) of whom were housewives, and 84% of the patients were married. The majority (46%) of the patients had complaints for 1-5 years of headaches, and the most common (61%) compressive and (33%) pulsatile type of headache was the most frequently observed characteristics. Anxiety (39%), tiredness (24%), disturbance at night (21%), and sunlight (21%) were the most frequent precipitating factors. The optimal relief situations observed were sleep (51%), medicine (50%), and rest (39%).*
Conclusion: *Anxiety was the most common precipitating factor for headaches, followed by fatigue, sleep disturbance, and environmental precipitants like exposure to sunlight. These findings highlight the multifactorial etiology of headache disorders and reinforce the importance of addressing psychological and lifestyle factors in headache management. Intervening specifically against these identified precipitating factors can have a significant effect on headache burden and patient outcomes.*
Keywords: *Headache, Neurological disorder, Anxiety, Migraine, Tension-type headaches (TTH)*

I. INTRODUCTION

Cephalalgia, commonly known as a headache, emerges as one of the most frequently encountered medical conditions impacting nearly every individual worldwide, irrespective of age, sex, or geographical scenarios. The expressions of headaches can differ in severity, ranging from slight unease that is hardly perceptible to severe pain that can incapacitate an individual and considerably influence their daily pursuits [1]. It is acknowledged as one of the most widespread neurological ailments, with a high prevalence across various populations and demographic segments, rendering it a significant issue in both clinical practice and public health arenas [2]. Headaches can be classified into two principal categories: the primary headache, which is characterized by no association with any underlying medical condition, and the secondary headache, which is recognized as a medical condition that may arise due to various factors [3]. The spectrum of primary headaches encompasses several specific types, including migraine, tension-type headaches (TTH), and cluster headaches, among other

forms of primary headaches; conversely, secondary headaches, which can lead to serious or potentially life-threatening complications, include post-traumatic headaches, cervicogenic headaches, medication overuse headaches, and those associated with intracranial pathology, among others [4,5]. Numerous research studies conducted across different populations have consistently indicated that, on a global scale, females exhibit a significantly higher prevalence of primary headaches compared to their male counterparts, with the disparity in affected rates being markedly pronounced [6]. In various studies, it has been suggested that tension-type headaches represent the most prevalent type of headache experienced by individuals, whereas migraine ranks as the second most common form of headache reported [7]. Both tension-type headaches and migraines impose a considerable burden not only on the global healthcare system but also on society at large, leading to significant challenges in terms of both health management and economic costs. According to comprehensive analyses conducted under the auspices of Global Burden of Disease (GBD) studies, migraine and TTH have emerged as leading contributors to the loss of disability-adjusted life years (DALYs), particularly within the demographic of individuals who are under the age of fifty years [8,9]. By the year 2021, the global incidence, prevalence, and disability-adjusted life years associated with headache disorders experienced marked increases of 35%, 39%, and 41%, respectively, when compared to data from the preceding three decades [9]. The condition of migraine alone is believed to impact over 1.16 billion individuals worldwide, positioning it as the foremost cause of disability among children and adolescents, and the second leading cause of disability among adults who are below sixty years of age [10]. Therefore, it becomes imperative to identify the various precipitating factors associated with headaches, as this knowledge is crucial for the formulation of targeted treatment strategies; by gaining an understanding of these triggers, healthcare professionals are equipped to recommend specific interventions, such as the avoidance of particular foods or substances, which can effectively mitigate the onset of headaches. This evaluation not only enhances the effectiveness of treatment approaches but also diminishes the dependency on pharmacological therapies, thereby reducing the potential for adverse side effects. The principal aim of our study is to evaluate the various precipitating factors that contribute to headache occurrences among patients who are receiving care at a tertiary care hospital.

II. METHODS AND MATERIALS

From July to December of the year 2013, the Neurology Department at Dhaka Medical College Hospital (DMCH) executed a hospital-based observational descriptive study, concentrating on patients suffering from headaches within the Headache Clinic. Individuals presenting headaches as their primary complaint, who were 18 years of age or older and did not exhibit serious mental illness, active stroke, fever, sinusitis, or significant co-morbidities, were systematically excluded utilizing a purposive, non-probability sampling methodology. A standardized questionnaire, which underwent inspection for accuracy, was employed to gather the requisite data. The data was processed through methods including registration, editing, coding, and computerization. Analytical procedures were conducted utilizing SPSS/PC software, while the results were presented through MS Excel tables, graphs, and charts. Statistical significance was ascertained with a p-value threshold set at less than 0.05. In order to ensure the integrity of the data, a systematic work manual was developed, and the questionnaire underwent pretesting to ascertain clarity. Rigorous adherence to ethical standards was upheld, encompassing participants' voluntary participation, informed consent obtained in Bangla, confidentiality, and private interviews conducted at a time and location convenient for the participants.

III. RESULTS

Table 1: Distribution of study population based on Basic characteristics (n=100)

Basic characteristics	Number of patients (n=100)	Percentage (%)
Age (in years)		
≤20	6	6%
21-30	50	50%
31-40	28	28%
>40	16	16%
Sex		
Male	25	25%
Female	75	75%
Occupational status		
Housewife	57	57%
Student	13	13%
Businessman	12	12%
Textile mill worker	5	5%
Service	4	4%
Garments worker	4	4%
Tailors	3	3%
Taxi Driver	2	2%

Religion		
Islam	98	98%
Hinduism	2	2%
Marital status		
Unmarried	16	16%
Married	84	84%

The information presented in Table 1 outlines the basic characteristics of the study population through an analysis of various demographic factors, including, the age distribution, occupational status, religious affiliations, and marital statuses of the individuals involved in this study. According to the findings illustrated in Table 1, it is evident that a significant proportion, precisely half of the study population, falls within the age range of 21 to 30 years, as evidenced by the presence of 50 respondents, which constitutes 50% of the total participants, thereby indicating that the phenomenon of headaches is predominantly experienced by the younger demographic cohort. In addition, the respondents, those aged between 31 to 40 years sum to 28 individuals, representing 28% of the population, while 16 respondents, or 16%, belong to the category of individuals over the age of 40, and a smaller segment of 6 respondents, accounting for 6%, comprises those who are under the age of 20. Furthermore, the analysis of gender-related data reveals a pronounced predominance of female patients who are afflicted by headaches, with a total of 75 respondents, which constitutes 75% of the sample, whereas the male respondents are significantly fewer in number, totaling only 25 individuals, thus representing 25% of the population surveyed. Regarding occupational classifications, the data indicates that the most common occupation among the respondents is that of housewives, with 57 individuals, which represents a substantial 57% of the total, followed by students who account for 13 respondents, equating to 13%, and businessmen who make up 12 respondents (12%), with textile mill workers numbering 5 (5%), service holders at 4 respondents (4%), garments workers also at 4 respondents (4%), tailors comprising 3 respondents (3%), and finally, taxi drivers totaling 2 respondents, thereby constituting 2% of the population surveyed. In terms of religious affiliation, the data reveals that a remarkable 98 respondents, representing 98% of the total, practice Islam, while a mere 2 respondents, or 2%, adhere to Hinduism, which is not surprising given that the study was conducted in Bangladesh, a nation characterized by a Muslim-majority demographic. Lastly, the analysis of marital status within the respondent group indicates that a considerable majority of the patients, specifically 84 individuals, which constitutes 84% of the total, are married, while there exists a smaller subgroup of 16 respondents, representing 16%, who are categorized as unmarried.

Table 2: Distribution of the study patients based on pattern of headache (n=100)

Pattern of Headache	Number of patients (n)	Percentage (%)
Duration of illness		
Under 1 year	25	25%
1-5 years	46	46%
6-10 years	19	19%
>10 years	10	10%
Mean±SD	4.6±3.3	
Range (min,max)	(15 days, 12 years)	
Character		
Compressive	61	61%
Pulsatile	33	33%
Heavy	14	14%
Dull	11	11%
Penetrating	6	6%
Tingling	4	4%
Burning	3	3%
Electric shock	2	2%

The data delineated in Table 2 underscored the intricate patterns associated with the prevalence of headaches experienced by the study population, categorized according to both the duration of the illness as well as the specific types of sensations that the patients endure as a result of their affliction. Analysis of the duration of the illness reveals that a total of 46 patients, which corresponds to a significant 46% of the entire study population, have reported suffering from headaches for an average duration ranging from 1 to 5 years, thereby establishing this particular duration as the most prominent within the categorization of illness duration. Furthermore, a total of 25 respondents, representing 25% of the cohort, indicated that they have experienced headaches for less than 1 year, while 19 respondents, accounting for 19%, reported suffering from headaches for an average duration of 6 to 10 years; additionally, 10 respondents, equivalent to 10%, were identified as having endured headaches for a period exceeding 10 years. The cumulative mean duration of illness across the study population is calculated to be 4.6 years, accompanied by a standard deviation of 3.3, with the data revealing a remarkable range that extends from a mere 15 days to a substantial 12 years. In terms of character data regarding the sensations experienced by

the patients, it has been observed that 61 responses, corresponding to 61% of the participants, reported a compressive feeling attributable to their headaches, while 33 respondents, representing 33%, described their sensation as pulsatile; additionally, 14 respondents, or 14%, articulated a feeling of heaviness, 11 respondents, equating to 11%, reported a dull sensation, 6 respondents, amounting to 6%, experienced a penetrating feeling, 4 respondents, which is 4%, indicated a tingling sensation, 3 respondents, representing 3%, described a burning sensation, and finally, 2 respondents, corresponding to 2%, conveyed the experience of an electric shock-like feeling.

Table 3: Distribution of the study patients based on precipitating factors and relieving factors of headache

Contributing factors	Number of patients (n)	Percentage (%)
Precipitating factors		
Anxiety	39	39%
Fatigue	24	24%
Sleep disturbance	21	21%
Sunlight	21	21%
Activities	16	16%
Stress	14	14%
Journey	6	6%
Warm	5	5%
Menstruation	3	3%
Cold	0	0%
Others	3	3%
Relieving factors		
Sleep	51	51%
Medication	50	50%
Rest	39	39%

The data presented in Table 3 illustrates various contributing factors that affect individuals who suffer from headaches, specifically focusing on both the precipitation and alleviation of such conditions. The information regarding precipitating factors reveals that there are a total of 39 patient responses indicating anxiety, which constitutes 39% of the overall responses, alongside 24 responses attributed to fatigue representing 24%, 21 responses related to sleep disturbances accounting for 21%, 16 responses linked to activities making up 16%, 14 responses connected to stress equating to 14%, 6 responses associated with journeys corresponding to 6%, 5 responses due to warmth reflecting 5%, 3 responses linked to menstruation representing 3%, with no recorded responses for cold factors, and an additional 3 responses categorized as others constituting 3%. The data concerning precipitating factors strongly suggests that the primary contributors to headaches are anxiety, fatigue, sleep disturbances, and exposure to sunlight, as these factors prominently emerged from the responses collected. In terms of the data related to relieving factors, it is noteworthy that 51 patients indicated that sleep served as a relief measure, constituting 51% of the total responses, whereas 50 patients, which corresponds to 50%, reported that medication was effective for them, and additionally, 39 patients representing 39% expressed that they found relief through rest. The insights derived from the relieving factor data indicate that a significant majority of patients experienced an improvement in their condition after engaging in sleep or utilizing medication, while a slightly smaller subset of patients reported feeling better specifically after taking time to rest.

IV. DISCUSSION

Our study yields insights into the precipitating factors associated with headaches in patients who attended a tertiary care hospital situated in Bangladesh. Our analysis elucidated demographic profiles, manifestations of headaches, and precipitating factors for the overall assessment of the study. The demographic profiling of our study cohort revealed a notable female predominance (75%) in comparison to males (25%), which aligns with international epidemiological trends. Female dominance in headache prevalence has been consistently documented across various studies globally, suggesting a probable hormonal influence on the pathophysiology of headaches [11]. The observed female predominance in our study assumes further importance as housewives represented the majority of our participants (57%), indicating a potential correlation between domestic responsibilities, stress levels, and the frequency of headache episodes. The age distribution indicated that 50% of the patients were aged between 21 to 30 years, thereby underscoring that headaches predominantly afflict young adults, which may lead to substantial socioeconomic complications due to diminished workforce productivity and heightened healthcare expenditures. In terms of headache chronicity, our findings revealed that 46% of patients had been enduring headaches for 1-5 years, whereas 10% reported experiencing headaches for over a decade. This chronicity underscores the enduring nature of headache disorders and highlights the considerable burden they impose on individuals and healthcare systems alike. The characteristics of headaches varied significantly among patients, with compressive (61%) and pulsatile (33%) types being the most frequently reported. These characteristics are recognized as being associated with tension-type headaches and migraines, respectively, which

is consistent with global data indicating that these two types represent the most prevalent primary headache disorders according to the Global Burden of Disease studies [12,13]. Anxiety has emerged as the most prevalent precipitant, affecting 39% of the patients, followed by fatigue (24%), and sleep disturbances (21%). The results underscore the fundamental role of psychopathological factors in the pathogenesis and exacerbation of headaches. The heightened prevalence of anxiety as a precipitant aligns with contemporary neurobiological models that propose interconnected pathways between headache syndromes and anxiety disorders, predominantly involving serotonergic and noradrenergic pathways. Likewise, the recognition of sleep disorders and fatigue as prevalent precipitants underscores the complex interplay between pain modulation and sleep physiology, suggesting that interventions aimed at enhancing sleep hygiene may prove advantageous for the management of headaches. Environmental precipitants, such as sun exposure (21%), also appear to be significant factors, particularly in tropical nations like Bangladesh, which experience extended periods of sunlight. This observation is consistent with the role of neuronal hyperexcitability and cortical spreading depression in the pathophysiology of headaches, particularly in photosensitive individuals. Notably, menstruation was reported as a precipitant by only 3% of women, a figure that is considerably lower than what is documented in multiple literatures [14,15]. This discrepancy may be attributable to cultural variations in the reporting of symptoms or may indicate genuine epidemiological differences that warrant further investigation. In the context of alleviating factors, sleep (51%) and medication (50%) have been recognized as the most efficacious modalities for the relief of headaches, succeeded by rest (39%). The therapeutic impact of sleep on headache relief underscores the restorative function of sleep in maintaining neural homeostasis and modulating pain thresholds. Additionally, the equivalency of medication efficacy indicates that existing pharmacological interventions continue to serve as fundamental components despite the risk of developing medication overuse headaches. We have identified several clinical implications stemming from our analysis. Firstly, they underscore the imperative of integrating anxiety evaluation and management within headache treatment protocols. Secondly, they emphasize the importance of patient education concerning lifestyle modifications, particularly about sleep hygiene and stress management. Thirdly, it is recommended that various spheres, including neurology, psychiatry, and pain management, may be more adept at addressing the intricate interplay of causative factors associated with headache disorders.

Limitations of the Study

This study is not without its limitations as the sample size of 100 patients may not adequately represent the full range of headache precipitants prevalence within the general population. The hospital-based nature of the study may introduce selection bias, as individuals seeking treatment at a tertiary facility may present with more severe or complex cases. The cross-sectional design employed in this study does not properly facilitate the establishment of causal relationships between the identified factors and the onset of headaches.

V. CONCLUSION

This study revealed the basic characteristics, patterns of headaches, precipitating, and relief factors of individuals who seek care at a tertiary healthcare hospital in Bangladesh. The findings indicate a multifactorial etiology for headache disorders, which encourages focus on psychological and behavioral elements that are predictive of headaches. Subsequent studies of all diversities should aim to tailor specific interventions designed to address these particular triggering circumstances to alleviate the burden of headaches and enhance the overall quality of life for patients.

VI. RECOMMENDATION

Future research ought to employ larger, community-based longitudinal designs to improve generalizability and establish causal associations.

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