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Migraine in Adult Saudi Population: Exploring Common Predictors, Symptoms and Its Impact on Quality of Life

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Abstract

Purpose of study: Migraine is the commonest type of headache, affecting 12% Saudi population. Disparities in presenting symptoms and predictors lead to improper diagnosis and treatment of this condition having a negative impact on quality of life. The main objective is to explore the common predictors and symptoms of migraine affecting adult Saudi population and to assess its influence on their quality of life.

Methods: A cross sectional study was conducted on 500 subjects suffering from migraine, aged between 18-55 years. A self-administered questionnaire was used to assess the objectives, comprising demographic data, symptoms and predictors related to migraine and the effect of migraine on the quality of life. Data was collected from students of different colleges, males and females from shopping malls and parks etc. representing general Saudi population. The data was analysed by SPSS version 21; Chi-square test was applied for comparison and Pearson's correlation assessed to evaluate impact on quality of life.

Results: Majority of participants were females, aged between 18-35 years, belonging to higher income group and with higher education level. The associated symptoms included vertigo in 74.4% subjects followed by nausea (67.9%). The predictors were chiefly lack of sleep, exam stress and hunger in 88%, 67.2% and 68.5% subjects respectively. A positive correlation was found between severity of symptoms and worsening of quality of life (p value <0.04).

Conclusion: Severity of symptoms was accompanied by poor quality of life in terms of social and professional aspects. There was a lack of awareness in majority of subjects about migraine leading to underdiagnoses, under treatment and with high use of over the counter medications. There is a need for proper awareness campaigns in Saudi population.

Keywords: Migraine; Predictors; Aura; Saudi population; Quality of life

Introduction

Migraine is a common disorder causing attacks of neurological dysfunction and pain [1]. It is a unilateral/pulsating headache, diagnosed on the basis of at least five attacks lasting for 4-72 hours and accompanied by nausea, vomiting, photophobia or phonophobia; the symptoms not attributed to any other disorder [2,3].

Migraine affects over 20% of world population at some point in their lives. Epidemiological studies have shown that 4.5% of the Western European population has headache at least 15 days per month [4] whereas prevalence is 14.2% in USA adults [5], 1-22% in Asian countries [6] and 12.1% in Saudi Arabia [7]. Moreover, prevalence is strikingly higher among females compared to males (17.3%: 5.7%) [8].

Migraine is of two main types, episodic (EM) and chronic migraine (CM); individuals diagnosed with EM experience 0-14 headache days per month, while those with CM mostly experience more than 15 episodes per month for 3 months. Although they both share almost the same risk factors, they differ in epidemiology, symptoms, disabilities and ways of treatments [9] as documented by three large observational studies: The International Burdens of Migraine Study (IBMS) [10], The American Migraine Prevalence and Prevention (AMPP) [11] and the German Headache Consortium (GHC)". Global studies suggest that CM imposes substantial economic burden on society [9], and is generally costlier than EM, due to more hospital and specialist's visits compared to EM, and is more associated with comorbidities such as vascular diseases and psychiatric disorders [12].

The pain of migraine is typically supplemented by a constellation of warning signs such as nausea, dizziness, extreme sensitivity to light etc. Additionally, about 20% of migraine sufferers experience visual aura, usually before the headache starts [13], comprising floaters, flashes of light, zig zag patterns etc. Approximately 10-20% of migraineurs experience premonitory symptoms up to 48 hours before

attack [14] including fatigue, abnormal bursts of energy, neck stiffness, yawning and frequent urination [15].

To trigger an attack of migraine, many potential causes have been suggested, including hormonal, emotional, physical, dietary, environmental and medicinal factors. These triggers vary in different individuals and sometimes it is difficult to identify whether it is a cause or effect of a migraine attack [16]. Cyclical hormonal changes in women due to fluctuations in estrogen level seem to trigger headaches in many women [17], as majority of them report headaches immediately before or during their menstrual periods, while others develop migraines during pregnancy or menopause. Hormonal medications, such as oral contraceptives and hormone replacement therapy, may also worsen migraines, nonetheless some women find their migraines occurring less often while taking these medications [18].

Intake of caffeinated drinks, alcohol, salty and processed foods, as well as skipping meals or fasting can also trigger these attacks [19,20]. Stress, anxiety and depression at work or home and disturbances in sleep pattern and meal time or lack of sleep (less than 7-9 hours) can cause migraines. Sensory stimuli, bright lights, sun glare and strong smells can induce migraines besides loud sounds [21]. Medications like vasodilators, such as nitroglycerin, can also aggravate migraine [22].

Frequency of migraine affects the health-related quality of life (HRQoL) in physical, social and mental dimensions [23]. Many patients with migraine experience reduced productivity and decision making at work and disruption of their family, social, and leisure activities [24].

Migraine is a common disabling disorder with a higher prevalence in Saudi Arabia, affecting people's productivity, yet there is a lack of awareness regarding symptoms and predictors of migraine. This study was planned to investigate the common triggers and lifestyle behaviors causing migraine, and to study its effect on the HRQoL in adult Saudi population who is socially and culturally different from other countries.

Methods

Study setting

Colleges of Princess Nourah Bint Abdulrahman University, shopping Malls, Coffee shops, hospital patients and their relatives in Riyadh, Saudi Arabia. Data was collected from September to December 2018.

Study subjects

It includes adult Saudis of both genders between the ages of 18-55 year. Children less than 18 years and elderly people more than 55 years of age were excluded; also, patients with neurological diseases as well as Non-Saudis were omitted.

Study design

It is a cross sectional study.

Questionnaire

The study was based on a structured, closed-ended questionnaire comprising a total of 16 items. It comprised three portions: the first part included personal information and demographic data (Table 1). The second part contained five questions related to causes and characteristics of migraine. These questions were selected from Headache questionnaire prepared by Cleveland Clinic Canada for diagnosis of migraine. The responses in this part were affirmative (yes) or negative (no) and were numbered accordingly. The third part comprised eleven questions related to impact of headache on the HRQoL, in terms of handling routine house-hold chores, canceling work/social activities, feeling less energetic, tired and frustrated, dealing with family and friends, and lacking focusing abilities etc. These questions have been selected from Glaxo questionnaire, used in many published studies. The responses were measured on a four-point scale starting from "none of the time, some of the time, most of the time and all of the time" and were numbered one to four. There were no negative questions.

Table 1: Demographic data of participants.

Variables	Category	Number (n)	Percentage (%)
Age	18-35	407	88.5
	36-55	53	11.5
Gender	Male	33	7.2
	Female	427	92.8
Education	Primary	13	2.8
	Secondary	28	6.1
	Intermediate	108	23.5
	Higher	311	67.6
Occupation	Student	324	70.4
	Employed	95	20.7
	Unemployed	41	8.9
Average monthly income	Satisfactory	167	36.3
	Not enough, in debt	77	16.7
	Enough, save	216	47

Since, the questions were selected from two different questionnaires, so the content validity and internal consistency were tested through a pilot test by distributing this questionnaire to twenty subjects and calculating the Cronbach alpha.

The questionnaire was translated in Arabic language to facilitate the Non-English-speaking participants and then back to back translated.

The questionnaires were distributed manually among the participants according to the criteria of International

Headache Society Classification (IHSC,2013) by the members of the Research team.

Sample size

Previous literature showed that the prevalence of migraine in Saudi Arabia is 12.1 (0.12), using level of confidence 95% ($\alpha=0.05$), power of study of 80% ($\beta=20\%$), difference of (± 0.05) in G power program, the minimal sample size for current study was calculated to be 392. To compensate for incomplete responses of questionnaire, a total of 500 samples of Questionnaires were distributed.

Sampling technique

Purposive and snowball sampling were used to approach the subjects who were suffering from migraine. Participants were chosen according to the criteria of IHSC.

Results

A total of 500 questionnaires were distributed to subjects complaining of migraine. There were six incomplete responses, whereas 34 subjects who did not fulfil the criteria of migraine (having only aura without headache) were excluded. A total of 460 responses who fulfilled the criteria for migraine according to IHSC were thus finalized for statistical analysis.

Gender-wise the participants comprised 33 (7.2%) males, and 427 (92.8%) females; while age-wise there were 407 (88.5%) subjects in 18-35 age group and 53 (11.5 participants %) in 36-55 age group.

Regarding the education level, majority of participants (67.6%) had higher education (bachelor, master etc.), while the least belong to primary education level (2.8%). The average monthly income was satisfactory in 167 (36.3%) participants, while most participants have enough income (47%).

Among the occupations, majority of participants were students (323: 70.2%), whereas 95 (20.7%) were employed, and 41 (8.9%) were unemployed including mostly housewives.

Regarding the symptoms of migraine, 303 (74.4%) subjects had complaint of vertigo in age category 18-35 and 36 (67.9%) subjects complained of nausea in age category 36-55 years. Also, 299 (68%) participants did not visit the doctor for their symptom while only 160 (34.8%) visited the doctor. Out of them 144 (40.2%) took their medication to relieve their symptom whereas 214 (59.8%) took over the counter medication without visiting the doctors (**Table 2**).

Most of our participants in all age categories relieved their symptoms by either taking medications (77.8%) or resting in a quiet place (78.5%). Moreover, the commonest cause of life style behavior causing migraine was lack of sleep in (88%) cases, followed by stress of exams (67.2%) and prolonged hunger (68.5%). Finally, the migraine has badly affected the quality of life in both age categories (56.7%); thus there was a positive correlation between severity of symptom and worsening of quality of life (correlation coefficient =0.04)

which reflects that more severe the symptoms, poorer the quality of life (**Table 3 and Figure 1**).

Table 2: Symptoms associated with migraine in Saudi population.

Symptoms	Age category in years (percentage)		P value
	18-35	36-53	
Flash of light	153 (37.6)	18 (34)	0.6
Nausea	230 (56.3)	36 (67.9)	0.04*
Blurred vision	182 (44.7)	29 (54.7)	0.1
Tingling	120 (29.5)	21 (39.6)	0.1
Speech disturbances	126 (31)	8 (15.1)	0.1
Vomiting	107 (26.3)	21 (39.6)	0.1
Light sensitivity	231 (56.8)	33 (62.30)	0.4
Vertigo	303 (74.4)	29 (54.7)	0.03*

(*) Significant

Discussion

Migraine, despite having a higher prevalence in young adult Saudi population (12%), is frequently underdiagnosed and undertreated. Our study reported that episodic migraine is the commonest headache occurring in younger age group, predominantly in women. This finding is consistent with many studies documenting that migraine is experienced mostly at young age, among 20% of women and 10% men [13,25]. The female gender predominance may be attributed to the role of estrogen acting as a key factor in the increased prevalence of migraine in women [26].

Interestingly, our study showed a positive correlation between migraine and higher educational level as well as satisfactory monthly income. On the contrary, a recent study conducted in India showed that migraine was more common in patients with lower educational level and lower monthly income [27].

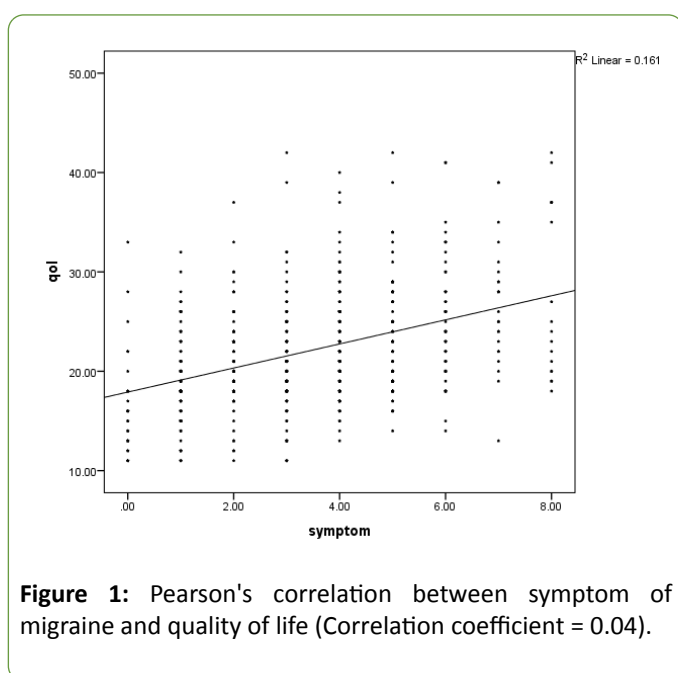
Regarding associated symptoms, an overwhelming majority of our participants did not experience aura whereas vertigo was the commonest symptom observed in a clear majority, followed by nausea. On the other hand, a study done in the USA reported vertigo to be experienced by a much lower proportion of migraineurs [8]. Furthermore, another study showed that half of the overall migraine participants reported high frequency of nausea (greater than 50% of the time) and there were no differences related to age, income or population size [27].

Among the triggers of migraine, our study determined that lack of sleep is the most common cause of migraine, followed by stress of exams and hunger. Other studies endorsed our findings that sleep disturbances may predispose individuals to migraine attacks [28]. Taking medications and resting in quiet

place were main relieving factors in our study which is consistent with other studies.

Table 3: Comparison of demographic variables and quality of life with severity of symptoms.

Variables	Categories	Mild	Moderate	Severe	p value
Age	18-35	31.50%	49.40%	19.20%	0.582
	36-55	25.50%	56.90%	17.60%	
Gender	Female	31.50%	50%	18.50%	0.45
	Male	21.90%	53.10%	25%	
Education	Primary	16.70%	41.70%	41.70%	0.137
	Intermediate	44.40%	44.40%	11.10%	
	Secondary	25%	57.70%	17.30%	
	Higher	32.10%	48.50%	19.40%	
Occupation	Student	29.60%	50%	20.40%	0.448
	Employed	30%	52.20%	17.80%	
	Unemployed	42.10%	47.40%	10.50%	
Quality of life	Good	41.90%	48.40%	9.70%	0.000*
	Bad	22.70%	51.60%	25.80%	



A significant finding of our study was low level of self-awareness about symptoms and predictors of migraine. Majority of participants were unaware that they were suffering from migraine and were eventually using self-medications to relieve their headaches without consulting a physician. A study done on German population also documented low self-awareness and medical recognition of migraine [29].

Concerning the effects of migraine on the social and professional aspects of quality of life, both sexes but the younger age group was most negatively affected. There was a

positive correlation between the severity of symptoms and poorer quality of life, with a great majority being unable to concentrate on work or daily activities, having tiredness, frustration and interferences with leisure time activities.. Multiple studies display the burden of migraine on the quality of life on both the social and the economic aspects. A study conducted in USA showed that majority of participants have missed work or schedule, cancelled social events, were less productive at work or school, and skipped their household chores [5].

Conclusion

It is recommended that awareness related to knowledge of symptoms and triggers of migraine among general Saudi population be raised by print and electronic media as well as printed brochures should be placed in every health care center. Time and stress management courses and relaxation sessions to improve productivity among migraineurs should also be arranged.

Limitation of Study Population

The study sample belonged to Riyadh, the capital of Saudi Arabia which has a higher education and income level.

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