ASSOCIATION OF DEPRESSION WITH MIGRAINE WITHOUT AURA; A CROSS-SECTIONAL STUDY

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Abstract

Objective: Migraine is ranked as the seventh leading cause of disability worldwide, and it is characterized by a manifestation of combined neurological, gastrointestinal, and autonomic symptoms linked with different provoking factors. Aim of the study: This study investigates the association between migraine without aura and depression.

Method: A total number of 100 patients were enrolled in the study and were divided into two groups: 50 individuals with confirmed migraine without aura (the study group) and 50 individuals with no history of headaches (control group). All individuals were evaluated using the ICHD- II diagnostic criteria for migraine, as well as the Beck test for depression.

Results: Statistical analysis showed a significant relationship between migraine without aura and depression (p=0.023), but no significant association between depression and BMI, migraine length, gender, family history of depression, alcoholism, smoking cigarettes and number of drugs consumed.

Conclusions: Based on our data we can confirm an association between depression and migraine without aura.

Key words: migraine, depression, comorbidity, headache, migraine without aura

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Introduction

Migraine is a common multifactorial headache disorder consisting of neurological, gastrointestinal, and autonomic symptoms (Woldeamanuel & Cowan, 2017) with a prevalence of 12% of the adults in occidental countries (Lipton et al., 2007). Its seventh known cause of disability globally (Vetvik & MacGregor, 2017). Studies persistently indicate that migraine is more common in women than men, and peak in incidence is between ages 25 and 44 years (Jette, Patten, Williams, Becker, & Wiebe, 2008). Symptoms are determined by symptom-based criteria defined by the International Headache Society (IHS) International Classification of Headache Disorders 3rd edition ("The International Classification of Headache Disorders, 3rd edition, beta version", 2013). According to the International Headache Society diagnostic criteria, migraine is divided into six major types; the two most important ones are migraine without aura and migraine with aura (Patel et al., 2004). A variety of premonitory symptoms may occur hours before a migraine attack begins, and postdrome symptoms can last for hours after the headache ends. Yawning, mood change, light sensitivity, neck pain, and fatigue are common premonitory symptoms that may persevere during and after the headache. Aura symptoms may include visual disturbances (e.g. wavy lines or bright or dark spots), other sensory changes (e.g., numbness or tingling), language dysfunction, and vertigo (Giffin et al., 2003; Solomon, 2017). Psychiatric comorbidities are associated with migraine, such as depression, anxiety, and post-traumatic stress disorder (Minen et al., 2016), which affects disease prevalence, prognosis, treatment, and clinical outcomes (Peres, Mercante, Tobo, Kamei, & Bigal, 2017). Also, the risk of suicide becomes greater in patients with migraine (Jette et al., 2008). Anxiety is the most common psychiatric comorbidity of migraine, with a prevalence rate of 25.5%–57.6%. Depression is another common comorbidity of migraine, with a prevalence of up to 29.1% among migraine sufferers (Bigal, Lipton, & Stewart, 2004) while the prevalence of the depressive disorder in general population is 14.9% (Richards, 2011). Anxiety may result from the pain caused by headaches and unpredictability of migraine attacks, and depression by uncontrollability if poorly treated (Lanteri-Minet, Radat, Chautard, & Lucas, 2005). Several pathways including genetic factors, serotonergic dysfunction, ovarian hormone impacts, and hypothalamic-pituitary-adrenal (HPA) axis dysregulation, may be involved in the pathophysiology of comorbid migraine and depression (Baskin &

Smitherman, 2009). Besides, patients with migraine and psychiatric comorbidities tend to have more frequency of headache and severity of disability compared with those with migraine without comorbidity (Song et al., 2017). Studies have proved compatible evidence for the association between migraine and depression, but whether migraine with aura is more strongly associated than migraine without aura is unclear (Oedegaard et al., 2006).

The present study aimed to evaluate the association between depression and migraine without aura.

Method and Material

Participants

Participants were divided into two groups: a study group (50 individuals) and a control group (50 individuals). The study population consisted of 50 consecutive patients suffering from migraine without aura (15 males and 35 females) referred to the Headache Center of Tehran University of Medical Sciences. The control group consists of 50 patients without migraine and psychiatric disorders. This group of patients has never complained about any kinds of headache.

The study was approved by the Ethical Committee of the University Clinical Centre, and the participants have signed the informed consent.

Inclusion Criteria

Patients were 20 years of age or older, with a diagnosis of definite or probable episodic or chronic migraine as per the International Classification of Headache Disorders-Edition II (ICHD- II) criteria, able and willing to provide informed consent, able to speak, read, write and understand Persian. Exclusion Criteria

Patients were excluded if they had a headache not meeting ICHD-II criteria for migraine, and using antidepressant and anti-psychotropic drugs in the last six months, mental retardation and chronic or acute psychosis.

Assessment

The diagnosis of migraine without aura for participants in the study group was confirmed by a specialist in neurology, according to the International Classification of Headache Disorders.

Self-reported demographic and clinical information was also collected (e.g., marital status, education, employment, alcohol consumption, smoking history, drug use, family history of depression, Past medical history).

Abstracted data included: patient's date of birth, sex, episodic versus chronic migraine, current medications, and current migraine preventative medications.

A structured psychiatric interview was used to detect depression, and Beck questionnaire was used to compare and determine its severity. Both the study and control group assessed Beck test for depression.

Beck test is a questionnaire completed by patients and contains 21 questions which each of the 21 questions are scored from 0 to 3, for a total range of scores of 0 to 63. BDI scores between 0-9 are considered as minimal depression, 10-18 as mild depression, 19-29 as moderate depression, 30-63 as severe depression.

Statistical analysis

A Chi-square test was applied to analyze the association between psychological factor and migraine. IBM SPSS 24 software was used.

Results

In the period of 2016, 50 migraine without aura patients (consisting of 35 women and 15 men, ages 20–65) and 50 non-migraine patients (including 12 women and 38 men, ages 20–65) were enrolled in the study. The mean age of 100 patients was 34.63 years old. Mean migraine duration in the study group was 7.36. A summary of the characteristics of patients in the study and control groups is presented in **table 1**.

Table1

	Study group		Control group	
Gender	Women	Men	Women	Men
	35	15	12	38
Mean age	34.92		34.34 (P=0.803)	
Mean BMI	24.76		25.85 (P=0.841)	
Smoker	4%		12% (P=0.008)	
Alcoholism	14%		4% (P=0.039)	
Family history of depression	18%		0% (P=0.003)	
Mean Beck test score	14.88		8.92 (P=0.023)	

Table 2. *Distribution of types of medications used during attacks in the study group*

Type of drug used during attacks	Number (frequency)
No durg	34 (68%)
Acetaminophen	5 (10%)
Ibuprofen	7 (14%)
Sumatriptan	3 (6%)
Dexamethasone	1 (2%)
Diclofenac	2 (4%)

Table 3. *Distribution of the types of drugs used as prophylaxis in the study group*

Type of drug used as prophylaxis	Number (frequency)
No drug	23 (46%)
Propranolol	13 (26%)
Amitriptyline	5 (10%)
Nortriptyline	6 (12%)
Valproate	1 (2%)
Aspirin	1 (2%)
Prednisolone	1 (2%)
Venlafaxine	2 (4%)
Verapamil	1 (2%)
Gabapentin	1 (2%)

Table 4. *The association between depression and migraine without aura*

P-value	Depression severity				
	Severe	Moder-ate	Mild	Minimal	
0.023	4 (8%)	10 (20%)	13 (26%)	23 (46%)	Study group
	1 (2%)	3 (6%)	9 (18%)	37 (74%)	Control group

Table 5. *Mean dosages of medications used during migraine attacks and prophylaxis*

Medication	Mean dosage used during migraine attack
Acetaminophen	300mg
Ibuprofen	400mg
Sumatriptan	35mg
Dexamethasone	8mg
Diclofenac	50mg

Medication	Mean dosage used as prophylaxis
Propranolol	40mg
Amitriptyline	25mg
Nortriptyline	25mg
Valproate	250mg
Aspirin	300mg
Prednisolone	10mg
Venlafaxine	75mg
Verapamil	80mg
Gabapentin	300mg

The number of daily drug intake and the number of medications used during migraine attacks were also evaluated in this study. 23 patients do not regularly take medication. 18 patients take only one medication regularly, and 2 patients take the two drugs regularly and as prophylaxis.

The mean score of Beck questionnaire in migraine patients in this study was 14.88 with a standard deviation of 9.88. In control subjects, the average score was 8.92, with a standard deviation of 7.09.

Suicidal thoughts, as a specific item on the BDI questionnaire, were investigated; all of the patients in the control group had zero scores. Sixteen patients with migraine had a score of 1, and three patients had a score of 2, and only one patient was scoring 3 points, which indicates that suicidal thoughts are more common among migraine patients. However, none of the patients had suicide attempts.

As shown in Table 4, patients were divided into four groups according to the Beck questionnaire. This study showed that migraine has a significant relationship with depression.

Statistical analysis showed no relation between depression and BMI, migraine duration, gender, family history of depression, alcoholism, smoking cigarettes and number of drugs consumed.

Discussion

Migraine and depression are common comorbid conditions that may result in significant disability and immensely affect individuals, families, and social aspects (Francoise Radat et al., 1999). Patients with migraine are at risk of developing a depressive disorder contrast to patients without migraine. Patients who have migraine with aura, chronic, and disabling headaches, are widowed, separated, divorced, or a lower-income category are at the highest risk of expanding a depressive disorder (Amoozegar, 2017). Studies showed that there is a bidirectional relationship between migraine and depression, migraine increases the risk of incident depression, and depression increases the risk of incident migraine (Gudmundsson et al., 2013). In a population-based study by (Lipton, Hamelsky, Kolodner, Steiner, & Stewart, 2000), Mental Primary Care evaluation of disorders questionnaire was used to study depression in people with migraine and healthy people. Based on this questionnaire, 47% of people with depression migraine were depressed, While only 17% of the healthy people were depressed. Another study used the Anxiety Stress Scale (DASS) questionnaire to assess depression, which is a 3-part questionnaire. According to this study, patients with migraine had worse scores in the DASS questionnaire than the general population (Yavuz, Aydinlar, Dikmen, & Incesu, 2013). In addition, in a study by (Camarda et al., 2008)on patients over 65 years old, it was found that the probability of depression in migraine patients is higher than healthy people, and the headache seems to be independently associated with depression in the elderly. Beck questionnaire was used in a study by (Eraslan, Dikmen, Aydınlar, & İncesu, 2014); the average score of Beck in patients with migraine was 13.6. Also, Respectively, 40%, 30%, 28%, and 2% of the population in the study had scored with no depression, mild depression, moderate depression, and severe depression. Moreover, in a survey by (Santangelo et al., 2016), the mean beck score for migraine without aura patients was 10.6, and the frequency of severe, moderate, mild and minimal depression was 75%, 11.1%, 9, 75% and 4.2% respectively. In our study, the Mean Beck Score for Migraine patients was 14.88, and the frequency of severe, moderate, mild and minimal depression was 46%, 26%, 10%, and 8% respectively. The findings of our study are consistent with what Eraslan reports.

Three underlying mechanisms have been considered as probable cause of association between migraine and depression; (i) Psychiatric disorders are essential factors in the development of migraine; (ii) migraine is a causal factor in the development of psychiatric disorders; (iii) that a common shared etiological factor may explain the co-occurrence of both syndromes without a causal association between them (FetJSWENDSEN Radat & Swendsen, 2005). Although no study has explored the interaction between the severity of migraine and the severity of depression, (Mitsikostas & Thomas, 1999)manifested that the severity of headache is not associated with depression, but there was a significant relationship when considering the frequency and duration of the attacks. Besides, depression may affect the efficacy of usual treatment for migraine attacks and have an impact on the quality of life impairment, and medical and therapeutic management of migraine. It is also a risk factor for drug overuse (Lanteri-Minet et al., 2005; F. Radat et al., 2005). Besides, Suicide attempts seem to be more frequent in patients suffering from migraine than in the general population (Pompili et al., 2010). Analyzing individual suicide item from the Beck Depression Inventory (BDI) showed that compared with the non-migraine group, subjects with migraine displayed a higher frequency of suicidal thoughts.

A study of participants at a U.S. health maintenance organization (HMO) (Breslau, Davis, & Andreski, 1991)found that individuals with migraine without aura headaches are more likely to have suicide attempts than those without migraine. While there is evidence of an association between migraine and suicide attempts, it is not yet known if other variables may explain the relationship. Several essential variables were shown to be related to both migraine and suicide attempts (drug and alcohol abuse; pain severity; anxiety and depression; early adversity; income and education; gender; race; age) (Kessler, Borges, & Walters, 1999).

This study provides evidence that depression is common among people with migraine without aura. In our study, migraine was presented as a disease with extensive clinical presentations. Headache as a superior symptom was present in all patients. In migraine patients, temporal-parietal and cervical-orbital headaches were remarkably more common, whereas the control group had no previous history of any kinds of headache.

The measure chosen to satisfy the existence of depression in study and control group patients was the Beck Depression Inventory (BDI). As it is the most convenient questionnaire for use in general medical practice, by focusing on specific cognitive/affective symptoms, BDI keeps high sensitivity and specificity (Richter, Werner, Heerlein, Kraus, & Sauer, 1998).

Our data present a significantly higher (P=0.023) prevalence of depression among the patients of the study group compared to the control group.

Conclusions

This study indicates that BDI depression screening tools may be helpful in identifying migraine patients with depression. This study also shows the high burden of depression experienced by migraine patients and the lack of appropriate treatment in many of these patients. Future studies are required to further validate the BDI depression scales in community-based migraine patients.

Funding

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