Evaluation of Eating Attitude in Patients with Migraine

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ABSTRACT

Introduction: This study aimed to investigate the eating attitudes in patients with migraine.

Methods: Fifty-nine patients (mean age: 32.54±8.47 years) diagnosed with migraine according to the International Classification of Headache Disorder, 2004, and 47 age-, gender- and education-matched healthy controls (mean age: 31.85±7.14 years) were enrolled for this study. Sociodemographic data were recorded, and the body mass index was calculated as kilograms per meter squared. Data regarding the duration of illness and attack, frequency of migraine attacks, and the presence of aura were recorded. Migraine severity was assessed by Migraine Disability Assessment Score (MIDAS). Eating Attitudes Test (EAT), Beck Depression Inventory (BDI), and Beck Anxiety Inventory were applied to all participants.

Results: The patients with migraine had significantly higher EAT scores, levels of anxiety, and depression than controls ($p<.01$). Furthermore, 11.9% of patients with migraine had an EAT score of 30 or higher, which is suggestive of a disordered eating attitude, whereas this rate was 2.1% in healthy controls ($p<.05$). The scores of EAT and BDI had positive correlation with the scores of MIDAS in patients with migraine ($r=.298$, $p<.05$; $r=.332$, $p=.01$, respectively).

Conclusion: In our study, disordered eating attitudes and the levels of anxiety and depression were high in patients with migraine than controls. Our study is important to demonstrate the connection between migraine and disordered eating attitudes.

Keywords: Migraine, eating attitude, eating disorder

INTRODUCTION

Following the tension-type headache among primary headaches as the second most frequently observed type, migraine is a neurological disease characterized by recurring headache attacks with medium or high severity, accompanied by different combinations of neurological, gastrointestinal, and autonomous symptoms. Migraine is divided into two general categories depending on the presence or absence of aura (1). In Turkey, the prevalence of migraine has been reported to be 16.4% (24.6% in women and 8.5% in men). The prevalence of migraine is highest among 35–40-year-old women (2).

Migraine is a multifactorial disease. Genetically susceptible individuals are exposed to headache attacks with the impact of triggering factors. Changes in stress levels, sleep patterns, and hormone levels as well as climate and pressure changes, intake of certain nutrients, alcohol consumption, or medication may trigger migraine attacks. It has been reported that particularly citrus fruits, caffeine, aspartame, chocolate, red wine, monosodium glutamate, and nutrients with nitrite may trigger migraine attacks (3).

Migraine is associated with many psychiatric disorders, such as major depression, bipolar disorder, and anxiety disorder. Both migraine attacks and comorbid psychiatric disorders cause significant labor loss and adversely affect the quality of life (4,5). Studies suggest a relation between migraine and eating disorders, and a common biological susceptibility between them (6,7,8). Migraine and eating disorders display common demographic characteristics, such as higher prevalence at relatively younger ages and in women, and common psychiatric comorbidities, such as depressive symptoms, anxiety, and body-image disorders. Pathophysiology of migraine and eating disorders remain unclear. It has been demonstrated that migraine may pose a risk for the development of eating disorders (6). Metabolic dysfunctions of serotonin, noradrenaline, and dopamine, which are included among the biological factors in the pathophysiology of eating disorders, have been demonstrated in the case of migraine as well. In addition, high tyramine and octopamine levels present in the plasma and platelets of patients with migraine support the role of hypothalamic and limbic dysfunctions in the pathophysiology of migraine (7,8). On the basis of this information, it can be observed that the studies conducted on the relationship between migraine and eating disorders are inadequate. Our study was based on the hypothesis that the frequency of disordered eating behavior in patients with migraine could be different than in healthy individuals. This study aims to examine eating attitudes of patients with migraine.

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METHODS

Patients diagnosed with migraine according to the classification of International Headache Society in 2004 who are not subject to any treatment ($n=59$) and healthy individuals with similar education levels and gender ($n=47$) were included in the study. The study has been approved by the Faculty of Medicine Clinical Research Ethics Board of our university, and written consents of all participants have been obtained. The criteria for inclusion in the study comprised volunteering, being literate, using no constant medication, and being between the age interval of 18 and 45 years; furthermore, the inclusion criteria for the patient group was being diagnosed with migraine without any other disease and for the control group was being healthy. Sociodemographic details of the participants were obtained, their body mass indexes (BMI) were calculated by measuring their height and weight, and they were categorized under three groups according to their BMI score: <18.5 low, $18.5\text{--}24.9$ normal, and ≥ 25 high. In the migraine group, duration of disease, duration of attack, attack frequency, and the presence of aura were evaluated, and the Migraine Disability Assessment Score (MIDAS) was applied to determine migraine severity. All participants received a detailed neurological examination, and they were assessed by Eating Attitudes Test (EAT), Beck anxiety inventory (BAI), and Beck depression inventory (BDI) through semi-structured psychiatric interviews. Participants were divided into following groups: $EAT < 30$ and $EAT \geq 30$ according to the scores of EAT and $BDI < 17$ and $BDI \geq 17$ according to scores of BDI.

Migraine Disability Assessment Score: Of the scales developed to measure the level of disability in migraine, this scale is among those that are most commonly used. This scale determines migraine-associated disability in all areas of activity for a period of 3 months and is filled by patients (9). It has been translated into Turkish with a validity and reliability study (10,11).

Eating Attitudes Test: Applied to individuals older than 11 years, this is a self-reporting scale used for measuring possible disorders in the eating attitudes of both the patients with and individuals without eating disorders (12). EAT is able to determine the susceptibility to the eating behavior and attitude that are disordered on a clinical level. Cut-off score of the six-point Likert scale comprising 40 items has been determined as 30. The level of total score is directly related to the level of the psychopathology. A validity and reliability study has been completed for the Turkish version of the test (13).

Beck Depression Inventory: It measures physiological, emotional, cognitive, and motivational symptoms observed in depression. The scale does not aim to diagnose depression; however, it determines the level and severity of changes of the symptoms of depression. BDI contains 21 self-assessment phrases, and each symptom category comprises four alternatives. Each item is scored from 0 to 3, and total score varies within the range of 0–63 (14). For this scale, a validity and reliability study has been conducted in Turkey. Cut-off point has been determined as 17 for the Turkish version (15).

Beck Anxiety Inventory: This scale measures the commonness of the symptoms of anxiety experienced by an individual. BAI, a self-report scale, comprises 21 items; each item is scored from 0 to 3, and the total score varies within the range of 0–63. A high score implies the severity of the anxiety experienced by the individual (16). In Turkey, validity and reliability study for BAI has been conducted by Ulusoy et al. (17).

Statistical Analysis

Statistical package for the social sciences (SPSS Inc., Chicago, IL, USA) 15.0 pack software was used for the statistical analysis of the data ob-

tained in this study. Conformity of the variables to normal distribution was examined via Kolmogorov–Smirnov test, and because a normal distribution was observed, t-test was used to compare the continuous variables between the groups. Chi-square test was used for the comparison of groups with respect to the inventory scores categorized according to sociodemographic characteristics. The relationship between variables was assessed via Pearson correlation test. The $p < .05$ value was determined as the threshold for statistical significance.

RESULTS

Sociodemographic and clinical characteristics of the migraine group and the sociodemographic data of the control group are demonstrated in Table 1. No statistically significant difference was detected between the groups in terms of age, gender, and level of education. The EAT scores, anxiety, and depression levels in the migraine group were significantly higher than in the control group ($p < .001$). EAT, BAI, BDI, and BMI scores of the migraine and control groups are given in Table 2. In the assessment based on gender, within the migraine and control groups, no statistically significant difference was observed between women and men in terms of their EAT scores ($p = .596$, $p = .390$, respectively). Moreover, 11.9% of the migraine group scored 30 and above in EAT, implying a disordered eating behavior, whereas this ratio was found to be 2.1% in the control group ($p = .039$). The comparison between the migraine and control groups in terms of their body mass index, eating attitudes, and depression levels according to the cut-off points is presented in Table 3. In the migraine group, a positive significant correlations were found between MIDAS scores with EAT ($r = .298$, $p < .05$) and BDI scores ($r = .332$, $p = .01$). There was no significant correlation between duration of disease, duration of attack, attack frequency, and presence of aura and EAT, BAI, BDI, and BMI scores in the migraine group ($p > .05$). The correlations between the scores of scales in the migraine and control groups are demonstrated in Table 4.

DISCUSSION

In our study, we found that patients with migraine had significantly higher EAT scores and higher disordered eating behavior than controls, according to the cut-off score of EAT, and there were positive correlations between MIDAS scores with EAT and BDI scores. These findings have verified the hypothesis of our study. To the best of our knowledge, this study has been the first one to assess eating attitudes of and eating disorders in patients with migraine.

In our study, the absence of a statistically significant correlation in terms of BMI between the groups suggests that disordered eating behavior, which

Table 1. Sociodemographic and clinical characteristics in the migraine and control groups (mean $\pm$ SD)

	Migraine ($n=59$)	Control ($n=47$)	p
Age (year)	32.54 $\pm$ 8.47	31.85 $\pm$ 7.14	.65
Female gender	42 (71.2%)	29 (61.7%)	.30
Male gender	17 (28.8%)	18 (38.3%)	
Education level (year)	10.91 $\pm$ 4.15	10.72 $\pm$ 4.14	.81
Migraine with aura	18 (30.5%)	-	-
Headache duration (year)	9.45 $\pm$ 7.32	-	-
Attack frequency (month)	4.77 $\pm$ 2.63	-	-
Attack duration (hour)	26.87 $\pm$ 20.07	-	-
Migraine severity (MIDAS)	16.96 $\pm$ 9.42	-	-
SD: standard deviation; MIDAS: Migraine Disability Assessment Scale			

Table 2. Comparison between the migraine and control groups for eating attitudes, levels of depression, and anxiety and body mass indexes (mean±SD)

	Migraine (n=59)	Control (n=47)	p
EAT	20.18±8.91	14.19±6.36	<.001
BAI	17.28±11.72	7.38±8.28	<.001
BDI	13.88±9.36	6.14±7.82	<.001
BMI	24.48±4.47	24.01±3.77	.56

SD: standard deviation; EAT: eating attitudes test; BAI: Beck anxiety inventory; BDI: Beck depression inventory; BMI: body mass index

Table 3. Comparison between the migraine and the control groups in terms of body mass index, eating attitudes, and depression levels according to cut-off point

	Migraine (n=59)	Control (n=47)	p
Low: BMI<18.5	5 (8.5%)	3 (6.4%)	.91
Normal: BMI=18.5-24.9	30 (50.8%)	24 (51.1%)	
High: BMI≥25	24 (40.7%)	20 (42.6%)	
EAT<30	52 (88.1%)	46 (97.9%)	.039
EAT≥30	7 (11.9%)	1 (2.1%)	
BDI<17	39 (66.1%)	42 (89.4%)	.006
BDI≥17	20 (33.9%)	5 (10.6%)	

EAT: eating attitudes test; BAI: Beck anxiety inventory; BDI: Beck depression inventory; BMI: body mass index

Table 4. Correlation between scale scores of the migraine and control groups

Scale	EAT	BDI	BAI	BMI	MIDAS
Migraine (n=59)					
EAT	-	.381**	.381**	.211	.298**
BDI	.381**	-	.807**	.096	.332*
BAI	.381**	.807**	-	.041	.182
BMI	.211	.096	.041	-	.131
Control (n=47)					
EAT	-	.424**	.352*	-.031	-
BDI	.424**	-	.670**	.008	-
BAI	.352*	.670**	-	.151	-
BMI	-.031	.008	.151	-	-

*p<.05, **p<.01. EAT: eating attitudes test; BAI: Beck anxiety inventory; BDI: Beck depression inventory; BMI: body mass index; MIDAS: Migraine Disability Assessment Scale

was found to be higher in the migraine group, may be directly associated with migraine that was independent of BMI.

Pathophysiology of both migraine and eating disorders remain unclear. However, it has been suggested that both of these diseases have common pathophysiological characteristics, such as serotonin dysfunction (2,7,18). It has been reported that, particularly the changes of serotonin functions may predispose some individuals to dysregulation of mood and anxiety, and vascular tone and pain (18). The hypothalamus, limbic system, and amygdala may play significant roles in the pathogenesis of eating disorder (19,20,21). Similarly, dysfunctions of the hypothalamus and limbic system

are also accused of the premonitory symptoms, such as nausea, depression, polydipsia, sexual excitement, nervousness, and hyperosmia, that precede migraine attacks (22,23).

In a study investigating migraine and eating disorders, binge eating behavior was reported for 59%, self-induced vomiting for 26%, and bulimia nervosa for 39% of female patients with migraine who constituted 88% of the participants. Regarding eating disorder-related traits, the same study revealed high scores of perfectionism, body dissatisfaction, interpersonal distrust, and ineffectiveness in the half of patients with migraine (18). Another study reported that 74% of patients with eating disorders were diagnosed with migraine (6). Moreover, Mustelin et al. (24) reported the prevalence of migraine to be 12% in general female population and 22% among individuals with anorexia nervosa and bulimia nervosa. In the light of this information, our findings can be considered to be in conformity with those presented in the literature. Another significant result of this study is the positive correlation between MIDAS scores, which indicate the severity of migraine, and EAT scores. This result may be important in terms of demonstrating that disordered eating behavior increases the severity of pain. Our study also determined high levels of anxiety and depressive symptoms as well as a high risk of depression in patients with migraine. A study reported that 42% of female patients with eating disorder had depressive disorder as well, and a strong correlation existed between major depressive disorder and migraine (24). In a study conducted on university students in Turkey, a significant correlation was reported to exist between eating attitude and symptoms of depression (25). Our study has demonstrated significant positive correlations between EAT scores and the levels of the symptoms of depression and anxiety in patients with migraine.

Absence of medication and other physical or psychiatric diseases in both the groups and their similarity in terms of BMI scores, age, gender, and level of education are considered to constitute the strong points of our study. In contrast, the features, such as small sample size, being a single-center study, and the non-diagnostic characters of the scales used, are the limitations of this study. Despite such limitations, we think that our study contributes to the literature by presenting the correlation between migraine and disordered eating behavior.

The presence of eating disorder or disordered eating behavior in the follow-up and treatment process of the migraine patients is important when considering that certain nutrients are among the triggers of migraine attacks. Early diagnosis and treatment of disordered eating behavior may positively contribute to the patients with migraine.

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