

The Prevalence of Eating Disorders in Migraine and Tension Type Headache Patients

Migren ve Gerilim Tipi Baş Ağrılı Hastalarda Yeme Bozuklukları Prevalansı

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Abstract

Psychiatric disorders obesity, primary headache and eating disorders share the same clinical context. In this study, we aimed to investigate the prevalence of the eating disorders and the possible common pathophysiological association in patients with primary headache. 210 migraine (without aura) and tension type headache (TTH) (frequent episodic tension type headache) patients were included. The characteristics of the headaches, resume/family histories, information about the medications were recorded. The prevalence of night eating syndrome (NES) was found to be 53.8% (n=51) in migraine group. Both the frequency of the diagnosis of NES and (add) NES questionnaire score with the diagnosis of migraine participants were demonstrated significantly higher than TTH group (p=0.001). The mean BMI was significantly higher in the patients with NES than those without NES (32.87±4.81 vs 27.37±4.59; p= 0.003). In migraine group, migraine with NES patients were more obese than without NES (p=0.001). There was a positive correlation between BMI&BDI score and NES&BDI score (p≤0.005). The mean emotional eating score of DEBQ was significantly higher in migraine group compared to TTH group [(p<0.01);28.4±3.1 vs 19.7±1.4]. The mean external eating score was significantly higher in TTH than that of migraine group [(p=0.002); 30.1±2.9 vs 20.7±0.8]. This was the first study, where we investigated the prevalence of eating behaviors in patients with primary headache. The diagnosis of night eating syndrome should be questioned in migraine patients. This comorbidity may be led to determine an effective and first therapeutic choice for migraine therapy.

Keywords: Anxiety, Eating Disorders, Migraine, Night Eating Syndrome, Tension Type Headache

Öz

Psikiyatrik hastalıklar, obezite primer baş ağrıları ve yeme bozuklukları ortak klinik içerirler. Biz bu çalışmada primer baş ağrılı hastalarda yeme bozukluklarının prevalansını ve ilişkili olası patofizyolojik ilişkileri araştırmayı amaçladık. Çalışmaya 210 migren (aurasız) ve gerilim tipi baş ağrısı (GTBA) hastası dahil edildi. Baş ağrısı karakterleri, öz/soygeçmişleri, tedavileri kaydedildi. %53.8 (n=51) Migrenlide gece yeme sendromu (GYS) izlendi. Migrenlilerde hem NES klinik-tanısı hem de NES skoru GTBA'ya göre anlamlı yüksek saptandı. (p=0.001). GYS olanlarda olmayanlara göre BMI anlamlı daha yüksekti (32.87±4.81 vs 27.37±4.59; p=0.003). Migrenlilerde GYS tanısı olanlarda olmayanlara göre daha obezdi (p=0.001). BMI&BDI skorları ile GYS&BDI skorları kendi aralarında pozitif koreleydi (p<0.005). Duygusal yeme puanı migrenlilerde GTBA'lara göre anlamlı daha yüksekti [(p<0.01);28.4±3.1 vs 19.7±1.4]. Dışsal yeme puanı GBTA'da migrenlilere göre anlamlı daha yüksekti [(p=0.002); 30.1±2.9 vs 20.7±0.8]. Çalışmamız, primer baş ağrılarında yeme bozukluklarının incelendiği ilk araştırmadır. Gece yeme sendromu migrenlilerde sorgulanmalıdır. Bu komorbite, migrenin başlangıç tedavisi seçiminde etkili olabilir.

Anahtar Kelimeler: Anksiyete, Yeme Bozuklukları, Migren, Gece Yeme Sendromu, Gerilim Tipi Baş ağrısı

Introduction

As defined in the medical literature, headache or cephalalgia is the experience of pain sensation anywhere in the region of the head. Primary headaches are the most prevalent neurological disorders which have great impact on quality of life

and psychosocial functioning. With respect to etiology, primary headache is considered as not having an underlying organic origin, while a secondary headache is due to a causal pathological lesion. Primary headache is an extremely common neurological disorder that can be separated as migraine, tension-type headache, trigemino-autonomic headaches and other primary headaches (1). There is no underlying- available organic cause in their etiology. The prevalence of primary headache in adult patients is 46% (2). However, the most prevalent subtypes of primary headaches are migraine and tension-type headache (TTH) which affect approximately 11 and 42% of the general population respectively (3,4). Epidemiological studies show that a lifetime prevalence of primary headache including migraine and TTH is 90% (5). Thus, the psychiatric disorders are also major disorders in the brain likewise primary headaches,

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the studies support that the mood disorders as anxiety, depression and primary headaches are highly comorbid particularly in adult population with directional or syndromic associations (6).

Feeding and eating disorders are characterized by a persistent disturbance of eating and or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health and psychosocial functioning (DSM 5). Feeding and eating disorders consist of pica, rumination disorder, avoidant/restrictive food intake disorder, anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (DSM 5). Although the etiology is unknown, psychological and biological factors play relevant role in ED (Management of Eating Disorders (2006) RTI-UNIC Evidence Based Practice Center, Research Triangle Park, NC. AHRQ Publication No. 06-E010 April). Psychological factors include depression, low self-esteem, insecure attachment, anxiety, and obsessive traits, while biological factors include abnormalities of serotonin (5-HT), noradrenaline (NA), and dopamine metabolism. Migraine shares with ED the same metabolic profile and the same psychiatric and psychological conditions. The high level of elusive amines such as tyramine and octopamine in plasma and platelets recently found in migraine patients suggests that a hypothalamic and limbic dysfunction contributes to migraine physiopathology as trace amine associated receptors (TAARs) are mainly localized in such brain areas. Indeed, the altered psychological behavior of ED patients suggests that abnormalities of these brain centers may also play a role in ED pathophysiology (7,8). The common pathways of eating disorders and migraine are that they are both seen more often in females, there is a high rate of psychiatric comorbidity and there are changes in serotonin metabolism in both diseases (9). In a study investigating the relationship between migraine and ED, it was shown that the prevalence of migraine in women affected by AN and BN was 75% (10). However, recent research indicates that headache frequency and severity of migraine headache may be related to obesity, and that the prevalence of migraine attack in obese individuals is higher than in non-obese migraine patients. Obesity also contributes to depression and anxiety disorder in individuals. Obesity related stress and psychological conditions trigger migraine onset, pain level and duration, causing chronic migraine. The findings show that depression and anxiety are more common in migraineurs who are obese (11).

Night eating syndrome was described by Stunkard, Grace and Wolff in patients with treatment-resistant obesity firstly, in 1955 and has not yet officially been considered an eating disorder (12,13). Recently, night eating syndrome (NES) was included into the DSM-5 as an example of

“Other Specified Feeding and Eating Disorders” which characterized by “recurrent episodes of night eating, as manifested by eating after awakening from sleep or by excessive food consumption after the evening meal. Awareness and recall of the eating are required, as are significant distress or impairment caused by the disorder. Exclusion criteria are binge eating disorder or another mental disorder, as well as medical disorders or medication that might better explain the disordered eating pattern” (12). The Prevalence of NES in the general population is estimated at 1.5% and it is reported to be between 6-16% in obese people (14). However, NES also can be seen among non-obese persons. The previous studies show that NES is related with the patients with psychiatric disorders as life-time mood and anxiety disorders, depression (12–35%) (15,16).

The co-existence of psychiatric comorbidities with primary headache including migraine is well known; however, the relationship between eating disorders as NES and primary headache has not been shown yet. Psychiatric disorders obesity, primary headache and eating disorders share the same clinical context. In this study, we aimed to investigate the prevalence of the eating disorders and the possible common pathophysiological association in patients with primary headache.

Material and Method

Ethics committee approval approval was obtained from the Ethics Committee of Bakırköy Research and Training Hospital for Neurologic and Psychiatric Diseases on 07.02.2017, number: 641. This study was conducted on 210 migraine (without aura) and tension type headache (frequent episodic tension type headache) patients who applied to Bakırköy Research and Training Hospital, Department of Neurology. The participants were recruited between 2017-2019. All participants were between 18 and 74 years of age. Prior to diagnosis, all cases were screened for complete blood count, liver function tests, renal function tests, electrolytes, sedimentation, CRP, thyroid function tests, vitamin B12, folic acid, ferritin levels, computerized brain tomography (CT) or brain magnetic resonance imaging (MRI) and the causes of secondary headache were excluded. According to international headache diagnosis criteria, 95 of 210 diagnosed with migraine, 125 of 210 had tension type headache. Written consent was obtained to participate in all cases. The characteristics of the headaches, resume and family histories, information about the medications were recorded. The patients have been suggested to keep a headache diary that includes features such as headache frequency, severity, duration, symptoms associated with pain. The study was approved by the Ethics Committee of Bakırköy Research and

Training Hospital for Neurologic and Psychiatric Diseases.

Sociodemographic question form: The sociodemographic data include questions on age; gender; socioeconomic status; marital status, education, suicide attempt, alcohol-substance use, and non-psychiatric disease history; and their body weight. After the participants' BMI was calculated during the interview, the ones with BMI 25-29 were classified as being overweight and the ones with over 30 were classified as the obese group.

Night Eating Questionnaire (NEQ): NEQ is a screening questionnaire that was developed to diagnose NES. This questionnaire includes questions about hunger, food craving patterns, number of calories gained after dinner, sleeplessness and awakening states, presence of eating behavior at night, and mood. The current version is created with 14 questions and the alpha value of the total score has been found to be as .70. Although, the Turkish validity and reliability study of this has not been fulfilled, the Turkish questionnaire form, which received good comment by Atasoy, had been used for this study. The total score ranges from 0-52. In original work for scanning purposes a cut-off score of NES for research is recommended as 25 point (17,18).

Beck Depression Inventory (BDI): Beck depression inventory was used to determine the severity of depression in the patients. The Beck Depression Scale is a multiple-choice, 21-item, measure of severity of depression. In addition to emotional symptoms such as hopelessness and guilt, physical symptoms such as fatigue and weight loss are also examined at this scale. The Turkish validity and reliability study of the Beck Depression Scale was conducted by Hisli in 1989 and found suitable for use in Turkish society. The total score ranges from 0 to 63. In the Turkish form the cut off score was determined as 17 (19).

The Dutch Eating Behavior Questionnaire (DEBQ): DEBQ contains 33 items to measure emotional, external, and restrained eating behaviors. Emotional eating was assessed by 13 items, whereas external and restrained eating behaviors were assessed by 10 items. Items are answered according to the Likert scale with a scoring system identified as follows: 1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = very often, with the exception Item 21 'Do you find it hard to resist eating delicious food?', which requires reverse scoring (20,21).

All of the statistical analyses were performed by SPSS 22.0. The normal distribution of data was assessed with Kolmogorov-Smirnov test. Frequency levels of sociodemographic features were reported via descriptive analyses. For categorical comparisons, Chi-Square test was applied and for comparisons of continuous

variables t-test was conducted. Significance level of p values set as .05 and .01 was also noted.

Results

This study included 210 patients diagnosed as having migraine (n=95) or tension type headache (TTH) (n=125). The mean age of the TTH headache group (n=125) was 42.8±11.15 years (min-max:19-74), with 74.4% being female (n=93). 60% (n=75) were married, 51 of 125 patients were housewife (40.8%) and 63 of 125 patients (50.4%) had finished high school or attained education beyond high school. 83 of 125 subjects had no illness in their background, 1 had ulcerative colitis disease, 31 had psychiatric disorder (panic attack, mild/moderate or severe depressive disorders), 10 had other disorders (hypertension, diabetic, hypercholesterolemia) in their history.

The mean age of migraine group (n=95) was 38.217±8.16 years (min-max: 18-67). 68 of 95 were female (71.5%), 60 of them were married (63%), 42 of 95 were housewife (44.2%), 48 of 95 had finished high school or attained education beyond high school. 56 of 95 had no illness in their background, 3 had Hashimoto thyroiditis, 21 had psychiatric disorder (panic attack, depression, obsessive compulsive disorder) 14 had diabetes mellitus or/and hypercholesterolemia or/and hypertension also. Although there were more women than men in all two groups each other, to compare sociodemographic and clinical features of the participants in migraine and TTH groups, no results were found to reach statistical significance by Chi-Square analysis and independent sample T test. There was no suicide attempt in the history of both groups. Thus, 8 people in migraine group and 12 people in tension headache group were social alcohol drinkers. Substance use was not detected in any groups.

When patients are evaluated in terms of eating disorders, NES questionnaire total scores were significantly higher in those with NES symptoms than those without NES symptoms. Results revealed that 68 of 210 (32.3%) primary headache patients had NES. According to adjusted p values of cells with Bonferroni correction, the rate of NES in the TTH group (n=125) was 13.4% (n=17). The prevalence of NES was found to be 53.8 % (n=51) in the patients with migraine. Thus, either the frequency of the diagnosis of NES or NES questioner score with the diagnosis of migraine participants were demonstrated significantly higher than TTH group (p=0.001) (Table 2). No statistically significant difference was found between a positive NES screening result and any of the socioeconomic parameters (age, sex, marital status, education, employment status etc.) and behavioral disorders as smoking, alcohol drinking (p>0.005).

87 of 210 primary headache patients were detected as having obesity. 37 of 87 (42.5%) had migraine and 50 of 87 had TTH also. However, there was no significance between two groups, obesity had been shown more frequent in TTH group than in migraine group (p= 0.021). Besides, the mean BMI was significantly higher in the patients with NES than those without NES (32.87±4.81 vs 27.37±4.59; p= 0.013) (Table 2).

To compare NES and obesity frequency values of migraine and TTH groups, Chi-Square analysis

was conducted. According to the results of Chi-Square analysis, obesity frequencies of TTH and migraine groups were differed significantly, despite 12 TTH patients with NES (%9.6) and 23 migraine patients with NES (24.2%) had above 30 BMI Scores [$X^2(3) = 63.445, p=0.000$]. (Table 1). In migraine group, migraine with NES patients were more obese than without NES also (p=0.001) (Table 2).

Table 1. Sociodemographic and Clinical Features of the Participants

| Features | Migraine Headache Group (N=95) | Tension Type Headache Group (N=125) | p* |
|---|--------------------------------|-------------------------------------|------|
| | N (%) / Mean (SD) | N (%) / Mean (SD) | |
| Age | 38.21 (8.16) | 42.08 (11.15) | .213 |
| Gender | Female | 68 (71.5%) | .139 |
| | Male | 27 (28.5%) | |
| Marital Status | Married | 60 _a (63%) | .143 |
| | Single | 35 _a (37%) | |
| Education | Divorced/Widowed | 0 _a | .269 |
| | >Primary School | 30 _a (31.5%) | |
| | Secondary School | 10 _a (10.5%) | |
| | High School | 48 _a (50.5%) | |
| Occupation | University | 7 _a (7.36%) | .015 |
| | Employed | 53 _a (55.7%) | |
| | Housewife | 42 _a (44.2%) | |
| | Unemployed | 0 _a | |
| Previous Medical History (Except Psychiatric Disorders) | Retired | 0 _a | .241 |
| | Yes | 37 (38.9%) | |
| Previous Psychiatric History | No | 37 (38.9%) | .020 |
| | Yes | 21 _a (22.2%) | |
| | No | 74 _a (77.8%) | |
| | Yes | 31 _b (24.8%) | |
| | No | 94 _b (75.2%) | |

Note 1. Each subscript letter denotes a subset of headache/control categories whose column proportions do not differ significantly from each other at the .05 level. Note 2. p*: P values of comparisons; Independent Sample T tests for "Age" feature, Chi-Square Analysis with Bonferroni correction for other features. Note 3. N: Number, SD: Standard Deviation, BDI*: Beck Depression Inventory with cutoff score of 17.

Table 2. The prevalence of Night Eating Syndrome and Obesity in Primer Headache Patients

| | MIGRAIN (n=95) | TENSION TYPE HEADACHE (n=125) | p value |
|--------------------------------------|----------------|-------------------------------|---------------|
| NES (+) (n) | 51 (53.8%) | 17 (13.4%) | 0.001* |
| Obesity (+) (n) (BMI≥30) | 37 (42.5%) | 50 (57.4%) | 0.021 |
| NES (+) and Obesity (+) (n) (BMI≥30) | 23 (24.2%) | 12 (9.6%) | <0.001 |

In all headache patients, the mean score of the Beck Depression test was 23±12.4 (min-max:0-31). According to the Beck depression scores, 21 of 210 had mild; 47 of 210 had moderate and 15 of 210 had severe depression scores. To compare between

migraine and headache patients, there was no significance between two groups additionally (p=0.032). However, we already established that there was a positive correlation either BMI&BDI score or NES&BDI score (p≤0.005). The patients had not been detected any serious stress factors likewise substance and alcohol addiction, we couldn't reach any conclusion about the effects of stress factoring about these correlations.

On the other hand, when we evaluated the other eating scale by DEBQ test between these groups, results showed that the mean emotional eating score of DEBQ was significantly higher in migraine group compared to patients with TTH [(p<0.01);28.4±3.1 vs 19.7±1.4]. However, the mean external eating score was significantly higher in TTH than migraine patient's [(p=0.002); 30.1±2.9 vs 20.7±0.8].

Discussion

In our study, the frequency and clinical properties of NES were examined in patients who had a diagnosis of primary headache. To the best of our knowledge, this is the first study that investigated the relationship and comorbidity between primary headaches and NES syndrome - other eating behavior disorders. NES had been showed 32.3% in primary headache patients. Either the frequency of the diagnosis of NES or NES questioner score with the diagnosis of migraine participants were demonstrated significantly higher than TTH group (13.4% vs 53.8%) ($p=0.001$). Thus, in the migraine group, emotional eating score was higher, however external eating score was higher rate in the TTH patients also. As there was no published paper which searched the subgroup eating scores of headache patients, we could not compare these results with the literature.

The prevalence of NES is higher in weight-related populations than in the general community (22,29). Studies conducted to date have reported that late night eating and delayed sleep affect nocturnal peaks of melatonin and leptin which affect the circadian arrhythmicity of glucocorticoid and serotonergic systems related with obesity. The NES-symptoms could be lower with weight-reduction interventions. In our study, we found that patients with NES had higher BMI score than patients without NES. Besides, obesity frequencies of TTH and migraine groups were differed; results significantly showed that TTH group had more obese patients than migraine group ($p<0.005$). However, migraine patients with NES had higher BMI score than migraine without NES patients ($p<0.005$). The same comparison for TTH subgroups (TTH with or without NES) were similar but no significant ($p >0.005$).

Studies conducted to date showed that NES was related to stress factors and depressive mood (21-26). In Kucukgoncu et al's study it was revealed that the frequency of NES was detected to be 15.7% in the patients with major depression, generalized anxiety disorder, panic disorder, and obsessive-compulsive disorders (OCD), and NES was shown to be significantly more common in patients with depression likewise other studies (29).

The findings regarding the main objectives of our research are in accordance with previous population-based studies concerning the prevalence of primary headache in depressive mood was changed from 53% to 70% (27). Thus, the prevalence of depression in migraine patients and tension-type headache patients were 47% and 33.3% respectively (28). There are more studies about the positive relationship co-occurrence between migraine and depression and/or anxiety disorders. It can be clarified by same biological pathways, the serotonergic and dopaminergic

systems or by shared genetic risk factors; the real mechanism of this co-morbidity is not well understood (30-33). It could be explained that these disorders may have similar pathophysiology as modular theory and convergent hypothesis of headache (34,35) Then, the previous studies showed that the presence of mood disorders is a risk factor for transformation of migraine into a chronic form additionally (36). In our results showing similar characteristics to the studies; we already established that there was a positive correlation either BMI&BDI score or NES&BDI score. ($p<0.005$).

The relationship between obesity and migraine is related to several mechanisms, which are classified into three groups as physiological, psychological and behavioral. It has been determined that the prevalence of obesity is associated with migraine attack in many migraine patients (37).

In conclusion, it is important to note that it was the first study, where we investigated the prevalence of night eating syndrome and other eating behaviors in patients with primary headache due to common clinical symptoms that revealed that migraine patients had been diagnosed with NES higher prevalence than the TTH which may be cause or to be comorbidity the other symptoms like obesity, psychological disease. In case of obesity or psychiatric disease in primary headache patients, especially migraine, the diagnosis of NES should be questioned in patients. This finding- comorbidity may be led to determine an effective and first therapeutic choice for migraine therapy.

Ethics Committee Approval: The ethics committee approval was obtained from the Ethics Committee of Bakırköy Research and Training Hospital for Neurologic and Psychiatric Diseases on 07.02.2017, number: 641.

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