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Research Article

The High Level of Psychiatric Disorders Associated with Migraine or Tension-type Headache in Adolescents

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Summary

Objectives: This study aimed to evaluate the relation between psychiatric disorders, and migraine or tension-type headache (TTH), together with severity of depression and anxiety symptoms, in adolescents with headache.
Methods: Headache types of 140 adolescents aged 12 to 18 years were investigated by a headache specialist, through face-to-face interviews according to the diagnostic criteria of International Classification of Headache Disorders, 3rd edition beta version (ICHD-3 beta). Psychiatric disorders of participants were assessed via DSM-IV diagnostic criteria. Sociodemographic information form, Depression Scale, and the State-Trait Anxiety Scale for Children were applied to the patients accordingly.
Results: Higher rates of psychiatric disorders (82%) were observed in the migraine and tension-type headache (TTH) groups. The most frequent comorbid psychiatric disorder was anxiety disorder. In patients with TTH, the number of attacks was statistically higher. In patients with migraine, the frequency of throbbing headache was elevated with the co-occurrence of anxiety disorder and attention deficit hyperactivity disorder (ADHD). In patients with TTH, the description of worsening of pain with movement was raised with anxiety disorder comorbidity. A weak correlation existed between headache prevalence and headache severity in patients with migraine. Similarly, in the TTH group, a weak association between headache prevalence and depression-anxiety scores were reported.
Conclusions: Our findings support the association between migraine or TTH and anxiety and depression symptoms in adolescents. This highlights the importance of headache considering possible comorbid psychiatric disorders. This implies a necessity for multidisciplinary and prospective clinical studies to make clear the importance of the chronification hypothesis.

Key words: Headache; Child psychiatry; Adolescent; Psychopathology; Anxiety; Depression

Ergenlerde Migren veya Gerilim Tipi Baş Ağrısı ile İlişkili Psikiyatrik Bozuklukların Yüksek Düzeyleri

Özet

Amaç: Bu çalışma, ruhsal bozukluklarla migren veya gerginlik tipi baş ağrısı arasındaki birlikteliğin, depresyon şiddeti ve kaygı belirtileri ile birlikte değerlendirilmesini amaçladı.
Metod: 140 ergenin başağrısı tipleri, başağrısı uzmanı tarafından yüzyüze görüşme ile International Classification of Headache Disorders, 3rd edition beta version (ICHD-3 beta) tanı kriterlerine göre konuldu. Katılımcıların ruhsal bozukluk tanıları DSM-IV tanı kriterlerine göre değerlendirildi. Hastalara sosyodemografik bilgi formu, Depresyon Ölçeği ve Çocuklar İçin Durumluluk- Süreklilik Kaygı Ölçeği uygulandı.
Bulgular: Migren ve gerginlik tipi baş ağrısı (TTH) gruplarında yüksek oranda ruhsal bozukluklar (% 82) görüldü. En sık görülen komorbid ruhsal bozukluk anksiyete bozukluğuydu. TTH hastalarında, atak sayısı istatistiksel olarak daha yüksekti. Migren hastalarında anksiyete bozukluğu ve dikkat eksikliği hiperaktivite bozukluğu eşlik ettiğinde zonklayıcı başağrısı sıklığında anlamlı artış görüldü. TTH hastalarında anksiyete bozukluğu birlikteliğinin ağrıların hareketlerle kötüleşme özelliğini artırdığı saptandı. Migren hastalarında baş ağrısı sıklığı ve şiddeti arasında oldukça zayıf bir korelasyon vardı. Benzer şekilde, TTH grubunda baş ağrısı prevelansı ile depresyon - kaygı puanları arasında zayıf bir ilişki vardı.
Sonuç: Bulgularımız ergenlerde migren veya TTH ile anksiyete ve depresyon belirtileri arasındaki ilişkiyi desteklemektedir. Bu çalışma başağrısında olası ruhsal bozuklukları göz önünde bulundurmanın önemini vurgulamaktadır. Kronifikasyon hipotezine verilen önemin açıklığa kavuşturulması için multidisipliner ve prospektif klinik araştırmaların gerekliliğini ortaya koymaktadır.

Anahtar Kelimeler: Başağrısı; Çocuk psikiyatri; Ergen; Psikopatoloji; Anksiyete; Depresyon

INTRODUCTION

Headache is the most frequent somatic symptom in children and adolescents (1). Recent pain research on children and adolescents documented that recurrent headache was one of the most common chronic pain types, with an estimated prevalence of approximately 18.9% of the general pediatric population (2). Although headache rarely occurs in children aged under 4 years, its prevalence increases with age during childhood and peaks at around age 13 years for both males and females (3). In population-based studies, the higher prevalence of headache is mainly attributed to primary headache types, which are migraine (range, 10.4-18.6%) and tension-type (15-27%) pain, depending on the methodology and study sample (4-6).

It is known that biologic, cognitive, emotional, and behavioral variables play an important role in the process of headaches in adolescents (7). Recently, an important relationship was reported between headache and psychiatric disorders such as anxiety, depression, and even attention deficit hyperactivity disorder (ADHD) in children and adolescents (8,9). In the aspect of burden, headache may lead to impaired social interactions, declining academic performance, and distortions in peer relations (10). The research indicated that social events in childhood or adolescents, such as loss, injuries, or lack of social and economic resources in families, schools, and societies, may catalyze or intensify headache symptoms (11).

Co-morbid psychological symptoms generally imply poorer management of headache disorders. In addition to prevention strategies of primary headache

disorders, it is essential to identify risk factors and enhance the understanding of headache development during adulthood (4).

In this study, we evaluated migraine and TTH together with anxiety disorders and depression in adolescents. Migraine was evaluated as migraine without aura (MwoA), migraine with aura (MwA), and chronic migraine (CM). We also evaluated tension-type headaches as episodic tension-type headache (ETTH), and chronic tension- type headache (CTTH) in line with ICHD-3 beta criteria updated version of 2013 (12).

MATERIAL AND METHODS

Sample

This study was performed in Mersin University Child and Adolescent Psychiatry Department (GG, FT) and Neurology Department (AO) between June 2015 and October 2015 (Institutional Review Board protocol approval date 28/05/2015, number 78017789/050.01.04/198). In total, 140 adolescents with primary headache disorders such as migraine or TTH (age range: 12 to 18 years) were included in the study. Headache diagnosis was made according to the diagnostic criteria of the International Classification of Headache Disorders, 3rd edition beta version (ICHD-3 beta) and comorbid psychiatric diagnoses were assessed using Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) diagnostic criteria. Adolescents with headache were evaluated under 4 main categories: patients without psychiatric disorders, comorbid depression, comorbid anxiety disorders, and comorbid ADHD, according to the psychiatric examination. Patients aged under 12 and over 18 years and those diagnosed as having other headaches were excluded from our sample. Children with a main representative headache type as mixed headache were also excluded. Written informed consent was obtained from the parents.

Measures

Socio-demographic Information:

The following socio-demographic data were asked of the adolescents and their representative parents: age, sex, educational status, the number of brothers or sisters, postpartum course and complications, physical illness, exposure to physical violence, together with parents age, educational status, occupation, mental and physical illness, socio-economical level, and family type.

State-Trait Anxiety Scale for Children (STAI):

The STAI is a brief self-report assessment designed by Spielberger to measure and differentiate between anxiety as a trait and a state (13). The STAI consist of two sub-scales of 40 items each. The first questionnaire measures state anxiety (STAI-S) (how one feels at the moment) the second, trait anxiety (STAI-T) (how one generally feels). Each scale scored between 20 and 80. Higher scores indicate higher anxiety state (13). The validity and reliability of the Turkish version of scale was conducted by Özusta (14,15).

Depression Scale for Children (DSC):

This instrument was developed by Kovacs on the basis of the Beck Depression Scale. The validity and reliability of the Turkish version of the scale was conducted in 1991 (16). The DSC is a self-report (completed by the child/ adolescent) that contains 27 items, each with a response set of four statements describing the severity of depressive symptoms from 0 (absent or mild) to 3 (severe). Each item is scored as 0, 1 or 2. A total score is computed by summing the scores across the items (range, 0-54). The cut-off point is 19 and above (16,17).

Statistical analysis

All data were analyzed using the STATA/MP11 package program by an expert biostatistician (BT). Individual and aggregate data are summarized using

descriptive statistics including mean, standard deviations, medians (min-max), frequency distributions, and percentages. The Chi-square test, t-test and Mann-Whitney U test were used to compare the groups with and without psychiatric disorders. Variance analysis and Kruskal-Wallis tests were used to compare the psychiatric diagnosis groups in terms of various factors. Differences between the groups were assessed using the post-hoc Tukey test. The relationship between migraine and headache duration, frequency and severity of TTH with DSC, and STAI-T and STAI-S scores were evaluated using Spearman's correlation analysis. P values of < 0.05 were considered statistically significant.

RESULTS

The patients included in this open-label cross-sectional clinical-based study included 49 (35%) boys and 91 (65%) girls. The mean age of the 140 patients was 14.37±1.79 years. Of the 140 adolescents, 98 (70%) were diagnosed as having migraine (68.3% girls and 31.7% boys) and 42 (30%) were diagnosed as having TTH (57.1% girls and 42.9% boys). Both migraine and TTH were more frequent in girls (Table 1).

Most patients showed a psychiatric comorbidity with a frequency of 82.2%. Among the psychiatric disorders, the most common type identified in the full psychiatric evaluation was anxiety disorders (Table 2).

There were no significant predictors of psychiatric comorbidity on headache clinical variables. However, adolescents with migraine showed a high ratio of psychiatric comorbidities (Table 3).

Detailed analysis of the study set showed that throbbing headache was detected 3.667 times more frequently (OR= 3.667, P = 0.038) in patients with migraine with co-occurrence of anxiety than in the group without psychiatric disorders, and 7.464 times more often (OR= 7.464, P = 0.006) in patients with migraine with co-occurrence of ADHD than in the group without psychiatric disorders. Moreover, the description of worsening of pain with movement was detected 10 times more frequently (OR= 10.00, P = 0.05) in patients with TTH with co-occurrence of anxiety than in the group without psychiatric disorders. Additionally, the median number of headache attacks (15.00) was significantly higher in the anxiety disorder group than in those without psychiatric disorders (4.00).

In our study, there was a weak correlation between the frequency and severity of migraine attacks. Similarly a weak correlation was found between the frequency of attacks and DSC, STAI-T, and STAI-S scores in TTH. Furthermore, the DSC, STAI-T, and STAI-S scores were found significantly higher in patients with migraine and TTH, particularly in patients with co-occurrence of anxiety and depression as consistent with published data.

Table 1. Main headache subtypes according to sex

Headache type	Girls	Boys	Total *	*P***
Migraine	67 (73.6%)	31 (63.3%)	98	0.28
MwA	9 (14.3%)	7 (9.9%)	16 (16.4%)	0.61
MwoA	43 (38.8%)	19 (47.3%)	62 (63.2%)	0.43
CM	15 (16.5%)	5 (10.2%)	20 (20.4%)	0.44
TTH	24 (26.4%)	28 (36.7%)	42	0.29
ETTH	12 (30.6%)	15 (13.2%)	27 (64.2%)	0.002
CTTH	12 (13.2%)	3 (6.1%)	15 (35.8%)	0.31

*represents the % of the column in each headache subtypes as migraine or TTH

**Chi-square test was used and p values represent the comparison of girls and boys

Table 2. Psychiatric comorbidities of adolescents with migraine or TTH

Psychiatric disorders	Migraine (n=98, 70%)	TTH (n=42, 30%)	*P*
None (n=25, 17.8%)	18 (18.4%)	7 (16.7%)	0.99
Depression (n=36, 25.7 %)	27 (27.6%)	9 (21.4%)	0.57
Anxiety Disorders (n=46, 32.8 %)	30 (30.6%)	16 (38.1%)	0.50
ADHD (n=33, 23.5 %)	23 (%23.5)	10 (%23.8)	0.85

Table 3: Migraine characteristics according to psychiatric comorbidities

Headache characteristics	With psychiatric comorbidity (n=80)	Without psychiatric comorbidity (n=18)	*P*
Frequency (attacks per month) (mean±SD)	12.41±9.49	12.22±8.95	0.94
Severity (VAS) (mean±SD)	6.80±1.35	7.06±1.66	0.49
Duration of attack (hours)	5.63±6.50	5.33± 5.88	0.86
Associated features			
Nausea	43 (79.6%)	11 (20.4%)	0.57
Vomiting	19 (82.6%)	4 (17.4%)	0.89
Photophobia	42 (77.8%)	12 (22.2%)	0.27
Phonophobia	58 (82.9%)	12 (17.1%)	0.62
Motion sickness	44 (78.6%)	12 (21.4%)	0.36

Table 4. Correlation between migraine and psychiatric comorbidities

	OR [95% CI for OR]	*P*
None		
Depression	0.857 [0.270-2.717]	0.793
Anxiety Disorders	1.371 [0.474-3.971]	0.560
ADHD	1.118 [0.355-3.517]	0.849

DISCUSSION

This study showed that higher rates of psychiatric disorders (82%) were observed in the migraine and tension-type headache (TTH) groups. The most frequent comorbid psychiatric disorder was anxiety disorder. In patients with TTH, the number of attacks was statistically significantly higher. In patients with migraine, the frequency of throbbing headache was increased with the co-occurrence of anxiety disorder and ADHD. In patients with TTH, the description of worsening of pain with movement was increased with anxiety disorder comorbidity. A weak correlation was present between headache prevalence and headache severity in patients with migraine. Similarly, in the TTH group, a weak association between headache prevalence and depression-anxiety scores was found in our cross-sectional sample.

Migraine was the most frequent (70%) headache type in our study, although TTH was the most common cause of headache generally (18). Serotonergic systems are involved in the pathophysiology of both migraine and psychiatric disorders (19). As such, migraine may arise from a common pathway associated with central mechanisms, which may account for the higher migraine prevalence obtained from this study. However there are no satisfactory data about the effect of psychiatric comorbidities on migraine or TTH phenotypes. Our study supports subtle clinical variables but not a definite correlation.

In a considerable amount of published studies there was no significant difference between the groups when migraine and TTH were compared in terms of comorbid psychiatric disorders (20). Similarly, in our study, no statistically significant difference was found in patients without psychiatric disorders regarding depression, anxiety disorder, and ADHD when examined for migraine and TTH. Psychiatric comorbidity is a risk factor for the chronification of headache. Population-based studies reported that the prevalence of psychiatric comorbidity, especially mood disorders and anxiety disorders in chronic migraine were higher than in episodic migraine (21). It was reported that psychiatric disorder comorbidities were found in patients with CTTH (84%) and ETTH (70%) in a multi-centered study that evaluated TTH (22). There was at least one psychiatric disorder in patients diagnosed as having ETTH (74%) and CTTH (100%) in our study, in accordance with the published data.

It has been reported that headache had a stronger association with anxiety disorder than depression (23). In our study, depression was detected at rate of 27.5% in patients with migraine and 21% in patients with TTH. Anxiety disorders were found at rates of 31% and 38%, respectively, according to headache groups. In our study, the most common psychiatric disorder in both the migraine and TTH groups was anxiety disorder. It is interpreted that these high rates may have been observed due to the hospital-based nature of the study, and low socioeconomic and sociocultural level of the patients.

It has been documented that psychiatric comorbidities are more frequent in CTTH than ETTH. Depression is the most commonly associated psychiatric disorder with headache (24). In our study, psychiatric disorders were found statistically more frequently in CTTH compared with ETTH. In addition, there was a psychiatric disorder in all CTTH patients. The inclusion of adolescents in this study, the lower incidence of depression occurrence in adolescence than in adulthood, and variability of diagnostic stability in adolescence may have caused this higher rate of anxiety disorders.

In study performed by Tan et al., there was no significant relationship between scale

scores and duration of headache or frequency of episodes in the presence of psychiatric disorders between migraine and TTH, despite the scale scores being at pathologic levels (20). Similarly, in our study, there was no statistically significant difference between the severity and duration of headache with the co-occurrence of psychiatric disorder in TTH and migraine. However, unlike migraine, there was a statistically significant increase in the number of attacks with the co-occurrence of psychiatric disorder in TTH. This may be due to the fact that TTH is more related to peripheral causes and stress.

The description of worsening of pain with movement and the number of headache attacks was significantly higher in patients with TTH with co-occurrence of anxiety than in the group without psychiatric disorder (25). Similarly, throbbing headache was found significantly more frequently in patients with migraine with co-occurrence of anxiety than in the group without psychiatric disorders. Moreover, the description of worsening of pain with movement was detected 10 times more often (OR= 10.00, P = 0.05) in patients with TTH with co-occurrence of anxiety than in the group without psychiatric disorders. Additionally, the median number of headache attacks was significantly higher in the anxiety disorder group than in those without psychiatric disorders. Although the description of worsening of pain with movement is mainly associated with migraine, this pain, which is defined as TTH in childhood, may transform into migraine, especially in future life with anxiety disorder co-occurrence (26). Throbbing headache was detected 3.667 times more frequently with co-occurrence of anxiety, and 7.464 times more often with co-occurrence of ADHD in patients with migraine.

Our results consistently demonstrate the relationship between headache severity and anxiety and depression for the first time in published data. In a study, a relationship between frequency of headache attacks and depression scores was reported; however, it was not confirmed in other articles (27,28). In our study, there was a weak correlation between the frequency and severity of attacks in migraine. Similarly, a weak correlation was found between the frequency of attacks and DSC, STAI-T, and STAI-S scores in TTH; no correlation was found between severity of headache and anxiety or depression.

A considerable amount of published data highlighted that BDI, STAI-S, and STAI-T scale scores were found higher at pathologic levels in many types of headache (20). In our study, DSC, STAI-T, and STAI-S scores were statistically significantly higher in patients with migraine and TTH, particularly in those with co-occurrence of anxiety, thereby providing evidence that both anxiety disorder and depression may present together in patients with headache.

In conclusion, co-occurrence of anxiety disorders significantly increases the occurrence of throbbing headache in migraine, and remarkably, increases the number of attacks and description of worsening of pain with movement in patients with TTH. An attentive assessment of headache is essential, considering the higher risk of comorbid psychiatric disorders in adolescents reporting headaches. This implies a necessity for multidisciplinary and prospective clinical studies to make clear the importance of the chronification hypothesis.

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