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Original Article

Attention deficit and hyperactivity symptoms in adult migraine patients

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Abstract

Aim: To screen the symptoms of attention deficit and hyperactivity disorder in adult migraine patients.

Material and Methods: Our study included 102 migraine patients and 93 sex- and age-matched healthy volunteers. Gender, age, level of education and duration of disease were recorded. We used the adult attention deficit/hyperactivity disorder self-report scale to evaluate the symptoms of adult attention deficit / hyperactivity disorder. In addition, the short form-36 and the hospital anxiety and depression scale were applied to the patients and the healthy controls.

Results: The mean scores of attention deficit hyperactivity disorder were significantly higher in migraine patients compared to the control group. There was no significant relationship between the Adult Attention Deficit and Hyperactivity Disorder Self-Report Scale scores and the duration of the disease. There was a negative correlation between the SF-36 health questionnaire scores and the Adult Attention Deficit and Hyperactivity Disorder Self-Report Scale scores. There was a positive correlation between the Migraine Disability Assessment scores, the number of migraine attacks and the Adult Attention Deficit and Hyperactivity Disorder Self-Report Scale scores.

Conclusion: Attention-deficit and hyperactivity symptoms can develop in adult migraine patients and cause psychosocial morbidity and poor quality of life.

Keywords: Migraine; attention; hyperactivity; scale.

INTRODUCTION

Migraine is one of the most common causes of headache in the community (1). It is more common in women than men; its average incidence in women in the general population is 17%, while it is 6% in males. Migraine is most common between the ages of 30 and 39 (2). Despite the fact that it is not a disease that can cause mortality, migraine is an important cause of loss of workforce; in 2016, it ranked second among all diseases worldwide in terms of the disability-adjusted life years (DALYs) (3). In accordance with the world data, the prevalence of migraine in Turkey has been reported to be between 15-20%. Many psychiatric disorders may often accompany migraine. Among these, the most common are depression and anxiety disorder (4). Major depression is twice as high in the migraine population compared to the healthy subjects, while the risk for anxiety disorder is 3-6 times higher. Approximately 30% of migraine cases are associated with major depression and anxiety disorders. In our country, several studies reported that the prevalence of lifelong major depression is approximately three times higher in patients with migraine than in those without migraine. Migraine itself and various psychiatric disorders associated with migraine affect the quality of life significantly and often cause serious loss of workforce.

Attention Deficit and Hyperactivity Disorder (ADHD) is also a serious psychiatric disorder that may be associated with migraine, especially in childhood (5). These two diseases can often be concomitant in adult patients, too (6). This disorder, which is of great importance in pediatric psychiatry, has begun to attract interest in adult psychiatry in recent years owing to studies demonstrating that academic success, business achievements and the socioeconomic status of young adults diagnosed with ADHD in their childhood are lower than in controls (7). In most patients, childhood symptoms continue to be problematic in adulthood, and this syndrome, which is very well diagnosed in childhood, has also been frequently seen in adults recently (8).

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In our study, we aimed to evaluate the symptoms of ADHD using the Adult Attention Deficit and Hyperactivity Disorder Self-Report Scale (ASRS) in adult patients with migraine.

MATERIAL and METHODS

The patients included in the study were selected among those who had been admitted to the Kirikkale University Faculty of Medicine Neurology outpatient clinic. We followed the principles of the original version of the Helsinki Declaration. The ethics committee approval was obtained. The patients were informed about the study process. Each patient signed an informed consent form following detailed information. A total of 102 adult patients diagnosed with migraine and 93 healthy controls were included in the study. All migraine patients had been diagnosed with migraine according to the international classification of headache criteria. The study sample was generated according to the patient population presenting to our neurology outpatient clinic. We took into account the similar previous studies. The control group consisted of healthy volunteers who did not have a history of neurodegenerative or psychiatric disease and were compatible with the patients in terms of age, gender, and educational levels. The demographic characteristics including gender, age, educational level and disease course were recorded. Patients with a history of depression, anxiety disorder, psychosis, bipolar disorder, dementia, epilepsy, Parkinson's disease, B12 deficiency, substance or drug use and mental retardation, and those with a history of neurodegenerative disease were excluded from the study. In all patient and control groups, the Attention Deficit and Hyperactivity Disorder Self-Report Scale (ASRS), the Short Form (SF)-36 health-related quality of life (HRQL) scale and the Hospital Anxiety Depression Scale (HADS) were applied. In our study, the Migraine Disability Assessment (MIDAS) questionnaire was used to determine the limitation of daily life activities due to migraine.

Attention Deficit and Hyperactivity Disorder Self-Report Scale (ASRS) is a scale present with validity and reliability in its Turkish version and commonly used in the screening of symptoms of ADHD (9). ASRS comprises 2 sub-scales, each of which consists of 9 items, which investigate the inattention, hyperactivity, and impulsivity. It is considered as high probability that subjects with ASRS total score of 36 or higher would have ADHD.

In our study, the Short Form-36 (SF-36) health scale was used to evaluate the health-related quality of life (HRQL). SF-36 evaluates functions such as pain, social function, general and mental health, and restriction of daily life activities due to health problems (10). These functions are evaluated in two groups as mental and physical health scores.

We used The Hospital Anxiety Depression Scale (HADS) to determine the anxiety and depression levels of patients and healthy control subjects. There are 14 items in this scale, consisting of 7 items related to depression and anxiety each (11). The total score for both subgroups is 21, where 8 points and above are considered significant.

In our study, the Migraine Disability Assessment (MIDAS) questionnaire was used to determine the limitation of daily life activities due to migraine. This questionnaire is a test tool frequently used to determine the effects of a person's headaches on their activities at work, at home and in their social environment. In this questionnaire, the number of days in which the social activities are restricted is calculated and the MIDAS rating is determined to be from 1 to 4, where 4th degree indicates severe limitation.

RESULTS

Table 1 shows the characteristics of migraine patients and the control group. No significant difference was found between the two groups in terms of educational levels, age, and gender distribution. Anxiety and ASRS scores were significantly higher in migraine patients compared to the control group. No significant difference was found between the two groups in terms of depression scores. The physical and mental health scores of SF-36 were significantly lower in migraine patients compared to healthy controls. Patients with tension-type headache and migraine headache were not significantly different in terms of ASRS scores when compared to patients with migraine headache only (Table 2). There was no significant difference between patients with and without aura in terms of the ASRS scores (Table 3). No significant relationship was found between the disease duration and the ASRS scores (Table 4). A negative correlation was found between the SF-36 health questionnaire scores and the ASRS scores (Table 4). There was a positive correlation between MIDAS scores and the number of migraine attacks and the ASRS scores (Table 4).

Table 1. Comparison of control and patient group

	Control (n=93)	Patient (n=102)	p
Age	30.2±7.5	31.9±11.0	0.203
Gender (Female/Male)	66/27 (%70.9/%29.1)	76/26 (%74.5/%25.5)	0.581
ASRS part A score	5 (1-11]	9 (2 -21)	<0.001
ASRS part B score	10 (0 -27)	18 (7 -37)	<0.001
ASRS total score	15 (2-38)	27 (3 -56)	<0.001
HAD anxiety score	6 (0-18)	9.5 (0-22)	<0.001
HAD depression score	6 (0-15)	7 (1-16)	0.054
General health score	70 (16-100)	55 (4-100)	0.001
PF score	100 (20-100)	85 (20-100)	<0.001
PH score	100 (0 -100)	62.5 (0-100)	<0.001
EP score	100 (0 -100)	66.6 (0-100)	0.026
SF score	75 (0-100)	67.5 (0-100)	<0.001
Pain score	77.5 (0-100)	46.3 (0-100)	<0.001
Energy score	65 (15-100)	55 (0-90)	<0.001
EWB score	70 (24-100)	60 (4-100)	<0.001

PF: Physical functioning, PH: Physical health, EP: Emotional problem, SF: Soical functioning, EWB:Emotional well being

Table 2. Comparison of patients with and without tension-type headache

		without TTH (n=78)	With TTH (n=25)	p
Age		31.9±11.0	32.2±11.0	0.917
Gender (female/male)		59/19 (%75.6/%24.4)	17/8 (%68/%32)	0.621
AURA	no aura	61 (%78.2)	18 (%72)	0.714
	with aura	17 (%21.8)	7 (%28)	
ASRSA score		9 (2-21]	11 (2 -20)	0.731
ASRSB score		17.5 (7-35)	18 (8 -37)	0.865
ASRST score		27 (3- 56)	29 (10 -53)	0.706
HADA score		9 (0-21)	12 (1-22)	0.191
HADD score		7 (1-15)	7 (1-16)	0.442
GH score		55 (4-100)	55 (12.5-100)	0.874
PF score		90 (35-100)	80 (20-100)	0.216
PH score		75 (0-100)	50 (0-100)	0.474
EP score		66 (0-100)	100 (0-100)	0.175
SF score		62.5 (0-100)	75 (12.5-00)	0.455
Pain score		56.3 (0-100)	32.5 (0-100)	0.010
Energy score		55 (0-90)	40 (5-90)	0.146
EWB score		60 (4-96)	56 (4-100)	0.920
MIDAS score		2 (0-10)	2 (0 -7]	0.480
Disease duration		4 (0.5-20)	4.5 (1-15)	0.833
Number of attacks		4 (1-15)	3 (1-10)	0.356

TTH: Tension-type headache

Table 3. Comparison of groups with and without aura

		No aura (n=79)	p
Age		31.2±10.8	0.202
Gender (female/male)		57/22 (%72.2/%27.8)	0.675
TTH	No TTH	61 (%77.2)	0.714
	TTH	18 (%22.8)	
ASRSA score		9 (2-21)	0.243
ASRSB score		17 (7 -37)	0.243
ASRST score		27(3-56)	0.141
HADA score		9 (0-22)	0.099
HADD score		7 (1-16)	0.239
GH score		55 (4-100)	0.648
PF score		85 (45-100)	0.249
PH score		75 (0-100)	0.382
EP score		66.6 (0-100)	0.316
SF score		67.5 (0-100)	0.315
Pain score		55 (0-100)	0.229
Energy score		55 (0-90)	0.592
EWB score		60 (4-100)	0.195
MIDAS score		2 (0-8)	0.145
Disease duration		4 (0.5-20)	0.317
Number of attacks		4 (1-15)	0.827

Table 4. Correlations with ASRST score in the patient group

	Correlation coefficient	p
HADA score	0.531	<0.001
HADD score	0.409	<0.001
GH score	0.439	<0.001
PF score	0.189	0.057
PH score	0.163	0.101
EP score	0.292	0.003
SF score	0.370	<0.001
Pain score	0.294	0.003
Energy score	0.294	0.003
EWB score	0.364	<0.001
MIDAS score	0.209	0.035
Disease duration	0.038	0.704
No. of attacks	0.141	0.158

DISCUSSION

ADHD is a very common disease in childhood and its incidence has been reported to be between 2-18% (12). Migraine is also relatively common in childhood and the incidence has been reported to be between 4% and 10% (13). In a systematic review of these two diseases, which are common in the pediatric age group, a significant relationship between these two diseases has been confirmed (14), and this relationship has been shown to be similar in adult patients in a recent large-scale study (15) and another recent systematic literature review as confirmed this relationship between adult ADHD and migraine (16). In our study, in accordance with the literature, it was also found that the ADHD scores were higher in migraine patients than in the healthy population.

There may be some factors that can explain the occurrence of migraine and ADHD together. For example, the study by Villa et al. suggested that visual attention was impaired in children with migraine (17). They attributed this to the role of neurotransmitters such as dopamine, noradrenaline, and GABA, both in the pathophysiology of migraine and their important role in the pathophysiology of ADHD.

Another hypothesis to explain this comorbidity is that headaches may increase the frequency of inattention and irritation independently. This hypothesis is also supported by a study by Camarda et al. suggesting that recurrent migraine attacks may cause executive dysfunctions (18), and similarly Koppen et al. have also suggested that migraine attacks may impair attention processes (19). Besides all these, Han et al. showed that the executive control of attention was impaired in migraine patients during the interictal period (20). In our study, a positive correlation between the number of attacks and ASRS scores was demonstrated, consistent with the literature.

In addition to all these factors, it has been suggested that the common genetic characteristics between diseases can lead to this comorbidity, correlating with Antilla et al.'s finding determining that migraine has some genetic characteristics similar to ADHD (21).

In a study including 62 children and adolescents by Riva et al., it was shown that there was no difference between the groups in terms of attention performance among those with migraine with aura and without aura and tension-type headache (22). In our study conducted in adult patients, when we examined the patients with migraine with and without aura in terms of the ASRS scores, no statistically significant difference was found between the two groups. Similarly, there was no significant difference between the tension-type headache group and the patients with isolated migraine headaches in terms of the ASRS scores.

Although there is no physical disability in migraine patients, the recurrent pain and related symptoms and the nature of attacks affect the ability of patients to work normally and leads to impaired quality of life in migraine patients. Accompanying psychiatric disorders in patients with migraine, in particular depression and anxiety, cause deterioration of the quality of life. The quality of life scores was also found to be significantly decreased in adults with ADHD (23). In our study, the ASRS scores were also found to be negatively correlated with SF-36 quality of life scores in migraine patients, consistent with the literature.

CONCLUSION

In conclusion, it should be kept in mind that the symptoms of ADHD, which is common in childhood, and which has recently been reported to be common in the adult population, is common in migraine disease, which is common in adulthood and causes serious deterioration in the quality of life besides serious loss of workforce. In clinically suspected cases, it will be appropriate to evaluate patients with the adult ADHD self-report scale (ASRS) and to refer patients with high scores to psychiatrists for a detailed evaluation of ADHD.

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