Original Article / *Özgün Makale*

DOI: 10.4274/jtsm.66375

Journal of Turkish Sleep Medicine 2018;5:24-6

A Survey Study to Investigate the Relationship of Sleep Disorders, Depression and Anxiety in Headache Patients

Baş Ağrılı Hastalarda Uyku Bozuklukları, Depresyon ve Anksiyete Arasındaki İlişkinin İncelenmesi: Bir Araştırma

Aylin Bican Demir, Necdet Karlı

Uludağ University Faculty of Medicine, Departmant of Neurology, Bursa, Turkey

Abstract

Objective: There is a complex relationship among pain, sleep and mood, with boundaries indistinguishable from each other. Pain can disrupt the quality of sleep, disturbance of sleeping pattern can create pain and the reflection of this period can manifest itself as depression and anxiety in people.

Materials and Methods: A total of 297 patients, followed up due to headache, were enrolled in the study. Patient study groups were classified as episodic tension-type headache (TTH), migraine, chronic migraine and chronic tension-type headache. Patient assessments were performed by Epworth sleepiness scale, Hamilton Anxiety Rating scale (HAM-A) and Hamilton Depression Rating scale (HDRS).

Results: In all groups, excessive daytime sleepiness accompanied the clinical picture. In episodic TTH group, HAM-A was 12.27±3.34 ($p<0.001$), in migraine group, 10.09±2.94 ($p<0.05$), in chronic migraine group HAM-A was 7.90±2.41 ($p>0.05$), and in group with chronic TTH, HAM-A was 5.71±2.51 ($p>0.05$); anxiety scores were increased in episodic TTH and migraine groups when compared to other groups and also normal population. In episodic TTH group, HDRS was 8.34±3.85 ($p>0.05$); in migraine group, 9.01±1.25 ($p>0.05$); in chronic TTH group, 10.05±3.40 ($p<0.001$) and in group with chronic migraine HDRS was 11.70±3.25 ($p<0.001$). The depression scores were increased in chronic migraine group and chronic TTH group when compared to other groups and to normal population.

Conclusion: As a conclusion, we suggest that pain, depression, anxiety and disorders of sleep should be considered as a whole and patient approach should be planned according to this concept.

Keywords: Sleep disorders, headache, anxiety, depression

Öz

Amaç: Ağrı, uyku ve ruh hali arasında, birbirinden ayırt edilemeyen sınırlarla kompleks bir ilişki vardır. Ağrı, uyku kalitesini bozabilir, uyku düzeninin bozulması ağrı yaratabilir ve bu dönemin yansıması insanlarda depresyon ve endişe olarak kendini gösterebilir.

Gereç ve Yöntem: Baş ağrısı nedeniyle takip edilen toplam 297 hasta çalışmaya alındı. Hasta çalışma grupları epizodik gerilim tipi baş ağrısı (TTH), migren, kronik migren ve kronik gerilim tipi baş ağrısı olarak sınıflandırıldı. Hasta değerlendirmeleri Epworth uykululuk ölçeği, Hamilton Anksiyete Derecelendirme ölçeği (HAM-A) ve Hamilton Depresyon Derecelendirme ölçeği (HDRS) ile yapıldı.

Bulgular: Tüm gruplarda aşırı gündüz uykusu klinik tabloya eşlik etti. Epizodik TTH grubunda, HAM-A 12,27±3,34 ($p<0,001$), migren grubunda 10,09±2,94 ($p<0,05$), kronik migren grubunda HAM-A 7,90±2,41 ($p>0,05$), ve kronik TTH'de, HAM-A 5,71±2,51 ($p>0,05$) olarak sonuçlandı; epizodik TTH ve migren gruplarında anksiyete skorları diğer gruplara ve normal popülasyona göre artmıştır. Epizodik TTH grubunda HDRS, 8,34±3,85 ($p>0,05$); migren grubunda 9,01±1,25 ($p>0,05$); kronik TTH grubunda 10,05±3,40 ($p<0,001$), kronik migren HDRS'li grupta ise 11,70±3,25 ($p<0,001$) bulundu. Depresyon skorları, kronik migren grubunda, diğer gruplara kıyasla kronik TTH olan grupta ve normal popülasyonda artmıştır.

Sonuç: Sonuç olarak, ağrı, depresyon, anksiyete ve uyku bozukluklarının bir bütün olarak ele alınması gerektiğini ve hasta yaklaşımının bu kavrama göre planlanması gerektiğini öneriyoruz.

Anahtar Kelimeler: Uyku bozuklukları, baş ağrısı, depresyon, anksiyete

Introduction

Sleep disorders may lead to fatigue, exhaustion, somnolence, headache, anxiety, impaired concentration, confusion, cognitive disorders, difficulties in learning and increasing health problems. While sleep is organized by some complex mechanisms in hypothalamus and brain stem, many neurotransmitters such as serotonin, adenosine, histamine, hypocretin, norepinephrine-gamma-aminobutyric acid, norepinephrine and epinephrine are involved in the process (1). In patients with primary headaches such as migraine and tension-type headaches, major depression and dysthymic disorders are seen more frequently

Address for Correspondence/Yazışma Adresi: Aylin Bican Demir MD, Uludağ University Faculty of Medicine, Departmant of Neurology, Bursa, Turkey
Phone: +90 532 488 19 07 **E-mail:** aylinbican@mynet.com **ORCID-ID:** orcid.org/0000-0001-6739-8605
Received/Geliş Tarihi: 12.02.2018 **Accepted/Kabul Tarihi:** 29.03.2018

when compared to patients with secondary headaches. 50-70% of patients with chronic headache also have depression or dysthymia. In addition, depression is a factor leading the pain to become chronic, and the vicious cycle between sleep and pain may similarly manifest itself between sleep and depression (2).

Materials and Methods

A total of 297 patients admitted to the Uludağ University of Department of Neurology for a headache complaint between 2013 and 2016, having no previous treatment history, were evaluated prospectively. Patients were classified according to International Classification of Headache Disorders-II. Patients under 18 years of age or above 65 years of age and also patients not receiving treatment regularly or with headaches other than migraine, chronic migraine and tension-type headaches (TTH) were excluded from the study. Patient assessments were performed by using Epworth sleepiness scale (ESS), Hamilton Anxiety Rating scale (HARS) and Hamilton Depression Rating scale (HDRS).

Results

Among patients enrolled in the study, 195 were female and 102 were male. The average age of the patients was 36.34±11.64 (18-65). Forty-eight patients were diagnosed with episodic TTH, 60 patients with migraine, 66 patients with chronic migraine and 123 patients with chronic TTH.

In patients with episodic TTH, ESS was 10.70±3.13 ($p<0.05$), in migraine 12.15±3.01 ($p<0.001$), in chronic migraine ESS was 11.3±4.02 ($p<0.001$), in patients with chronic TTH ESS was 12.85±2.90 ($p<0.001$) and in all groups ESS was higher when compared to the normal population (Table 1).

In patients with episodic TTH, HARS was 12.27±3.34 ($p<0.001$), in migraine 10.09±2.94 ($p<0.05$), in patients with chronic migraine HARS was 7.90±3.65 ($p>0.05$), in chronic TTH group, HARS was 5.71±2.51 ($p>0.05$); anxiety scores were increased in episodic TTH and migraine groups, when compared to other groups and also to normal population (Table 1).

HDRS was 8.34±3.85 ($p>0.05$) in episodic TTH group, 9.01±1.25 ($p>0.05$) in migraine group, 10.05±3.40 ($p<0.001$) in chronic TTH group and 11.70±3.25 ($p<0.001$) in patients with chronic TTH; the depression scores were increased in chronic migraine and chronic TTH groups, when compared to other groups and also to normal population (Table 1).

Table 1. The Epworth sleepiness scale, Hamilton Anxiety Rating scale and Hamilton Depression Rating scale values of patient groups with headache

Groups	ESS	HARS	HDRS
Episodic TTH	10.7±3.13 p<0.05	12.27±3.34 p<0.001	8.34±3.85 p>0.05
Migraine	12.15±3.01 p<0.001	10.09±2.94 p<0.05	9.01±1.25 p>0.05
Chronic TTH	12.85±2.90 p<0.001	5.71±2.51 p>0.05	10.05±3.40 p<0.001
Chronic migraine	11.3±2.36 p<0.001	7.90±2.41 p>0.05	11.70±3.25 p<0.001

ESS: Epworth sleepiness scale, HARS: Hamilton Anxiety Rating scale, HDRS: Hamilton Depression Rating scale, TTH: Tension-type headaches

Discussion

There are numerous studies in the medical literature about the relationships of painful syndromes, depression, anxiety and sleep. There is a complex relationship between pain, sleep and mood, with boundaries indistinguishable from each other. Pain can disrupt the quality of sleep, disturbance of sleep pattern can create pain and the reflection of this period can manifest itself as depression and anxiety. ESS is a simple and reliable test for detection of tendency of individual for sleep; it can be used on its own for evaluation of excessive daytime sleepiness (EDS) and scored in just a few seconds (3). In a study performed by Barbanti et al. (4), ESS score was determined to be equal or over 10 in 37% of patients having migraine type headache; this rate being 2.4% in migraine and 39.8% in chronic migraine. In the other study as a case study, they looked into frequency data for EDS in 100 patients having chronic migraine and 100 healthy controls divided in sex and age and they evaluated some risk factors such as the people's life style, their sleep quality, anxiety, depression, concomitant disease and medications. That study demonstrated that the frequency of extensive daytime sleepiness was more in migraineur (particularly in those who overuse medication) than in controls (20% versus 6%; odds ratio: 3.92, 95% confidence interval: 1.5-10.22) however it was less than once reported and associated with poor quality sleep and anxiolytic and antidepressant use (4). Since depression may lead to migraine attacks well as EDS, because of their comorbidity, it may be more common in migraine patients (5). Hypothalamus may be the potential mediator in migraine patients also having EDS. Orexin is a neuropeptide released from the lateral hypothalamus to adjust food intake, sleep state, autonomous nervous system activity and basal metabolic rate. Time-independent wakefulness provided by inputs exiting from hypothalamus, inducing suprachiasmatic neurons, which were stimulated by orexin. Orexin cells use the monoaminergic activity that is also involved in sleep cycle as well as pain modulation (6). Boardman et al. (7) reported that sleep disorders accompanied all types of headache in general population and stated that increasing severity of sleep disorder was together with increasing severity of headache. There is another study in which participants with no migraine were compared stated poorer sleep quality ($p<0.001$), and clinically significant poor sleep quality is reported with the rate of 85.9 %. Poor quality in sleep was essentially linked with frequency in headache and disabilities relating with headache and they account for rates of differences (14.8% in frequency and 18.2% in disability. Both of them $p<0.001$) are alike to those ascribe to depression and anxiety. (8). In our study, also, ESS score was higher than general population and EDS accompanied the clinical picture in episodic TTH, migraine, chronic TTH and chronic migraine patient groups.

Findings of studies on migraine and sleep show similarities to each other as well as the findings of syndromes with pain in general. Spierings and van Hoof (9) determined difficulties in falling asleep and maintaining the sleep, as well as reduction in sleep duration in male patients with headache. Kelman and Rains (10), in their clinical study on 1283 patients with migraine, identified sleep disorders in more than half of them. Difficulties in falling asleep and maintaining sleep were more

prevalent in patients with chronic migraine, when compared to patients with migraine. 71% of patients with sleep problems woke up with headaches (10).

In another study, depression was observed more commonly in individuals with chronic migraine than with migraine. Also, in that study, more often interruption of sleep was encountered as a factor independent of depression in patients with chronic migraine. The reason for these interruptionsof sleep may be the pain, as in other painful diseases (11). Monoamine neurotransmitters such as serotonin and noradrenaline are accepted to play roles in pathophysiology of depression and anxiety. Serotonergic and noradrenergic pathways originating from dorsal raphe and locus ceruleus terminate in frontal cortex for mood regulation; in limbic areas for emotional and anxiety regulation and in hypothalamus for appetite, weight and sleep regulation. Therefore, patients with depression and anxiety complain of many physical ailments such as headache and musculoskeletal pain, as well as sleep disorders (12). In our study, also, high depression scores were determined in patients with chronic migraine or chronic TTH, with accompanying sleep disorders. However, in our patients having episodic headache, depression took place in the background level and high anxiety scores, together with sleep instability, were determined.

It is understood that common anatomic, hormonal and immunologic factors exist in the quadruplet of pain, depression, anxiety and sleep disorders. Probably, the pathophysiologic mechanisms associated with migraine and mood are also responsible for sleep disorders.

Conclusion

As a conclusion, pain, depression, anxiety and sleep disorders should be taken as a whole and treatment approaches should be planned considering this concept.

Ethics

Ethics Committee Approval: It was not taken.
Informed Consent: The data of this study was collected from patients' files.
Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: A.B.D., Design: A.B.D., N.K., Data Collection or Processing: A.B.D., Analysis or Interpretation: A.B.D., N.K., Literature Search: A.B.D., Writing: A.B.D., N.K.

Conflict of Interest: No conflict of interest was declared by the authors.
Financial Disclosure: The authors declared that this study received no financial support.

References

1. Ramadan NM, Tfelt-Hansen P, Welch KMA, editors. The Headaches in. 3.edition. Philadelphia: Lippincott, Williams & Wilkins 2006; 1099-104.
2. McCracken LM, Iverson GL. Disrupted sleep patterns and daily functioning in patients with chronic pain. Pain Res Manag 2002;7:75-9.
3. Johns MW. A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. Sleep 1991;14:540-55.
4. Barbanti P, Aurilia C, Egeo G, Fofi L, Vanacore N. A case-control study on excessive daytime sleepiness in chronic migraine. Sleep Med 2013;14:278-81.
5. Peres MF, Stiles MA, Siow HC, Silberstein SD. Excessive daytime Sleepiness in migraine patients. J Neurol Neurosurg Psychiatry 2005;76:1467-8.
6. Bartsch T, Levy MJ, Knight YE, Goadsby PJ. Differential modulation of nociceptive dural input to [hypocretin] Orexin A and B receptor activation in the posterior hypothalamic area. Pain 2004;109:367-78.
7. Boardman HF, Thomas E, Millson DS, Croft PR. Psychological, sleep, lifestyle, and comorbid associations with headache. Headache 2005;45:657-69.
8. Walters AB, Hamer JD, Smitherman TA. Sleep disturbance and affective comorbidity among episodic migraineurs. Headache 2014;54:116-24.
9. Spierings ELH, van Hoof MJ. Fatigue and sleep in chronic headache sufferers: an age- and sex controlled questionnaire study. Headache 1997;37:549-52.
10. Kelman L, Rains JC. Headache and sleep: examination of sleep patterns and complaints in a large clinical sample of migraineurs. Headache 2005;45:904-10.
11. Tfelt-Hansen P, Rolan P. Adrenoceptor blocking drugs in migraine prophylaxis. Olesen J, Goadsby PJ, Ramadan NM, Tfelt-Hansen P, Welch KMA, editors. The Headaches in. 3.edition. Philadelphia: Lippincott, Williams & Wilkins 2006;519-28.
12. Stahl S, Briley M. Understanding pain in depression. Hum Psychopharmacol 2004;19 (Suppl 1):S9-513.