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Effect of Smoking on Migraine Attack Frequency in Patients with Migraines

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ABSTRACT

Purpose: Smoking and smoke inhalation are known to have negative effects on many diseases, primarily lung diseases. The aim of this study was to examine the effect of smoking on the frequency of migraine attacks in patients.

Methods: A total of 82 migraine patients diagnosed in accordance with the revised diagnosis criteria of the International Headache Society were involved in this study. For each patient, we recorded demographic findings, smoking habits, disease duration, attack frequency, headache severity (determined with a visual analogue scale [VAS]), medicine and triggering factors. Those with a migraine attack frequency of less than three times a month were grouped as mild migraine, and those with a greater frequency were grouped as severe migraine. Those that smoked up to and including five cigarettes a day were grouped as mild smokers and those that smoked more than five per day were grouped as severe smokers. The Chi square test was used for parametric distribution. A p-value of < 0.05 was considered significant.

Results: Among the 82 migraine patients involved in the study, 13 were male (15.9%) and 69 were female (84.1%). The mean age was 35.85 ± 9.90 years. Migraines with aura were seen in 38 patients (46.3%) and without aura in 44 patients (53.7%). Regarding smoking, 29 patients smoked (35.3%), while 53 did not smoke (64.6%). With patients who smoked, especially in females, the incidence of migraine attacks by 2 or more was higher than those who did not smoke. (57,5%)

The mean number of attacks that patients had in a month was 5.45 ± 4.97 and the mean duration of the disease was 11.58 ± 8.43 years. VAS values were 5.85 ± 0.86. A significant relationship was found between smoking and migraine attack frequency in the smoking group (p = 0.002).

Conclusion: Migraines are a chronic disease that negatively affects a patient's quality of life. This study was undertaken to contribute to the relevant literature by showing the effect of smoking on attack frequency in migraines.

Key words: Migraine, smoking, attack frequency

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MİGREN HASTALARINDA SİGARA İÇİMİNİN ATAK SIKLIĞI ÜZERİNE ETKİSİ

ÖZET

Amaç: Sigara içiciliği ve duman inhalasyonunun, başta akciğer hastalığı olmak üzere pekçok hastalık üzerine olumsuzetkisi bilinmektedir. Bu çalışmanın amacı migren hastalarında sigara içiminin atak sıklığı üzerine etkisini araştırmaktır.

Hastalar ve Yöntem: Bu çalışmaya, Uluslararası Baş Ağrısı Derneğinin revize tanı kriterlerine göre tanı alan 82 migrenli hasta alındı. Her olgunun demografik bulguları, sigara içiciliği, hastalık süresi, atak sıklığı, ağrı şiddetini gösteren VAS (vizuel analog skala) skorları, kullandığı ilaçlar ve tetikleyici faktörler kaydedildi. Atak sıklığı, ayda3'ün altında olanlar hafif migren, 3'ün üzerinde olanlar şiddetli migren olarak gruplandırıldı. Sigara içimine göre; günde 5 adetin altı hafif içiciler ve 5 adetin üstüağır içiciler olarak gruplandırıldı. parametrik dağılım için ki-kare testi ile değerlendirildi. P<0.05 anlamlı olarak kabul edildi.

Bulgular: Çalışmaya alınan 82 migrenli hastanın 13'ü erkek (%15,9), 69'u kadın (%84,1) idi. Yaş ortalaması 35.85±9.90 idi. Olguların 38'i auralı migren (%46,3), 44'ü aurasız migren (%53,7) tanılı idi. Hastaların 29'u sigara içiyor (%35,3), 53'ü içmiyordu(%64,6). Hastaların bir ayda geçirdiği atak sayısı ortalama 5,45±4,97 idi. Hastalık süresi ortalama 11,58±8,43 yıl idi.VAS değerleri 5,85±0,86 idi. Sigara içen grupta, migren atak sıklığı arasında anlamlı bir ilişki saptandı(p=0,002).

Sonuç: Migren yaşam kalitesini olumsuz etkileyen kronik bir hastalıktır. Bu çalışma migren hastalığında sigara içiciliğinin atak sıklığına etkisini göstermesi bakımından literatüre katkı amacıyla sunulmuştur.

Anahtar sözcükler: Migren, sigara içimi, atak sıklığı

igraines are a primary type of headache that are mostly localized on one side of the head, develop as a result of neurovascular mechanisms, and can be triggered by various factors. Migraines are diagnosed based on the patient's medical history, and in most cases, a neurological examination, laboratory results, and imaging results are normal. As a commonly occurring type of headache, migraines pose significant health problems that often lead to a loss of labor (1,2). The incidence of migraines is approximately 10.5–16.5% in Europe and the United States (US) and 16.4% in Turkey (3,4). Although many studies have examined the pathophysiology and genetics of migraines, none have reached a clear conclusion.

Migraine headaches are affected by many factors, such as tiredness, hunger, lack of sleep, stress, sudden mood changes, alcohol, smells, just a change in the local environment and excessive exposure to the sun. Smoking has also been shown to impact the etiology and clinical deterioration of many diseases, primarily lung diseases. The aim of the present study was to examine the effects of smoking on migraine attack frequency and severity.

Materials and methods

A total of 82 migraine patients were involved in this study. These patients had presented to the Neurology Polyclinics of the Ministry of Health Sakarya University Training and Research Hospital with the complaint of headaches. The patients had normal neurological examination results and were diagnosed in accordance with the revised diagnosis criteria of the International Headache Society (IHS 2013). Demographic findings, smoking habits, disease duration, attack frequency, a visual analogue scale (VAS) showing the headache severity, medication, and triggering factors of each case were recorded. Those with a migraine attack frequency of less than three times a month were grouped as mild migraine and those with a greater frequency were grouped as severe migraine. In regards to smoking, those that smoked up to and including five cigarettes a day were grouped as mild smokers, while those who smoked more than five per day were grouped as severe smokers. The distribution of smoking and migraine attack frequency were compared against age, gender, disease duration, presence of aura, attack frequency, and attack severity. The results were first compared with the literature results and then discussed.

The Statistical Package for the Social Sciences (SPSS) version 21.0 was used for statistical analysis. Compliance of data to a normal distribution was confirmed. In the comparison of data of two independent groups, a t-test was used if the compliance had a normal distribution, otherwise a Mann-Whitney U test was used. Chi square tests were used for comparisons of data specified in numbers. A p-value of < 0.05 was considered significant.

Results

Among the 82 migraine patients involved in the study, 13 were male (15.9%) and 69 were female (84.1%). The mean age was 35.85 ± 9.90 years and the mean age of males and females was 35.0 ± 9.90 and 36.01 ± 10.27 years, respectively. The number of migraine cases with and without aura were 38 (46.3%) and 44 (53.7%), respectively. The mean age of the smokers and non-smokers was 36 ± 9.91 and 35.77 ± 9.98 years, respectively. In terms of the number of patients who smoked, 29 of them smoked (35.3%), while 53 did not (64.6%). Of those who smoked, 5 were male (17.2%) and 24 were female (82.8%). The patients' mean number of attacks per month, disease duration, and VAS values were 5.45 ± 4.97, 11.58 ± 8.43 years, and 5.85±0.86, respectively. VAS values were 5.68 ± 0.76 in the smoking group and 5.94 ± 0.90 in the non-smoking group (Table 1). The presence of stress among the factors triggering migraines was 97.6%, while the presence of other triggers, in order of frequency, included hunger, physical activity, change of climate, menstruation, body position, and cigarette smell (Table 2). In terms of drug usage, 51 (62.2%) used analgesics, 23 (28%) used triptane, 5 (6.1%) used a prophylactic agents, and 3 (3.7%) used triptane and a prophylactic agent (Table 3).

While there was no significant relationship between migraine attack frequency and exposure to cigarette smoke (p = 0.466), the relationship with smoking was found to be significant (p = 0.002). Furthermore, there was no significant relationship between smoking and age (p=0,447), gender (p= 0.516), VAS values (p= 0.18), and the presence of aura (p= 0.047).

Discussion

Migraines are a type of headache that pose a serious social problem since they can lead to the loss of individual labor and a deterioration in quality of life. A migraine diagnosis is established by considering the typical characteristics of a headache and the accompanying symptoms. Laboratory tests and imaging methods are often used to exclude the possibility of a headache secondary to another condition. Therefore, in the present study, the cranial imaging used to examine each patient revealed that no secondary causes existed.

Table 1. Compared to evaluation of demographic data of patients with migraine smokers

	Smokers n:29	Nonsmokers n:53	Total n:82
Sex			
Male	5	8	13
Female	24	45	69
Age			
Male	31.80±9.33	37.00±6.78	35.00±7.92
Female	36.87±9.99	35.55±10.50	36.01±10.27
Total	36.00±9.91	35.77±9.98	35.859.90
Mean age of onset of disease			
Male	24.60±7.89	23.37±9.82	23.84±8.80
Female	25.87±9.21	23.62±9.22	24.40±9.21
Total	25.65±8.88	23.58±9.22	24.31±9.10
Disease duration (year)			
Male	7.20±7.12	13.62±5.04	11.15±6.77
Female	11.31±9.32	11.84±8.33	11.66±8.95
Total	10.60±9.09	12.11±8.09	11.58±8.43
Mean attacks number (month)			
Male	4.00±3.93	5.87±4.35	5.15±4.14
Female	6.75±7.03	2.97±3.34	5.50±5.14
Total	6.27±6.13	3.41±3.62	5.45±4.97
Attacks frequency n (%) (monthly 1/ monthly 2 and up)			
Male			
1 attack	4 (%80)	4 (%50)	8 (%61.5)
2 and up attack	1 (%20)	4 (%50)	5 (%38.5)
Female			
1 attack	5 (%20.8)	31 (%68.9)	36 (%52.2)
2 and up attack	19 (%79.2)	14 (%31.1)	33 (%47.8)
Total			
1 attack	9 (%31)	35 (%66)	44 (%53.7)
2 and up attack	20 (%69)	18 (%34)	38 (%36.3)
Presence of aura n (%)			
Male	5 (%100)	5 (%62.5)	10 (%76.9)
Female	8 (%33.7)	20 (%44.4)	28 (%40.6)
Total	13 (%44.8)	25 (%47.2)	38 (%46.3)
VAS values			
Male	5.00±0.70	6.25±0.88	
Female	5.83±0.70	6.06±0.86	
Total	5.68±0.76	5.94±0.90	

Table 2. The presence of the triggering factors in cases of migraine and relationship between attack frequency and aura

Migraines				Attack frequency	Presence of aura/without aura
Triggering factors		**Sayı (n)**	**Yüzde (%)**	**p**	**p**
Stress	Yes	80	97.6	0.646	0.715
	No	2	2.4		
	Total	82	100		
Hunger	Yes	65	79.3	0.299	0.096
	No	17	20.7		
	Total	82	100		
Physical activity	Yes	65	79.3	0.204	0.227
	No	17	20.7		
	Total	82	100		
Change of air	Yes	57	69.5	0.205	0.179
	No	25	30.5		
	Total	82	100		
*Menstruation	Yes	52	63.4	0.263	0.215
	No	17	36.6		
	Total	69	100		
Body position	Yes	44	53.7	0.306	0.100
	No	38	46.3		
	Total	82	100		
Cigarette smell	Yes	24	29.3	0.466	0.574
	No	58	70.7		
	Total	82	100		

Tablo 3. Medication data of migraines

Migraine Treatments	Number (n)	Ratio (%)
Analgesic	51	62,2
Triptane	23	28,0
Prophylactic agent	5	6,1
Triptane and Prophylactic	3	3,7
Total	82	100,0

The frequency of migraine attacks begins to decrease at the age of 20 and falls significantly further after the age of 40; attacks also occur more frequently in females (4-6). Similar to the information found in the literature, the mean age in the present study was 35.85 ± 9.90 years, and 84.1% of patients were female. Migraine attacks can emerge as a result of various triggers. Many studies have shown that food, such as chocolate and cheese; lack of sleep; caffeine; alcoholic drinks; hunger; smell; noise; estrogen; stress; menstruation; various drugs, such as indomethacin; and head and neck movements trigger migraine headaches (7-10). In a population-based study conducted by Zivadinov et al., telephone and face-to-face interviews were conducted and they found that stress (57.8%) was the greatest trigger of migraine headaches, followed by travel (54.6%), menstrual cycles (49.4%), change of climate (49%) and irregular sleep patterns (40.1%) (6). In the present study, the most frequent triggering factor was stress, with a rate of 97.6%. Other triggers were hunger (79.3%), physical activity (79.3%), change of climate (69.5%), menstruation (63%), and the smell of cigarettes (29.3%). The higher rates seen in the present study were possibly related to the low number of study patients. While many studies have been conducted on the smell of cigarettes and the triggering effect it has on migraines, only a limited number of studies have been conducted on the relationship between actual smoking and migraines. Certain data have shown that smoking, which is known to have an

effect on the etiology and clinical deterioration of many diseases, primarily lung diseases, might lead to a clinical deterioration in migraines, particularly in migraines with aura (10). In a study conducted among medical students, the migraine attack frequency of the smoking group was higher than in the non-smoking group (11).

There has been different hypotheses regarding the relationship between migraine and smoking. One of these hypotheses is that smoking triggers migraine by increasing platelet aggregation. The other is that smoking reduces pain and anxiety by increasing secretion of beta endorphins. The genetic connection betweeen smoking and migraine is another hypothesis. Some also point out the effect of nitric oxide on migraine. In the study by Chen et al in migraine it is more common in female smokers. Three hypotheses have been put forward about the possible causes of this. One of them is the possibility that smoking leads to migraine. Another is the possibility that migraine patients tend to smoke more to relieve their pain. As for the last hypothesis, the two disorders may appear in the same person if the genes are on the same cromosone. In our study also, in females who smoke, the relationship between migraine and smoking has been observed more intensely (12,13).

The relationship between migraines and strokes has also been demonstrated in many studies (14). The presence of smoking among the various risk factors in cerebrovascular diseases has increased the importance of the need for migraine patients to stop smoking. Studies have also suggested there is an impact of smoking on the etiology and clinical deterioration of some neurological diseases (14-15). The present study also examined the relationship between smoking and migraine attack frequency and severity. While no significant correlation was found between cigarette smell and attack frequency or disease severity, there was a significant correlation between smoking and attack frequency. Lastly, quitting smoking ranks highly among the many non-pharmacological approaches in migraine treatments, others include relaxation techniques, sufficient sleep, diet, and exercise (16).

In conclusion, smoking impacts the frequency of migraine attacks, which in turn, adversely affects the patient's quality of life and leads to a loss of labor and excessive consumption of medication. In addition to pharmacological treatments, non-pharmacological approaches, including quitting smoking, are also important for controlling migraines. This study contributes to the relevant literature by demonstrating the effect of smoking on the frequency of migraine attacks.

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