

## Prehospital methods applied in migraine attack

Prehospital migraine attack

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### Abstract

**Aim:** In this study, we aimed to detect the pharmacological and nonpharmacological methods used by the migraine patients before applying to the emergency department, and the factors triggering the migraine attack. **Material and Method:** Patients accepted to the emergency department due to a migraine headache were included in the study. Patients who had repetitive applications and those who did not approve participating in the study were excluded from the study. Their demographic features, possible triggering factors and what they do to eliminate a headache before applying to the emergency department were recorded. **Results:** The average ages of male and female patients were  $33.7 \pm 10.6$ ; 71,4% (n=200) of the patients were female. The menstruation was detected as one of the primary triggering factors in 28% (n=56) of the female patients. The other triggering factors for all patients were stress (83,6%), sleeplessness (72,1%), starvation (55,7%), malodor (44,3%), gurgling (25,4%), nutrient (20%), more light (19,3%), extreme cold weather (18,6%), fatigue (13,9%), extreme hot weather (10%), and smoking (7,5%). The methods that the patients used for a headache relief before applying to the emergency department were following: drugs intake (62,9%), nutrients intake (47,1%), massage (45%), exercises (34,3%), trying to sleep (32,1%), going out for fresh air (25,4%), and taking a shower (21,8%). **Discussion:** Although the ordinary analgesia or non-pharmacological methods are used by many patients when a migraine attack happens, the headaches do not sufficiently relieve and they apply to the emergency departments.

### Keywords

Migraine; Triggering Factors; Prehospital

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## Introduction

A migraine is one of the primer headache reasons, progresses with a headache and other symptoms in chronic and attack forms. It is seen approximately at the rate of 12% particularly in the females in most societies [1,2]. It causes limitations in daily activities of the individuals due to progressing attacks and these attacks lead to serious headaches from time to time [3]. Many internal (personal) or external (environmental) factors such as hormonal changes, menstrual period, emotional stress, starvation, fatigue, odor, noise, weather condition changes, change in sleeping pattern trigger the migraine attack or increase a headache [4-6].

A migraine is generally treated by the medication; however, some patients cannot tolerate the acute/prophylactic treatment or do not want a medical treatment due to various reasons [7]. The patients with a migraine attack use some methods such as taking painkillers, massage, taking herbal drugs, and trying to sleep to eliminate a headache before applying to the emergency department. If they fail with these methods, they apply to the emergency department for the treatment.

In our study, we aimed to detect the triggering factors in patients applying to the emergency department with a migraine attack and detect the methods which have been applied to eliminate the headache before applying to the emergency department.

## Material and Method

Our study that we prospectively organized was started after receiving the local university ethics committee approval. Two hundred and eighty patients aged 18 and older accepted to the emergency department due to a migraine headache during a 12-month period and previously diagnosed migraine were included in the study. International Classification of Headache Disorders 3rd Edition (ICHD-3) was used for the definition of migraine and for migraine and for possible migraine [8]. The patients diagnosed migraine recently, those who constantly applied, those with the secondary cause of headache and the patients who did not give an approval to participate in the study were excluded from the study. The demographic information of the patients, possible reasons triggering the migraine attack and information about methods they used to eliminate a headache before applying to the emergency department were filled in the standard data entry form; and obtained data were analyzed.

Statistical Package for the Social Sciences (SPSS 21, Chicago, IL, USA) statistical program was used for the data analysis in the statistical analysis. The numeric variables were expressed as the mean  $\pm$  standard deviation and categorical variables percentage. The continuous variables' distribution was detected by Kolmogorov-Smirnov and Shapiro-Wilk normality tests in the data analysis. Man-Whitney-U test was used in detecting the relationship between the dual groups not conforming to the normal distribution. Chi-Square test or Fisher's exact test were used in the analysis of categorical variables.  $P < 0.05$  was accepted as significant in all analyses.

## Results

Of the patients 71,4% (n=200) were female. The average ages

of male and female patients were  $33.7 \pm 10.6$ . There was no difference between the females and males according to the age averages ( $p = 0,121$ ). The mean period during which the patients received the migraine diagnosis was  $7,9 \pm 6,96$  /year. The headaches because of which they applied to the emergency department were between 1 and 72 hours and continued for 13,4 hours. The menstruation was detected as primary triggering factor in 28% (n=56) of 200 female patients when the triggering factors were analyzed according to the patients' gender. The other triggering factors for all patients and comparison of these factors according to the gender are given in Table 1.

Table 1. The factors triggering the migraine attack

Triggering Factors	Total N (%)	Female n (%)	Male n (%)	OR	%95 CI	P
Stress	234 (83,6)	164	70	1,537	0,723-3,267	0,290
Sleeplessness	202 (72,1)	136	66	2,218	1,160-4,244	0,014
Starvation	156 (55,7)	106	50	1,478	0,869-2,514	0,148
Malodor	124 (44,3)	84	40	1,381	0,821-2,324	0,223
Gurgling	71 (25,4)	48	23	1,278	0,713-2,289	0,409
Nutrient	56 (20,0)	44	12	0,626	0,311-1,259	0,186
More light	54 (19,3)	40	14	0,848	0,433-1,663	0,632
Extreme cold weather	52 (18,6)	38	14	0,904	0,460-1,778	0,771
Fatigue	39 (13,9)	30	9	0,718	0,324-0,590	0,413
Extreme hot weather	28 (10,0)	22	6	0,656	0,256-1,684	0,378
Cigarette	21 (7,5)	17	4	0,567	0,185-1,739	0,315

While the rate of patients' drug use was prophylactically 25,7% (n=72), it was detected that 74,3% of them did not use the prophylactic drugs regularly. The drug intake was the most used method with the rate of 62,9% (n=176) to eliminate the headache before applying to the emergency department. The NSAII was the most used drug with the rate of 33,2% (n=93) before the patients applied to the hospital. The use of Acetaminophen 19,3% (n=54), flunarizine 5,7% (n=16) and ergotamine tartrate 4,6% (n=13) followed it, respectively. The nutrition/food consumption was the most used method with the rate of 47,1% (n=132) after the drug intake to eliminate the headache before applying to the emergency department. The other methods that the patients used before applying to the emergency department were given in Table 2.

## Discussion

A migraine attack is a condition affecting the individuals' life quality. It causes a need to apply to the emergency department and especially NSAII use. The important points in preventing the migraine attack are the struggle with the triggering factors and headache.

The triggering factors can result from the individual or environmental reasons. In our study, the stress and sleeplessness were detected as the most seen triggering factors of the migraine attack. The drugs used for the prophylaxis purpose and non-pharmacological approaches to prevent the individual factors were in such a way to try to avoid the environmental factors causing a person's headache [9-11]. Even though a decrease in the number of applications to the outpatient clinics and emer-

Table 2. Methods used prehospital to heal the headache

Methods used before the emergency	Total N (%)	Female n (%)	Male n (%)	OR	%95 CI	P
Drug intake	176 (62,9%)	132	44	0,630	0,371-1,068	0,085
Nutrition	132 (47,1%)*	101	31	620	0,366-1,052	0,075
Massage	126 (45%)	102	24	0,412	0,237-0,716	0,001
Exercises	96 (34,3%)	76	20	0,544	0,304-0,972	0,038
Trying to sleep	90 (32,1%)	63	27	1,108	0,638-1,922	0,716
Going out for fresh air	71 (25,4%)	48	23	1,278	0,713-2,289	0,409
Taking a shower	61 (21,8%)	42	19	1,172	0,632 2,172	0,615

\*Lemon (n=56, 20,0%), Coffee (n=40, 14,3%), Garlic (n=24, 8,6%), Herbal tea (n=9, 3,2%)

gency departments by adding the prophylactic treatment to the migraine's acute treatment and the number of Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) was determined, the regular drug use rate for the prophylaxis purpose was at the low level [12]. The most important reasons for not using preventive treatment resulted from the socio-cultural reasons such as a decrease in the income level and a decrease of the educational level. However, Krymchantowski A et al. detected in their study that approximately 30% of the patients did not receive a headache preventive treatment in the metropolitan cities in Brazil [13]. In our study, 74,3% of the patients were detected not to use the prophylactic drugs regularly.

Most of the persons with a migraine prefer the acute treatments to eliminate a headache instead of the prophylactic drug use. In our study, the use rate of pharmacological and nonpharmacological methods was high in a struggle with a headache before the patients applied to the emergency. A painkiller was detected to be the most used method. The use of painkillers is prevalent in the chronic headaches and use or overuse of the analgesic and migraine drugs show changes according to the regional, psychosocial, medical, and economic factors. The ordinary analgesics are still the most frequently used drugs all over the world [14-16]. In our study, while the NSAID is the most used painkiller consistent with the literature, the acetaminophen was determined as the second most frequent.

There are many studies of the nutrition showing the effects in preventing and treating neurological diseases. However, the nutrition's role is still a controversial topic in migraine [17]. The chocolate, cheese, processed meat, and red wine are some of the triggers widely known related to nutrition. In addition to them, citrus, aspartame, monosodium glutamate, caffeine, fat-rich diet, insufficient liquid consumption, eating frequency, meal skipping and diet in macro-nutrition composition can play a role [18,19]. Avoiding the nutrients triggering the migraine attack was stated to decrease the attack frequency and attack severity [20]. The herbal food consumption with the rate of 47,1% was one of the most used non-pharmacological methods in a migraine headache before applying to the emergency department. The contradictory results are reached in the studies indicating that some foods trigger and/or heal the migraine attack. The reason can be related to the food products use habits [19].

In the study performed by Fukui et al. with 200 Brazilian migraine patients, the participants selected the starvation with 63,5%, chocolate with 20,5%, cheese with 8,5%, alcohol with 34%, aspartame with 8,5%, coffee consumption with 14,5%, salami with 4,5%, citrus with 4% and ice cream with 3% as the migraine trigger [21]. In this study, while the citrus was seen as an important migraine trigger, they were not found as the migraine trigger factor in the study by Yadav et al. [22]. In our study, we detected that while 20% of the patients consumed the lemon to eliminate the attack, the caffeine consumption at the rate of 14% followed it. However, the reason for applying to the emergency department by the patients even when they consumed the lemon or caffeine makes us think that the use of these products will be ineffective or faulty.

The massage therapy was the most applied method after the herbal food consumption. A limited number of studies were performed on the effect of massage therapy on migraine patients [7]. Karakum B et al. stated in their study that 51% of the patients with a primer headache applied the massage therapy and 33,6% of them benefited from the massage [23]. In our study, it is thought that our patients had used the massage method within their own opportunity and information but not as a professional support and therefore, they applied to the emergency department since the response rate was low.

Encouraging the health behaviors and lifestyle changes including the management of perceived stress with the relaxation way and increasing the physical activity levels with the aerobic exercise were shown to be effective in improving the clinic results in the primary headache disorders [24,25]. Moreover, sleeping, staying in a dark and silent environment and applying cold to the head are the effective factors in healing the migraine. The lifestyle habits should be changed, the sleeping hour should be regulated, stress should be avoided, pillows should be used more than usual while trying to sleep, regular exercises should be done and proper nutrition should be taken. In our study, joining in the activities such as exercising, trying to sleep, going out for fresh air, and taking a shower show that the patients are conscious of the nonpharmacological approaches and try to practice them.

As a conclusion, the reasons why headaches do not decrease sufficiently despite the ordinary analgesia or non-pharmacological efforts and applying to the emergency department with the migraine attack can be the wrong method, performed by professionals, started in the late period and show an individual difference of these methods. We think that the pharmacological and nonpharmacological methods are required to be selected consciously according to the individual response.

#### Scientific Responsibility Statement

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

#### Animal and human rights statement

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national re-*

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### Conflict of interest

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