NÖRO PSİKİYATRİ ARŞİVİ
ARCHIVES OF NEUROPSYCHIATRY

RESEARCH ARTICLE

Arch Neuropsychiatry 2021;58:217–220
https://doi.org/ 10.29399/npa.24839

The Effectiveness of Diet Restriction in Elderly with Migraine

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ABSTRACT

Introduction: Migraine type headache is a type of pain with a high socioeconomic burden that limits the activities of daily life of individuals of all ages. The pathogenesis is not fully understood. There are a lot of migraine's trigger factors and foods are one of them. The purpose of this study was to specify the effect of migraine triggering on the migraine attacks prevention in the elderly population.

Method: The study consisted of patients over the age of 65 with a diagnose of migraine without aura according to International Headache classification. Thirty-one migraine patients with migraine attacks were included in the study. Triggering foods were expelled from the diets of migraine patients. This diet and pre-diet 2 months after the application, the frequency of attack within a month, attack duration and visual analog scale (VAS) pain intensity, the number of analgesics and triptans used were recorded.

Results: A total of 31 patients (8 male and 23 female) were evaluated. In the second month after dieting, the frequency of attack, attack duration, pain severity, and analgesic and triptan counts were statistically significantly lower than the pre-treatment level ($p<0.05$).

Conclusion: Results of the study; In migraine-aged elderly patients, it can be concluded that migraine attacks may be an effective and reliable treatment in reducing the number of analgesics and triptans used in migraine attacks.

Keywords: Migraine, headache, food, elderly, nutrition, elimination

Cite this article as: Özön AÖ, Karadaş Ö. The Effectiveness of Diet Restriction in Elderly with Migraine. Arch Neuropsychiatry 2021;58:217-220.

INTRODUCTION

In the light of the information obtained from the studies on the pathophysiology of migraine, it is thought that migraine is not a vascular headache but a complex nervous system dysfunction. There are many complex underlying mechanisms. Migraine attacks can be present with various symptoms such as mood swings, irritability, photosensitivity, stretching, polyuria, neck pain, and concentration difficulties. Amendments in the functions of varied areas of the brain are seen and these amendments can cause symptoms to occur. For example, amendments in the hypothalamic function may be responsible for the changes in appetite, mood and polyuria. Increased activity in the occipital cortex may lead to light sensitivity. Activation of the brainstem is associated with nausea. Changes in thalamic and thalamo-cortical activity plays a role in sensory processes. The other symptom seen in migraine is cognitive dysfunction and it is caused by disruption of brain functional connections (1).

Stress, menstruation, hunger, visual stimuli, weather changes, sleep disturbances, nitrates and aspartame are among the triggers of migraine (2). In a retrospective study of 1750 patients with migraine, emotional stress, hormones in women, hunger, weather, sleep disturbances, smell, neck pain, light, alcohol, food, were reported as triggers of acute migraine attacks (3). There are non-pharmacological approaches like psychotherapy, biofeedback and cognitive behavioral methods in the treatment of migraine. Pharmacological treatment is used as acute attack treatment and prophylactic treatment. While simple analgesics, nonsteroidal anti-inflammatory agents, triptans, ergot alkaloids and opioids are used in the treatment of acute attacks, propranolol, metoprolol, amitriptyline, valproic acid, topiramate, flunarizine and melatonin are preferred for prophylactic treatment (4). There is a wide range of side effect profile at the drugs used in acute attacks and prophylactic treatment. Since there are drug interactions that may be dangerous besides their side effects, new and additional treatment strategies are needed (5–7).

Food may trigger migraine attacks although it can vary from person to person. It was well known to be that a number of foods trigger the pain in patients with migraine, but not every migraine patient has the same effect. In some studies, when migraine patients were removed from the diet (in migraine attacks triggered by the food), this has been reported to reduce pain attacks. Nevertheless, this issue is still controversial (8–10). Because of these reasons, in this study it was purposed to investigate whether removing foods which trigger migraine is effective or not on the short time within 2 months prevention of migraine attacks in migraine patients.

METHODS

Ethichal approval for the study was taken from the local ethics committee. Patients over 65 years of age, diagnosed with migraine without aura according to ICHD-3 Headache classification were included in the study (11). Migraine patients with normal physical examination and normal

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Received: 21.08.2019, **Accepted:** 17.11.2019, **Available Online Date:** 07.01.2020

neurological examinations who have migraine attack frequency 4 or more per month were selected by consecutive method. The causes of secondary headache were excluded by performing routine tests.

Patients with medication over use headache, those who used any prophylactic medication for migraine within 1 month prior to the onset of the study, patients who received Botulinum Neurotoxin Type A (BoNT-A) treatment for 6 months prior to the onset of the period, patients who received greater occipital nerve blockade or non-pharmacological treatment, patients with a history of primary headache other than migraine, patients with a history of malignancy, patients that undergone cranial surgery, patients with: uncontrolled hypertension, uncontrolled diabetes mellitus, chronic liver failure, chronic renal failure, congestive heart failure, hypophysis and hypothalamic dysfunction, patients who consumed 500 mg/day or more of caffeine for the last month, patients with major psychiatric disorders, and those who used antipsychotics, antidepressants, antiepileptic drugs during the last 3 months before the study were excluded

Of the 89 migraine patients over 65 years of age who were evaluated according to inclusion and exclusion criteria, 31 patients (8 males and 23 females) who were found to have migraine attacks associated with the intake of certain foods were included in the study. The headache diary of all patients were reviewed one month before the treatment and the number of attacks within one month, duration of the attack (in hours), pain intensity with visual analog scale (VAS), analgesic numbers and triptan numbers used were recorded. Triggering foods that were determined by implementing the food sensitivity questionnaire form (Table 1) for all patients were removed from that patient's diet. The frequency of attacks within one month, duration of attacks (in hours), pain intensity with Visual Analogue Scale, number of analgesic and triptan usage were recorded at 2 months after diet restriction. Entire data were procured by evaluating headache diary.

Statistical Analysis

In the analysis of statistical data, mean ± standard deviation was used for continuous variables. Discrete variables were expressed as numbers and%, median and minimum maximum values. Student's t test was performed to compare the differences between the dependent groups. SPSS 22 package program was used in statistical analysis of data and p<0.05 value was considered as statistically significant.

RESULTS

The number of geriatric patients diagnosed with migraine in this study was 31. The mean age was 68.6 years (65–80 years). Twenty-three patients (74.2%) were female and 8 (25.8%) were male. No statistically significant difference was found between age groups according to gender. The foods triggering migraine attacks were determined (Table 2). Our results showed the mean number of attacks before treatment was 5.74±1.55 (min-max: 4–9), while this rate decreased to 4.16±2.02 (min-max: 1–8) after treatment. According to our results seventeen foods were determined as a trigger of migraine attacks. All of them were excluded from the diets of patients during the study and also wheat, egg, cheese, Nescafé and milk were determined the most trigger foods. This decrease was statistically significant (p=0.001). While 8 (25.8%) patients had at least 4 attacks before treatment, the number of attacks decreased to 4 (71%) in approximately two-thirds of patients with dietary restriction (Table 3).

While the pre-treatment values were 32.65±19.38 (min-max: 6–72) in terms of the duration of pain, these values decreased significantly after treatment (18.74±13.99, min-max: 5–60) (p<0.001) (Table 3).

While the mean pain severity of the patients was 82.26±9.90 (65–100) points according to pre-treatment VAS, these values had decreased to 62.26±22.20 (min-max: 20–100) points after treatment and this decrease was statistically significant (p<0.001), (Table 3). The lowest pre-dietary pain severity was 65 points in 2 patients, whereas VAS pain severity decreased to less than 65 points in approximately half of the patients after diet (n=15, 48.5%). Seven patients (22.6%) reported no change in VAS pain severity.

The mean number of analgesics used by patients for migraine was 4.94±1.34 (min-max: 3–8) but had decreased to 2.74±1.98 (min-max: 0–8) after dietary restriction (p. <0.001) (Table 3). While at least 3 analgesics were used before diet, 4 patients (12.9%) did not feel the need to use any analgesics after diet, and 14 patients (45.2%) used 2 or less analgesics. The number of triptans used was 1.65±1.84 (min-max: 0–6) before treatment and decreased to 0.87±1.45 (min-max: 0–5) after treatment (p=0.001) which was demonstrated in Table 3.

Table 1. Food sensitivity questionnaire

Veal	Cabbage
Lamb	Cauliflower
Turkey meat	Broccoli
Fowl	Artichoke
Chicken	Apple
Sardine	Pear
Salmon	Mandarin
Shrimp	Orange
Oyster	Plum
Anchovy	Banana
Tuna fish	Apricot
Sujuk	Grape
Sausage	Raisin
Salami	Strawberry
Cows'	milk Kiwi
Goat's milk	Melon
Yoghurt	Pine apple
Butter	Mango
Cheese	Avocado
Cream cheese	Date
Parmesan cheese	Pumpkin
Kosher cheese	Coconut
Mozzarella cheese	Huckleberry
Roquefort cheese	Mushroom
Egg	Olive
Honeydew honey	Sesame
Flower honey	Thyme
Thyme honey	Cumin
Wheat	Curry powder
Rice	Clove
Lentil	Saffron
Corn	Starch
Oat	Vanilla
Soy	Ginger
Potato	Carob
Onion	Maple Syrup
Garlic	Sunflower seed
Tomato	Nut
Pepper	Peanut
Cucumber	Almond
Carrot	Walnut
Radish	Chocolate
Lemon	Pickle
Parsley	Tea
Mint	Turkish coffee
Dill	Nescafe
Garden Rocket	Sage tea
Eggplant	Fennel
Zucchini	Fruit juice
Leek	Alcohol
Other foods	

Table 2. Foods identified to trigger migraine attacks

Type of food	The number of people affected by the food
Wheat	15 (48%)
Egg	14 (45%)
Cheese	12 (39%)
Nescafe	11 (35%)
Milk	11 (35%)
Chocolate	9 (29%)
Alcohol	9 (29%)
Sujuk	7 (23%)
Tea	6 (19%)
Red Meat	6 (19%)
Onion	6 (19%)
Pickle	5 (16%)
Orange	4 (13%)
Oat	3 (10%)
Grape	3 (10%)
Garlic	2 (6%)
Sesame	2 (6%)

DISCUSSION

This study demonstrates the decreasing of migraine attacks via preventing of some foods for two months that trigger the attacks in elderly people. From this reason in this study, 31 elderly patients who have migraine attacks related with the intake of certain foods were evaluated by applying food sensitivity questionnaire. All these patients had more than one food related triggering factor. Foods that were determined as triggering factors were removed from the diet of all patients and migraine attack frequency, duration of attacks and pain severity were decreased in all patients in the second month after treatment compared to pre-treatment. After the removal of migraine triggering foods from the diet, the number of analgesics and triptans used in the elderly population had decreased.

In our study, food elimination identified as a triggering factor in the elderly with migraine has shown positive results in reducing migraine attacks and the use of analgesics and triptan for acute treatment. Recent studies have focused on the importance of food intolerance and food sensitivity in many painful conditions such as migraine, primary headache, and tried to develop treatment strategies for these. Elimination of foods and other factors that trigger migraine and treatment strategies for the prevention and treatment of migraine are the recent methods used.

It is stated that some foods may trigger migraine in susceptible individuals. Identifying foods that trigger migraine can sometimes be difficult. In such cases, the possible triggering foods can be removed from the diet and after the headache frequency decreases, these foods are slowly reintroduced into the diet and the triggering foods can be identified. With statistical modeling, these definitions can be made more accurately. Recently, immunological analyzes have been used in the detection of triggering foods in migraine. IgG analysis in food sensitivity in patients with migraine is promising. However, these analyzes are not standardized to be used routinely (9, 12). Therefore, in this study it was distracted the determined foods that trigger for the migraine attacks and evaluated the efficiency of results.

The one study which was conducted by Dora et al., 221 patients with tension-type headache, migraine without aura and migraine with aura were evaluated in terms of triggering factors. The differences between the sexes were also examined. The total number of triggers was higher in women with migraine without aura than in men. Again, insomnia, bright light, pungent odors, caffeinated beverages, and food sensitivity were more common in women. Some food triggers were found to be different in migraine patients with and without aura. In migraine without aura, bananas were more common triggers while raw onions and pods were more common in migraine with aura. Food sensitivity and coffee-containing beverages were more common triggers in women with migraine without aura. In this study it was investigated the migraine without aura in elderly people. In line with the study conducted by Dora found women were more than men but in our study wheat, egg, cheese and Nescafe were found to be more common triggering of migraine without aura (13).

Alpay et al. had evaluated 35 migraine patients with aura in a randomized double-blind study. They studied the IgG levels developed against 266 food antigens using Enzyme-Linked ImmunoSorbent Assay (ELISA) method after 6 weeks of normal diet, and 6 weeks after removing the foods that produced high IgG levels, there was a decrease in the number of headache days, number of attacks and drug use, but no change in attack severity and duration were reported. After a 2-week normal diet, the patients were given a provocative diet that produced a high level of IgG, and during the provocative diet, all parameters of the patients reached similar levels with the baseline values before the study. Dietary criteria based on IgG antibodies can be used as an effective strategy in reducing migraine attacks (14). In the study conducted by Alpay et al. the foods, according to IgG levels which was obtained via Elisa technic, were distracted from the diet migraine with aura. Although the differences methods between the studies, it was determined to be similar rates of using drugs, number of migraine attacks and number of painful days (14).

Egger et al. applied an oligoantigenic diet to children with migraine that was thought to be related to food allergy. A double-blind controlled

Table 3. Comparison of pain characteristics of migraine patients before and after diet

Variables (n=31)		Mean ± SD*	Mean	Min-max*	P***
Number of attacks	PT**	5.74±1.55	5.0	4–9	0.001
	AT	4.16±2.02	4.0	1–8	
Headache duration	PT	32.65±19.38	24.0	6–72	<0.001
	AT	18.74±13.99	12.0	5–60	
VAS score	PT	82.26±9.90	80.0	65–100	<0.001
	AT	62.26±22.20	65.0	20–100	
Number of Analgesics used	PT	4.94±1.34	5.0	3–8	<0.001
	AT	2.74±1.98	2.0	0–8	
Number of Triptans used	PT	1.65±1.83	1.0	0–6	0.001
	AT	0.87±1.45	0.0	0–5	

* Mean ± SD: Mean ± Standard Deviation
** PT: Pre treatment, AT: After treatment
*** Student t test for dependent variables
Min-max: minimum-maximum

trial involving 88 children; reported a significant reduction in migraine headache in 93% of children with oligoantigenic diet (15). In the study of Özön et al., 50 migraine patients who stated that migraine attacks had started after the intake of certain foods were evaluated. Foods that trigger migraine attacks were identified and excluded from the patients' diet. As a result of this study, it was stated that restricting the intake of foods triggering migraine attacks is an effective and reliable method in reducing migraine attacks in migraine patients (4).

Cultural differences also play an important role in identifying triggers. Foods and alcoholic beverages that are consumed depending on culture and belief vary between communities. Antibody tests can be performed for a certain number of foods by standard ELISA method. The food questionnaire allows the assessment of a greater number of foods. The treatment efficacy obtained by diet restriction applied to patients evaluated with a food questionnaire is like the treatment efficacy obtained by food intolerance defined by high cost methods such as ELISA (4, 14,15). In this study, a broad food intolerance evaluation was used with a food questionnaire containing foods that triggered migraine attacks without using the standard ELISA method.

In conclusion, some foods may trigger migraine attacks in elderly individuals. When migraine triggering foods are detected in the elderly, restricting the intake of these foods contributes to the prevention and reduction of migraine attacks. Another important consequence of the restriction of migraine triggering foods is the reduction in the intake of analgesics and triptans, which can lead to significant side effects and drug interactions. The results demonstrate that this method can be used as a treatment strategy in the prevention and treatment of migraine. Randomized, double-blind, placebo-controlled, long-term studies with large numbers of patients are required to fully demonstrate the efficacy and potency of this treatment strategy in the treatment of migraine.

Ethics Committee Approval: Approval was received for the study from the ethics committee of local (2019/002-007).

Informed Consent: Written informed consent was obtained from all individual participants included in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - AÖÖ, ÖK; Design - AÖÖ, ÖK; Supervision - AÖÖ; Resource - AÖÖ; Materials: AÖÖ, ÖK; Data Collection and/or Processing - AÖÖ, ÖK; Analysis and/or Interpretation - AÖÖ, ÖK; Literature Review -AÖÖ, ÖK; Writer - AÖÖ, ÖK ; Critical Review - AÖÖ, ÖK.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declare that this study has received no financial support.

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