



## The Prevalence of Migraine and Tension Type Headaches among Epileptic Patients

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### ABSTRACT

**Background:** Headache and epilepsy are two common chronic and recurrent disorders. Headache may be a premonitory or postdromic symptom of epileptic seizures.

**Objective:** This study aims to evaluate the prevalence of migraine and tension type headache in epileptic patients.

**Materials and Methods:** In a cross-sectional descriptive study, 100 patients with epilepsy who referred to the neurology clinics, affiliated to Shiraz University of Medical Sciences, in Southern Iran were enrolled this study since April to October 2013. Patients' demographic data and clinical characteristics of epilepsy and headache and temporal relationships between them were assessed. Mean±standard deviation for non-quantitative data and Chi square test for quantitative data were used in SPSS software version 18.  $p < 0.05$  was considered as the level of significance.

**Results:** Fifty-four patients (54%) have reported headache (15% migraine and 39% tension). The frequency of migraine, was higher in women than men ( $p=0.03$ ). The patients with generalized epilepsy experienced more headaches than the patients with localization-related (focal) epilepsy ( $p=0.001$ ). There was no statistically significant relationship between the prevalence of headache in the patients with controlled and uncontrolled epilepsies ( $p=0.45$ ). Overall assessment showed that interictal headaches were more prevalent (42.53%), and post-ictal headaches were more prominent than the preictal ones (31.48% vs. 25.92%).

**Conclusion:** In this study, headache was common in the epileptic patients. Consideration of these two common co-morbidities can be resulted in an appropriate drug selection for both epilepsy and headache.

**Keywords:** Epilepsy; Headache; Comorbidity

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### Introduction

Headache, especially migraine type and epilepsy are two common neurologic disorders sharing some similarities. Episodic attacks with the same triggers such as sleep deprivation, menstruation and alcohol drinking along

with some common clinical manifestations such as visual aura and cognitive disturbance during attacks are among these similarities. Additionally common medications such as Sodium Valporate, Topiramate and Gabapentin are used for treating of both

disorders (1,2). Their co-morbidity has been confirmed by several studies (1-6). Ottman *et al.* have postulated that the prevalence of migraine among patients with epilepsy is about 2.4 times higher than that of the normal population (7) and also the chance of migraine headache in epileptic patients is higher than the normal population (*i.e.* bidirectional co-morbidity) (8). Headache may occur with close temporal relation before one epileptic seizure (namely pre-ictal or rarely during seizure: ictal) and more commonly after it (post-ictal headache) (1,6). However, many epileptic patients may have headache without temporal relation with seizure named inter-ictal headache. This study aimed to estimate the prevalence of migraine and tension type headaches among epileptic patients in Fars Province in Southern Iran.

## Materials and Methods

In a cross-sectional descriptive study, one hundred patients with epilepsy who referred to the neurology clinics affiliated to Shiraz University of Medical Sciences enrolled this study since April to October 2013. Written informed consent was obtained from all the patients and epilepsy was diagnosed by a neurologist based on the patients' clinical and electroencephalogram data. The patients with concomitant psychogenic non-epileptic seizures, progressive degenerative central nervous system disease, malignancy, symptomatic epilepsy secondary to acute metabolic or infectious disorders or any mental disabilities, that would prevent them from answering the questions correctly, were excluded from the study. We designed a two part questionnaire: in the first part, patients' demographic data and in the second part of the questionnaire, the clinical characteristics

of epilepsy ( type of epilepsy and anti-epileptic drugs, response to treatment, and *etc.*), the history of headache and its types (migraine or tension or the other types) during the last 6 months and the temporal relationship of each headache episode to seizure (*e.g.* pre-ictal, post-ictal or inter-ictal headache) were filled out by a researcher.

In our study, tension type and migraine headache were diagnosed according to the International Classification on Headache Disorders (ICHD-II) as post-ictal headache which starts 3 hours after a seizure and lasts for 72 hours and as inter-ictal headache without temporal relation to seizure (9). The same as Yankovsky *et al.*, we considered the headache which starts 30 minutes or a longer time prior to a seizure and lasts until its onset, as pre-ictal (10). We did not evaluate the prevalence of ictal headache because of inability to record electroencephalography during the headache. According to the International League Against Epilepsy (ILAE) guidelines, epilepsy is classified into generalized and localization-related (partial, focal) types (11). Based on having unprovoked seizure or not during last 6 months, we divided the patients into two groups of uncontrolled and controlled epilepsies, respectively. Mean and standard deviation has been used for expressing non-quantitative, and Chi square test for analysis of the quantitative data.  $p < 0.05$  was considered statistically significant. SPSS software version 18 (SPSS Inc, Chicago) was used for the statistical analysis.

## Results

From one hundred patients with epilepsy, 48 patients (48%) were female with mean age of  $21.69 \pm 10.60$  years and 52 patients (52%) were male with mean age of  $23.29 \pm 14.11$

years. In this study, 46 patients (46%) had generalized epilepsy and 54 patients (54%) had localization-related (focal) epilepsy. The prevalence of controlled and uncontrolled epilepsy was 46% and 54%, respectively. The frequencies of each type of headaches based on clinical characteristic of epilepsy are presented in table 1.

**Table 1:** Clinical characteristics of patients with epilepsy based on the presence and the type of headache

Headache type	Migraine	Tension	Total
Frequency (%)	15 (15%)	39 (39%)	54 (54%)
Male	4 (26.7%)	22(56.4%)	26 (48.1%)
Female	11(73.3%)	17(43.6%)	28(51.8%)
<i>p</i>	<b>0.03</b>	0.48	0.65
Generalized epilepsy	9 (60%)	23 (59%)	32 (59.2%)
Focal epilepsy	6 (40%)	16 (41%)	22(40.7%)
<i>p</i>	0.23	<b>0.03</b>	<b>0.001</b>
Controlled epilepsy	5 (33.3%)	18 (46.2%)	23(42.6%)
Uncontrolled epilepsy	10 (66.7%)	21 (53.8%)	31(57.4%)
<i>p</i>	0.28	0.98	0.45

Table 2 represents the prevalence of pre-ictal, post-ictal and inter-ictal headaches among epileptic patients. Overall assessment showed that interictal headache was more prevalent (42.53% among all patients with headache and 23% among all epileptic patients), but in the patients with active epilepsy (seizure recurrence during the past six months) post-ictal headache was more prominent than the preictal ones (31.48% vs. 25.92% among all patients with headache and 17% vs. 14% among all epileptic patients).

**Table 2:** The prevalence of pre-ictal, post-ictal and inter-ictal headache among patients with epilepsy

Headache	Pre-ictal	Post-ictal	Inter-ictal	Total
<b>Migraine</b>	1 (1%)	9 (9%)	5 (5%)	15 (15%)
<b>Tension type</b>	13 (13%)	8 (8%)	18 (18%)	39 (39%)
<b>Total</b>	14 (14%)	17 (17%)	23 (23%)	54 (54%)

## Discussion

In our study, the total prevalence of tension type and migraine headaches was high in epileptic patients (39% and 15%, respectively). Migraine is a common neurologic disorder with frequency of about 12% in the general population (12,13). Similar to our finding, Marks and Ehrenberg found that 20% of the epileptic patients had migraine. Indeed, the co-morbidity of migraine and epilepsy is bidirectional which means that in addition to the higher prevalence of headache in epileptic patients, especially migraine type, there is a higher prevalence of epilepsy in migrainous patients (14). In a review study on migraine and epilepsy, Andermann F. and Andermann E. revealed that there is a bidirectional association (8). Tonini *et al.* studied in both epilepsy and headache centers in Italy and reported that the co-morbidity of headache and epilepsy, with a prevalence of 1.6 % from headache centers and 30% from epilepsy centers, is bidirectional (15). In a study of 1830 migraine patients, Baulac *et al.* reported that 5.9% of the patients had epilepsy which is significantly higher than a usual prevalence of 0.5% for epilepsy in the general population (16). Moreover, this finding has been also confirmed by other studies (17,18). In another study, Toldo *et al.* documented that epilepsy is 3.2 times higher than in migrainous patients and they did not find the same association with tension type headache and the difference between migraine with and without aura in this regard (19).

In the present study, female gender was an associated factor with migraine headache in the patients with epilepsy ( $p=0.03$ ) which is an expected finding because of the higher frequency of migraine among women rather than general population.

Our study also showed that the patients with generalized epilepsy had significantly higher prevalence of headache ( $p=0.001$ ) especially tension-type headache ( $p=0.03$ ) than the patients with focal epilepsy. Studies on the relationship between the type of epilepsy and the frequency of headache have reported various findings. Schankin *et al.* studied 75 patients with juvenile myoclonic epilepsy and found an increase in the prevalence of migraine, especially migraine with aura, and tension type headache (4). In addition Clarke *et al.* reported that the increased prevalence of migraine in children with rolandic epilepsy was 15% (20). Several studies have shown that there is an association between occipital lobe epilepsy, especially with photosensitivity, and migraine (21-26). These findings and close relationship of epilepsy with familial hemiplegic migraine may be explained with possible common genetic mechanisms of the migraine and epilepsy (27).

Although in our study there was no relationship between headache frequency and recurrence of seizure, Brodtkorb *et al.* conducted a study among 1656 epileptic participants and their findings showed that the patients with active epilepsy experienced a higher frequency of migraine than the patients with controlled epilepsy (45% and 14%, respectively) (28). Our smaller sample size and the retrospective nature of this research may explain the results.

Our study demonstrated a high frequency (23%) of inter-ictal headache which is headache without temporal relationship to seizure episode. However, post-ictal headache was more common than pre-ictal headache in the patients with active epilepsy (17% and 14%, respectively). Our results are close to the prevalence of 5-15% for pre-ictal

headache that was reported in epilepsy and of especially 11% in pharmacologically refractory partial epilepsy (29-31). Similar to our findings, in the other studies, post-ictal headaches are more common than pre-ictal headaches which are often the migraine type and especially occur after some types of epilepsy such as generalized tonic-clonic and occipital lobe epilepsies (1,29,32,33). Limitations of this study were small sample size, prospective nature of the study and un-differentiated epileptic syndromes.

## Conclusion

Prevalence of headache (migraine and tension types) is high among epileptic patient. Although headache may have any temporal relationship with one seizure attack, post-ictal headache is more common in patients with active epilepsy. Considering such kind of comorbidity can be resulted in an appropriate drug selection for both epilepsy and headache.

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## Conflict of Interest

No Conflict of Interest

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