



ORIGINAL ARTICLE

A Headache Diary Might be a Useful Tool in the Management of Chronic Migraine Patients.

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ABSTRACT

Background: Basic data on migraine headache characteristics, including frequency and severity, headache-associated impairment, and the intake of pain killer medications, may be influenced by the recording manner of these data. Headache diary can be used for that purpose. This study was done to evaluate if the regular use of headache diary can make a difference for patients with chronic migraine or not. **Methods:** This study included the patients with chronic migraine with improper headache control, who were coming to neurology outpatient clinic and were asked to record their data using either paper or digital diary. **Results:** Fifty patients mainly from females were included in our study, showed better compliance and headache control by detection and management of their reported triggers. The most reported triggering factors were stress followed by sleep deprivation. **Conclusions:** Headache diary regular recording is helpful in better management of headache attacks regarding frequency, duration, and pain intensity in patients with chronic migraine.

Keywords: Migraine ; Headache diary; Pain killer medications.



INTRODUCTION

Migraine is one of the most prevalent headache conditions, afflicting over 11% of individuals in western countries. It can sometimes be a chronic condition with long-term cardiovascular, cerebrovascular, and neurologic consequences [1]. Headache diaries aid in the collection of prospective data on migraine episodes and their usage is recommended for assessing the time pattern of patient's headaches, detecting triggering variables and determining whether their preventive therapies are effective [2]. There are many options to make a diary for headache. It is important to keep the diary as carefully as possible. The possible options are Smartphone's applications, computer-based programs, printed diaries, excel spreadsheet and simple calendars [3]. As is generally known, a variety of external and internal stressors can provoke migraine attacks in some people. Stress, sleep deprivation, exhaustion, fasting, hormonal fluctuations, bright light exposure, alcohol intake and a variety of sensory stimuli are all reported migraine triggers in 73–80% of migraineurs [4]. E-diaries and other medical apps on mobile phones are

rapidly expanding as the paper diaries can be bulky, data must be entered by hand and they can be lost or forgotten, all these factors made the compliance with paper diaries can be a problem [5]. Therefore, in this study, we investigated the impacts of using headache diary among chronic migraine patients who are not using it before, on headache frequencies, duration and pain score and its role in detection of their risk factors.

PATIENTS AND METHODS

The participants who met the inclusion criteria were recruited from the neurology outpatient clinics of Zagazig university hospitals. The following inclusion criteria were applied: 1) age between 19 and 55 years and migraine with or without auras, as defined by the International Headache Society Criteria for Migraine (ICHD-3 beta) [6]; 2) the frequency of headache attacks ≥ 15 headache days per month; 3) stable headache characteristics for at least 1 year prior to study entry and 4) patients freely have chosen their type of diary whether classic paper or digital one of Pavia medical center as both are similar [2]. Patients who had headaches attributed to secondary causes, other types of

headaches rather than migraine type, patients with underlying psychiatric disorders and those who are on regular diary use were excluded. The participants were also asked to complete the Hospital Anxiety and Depression Scale to determine their anxiety and depression levels [7]. The patient diary rating which is measured by following equation:

$$\frac{\text{average daily headache activity during last four weeks of baseline} - \text{average daily headache activity during weeks 7 and 8 of treatment}}{\text{average daily headache activity during last four weeks of baseline}} \times 100$$

A calculation was made for the degree of improvement in each patient with cut off value of $\geq 50\%$ [8]. After fixing the lines of treatments (acute and prophylactic) in each patient, reporting the triggers of each attack of headache and with education of these patients in monthly visits how to overcome the reported triggers. The frequency, duration, and pain score of headache attacks in the 3 months following the regular use of diary and compared to the month prior to its use. The participants received an explanation of the study's aims and procedures. Written informed consent was obtained from all participants; the study was approved by the research ethical committee of Faculty of Medicine. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

STATISTICAL ANALYSIS: The collected data were computerized and statistically analyzed using SPSS program (Statistical Package for Social Science) version 18. Qualitative data were represented as frequencies and relative percentages. Quantitative data were expressed as mean \pm standard deviation (SD). Independent T-test and Mann Whitney test were used when appropriate. Posthook Bonferroni test to reduce family wise error. The validity of data was calculated using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and

Table (1): Demographic and clinical characteristics of the studied cases

Variable		(n=50)	
Age: (years)	Mean \pm SD	31.5 \pm 7.29	
	Range	19 - 46	
Variable		No	%
Sex:	Female	42	84
	Male	8	16
Duration (years):	Mean \pm SD	11.84 \pm 5.04	
	Range	4 - 24	
	Median (IQR)	12 (8-15)	
Type of diary:	Written	17	34
	Digital	33	66

accuracy. A p-value ≤ 0.05 indicates significant results.

RESULTS

In this study, 50 patients with chronic migraine were involved, their age ranged from 19 to 46 years with a mean 31.5 years. Regarding their sex, most of them were females (84%). The duration of migraine since onset ranged from 4 to 24 years with mean 11.84 years. 66% of our patients preferred to use the digital diary, while 33% used the classic paper one (table 1). There was a statistically significant reduction in frequency of migraine in 3 months after regular usage of headache diary when compared to the month before, also in the second and third months in comparison to the first month after and similarly the third month when compared to the second one (table 2). Regarding the pain scale of our patients, there was a statistical significant improvement in pain scale and duration after regular use of diary compared to before (table 3). There was no obvious statistically significant difference between cases who preferred regular using of digital diary than used the paper one as regards the percent of frequency reduction of migraine and pain scale (table 4), however after 3 months there was a statistical significance decrease in the duration of migraine among cases who used digital comparing to written dairy (table 5). The most frequently reported triggers were stress (both physical and mental) (72%), sleep deprivation (56%) and strong perfumes (42%), followed by intake of salted nuts (34%) and excessive use of digital screens (32%) (table 6). The assessment of patient diary rating with the cut off value $\geq 50\%$, revealed that 26 patients (52%) were $\geq 50\%$ reduction, 15 patients used the paper diary (30 %) and 11 patients used the digital one (22%) (Fig 3).

Table (2): Frequency of migraine at different time of follow up among the studied cases:

Frequency/month	Before (n=50)	After 1 m. (n=50)	After 2m. (n=50)	After 3 m. (n=50)	F	P	Mean % of reduction
Mean ± SD	12.46 ± 3.34 ^a	10.6 ± 3.29 ^b	8.7 ± 2.96 ^c	6.38 ± 2.76 ^d	106.8	<0.001**	49.42%
Range	7 – 20	5 - 19	3 - 17	2 – 14			

SD: stander deviation, F: Repeated measure ANOVA test Posthook: Bonferroni test .statistically significant (P<0.05)
 **: highly significant (P<0.001)

Table (3): Pain scale and duration before and after 3 months among the studied cases:

Variable	Before (n=50)	After 3 m. (n=50)	T	P	Mean % of reduction
<i>Pain scale:</i> Mean ± SD	6.94 ± 0.90	5.26 ± 0.86	15.75	<0.001**	23.93%
Range	5 – 9	4 - 7			
<i>Duration:</i> Mean ± SD	6.51 ± 1.60	4.82 ± 0.95	10.42	<0.001**	24.18%
Range	4= 10	3 – 7.5			

SD: Stander deviation, t: Paired t test **: highly significant (P<0.001)

Table (4): Relation between type of dairy and percent of reduction in frequency, pain, and duration of migraine among of the studied cases.

Variable	Digital (n=33)	Paper (n=17)	P
<i>Frequency/month</i> Mean ± SD	51.74±16.76	44.93±14.28	0.16 NS
<i>Pain scale:</i> Mean ± SD	25.13±9.73	21.61±9.42	0.23 NS
<i>Duration:</i> Mean ± SD	23.01±11.12	26.46±13.15	0.34 NS

Independent t and Mann Whitney test. NS: Non-significant (P>0.05)

Table (5): Relation between type of dairy and frequency, pain, and duration of migraine after 3 months of diary use among of the studied cases:

Variable	Digital (n=33)	Paper (n=17)	P
<i>Frequency/month</i> Mean ± SD	6.09±2.83	6.94±2.61	0.31 NS
<i>Pain scale:</i> Mean ± SD	5.18±0.82	5.41±0.94	0.38 NS
<i>Duration:</i> Mean ± SD	5.05±0.92	4.38±0.86	0.02*

Independent t test, NS: Non-significant (P>0.05) *:Significant (P<0.05).

Table (6): the reported triggering factors in the studied cases

Triggers	N	%
Stress	36	72
sleep deprivation	28	56
caffeine deprivation	6	12
dark chocolate	8	16
excess daily caffeine	12	24
salted nuts	17	34
perfumes	21	42
ginger	2	4
digital screens more than 2 hours daily	16	32
noodles	5	10

Figure (1): Frequency of migraine at different time of follow up among the studied cases.

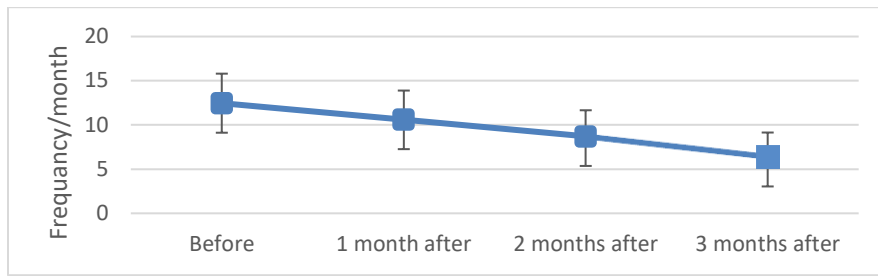


Figure (2): Pain scale and duration before and after 3 months among the studied cases.

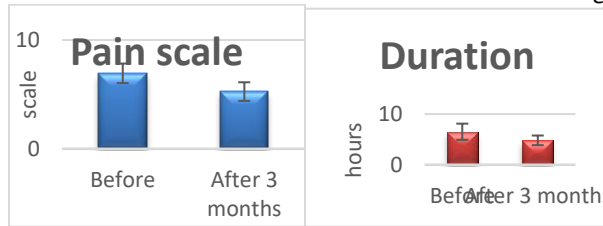
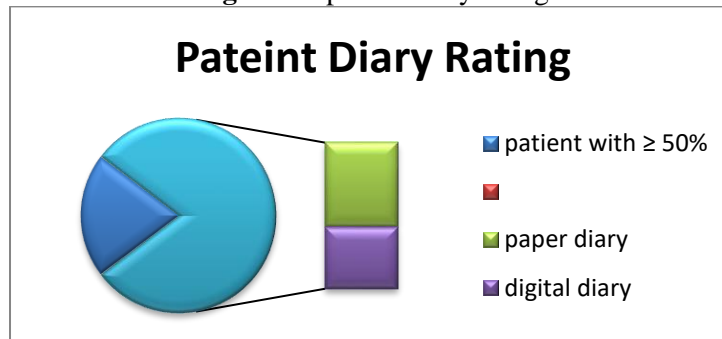


Figure 3 : patient diary rating



DISCUSSION:

In our current study, the addition of headache diary as a tool for uncovering the hidden triggers, increasing patients’ compliance and a follow up measure, was associated with reduction in headache frequency, pain, and duration after 3 months of regular dependency on headache diary using same medical treatment measures and intervention only by controlling patients specific reported triggers and enhancing their compliance. The headache diary usage was an effective tool to assess migraine trigger factors in our patients, as we found that stress was the most common reported trigger by 72%, followed by sleep deprivation in 56%, which was also reported by Park and colleagues [4], who found that 57.7% for stress, 55.1% for sleep deprivation, 48.5% for fatigue in 62 patients who used smartphone diary application. New triggers were reported in our patient which uncommonly reported in literature like ginger (4%), using digital screens more than 2 hours continuously (32%) and frequent daily noodles intake (10%). The calculation of patient diary rating revealed that more than half of our included patients achieved $\geq 50\%$ reduction, with higher prevalence for those using

classic paperform, but those who were using digital diary were better regards the duration of headache attacks after 3 months. In conclusion, the current study has proven the helpful role of headache diary for both physician and patients with chronic migraine in reaching better headache management and better compliance. I think headache diary either classic paper or digital form should be one of routinely used headache interview tools before treatment or with subsequent follow up visits. Relaxation therapy and meditation could be helpful if routinely advised to patients with poorly controlled migraine based on this study results which revealed that stress either physical or mental was the most common trigger.

REFERENCES

- 1- Hazard E, Munakata J, Bigal ME, Rupnow MF, and Lipton RB, The burden of migraine in the United States: current and emerging perspectives on disease management and economic analysis. Value Health, 2009; 12(1):55.
- 2- Nappi G, Jensen R, Nappi RE, Sances G, Torelli Pand OlesenJ, Diaries and Calendars for Migraine. A Review; cephalgia J., 2006, 26:905-916.

- 3- <https://stanfordhealthcare.org/medical-conditions/brain-and-nerves/headache/diagnosis/headache-diary.html>
- 4- Park J-W, Chu MK, Kim J-M, Park S-G, and Cho S-J, Analysis of Trigger Factors in Episodic Migraineurs Using a Smartphone Headache Diary Applications. PLoS ONE; 2016, 11(2): e0149577. doi:10.1371/journal.pone.0149577.
- 5- Hundert AS, Huguet A, McGrath PJ, Stinson JN, Wheaton M Commercially Available Mobile Phone Headache Diary Apps: A Systematic Review JMIR MhealthUhealth 2014;2(3):e36 doi: 10.2196/mhealth.3452.
- 6- Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia 2013; 33:629–808. doi:10.1177/0333102413485658 PMID: 23771276.
- 7- Zigmond AS, Snaith RP. The hospital anxiety and depression scale. ActaPsychiatrScand 1983; 67:361–370. PMID: 6880820.
- 8- Epstein LH., and Abel GG. An analysis of biofeedback training effects for tension headache patients. Behavior Therapy, 1977, 8, 37-47.

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