IF : 4.547 | IC Value 80.26 VOLUME-6, ISSUE-6, JUNE-2017 • ISSN No 2277 - 8160

Original Research Paper Psychiatry

A study of common side effects of Electro Convulsive Therapy and their predictors

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ABSTRACT

Background
The present study focused on the evaluation of myalgia and headache and their predictors after ETC. **Methods**
A prospective analytical descriptive study was conducted from Jan 2016 to December 2016, in an academic hospital in Central India. 621 patients with psychiatric disorders enrolled in the study. **Results:** 6 hours after ECT, 126 patients (21.9%) reported headaches, and 56 patients (9%) reported myalgia. The presence of headache or myalgia 6 hours after ECT was not correlated to the duration of convulsion, treatment sessions, sex, or age. But myalgia at 2 hours after treatment was correlated with sex (0.04). **Conclusion** The results of the present study demonstrate that headache after ECT procedures was more common than myalgia, but it was mild, tolerable, and decreased within 6 hours of the treatment.

KEYWORDS : ECT

Introduction

Electroconvulsive therapy (ECT) is the oldest surviving physical treatment for psychiatric disorders. Studies have noted that major depression is the most common indication for an ECT procedure. However, it is also safe and effective in a wide variety of conditions, such as mania, schizophrenia, and acute catatonia, and also in patients with severe and drug resistant psychiatric diseases or those whose treatment is limited by unacceptable side effects (1-6). Although studies have indicated ECT's efficacy and low mortality and morbidity rate, a few adverse events have been reported: oral cavity damage to tongue, teeth, and gums; damage to implants or intraosseous denture supports; confusion; dizziness; nausea and vomiting; headache, and myalgia (1, 3, 7).

In the United States about 100,000 patients receive electroconvulsive therapy (ECT) per year, and more than 45% of them report remarkable headaches after treatment (7). Past studies indicate that ECT induces headaches and exacerbates previous headaches such as migraines. These headaches have been reported to be mild, moderate, or severe and in some cases are refractory and resistant to available treatments (8, 9). The precise cause of headache after ECT is not clearly known. However, studies have hypothesized that contracture of the temporalis and masseter muscles and vasodilation may play an important role (10, 11).

The other well-known side effect after ECT is myalgia. The prevalence of post- ECT myalgia is not clear worldwide, due to the lack of evidence and correlation of myalgia to the technique, drugs and expertise of the psychiatrist. It is suggested that post-ECT myalgia is related to the use of muscle relaxant agents such as succinylcholine and to muscle injury during the procedure, due to fasciculation and seizure. It is also claimed that the biophysical effects of succinylcholine independent of fasciculation are capable of inducing myalgia, and applying non-depolarizing agents may prevent myalgia in these patients (10-13). Considering that myalgia and headache are two side effects of ECT that in some cases cause the patients to stop the course of treatment, and given the lack of similar studies in this area, this research seeks to clarify the causes and prevalence of post-ECT headache and myalgia (8, 10, 14).

Materials and methods

A prospective analytical descriptive study was conducted from Jan 2016 to December 2016, in an academic hospital in Central India. 621 patients with psychiatric disorders enrolled in the study. Reliable patients with major depression disorder, bipolar disorder, schizophrenia, or suicidal thoughts and delusions, based on DSM-IV definitions, were eligible to participate. Participants also had to be under treatment with risperidone (1.25 mg, adjusted based on the patient's needs), be between 18 - 60 years old, and be voluntarily receiving ECT. Patients with pregnancy, need for emergency ECT, ASA class III or IV, EF < 50%, uncontrolled HTN, mental retardation, addiction to any drug or substance, history of headaches, history of neuromuscular disease, or lack of written consent were excluded. Data were analyzed using SPSS version 16.

Results

Fewer patients complained of a headache 6 hours after ECT (P = 0.0001) and moreover the number of patients with mild headaches was reduced significantly (P = 0.0001). Among the patients with headaches the percentage of patients with moderate and severe headaches at 6 hours after ECT was higher than at 0 and 2 hours after ECT (34% for 6 hours after ECT, vs. 24% at 0 and 18% at 2 hours) but no statistical analysis was performed. The correlation of myalgia with post-ECT duration was not significant (P = 0.06) At 0 and 2 hours after ECT, the presence of severe headaches was more common in patients over 40 than in other patients: 8 of 11 the patients that showed headache at 0 hour after ECT were over 40, as were 6 of the 9 patients with severe headaches at 2 hours after ECT. The correlation between age and presence of myalgia 6 hours after ECT was not significant (P = 0.70). Logistic regression (enter mode) indicated that sex (P = 0.057), age (P = 0.50), duration of convulsion (P = 0.74), and number of treatment sessions (P = 0.51) were not predictors for headache and myalgia 6 hours after ECT (P = 0.13, P = 0.35, P = 0.88, and P = 0.46, respectively).

Discussion

ECT is an effective mode of therapy in the field of psychiatry. In the current study we evaluated the post-ECT frequency of myalgia and headache, and investigated the probable predictors. We used thiopental because this drug has been considered as the first line anesthetic for ECT procedures for a long time. As this treatment is generally not recommended for those less than 16 years old, our selected population was at least 18 years old (1, 14, 15). Our results indicated that headache was a more frequent adverse effect than myalgia within 6 hours after ECT (22% vs 9%). However, this type of headache was mild and tolerable. Considering that these patients did not have a history of headache or myalgia, it is likely that their complications were related to the ECT procedure.

Comparing the results of the present study to similar previous studies, we observe that the incidence of headache was lower in our study. Notably, Wang et al. reported that 46% of their patients experienced headache after ECT treatments (16). Saricicek et al. reported 62.5% headache and 37.5% myalgia incidence 6 hours after the procedure, and 30% headache and 12.5% myalgia after 12 hours (17). The presence of headache and myalgia in our research was not correlated to sex, age, duration of convulsion, or the number of treatment sessions. In contrast to our findings, Rasmussen et al. showed that the number of ECT sessions was correlated with myalgia one day after treatment (18).

Our results found no correlation between the intensity of headache and myalgia and other variables, in contrast to Dinwiddie et al. (10), who indicated that the intensity of headache 2 hours after ECT was correlated to the duration of seizure. Moreover, they observed that the presence of myalgia was correlated with age and was worse in patients younger than 45 years old. They emphasized that headaches were mild and more frequent than myalgia, which is in agreement to our findings. We found that the severity of headache and myalgia decreased within 6 hours after ECT, and similarly Ferreira-Valente et al. pointed out that headache severity peaked 2 hours after ECT and returned to baseline one day after treatment (19). The reason for the differences among the results might be multifactorial, and partly due to the different structures regarding population selection, study duration, the number of treatment sessions, and the intervals. For example, unavoidable variability among patients affects seizure duration (4).

In summary, the results of our study and similar previous reports (8, 10, 16, 17) emphasized that although ECT is generally a safe and effective therapy, some patient subgroups, such as those with certain cardiac conditions, a history of headache or chronic pain, and patients taking analgesics may require further evaluation. We applied a four-point verbal rating scale with a confirmed reliability, but other scales could also be used to evaluate ECT-treated patients (19). Further comparative studies (comparing pre- and post-ECT) with larger sample sizes and longer duration of follow up (at least 24 hours) are required to validate the results of the present study.

Some logistical factors limited this study, such as the short post-ECT follow up duration (6 hours) that restricted us from evaluating the possible long-term incidence of headache and myalgia. If we followed up with our patients after three months, the results might be different. In addition, our subjects were not evaluated with the 4-point scale before ECT, so their pre- and post-treatment conditions could not be not compared. However, we evaluated a large sample size in this cohort, the main strength of this study. This study revealed that headache after ECT was more common than myalgia in our ECT-treated patients. Also, it was shown that this type of headache is mild and decreases within 6 hours after ETC.

List of tables

TABLE 1: The Frequency and Severity of Headache and Myalgia

Variation	After ECT, h			P Value
	0	2	6	
Headache				0.0001
No	504 (81.2)	504 (81.2)	577 (92.9)	
Yes	117 (18.8)	117 (18.8)	44 (7.1)	
Myalgia				0.062
No	583 (93.9)	586 (94.4)	596 (96)	
Yes	38 (6.1)	35 (5.6)	25 (4)	
Severity of headache				0.0001
0 (no)	504 (81.2)	504 (81.2)	577 (92.9)	
1 (mild)	89 (14.3)	96 (15.5)	29 (4.7)	
2 (moderate)	17 (2.7)	12 (1.9)	10 (1.6)	
3 (severe)	11 (1.8)	9 (1.4)	5 (0.8)	
Total	621 (100)	621 (100)	621 (100)	
Severity of myalgia				0.087
0 (no)	583 (93.8)	586 (94.4)	596 (96)	
1 (mild)	31 (5)	30 (4.8)	14 (2.3)	
2 (moderate)	6 (1)	4 (0.6)	6 (1)	
3 (severe)	1 (0.2)	1 (0.2)	5 (0.8)	
Total	621 (100)	621 (100)	621 (100)	

TABLE 2: Characteristics of Patients

Variables	Values
Sex	
Male	385 (62)
Female	236 (38)
Age, y	
< 30	215 (34.6)
30 - 40	191 (30.8)
40 - 50	150 (24.2)
> 50	65 (10.5)
Mean ± SD	36.77 ± 10.93
Range	18 - 60
Weight, kg	
Mean ± SD	71.47 ± 15.29
Range	37 - 150
Convulsion duration, EEG	
0 - 19	38 (6.1)
20 - 39	299 (48.1)
> 40	284 (45.7)
Mean ± SD	37.03 ± 10.5
Range	10 - 85
Myalgia	
No	565 (91)
Yes	56 (9)
Headache	
No	495 (78.1)
Yes	126 (21.9)

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