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Research Article

Longitudinal evaluation and treatment compliance of patients with mood disorders treated with electroconvulsive therapy

Elektrokonvulsif tedavi alan duygudurum bozukluğu hastalarının uzunlamasına değerlendirmesi ve tedaviye uyumu

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Abstract

Introduction: The aim of this research was to evaluate the demographic characteristics, diagnosis, treatment compliance and follow-up of outpatient clinic patients who had undergone electroconvulsive therapy for the treatment of mood disorders.

Methods: This retrospective study has been conducted based on inpatient and outpatient clinical records of mood disorders patients who were treated with ECT between 2015-2018 in Department of Psychiatry Faculty of Medicine in University of Onsekiz Mart, Çanakkale Turkey.

Results: The distribution of study population were classified as bipolar disorder patients [50% (n=5) in manic episode, 30% (n=3) in depressive episode, and 20% (n=2) in mixed episode] and 35% (n=7) of the depressive disorder patients had depression with psychotic symptoms, 60% (n=12) had depression without psychotic symptoms, and 5% (n=1) had catatonic depression. During the evaluation for the reasons of electroconvulsive therapy, the need for rapid response was most important requirement in depression patients, and agitation excitation treatment was most important requirement in bipolar disease patients. During follow-up 55% (n=11) of the depression patients continued their outpatient visits regularly after discharge, and the mean follow-up period was 14.10 months while 70% (n=7) of the bipolar disease patients had continued their outpatient visits regularly after discharge. The mean follow-up period was 11 months.

Conclusion: Electroconvulsive therapy may be an important factor that increases treatment compliance for patients with mood disorders.

Keywords: bipolar disorder, depression, mood disorder, electroconvulsive therapy, treatment compliance

Öz

Giriş: Bu çalışmanın amacı kliniğimizde Elektrokonvulsif terapi (EKT) yöntemiyle yatarak tedavi edilmiş duygudurum bozukluğu hastalarının demografik özelliklerini, tanı, tedavi ve ayaktan poliklinik takiplerine devam süreçlerini değerlendirmekti.

Yöntem: Bu çalışma Çanakkale Onsekiz Mart Üniversitesi Tıp Fakültesi Psikiyatri Kliniğinde 2015-2018 yılları arasında EKT yapılan duygudurum bozukluğu tanısı almış hastaların yatarak ve ayaktan poliklinik kayıtlarının geriye dönük incelenmesi ile gerçekleştirilmiş tanımlayıcı bir çalışmadır.

Bulgular: Çalışma popülasyonunun dağılımı; Bipolar Bozukluk (BB) hastalarının; %50 (n=5)'i manik epizotta, %30 (n=3)'u depresif epizoda, %20 (n=2)'si karma epizotta idi ve depresif bozukluk hastalarının %35 (n=7)'i psikotik belirtili depresyon, %60 (n=12)'ı psikotik belirtisiz depresyon, %5 (n=1)'i katatonik belirtili depresyon idi. EKT tedavisi uygulanma sebepleri değerlendirildiğinde depresyon hastalarında hızlı yanıt ihtiyacı %45 ile birinci sırada iken, BB hastalarında ajitasyon ve eksitasyon %40 ile birinci sırada idi. Depresyon tanısı ile izlenen hastaların %55 (n=11)'i taburcu olduktan sonra poliklinik kontrollerine düzenli olarak devam etmişti, ortalama takip süresi 14,10 aydı. BB tanısı ile takip edilen hastaların %70 (n=7)'i taburcu olduktan sonra poliklinik kontrollerine düzenli olarak devam etmişti, Ortalama takip süresi 11 aydı.

Sonuç: EKT tedavisinin duygudurum bozukluğu olan hastalar için tedavi uyumunu artıran önemli bir faktör olabileceği söylenebilir.

Anahtar Kelimeler: Bipolar bozukluk, depresyon, duygudurum bozukluğu, Elektrokonvulsif terapi, tedavi uyumu

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Introduction

Electroconvulsive therapy (ECT) is an effective and safe alternative that can be used in the treatment of many serious mental illnesses. Cerletti and Bini performed convulsions in humans with electrical current in 1938 for the first time [1]. The first ECT application in Turkey was conducted by Huseyin Kerem Tunakan MD in 1946. Mazhar Osman Uzman MD has started to initiate this treatment with the ECT devices he developed in 1949 [2]. After 1950, the use of psychotropic drugs had increased and the clinical use of ECT gradually decreased. However, ECT has still been a convenient option in treatment-resistant patients. Although the mechanism of action of ECT is unknown assuming that it is based on convulsions with electrical stimulation, there are various theories such as amnestic theory, autonomic nervous system theory, neurohumoral theory, anticonvulsant theory and neuroendocrine theory [1]. ECT has multiple and profound effects on brain as many specific neurobiological changes develop during its administration. One can assume that ECT has antidepressant properties due to its anticonvulsant effect regarding the data that in bipolar depression, melancholic depression, and psychotic depression the hypothalamic-pituitary-adrenal axis is impaired (which works more than normal) returns to normal activity after treatment with ECT. In addition, the recent studies elaborated that ECT increases nerve cell growth factor and hippocampus volume, although the exact mechanism is unknown [3].

ECT is still one of the most effective treatment modalities in various mental and neurological disorders such as psychotic depression, high risk of suicide, treatment resistant manic episode, catatonic conditions, schizoaffective disorder, neuroleptic malignant syndrome. There are different factors affecting the choice of ECT such as the severity of the disease, denial for nutrition, agitation and excitation, severe psychomotor retardation, high risk of suicide, comparing other treatments' risk benefit ratio, history of good response, and patient preference [4]. ECT is usually administered 2-3 times a week, for 6-12 sessions, under general anesthesia with the use of intravenous anesthetics and muscle relaxants. The frequency and duration may vary depending on the clinical situation of the patient and the response to treatment [5]. The most common side effects of ECT are absence of epileptic seizures and cardiovascular side effects such as prolonged, delayed, or inadequate epileptic seizure, sinus bradycardia or tachycardia. Central nervous system adverse events can be elaborated as confusion, delirium after or between seizures, and cognitive side effects [6]. Considering all these facts, ECT is generally recognized as a safe method. The mean mortality is reported as 0.02-0.04%. Although the most important morbidity is memory impairment and confusion while this situation resolves spontaneously [7]. ECT is interpreted as a safe method in the last trimester of pregnancy and evaluated the first choice of treatment in some centers. However, pregnant women are at risk of aspiration under anesthesia due to uterine compression, increased intra-abdominal pressure, and reduced gastric motility so it should be decided with delicate caution [8].

Treatment adherence is defined as patients' acceptance of the healthcare professionals' recommendations thus requires complying with follow-up examinations, completion of the treatment program, regular use of medications, and initiating behavioral changes [9, 10]. There are subjective and objective methods that measure treatment adherence. Among the subjective methods one can say that examining the prescriptions and past treatment records of the patients where objective methods include counting the remaining tablets and capsules in the drug packages, measuring plasma concentrations according to received doses, and measuring the elimination metabolites in the urine. One of the biggest problems in the treatment of psychiatric disorders is treatment adherence as compliance determines the course of treatment in many psychiatric disorders such as bipolar disorder (BD), depression, an
d especially psychotic disorders. The factors affecting adherence to treatment are various and associated with the type of disorder. These can be classified as: patients' personality, family and social support, drugs used in treatment, and patient physician relationship [1]. The aim of this research was to elucidate the demographic characteristics, diagnosis, treatment compliance and follow-up of outpatient clinic patients who had undergone electroconvulsive therapy (ECT) for the treatment of mood disorders.

Methods

This descriptive study has been conducted based on inpatient and outpatient clinical records of mood disorders patients who were treated with ECT between 2015-2018 in Department of Psychiatry Faculty of Medicine in University of Onsekiz Mart, Canakkale Turkey. Informed consents of ECT have been obtained from all patients and their legal relatives of the patients who were not able to give consent. Anesthesiology consultancy has been conducted before the initiation of ECT. Bitemporal ECT has been performed by the responsible psychiatrist, psychiatry assistant, anesthesiology and reanimation specialist and technician. Spectrum 5000 Q (Mecta Corporation) device was utilized in ECT procedure. The patients were administered propofol as an anesthetic and succinylcholine as a muscle relaxant.

Statistical analysis

The statistical analysis of the study data was conducted with SPSS (SPSS Inc., Chicago, IL, USA) Version 20.0 for Windows. Descriptive statistical methods (mean, standard deviation) were used when evaluating study data. The results were given as mean ±SD with a 95% confidence interval.

Ethical approval

The approval of this study was given by the local ethics committee of Canakkale Onsekiz Mart University (2021-03).

Results

In this retrospective analysis patient files of 1081 individuals who had been hospitalized between June 2015 and December 2018 were analyzed. ECT treatment was applied to 30 (2.77%) mood disorder patients. The distribution of these patients was as follows: 33.33% (n=10) bipolar disorder (BD) and 66.66% (n=20) depressive disorder (DD).

Of the BD patients, 50% (n=5) were manic episode, 30% (n=3) were depressive episode and 20% (n=2) were in mixed episode. The mean age of the BD patients was 36.40±11.85 years, and 70% (n=7) of the patients were women. The mean number of ECT sessions was 7.30±2.16. After discharge, 50% (n=5) of the BD patients were taking mood stabilizer, 30% (n=3) antidepressant medication, and 100% (n=10) antipsychotic medication. ECT has been conducted in 3 pregnant patients with a diagnosis of BD and 20% (n=2) of these patients were in manic episodes and 10% (n=1) was in depressive episode (Table 2).

In terms of depressive disorder, 35% (n=7) had psychotic symptoms, 60% (n=12) had depression without psychotic symptoms, and 5% (n=1) had depression with catatonic symptoms. The mean age of the patients with depression was 55.20±16.23 and 60% (n=12) of the patients were women. The mean number of ECT sessions was 7.70±1.94. After discharge, 15% (n=3) of the depressed patients were taking mood stabilizers, 85% (n=17) were taking antidepressant drugs, and 65% (n=13) were taking antipsychotic drugs (Table 2).

Table 1. Diagnostic characteristics of the study groups

Diagnosis	n (%*)
Depression with psychotic symptoms	7 (23.3)
Depression without psychotic symptoms	12 (40)
Depression with catatonic features	1 (3.3)
Bipolar disorder (manic episode)	5 (16.7)
Bipolar disorder (depressive episode)	3 (10.0)
Bipolar disorder (mixed episode)	2 (6.7)

N; Number of patients, %; column percentage, *; among all participants (n=30)

Regarding the previous treatment history of subjects 30% (n=3) of BD patients and 10% (n=2) of depressed patients had ECT in the past. Before the initiation of ECT, 50% (n=5) of BD patients and 75% (n=15) of depression patients still had active suicidal ideation (Table-2).

The requirement for rapid response was the first reason in 45% of patients with depression, while agitation and excitation were the most important one in 40% of patients with BD. Resistance to drug treatment, risk of suicide, pregnancy and need for rapid response in BD patients were among the reasons for ECT application. ECT application as maintenance treatment was administered to 35% (n=7) of the patients with depression and 20% (n=2) of the patients with BD (Table-2).

According to our analysis 45% (n=9) of the depression patients and 30% (n=3) of the BD patients were re-hospitalized during the follow-up period. The diagnosis of 10% (n=2) of the depression patients have been changed during the follow-up in the outpatient clinic, but this pattern was not applicable for the follow-up of BD patients. Obsessive compulsive disorder was diagnosed during follow-up in 2 patients with a change in diagnosis. (Table 2)

After discharge, the compliance rate of depression patients in the follow-up period could be elaborated as 55% (n=11) and the duration of mean follow-up was 14.10 months (ranging between 6 to 41 months). The frequency of the follow-up visits was adjusted according to patients' clinical condition and can be elaborated as every two weeks, once a month, every two months, or every 3 months. The follow-up period of 9 patients who did not come for control was 1.85 months.

After discharge, the compliance rate of bipolar disorder patients in the follow-up period could be elaborated as 70% (n=7) and the duration of mean follow-up was 11.00 months (ranging between 8 to 49 months). The frequency of the follow-up visits was adjusted according to patients' clinical condition and can be elaborated as every two weeks, once a month, every two months, or every 3 months. The follow-up period of 3 patients who did not come for control was 1.66 months.

The rate of ECT has been observed as 16.66% (n=2) in the second and third hospitalizations. ECT was re-administered to 2 patients diagnosed with depression in order to achieve rapid clinical response.

Table 2. Results of the Sociodemographic and Clinical Characteristics of the Study Groups

	Depressive Disorder n (%), or Mean ±SS	Bipolar Disorder n (%), or mean ±SD
Gender		
Female	12(60)	7(70)
Male	8(40)	3(30)
Age, *mean*	55.20±16.23	36.40±11.85
Marital status		
Married	17(85)	7(70)
Single	3(15)	3(30)
Level of education		
Middle school and below	11(55)	3(30)
High School and above	9(45)	7(70)
Comorbid psychiatric disorder		
Yes	5(25)	2(20)
No	15(75)	8(80)
Pregnancy		
Yes	0(0)	3(30)
No	20(100)	7(70)
Suicide risk		
Yes	3(15)	1(10)
No	17(85)	9(90)
Resistance to pharmacotherapy		
Yes	8(40)	1(10)
No	12(60)	9(90)
Agitation and Excitation		
Yes	0(0)	4(40)
No	20(100)	6(60)
Need for Rapid Response		
Yes	9(45)	1(10)
No	11(55)	9(90)
Duration of hospitalization, *days*	25.90±10.15	37.50±27.24
ECT, *mean*	7.70±1.94	7.30±2.16
Termination reason of ECT		
Completion of treatment	15(75)	8(80)
Complication	2(10)	0(0)
Unresponsiveness	3(15)	2(20)
Complications after ECT		
Yes	13(65)	3(30)
No	7(35)	7(70)
Complications		
Amnesia-confusion	10(50)	0(0)
Cardiovascular side effects	3(15)	2(20)
No seizure	0(0)	1(10)
Follow-up period after ECT	14.10±12.55	11.00±10.46
Next hospitalization history		
Yes	9(45)	3(30)
No	11(55)	7(70)
Maintenance ECT		
Yes	7(35)	2(20)
No	13(65)	8(80)
Change of diagnosis in follow-up		
Yes	2(10)	0(0)
No	18(80)	10(100)

n; Number of patients, %; column percentage, SS; standard deviation

Discussion

According to the results of this analysis the rate of ECT has been found 2.77% during three-year period among patients hospitalized in our clinic. However, this figure was quite low compared to the data published in two different university hospitals in Turkey as 14.4% and 16% previously. The rate of ECT among inpatients were reported as 9-16.4% in different studies [5, 12, 13]. On the other hand, the rate of ECT were found as 2.2% and 4.21%, in two recent trials from Turkey, similar to our results [14, 15]. Considering the outcomes of different studies over the globe in different periods, rates of ECT were reported as 0.4-1.6% in the USA, 5% in Sweden and Norway, and 3% in Austria [16, 17]. These differences may be attributed to the lack of information about ECT, the negative perception in people's mind, and the lack of technical infrastructure.

In this study, complications were observed during or after ECT sessions in 53.3% of all patients. The most prominent complications can be elaborated as amnesia-confusion and cardiovascular system side effects (tachycardia, bradycardia, and hypertension). Delirium and absence of effective seizures were observed less frequently. According to the published literature headache, confusion, and temporary memory problems were the most frequent adverse events [18]. Neurocognitive side effects such as decreased memory functions, disorientation after seizures, impaired attention and higher cognitive function deterioration have been reported due to ECT treatment [19, 20].

All the enrolled subjects in this study had been diagnosed with mood disorder. On the contrary, ECT was preferred more frequently in patients with depressive disorder than in patients with BD. It has been reported in the literature that ECT treatment is an effective treatment option, especially in patients with major depression accompanying psychotic features [18].

The diagnostic segmentation of the study population could be elaborated as, 40% depression without psychotic symptoms, 23.33% depression with psychotic symptoms, 16.66% BD manic episode, 10% BD depressive episode, 6.66% BD mixed episode and 3.33% depression with catatonic symptoms. Yildiz et al. from University of Dokuz Eylul Department of Psychiatry stated that the rate of unipolar non-psychotic depression was 42.9%, unipolar psychotic depression was 12.5%, bipolar depression was 10.7% and bipolar manic-mixed episode was 12.5% in 2 years period [12].

Zeren et al. declared that the rate of ECT was 14.4% in inpatients at the University of Cukurova Department of Psychiatry over a 12-year period [12]. Yildiz et al. found that 16.4% of inpatients at University of Dokuz Eylul Department of Psychiatry were treated with ECT in a 2-year period [12]. On the other hand, Yildiz et al claimed that 16% of hospitalized BD patients were treated with ECT for 10 years period. Compared to these figures, the rates of ECT application in our clinic could be interpreted as quite lower. This result can be explained by the fact that Çanakkale is a smaller city than other centers, the number of severe admissions may be less as these patients may prefer larger institutions. One other reason could be emphasized by the fact that some physicians prefer ECT as a reserve treatment.

Psychiatric disorders may begin or recur during pregnancy. Hence drug treatments are very risky in pregnant women, especially in the first trimester psychotherapy may not be effective in all patients. Although there are several studies identifying the efficacy and possible risks of ECT in pregnant women, no controlled prospective publication has been reported up to date [22]. Untreated depression may lead to problems such as insufficient weight gain of the pregnant woman, alcohol and substance use, preterm birth, low birth weight, preeclampsia, and inadequate mother-infant attachment [23]. ECT can be positioned a safe option during pregnancy and patients respond better and more quickly than antidepressant medication [24]. Individuals with delusions and severe psychomotor retardation are strong predictors of response of ECT [25]. In our clinic, ECT treatment has been applied to a patient with a diagnosis of BD in depressive episode in the second trimester of pregnancy in order to achieve rapid response to eliminate the risk of suicide/infanticide and severe psychomotor retardation. ECT was applied to 2 pregnant individuals in BD manic episode for rapid response due to agitation and excitation, and the possible risks of drug treatment, and no complications were observed after the sessions.

It has been suggested that ECT might leverage the effects of pharmacotherapy in maintenance period [26]. In a randomized, single-blind controlled study, it was denoted that ECT could be successfully performed concomitantly with pharmacotherapy in elderly patients with psychotic depression [27]. According to previous research, the maintenance ECT rates were 15-25% in different centers, but in a study conducted in private hospitals, maintenance rate of ECT was 64% [28]. In this study, it was observed that 30% of the patients who received ECT treatment were administered maintenance ECT, and this rate seems to be partially compatible with the literature.

In this study, 55% of the depression patients complied to their regular outpatient visits after discharge. In a study conducted by Ervatan et al., 26.8% of the depression patients were non-adherent to treatment, while female subjects had higher compliance [9]. In another study, the rate of treatment discontinuation in depression patients after the first examination was 44% [29]. In a study conducted in Turkey, 52.5% of patients with depression were considered non-adherent to treatment [30]. These discrepancies in the previous studies can be explained by the differences in methods, demographic characteristics of patients and the severity of the disease. The results of this study were similar to the results of previous trials Turkey in which patients treated with drugs.

As a result, 70% of the BD patients continued their follow-up visits and the mean follow-up period was 1.66 months after discharge. Non-compliance to medication in long-term treatment ranges from 20-60%, with an average of 41% in BD patients [31]. The rate of non-adherence to treatment in our study seems to be consistent with the rates reported in the literature in BD patients.

Limitations

This study had some limitations. The sample size of the study was quite low, and the data were analyzed retrospectively, and no disorder severity assessment scales were available. In addition, the retrospective outpatient records of the patients were obtained only by reviewing the data in our hospital, individuals might proceed to their treatment or follow-up visits at other centers.

Conclusion

This is the first retrospective longitudinal evaluation of patients who were administered ECT in our institution. According to the outcomes of this study one can say that ECT treatment may increase treatment compliance of mood disorders patients. These results should be confirmed by future prospective, controlled studies with larger sample size.

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Author Contributions		Author Initials
SCD	Study Conception and Design	BAG, HE
AD	Acquisition of Data	BAG
AID	Analysis and Interpretation of Data	HE
DM	Drafting of Manuscript	BAG
CR	Critical Revision	HE

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