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Comparison of Clinical Characteristics of Patients on whom Electroconvulsive Therapy was Applied as Inpatient and Outpatient

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ABSTRACT:

Comparison of clinical characteristics of patients on whom electroconvulsive therapy was applied as inpatient and outpatient

Objective: Electroconvulsive therapy (ECT) is an efficient and reliable somatic treatment used to treat severe mental disorders. ECT procedure is generally performed by hospitalizing the patient in our country (Turkey). However, there is no obligation to perform ECT by hospitalization, as ECT may be performed without hospitalizing the patient. Outpatient ECT gradually increases during acute and maintenance treatment. Outpatient ECT provides some advantages, such as reduced disruption in social and professional functionality and decrease in treatment costs. Studies that compare acute outpatient ECT and ECT applied after hospitalization are limited. In the present study, we aimed to review clinical characteristics of acute ambulatory ECT and ECT applied by hospitalization comprehensively and retrospectively.

Methods: Inpatients and outpatients that received ECT in the Psychiatry Clinic of Dicle University between 2011 and 2014 were enrolled in the present study. Patients' files between aforementioned years were reviewed retrospectively and data including patient age, gender, diagnosis according to DSM system, hospitalization period, whether ECT was applied, number of ECT sessions, and whether ECT was performed as an inpatient or outpatient procedure were recorded. For the patients who were hospitalized multiple times, each hospitalization was regarded as a different patient and data were assessed independently. For the outpatients who received ECT, all separate ECT sessions were added and ECT count was determined. Those who received maintenance ECT sessions were not included in the outpatient ECT group. Patients who received ECT by acute referral as outpatients were included in this group.

Results: Between 2011 and 2014, 904 patients were admitted to the Psychiatry Clinic of Dicle University, Faculty of Medicine , of which 138 received ECT treatment. We also included in the study an additional 38 outpatients who received acute ECT. Inpatients of our clinic in application to ECT were rates of 15.3%. There was no statistically significant difference detected between age, number of ECT sessions applied, diagnosis, and gender of admitted inpatients and outpatients ($p>0.05$).

Conclusions: In our study clinical characteristics of inpatients and outpatients subjects who admitted in order to practiced the ECT were determined to be similar. We believe that an efficient treatment method may be presented to the patients by including acute outpatient ECT more frequently in the treatment plan from physicians.

Keywords: electroconvulsive therapy, outpatient, inpatient

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INTRODUCTION

Electroconvulsive therapy (ECT) is an efficient and safe somatic treatment used to treat severe mental disorders[1]. ECT is used to treat different psychiatric and neurological disorders such as depression, risk of suicide, manic excitation, schizophrenia with catatonic excitation, schizoaffective disorder, catatonic cases with organic etiology, treatment-resistant obsessive compulsive disorder, and

delirium. Furthermore, it is a preferred and reliable treatment method for the cases where drug use is limited, such as pregnancy[2-4].

ECT is applied for five to twelve sessions total, two or three times a week according to clinical status of the patient and treatment response obtained[5,6]. ECT procedure is generally performed by hospitalizing the patient in our country (Turkey). However, there is no obligation to perform ECT by hospitalization, as ECT may be performed without hospitalizing the patient. Outpatient ECT gradually increases as an acute and maintenance therapy[7]. Maintenance ECT is the type of ECT which is applied with in first 6 month to the outpatients regularly from one week to one month after succesfull ECT cure. Maintenance ECT is generally applied to prevent the recurrence of the disease. On the other hand, acute outpatients ECT is implementation of ECT which is applied for treatment in the acute phase of disease without patient hospitalization[8,9]. Outpatient ECT provides some advantages, such as reduced disruption in social and professional functionality and decrease in treatment costs[10].

Frequency of clinical use of ECT varies in different countries. For example, ECT is applied for 5% to 12% of inpatients in the USA[6,11], whereas it is applied for approximately 9% to 16% of inpatients in Turkey[12,13].

ECT is frequently applied in our clinic to both inpatients and outpatients. Our clinic provide third level health service that's why treatment-resistant patient apply to our clinic. We prefer to use ECT to outpaitent treatment because of limited hospitalization capacity, patient refusing hospitalization and some cases having indication of ECT which doesn't require hospitalization. Studies that compare acute outpatient ECT and inpatient ECT are limited. In the present study, we aimed to review clinical characteristics of acute ambulatory ECT and ECT applied by hospitalization comprehensively and retrospectively.

METHODS

Inpatients and outpatients that received ECT in the Psychiatry Clinic of Dicle University between 2011 and 2014 were enrolled in the present study. Required administrative permits and local ethics committee approval were obtained for the study. Patients' files between aforementioned years were reviewed retrospectively and data including patient age, gender, diagnosis according to DSM system, hospitalization period, whether ECT was applied, number of ECT sessions, and whether ECT was performed as an inpatient or outpatient procedure were recorded. For the patients who were hospitalized multiple times, each hospitalization was regarded as a different patient and data were assessed independently. For the outpatients who received ECT, all separate ECT sessions were added and ECT count was determined. Those who received maintenance ECT sessions were not included in the outpatient ECT group. Patients who received ECT by acute referral as outpatients were included in this group.

All ECT procedures are performed under operating room conditions and general anesthesia in our clinic. Before the ECT procedure, routine blood biochemistry, complete blood count, thyroid functions, and if necessary, electrocardiography (ECG), posterioanterior (PA) chest X-ray, electroencephalography (EEG), and spinal x-ray examinations are performed for all patients. Furthermore, all patients or their first degree relatives gave their informed consent for the ECT procedure before receiving treatment. Procedures in our clinic use an ultra-brief pulse wave Thymatron System 2 brand ECT device. It was observed if the patients had seizures during ECT procedures through EEG printouts of the device and a seizure lasting 25-60 seconds was provided by 20 to 60 joules. Midazolam was administered intravenously for sessions where seizures lasted more than 100 seconds. ECT procedures less than twenty five seconds were deemed as failures and were repeated. Bilateral bitemporal ECT is applied to all patients in our clinic. ECT was applied twice a week for the majority of the patients. On average, 7 to 9 ECT sessions are preferred for each patient in our clinic; however, sessions may be increased or decreased according to the clinical status of the patient and treatment response.

Statistical Analysis

SPSS 15.0 statistical package program was used to analyze the data. Chi-square test was used to compare categorical variables. Continuous data were provided by mean ± standard deviation and t test was used to compare continuous variables of both groups. Pearson's correlation analysis was used to assess correlation. Statistical significance was accepted as $p<0.05$.

RESULTS

Nine hundred and four patients were hospitalized in our clinic between January 2011 and January 2014. Inpatients of our clinic in application to ECT were rates of 15.3%. ECT was applied to 138 inpatients in our clinic. Age, number of ECT sessions, hospitalization period, gender, and diagnosis distribution of inpatients who received ECT are provided in Table 1.

Table 1: Age, Number of ECT Sessions, Gender, Diagnosis Distribution of Inpatients Who Received ECT

Age, Number of ECT Sessions, Hospitalization Period	Mean±SD
Age (year)	36.7±13.0
Number of ECT sessions	7.9±3.0
Hospitalization period (day)	38.2±19.6
Gender	**n (%)**
Female	79 (57.2)
Male	59 (42.8)
Total	138 (100.0)
Diagnosis	**n (%)**
Major Depression	63 (45.7)
Schizophrenia	26 (18.8)
Bipolar Disorder	41 (29.7)
Other	8 (5.8)

We assessed correlations between age, number of ECT sessions, and hospitalization period of inpatients who received ECT. A positive and statistically significant correlation was detected between hospitalization period and number of ECT sessions (Pearson's correlation coefficient = 0.527, $p<0.001$). No correlation was observed between hospitalization period, number of ECT sessions, and age of the patients ($p>0.05$).

Hospitalization period, age, and number of ECT sessions of inpatients were assessed according to diagnosis distribution. A statistically significant difference was detected between patients' ages and diagnosis distribution. There was not any statistically significant difference determined between diagnosis distribution and hospitalization period or number of ECT sessions. Hospitalization period, age, and number of ECT sessions of inpatients according to diagnosis distribution are presented in Table 2.

176 ECT-treated patients were selected from the our psychiatry department by the trained researchers, last 3 years. Among these, only 38/176 (21.6%) ECT-treated patients were applying to outpatient psychiatry department. Gender, age, number of ECT sessions and diagnosis distribution of outpatients were assessed. Outpatients who received ECT included 23 (60.5%) female and 15 (39.5%) male patients. The average number of

Table 2: Hospitalization Period, Age, and Number of ECT Sessions of Inpatients According to Diagnosis Distribution

	Diagnosis	n	Mean±SD	f	p
Hospitalization Period (day)	Depression	63	35.5±18.0		
	Schizophrenia	26	38.8±17.6	1.006	0.392
	Bipolar Disorder	41	40.3±23.6		
	Other	8	46.0±13.9		
Age (year)	Depression	63	40.7±14.1		
	Schizophrenia	26	36.4±13.9	5.136	0.002
	Bipolar Disorder	41	32.1±9.1		
	Other	8	28.8±6.1		
Number of ECT sessions	Depression	63	8.2±2.8		
	Schizophrenia	26	8.5±4.0	1.355	0.259
	Bipolar Disorder	41	7.2±2.6		
	Other	8	7.9±0.6		

Table 3: Age, Number of ECT Sessions, and Gender Distribution of Inpatients and Outpatients Who Received ECT

	ECT	n	Mean±SD	T	p
Age	Outpatient	38	32.7±8.8	-1.787	0.076
	Inpatient	138	36.7±13.0		
Number of ECT sessions	Outpatient	38	8.8±4.6	1.460	0.146
	Inpatient	138	7.9±3.0		
Gender	**ECT**	**Female**	**Male**	χ^2	**p**
	Outpatient	23	15	0.132	0.717
	Inpatient	79	59		
Diagnosis	**Outpatient n (%)**	**Inpatient n (%)**		**X2**	**p**
Major depressive disorder	24 (63.2)	63 (45.7)			
Bipolar disorder	10 (26.3)	41 (29.7)		5.377	0.146
Schizophrenia	4 (10.5)	26 (18.8)			
Other diagnoses	0 (0.0)	8 (5.8)			

sessions of ECT for outpatients was 8.8±4.6 and the average age of these patients was 32.7±8.8 years old. The diagnosis distribution of these outpatients included 24 (63.2%) with major depression, 4 (10.5%) with schizophrenia, and 10 (26.3%) with affective bipolar disorder.

The ages of outpatients who received ECT according to their diagnosis were 33.9±9.4 years old for patients with depression, 31.5±12.1 years old for patients with schizophrenia, and 30.2±5.8 years old for patients diagnosed with bipolar disorder. Number of ECT sessions according to the diagnosis was 8.9±4.6 times for outpatients with depressive disorder, 12.8±6.6 times for outpatients with schizophrenia, and 7.0±2.9 times for outpatients with bipolar disorder. We did not find any statistically significant difference between average age and number of ECT sessions by diagnosis (F=0.635, p= 0.536, F=2.425, p=0.103). In addition, no correlation was detected between age of outpatients and number of ECT sessions (Pearson's correlation coefficient: -0.184, p= 0.268).

Gender, age, number of ECT sessions, gender ratios, and diagnosis distribution of inpatients and outpatients were assessed. No statistically significant difference was observed between the groups in terms of number of ECT sessions, age, gender, and diagnosis distribution. Gender, age, number of ECT sessions, gender distribution, and diagnosis distribution of inpatients and outpatients are presented in Table 3.

DISCUSSION

There was no statistically significant difference detected between the age, number of ECT sessions applied, diagnosis, and gender of inpatients and outpatients. Limited data about ECT performed as outpatient due to acute referral gives the impression that it is applied less. It was specified that use of outpatient ECT gradually increases with acute and maintenance treatment, but maintenance ECT is applied more often. Maintenance ECT application range was reported as 15 to 25%[7,14,15].

Different factors may exist for physicians avoiding outpatient ECT by acute referral. These range from treatment incompliance, problems in transportation, forgotten appointments, preparation before ECT, follow-ups after ECT, and difficult assessment of treatment response. Such concerns may be eliminated by considering safe outpatient ECT application procedures[9].

Since outpatient ECT application does not restrict patient independence in the same way as inpatient ECT, it causes less disruption in social and professional functionality and decreases treatment costs[9,16,17]. It is reported that consultations, hospitalizations, and loss of productivity are all reduced in the patient group who benefited from maintenance ECT and it was emphasized that maintenance ECT is a cost-efficient treatment method[18,19].

In the present study, acute ECT was started with patients who had ECT as outpatients. In our clinic, 21.6% of the ECT treated patients who had applying to acute therapy as an outpatient within the past three years. This ratio shows that acute ECT is frequently performed as outpatient referral. Furthermore, no statistically significant difference was detected between demographic and clinical characteristics of inpatients and outpatients who received ECT treatments, indicating applicability of outpatient ECT.

The efficiency of outpatient ECT was assessed in a study. No statistically significant difference was found for treatment completion ratios between acute outpatient ECT and inpatient ECT. Treatment completion rate for maintenance ECT patients (an outpatient ECT method) was significantly higher than acute outpatient ECT and inpatient ECT[17]. This suggests that there is no efficiency difference between acute outpatient ECT and inpatient ECT.

The majority of patients who received ECT as outpatients were female (60.5%) and diagnosed with major depression (63.2%). This was similar to the inpatients who received ECT. The primary indication for ECT was reported as major depression and other mood disorders[20-22]. The diagnosis of patients of 85% who applied to ECT is major depression in the United States[23,24]. ECT is a commonly choosing among the former stage of treatment in women compared to men[25]. Bolu et al. were found that women who applied to ECT for much more diagnosis of major depression[26]. As in present study, a diagnosis of depression for the majority of the outpatients who received ECT is consistent with the literature.

There was not any statistically significant difference detected in terms of average age according to diagnoses of outpatients who received ECT. A statistically significant difference was detected between the age and diagnosis distribution of inpatients who received ECT. The age of patients with depression was higher than patients with bipolar disorder. It was reported in some studies that patients with depression who received ECT were older than the patients with schizophrenia and bipolar disorder[12,27,28]. The study conducted by Eroglu et al. did not find any significant relation between the diagnosis and age of the inpatients[29]. Although earlier onset of schizophrenia compared to depression might help explain the fact that inpatients with depression who received ECT are older, it cannot explain the lack of difference in age of outpatients according to diagnosis distribution.

There was no statistically significant difference detected for the number of ECT sessions according to diagnoses of outpatients who received ECT. Similarly, no statistically significant difference was determined between diagnosis distribution of inpatients who received ECT and number of ECT sessions. In other studies conducted, no statistically significant difference was found between diagnosis and number of ECT sessions[28,29]. There is no certain ECT session count applied according to the diagnosis in psychiatric diseases[30]. Treatment response of the patient may increase or decrease the number of ECT sessions.

Since there is insufficient data about outpatient ECT, we could not compare significant differences that appeared in outpatients with other studies. Instead, we compared these with data from the inpatients.

Inpatients of our clinic in application to ECT were rates of 15.3%. It was observed that ECT ratios applied to inpatients in all of Turkey is similar to our findings[12,13,31]. Results of studies conducted in 13 Asian countries and field studies carried out in the United States revealed that ECT application rate is as high as 12% for inpatients[6,32,33]. In light of the aforementioned ECT application rates , it is clear that the use of ECT varies between countries. ECT application rate from our study is consistent with the general ratio in our country, which is generally higher than other countries. This difference may be explained by different factors, such as health education of the countries, attitude of social security institutions and insurance companies, economic development level, legal restrictions, prejudices for ECT, and application of ECT with or without anesthesia.

A statistically significant difference was detected

between age and diagnosis distribution of the inpatients who received ECT. The age of patients with depression was higher than patients with bipolar disorder. In the study conducted by Eroglu et al., a significant relation was not found between the diagnosis and age of the inpatients[29]. In line with the present study, Balıkcı et al. reported in their study that patients with depression are older than the patients with schizophrenia and bipolar disorder[28]. It was also reported in some other studies that the average age of the patients with depression who received ECT was higher than other patients[12,27]. This may be explained by the fact that diseases within the psychotic spectrum start earlier than depression.

No statistically significant difference was detected between diagnosis distribution and number of ECT sessions and hospitalization period for the inpatients who received ECT. No statistically significant difference was found in the number of ECT sessions and hospitalization period in relation to the diagnosis in some studies similar to the present study[28,29]. Since there is no certain ECT session count according to the diagnosis, differences in the number of ECT sessions between diagnoses is expected[14].

When findings of the present study, which includes the previous three years period are evaluated, some restrictions should be considered. The retrospective design of our study is an important limitation. Our department is a center providing which third stage healthcare services, so our share of data may skew toward more resistant patient groups. Another limitation is not matching the number of outpatient and inpatient groups. Also, we did not compare the effectiveness of ECT treatments among the inpatient and outpatient ECT-treated participants, therefore this result may be substantial limitation of present study. At the end, it is essential to keep in mind the limitations of this study, while considering the findings.

Acute outpatient ECT provides some advantages, such as less disruption in social and professional functionality and decrease in treatment cost. Furthermore, it was shown as an efficient and applicable therapy. When these factors are considered, we believe that physicians may present an efficient treatment method to patients more frequently by including acute outpatient ECT. Consequently, prospective studies in future are highly required to reach to a conclusion for effectiveness of the ECT treatments between who applying to inpatient and outpatient ECT.

References:

1. Abrams R. History of ECT. Electroconvulsive Therapy, fourth ed., New York, Oxford University Press 2002:3-16.
2. American Psychiatric Association. Task force on ECT. The Practice of ECT, second ed. Washington DC, APA Press 2001.
3. Dogan O. Resistant obsessive compulsive disorder and treatment alternatives. Anatolian Journal of Psychiatry 2010;11:269-78.
4. Bulut M, Bez Y, Kaya MC, Copoglu US, Bulbul F, Savas HA. Electroconvulsive therapy for mood disorders in pregnancy. J ECT 2013;29(2):e19-20. [CrossRef]
5. Shapira B, Tubi N, Drexler H, Lidsky D, Calev A, Lerer B. Cost and benefit in the choice of ECT schedule. Twice versus three times weekly ECT. Br J Psychiatry 1998;172:44-8. [CrossRef]
6. Fink M. Convulsive therapy: a review of the first 55 years. J Affect Disorder 2001;63 (1-3):1-15. [CrossRef]
7. Rosenbach ML, Hermann RC, Dorwart RA. Use of electroconvulsive therapy in the Medicare population between 1987 and 1992. Psychiatr Serv 1997;48(12):1537-42. [CrossRef]
8. Bilgi MM, Eker C, Gönül AS. Maintenance electroconvulsive therapy. Current Approaches in Psychiatry 2010;2(4):421-42. (Turkish)
9. Reti IM, Walker M, Pulia K, Gallegos J, Jayaram G, Vaidya P. Safety considerations for outpatient electroconvulsive therapy. J Psychiatr Pract 2012;18(2):130-6. [CrossRef]
10. Bailine S. Reimbursement and documentation issues in an ambulatory ECT program. J ECT 1998;14(4):255-8. [CrossRef]
11. Hermann RC, Dorwart RA, Hoover CW, Brody J. Variation in ECT use in the United States. Am J Psychiatry 1995;152(6):869-75. [CrossRef]

12. Zeren T, Tamam L, Evlice YE. Electroconvulsive Therapy: assessment of practice of 12 years' period. New Symposium 2003;41(2):54-63. (Turkish)

13. SaatciogluO, Tomruk NB. Practice of electroconvulsive therapy at the research and training hospital in Turkey. Soc Psychiatry Psychiatr Epidemiol 2008;43(8):673-7. [CrossRef]

14. Tang WK, Ungvari GS. Continuation and maintenance electroconvulsive therapy: a selective review of the literature. Hong Kong J Psychiatry 1999;9:6-12.

15. Andrade C, Kurinji S. Continuation and maintenance ECT: a review of recent research. J ECT 2002;18(3):149-58. [CrossRef]

16. Bonds C, Frye MA, Coudreaut MF, Cunningham M, Spearing M, McGuire M, et al. Cost reduction with maintenance ECT in refractory bipolar disorder. J ECT 1998;14(1):36-41. [CrossRef]

17. Dew R, McCall WV. Efficiency of outpatient ECT. J ECT 2004;20(1):24-5. [CrossRef]

18. Srinivasan TN, Suresh TR, Jayaram V. Issues in the use of maintenance electroconvulsive therapy. Indian J Psychiatry 1995;37(3):139-42.

19. Steffens DC, Krystal AD, Sibert TE, Moore SD, Weiner RD. Cost effectiveness of maintenance ECT. Convuls Ther 1995;11(4):283-4.

20. Weiner RD. Convulsive therapy: 50 years later. Am J Psychiatry 1984;141(9):1078-9. [CrossRef]

21. Kaplan HI, Sadock BJ, Grebb JA. Synopsis of Psychiatry Seventh ed. Baltimore: Williams & Wilkins 1994:1005-11.

22. Ona CM, Onoye JM, Goebert D, Hishinuma E, Bumanglag RJ, Takeshita J et al. Sociodemographic characterization of ECT utilization in Hawaii. J ECT 2014;30(1):43-6. [CrossRef]

23. Bryant RA, O'Donnell ML, Creamer M, McFarlane AC, Clark CR, Silove D. The psychiatric sequelae of traumatic injury. Am J Psychiatry 2010;167(3):312-20. [CrossRef]

24. O'Donnell ML, Creamer M, Pattison P, Atkin C. Psychiatric morbidity following injury. Am J Psychiatry 2004;161(3):507-14. [CrossRef]

25. Aalto-Setälä T, Marttunen M, Tuulio-Henriksson A, Poikolainen K, Lönnqvist J. Psychiatric treatment seeking and psychosocial impairment among young adults with depression. J Affect Disord 2002;70(1):35-47. [CrossRef]

26. Bolu A, Ozselek S, Akarsu S, Alper M, Balikci A. Is There a Role of Gender in Electroconvulsive Therapy Response? Klinik Psikofarmakoloji Bulteni - Bulletin of Clinical Psychopharmacology 2015;25(3):228-32. [CrossRef]

27. Eranti SV, Thirthalli J, Pattan V, Mogg A, Pluck G, Velayudhan L, et al. Comparison of electroconvulsive therapy practice between London and Bengaluru. J ECT 2011;27(4):275-80. [CrossRef]

28. Balikci A, Bolu A, Akarsu S, Kocak N, Erdem M, Aydemir E, et al. Practice of electroconvulsive therapy between the years of 2006-2011 at a university hospital in Turkey. Anatolian Journal of Psychiatry 2013;14(4):340-46. [CrossRef]

29. Eroglu MZ, Icbay E, Tamam L. Demografic and clinical characteristics of the patients treated with electroconvulsive therapy in a university pschiatry clinic. Dicle Medical Journal 2012;39(3):371-6. (Turkish) [CrossRef]

30. Coffey CE, Weiner RD. Electroconvulsive therapy: an update. Hosp Community Psychiatry 1990;41(5):515-21. [CrossRef]

31. Yildiz A, Gokmen N, Turgut K, Yucel G, Tunca Z. Place of electroconvulsive therapy among the somatic treatments in a university clinic psychiatric inpatients. Klinik Psikofarmakoloji Bulteni - Bulletin of Clinical Psychopharmacology 2003;13:65-71. (Turkish)

32. Kramer BA, Pi EH. A Survey of ECT use in Asia. Convuls Ther 1990;6(1):26-31.

33. Bland RC, Brintnell S. Electroconvulsive therapy in a majör teaching hospital: diagnoses and indications. Can J Psychiatry 1985;30(4):288-92.