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

Suleyman Demir1, Mahmut Bulut2, Abdullah Atli2, Mehmet Gunes1, Mehmet Cemal Kaya2, Aslihan Okan Ibiloglu1, Songul Cati3, Aytekin Sir4

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

INTRODUCTION

Electroconvulsive therapy (ECT) is an efficient and safe somatic treatment used to treat severe mental disorders1. 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 pregnancy2-4.

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 obtained5,6. 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 therapy7. 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 hospitalization8,9. Outpatient ECT provides some advantages, such as reduced disruption in social and professional functionality and decrease in treatment costs10.

Frequency of clinical use of ECT varies in different countries. For example, ECT is applied for 5% to 12% of inpatients in the USA6,11, whereas it is applied for approximately 9% to 16% of inpatients in Turkey12,13.

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

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.

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

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

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

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>n</th>
<th>Mean±SD</th>
<th>f</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization Period (day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>63</td>
<td>35.5±18.0</td>
<td>1.006</td>
<td>0.392</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>26</td>
<td>38.8±17.6</td>
<td>5.136</td>
<td>0.002</td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td>41</td>
<td>40.3±23.6</td>
<td>2.882</td>
<td>0.052</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>46.0±13.9</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>63</td>
<td>40.7±14.1</td>
<td>5.136</td>
<td>0.002</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>26</td>
<td>36.4±13.9</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td>41</td>
<td>32.1±9.1</td>
<td>5.136</td>
<td>0.002</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>28.8±6.1</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Number of ECT sessions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>63</td>
<td>8.2±2.8</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>26</td>
<td>8.5±4.0</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td>41</td>
<td>7.2±2.6</td>
<td>1.355</td>
<td>0.259</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>7.9±0.6</td>
<td>1.355</td>
<td>0.259</td>
</tr>
</tbody>
</table>
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 procedures9.

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 costs9,16,17. 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 method18,19.
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. 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. The diagnosis of patients of 85% who applied to ECT is major depression in the United States. ECT is a commonly choosing among the former stage of treatment in women compared to men. Bolu et al. were found that women who applied to ECT for much more diagnosis of major depression. 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. The study conducted by Eroglu et al. did not find any significant relation between the diagnosis and age of the inpatients. 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. There is no certain ECT session count applied according to the diagnosis in psychiatric diseases. 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. 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. 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. 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. 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. 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. Since there is no certain ECT session count according to the diagnosis, differences in the number of ECT sessions between diagnoses is expected.

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:


