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Research / Araştırma

# ECT Practices in a Psychiatry Clinic at a Training and Research Hospital

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**ABSTRACT**

## ECT practices in a psychiatry clinic at a training and research hospital

**Objective:** Electroconvulsive therapy (ECT) is an effective method of somatic therapy used in the treatment of many psychiatric disorders. Studies conducted in Turkey indicate that the frequency of ECT use varies over quite a wide range (2.2-16.3%). This study aims to investigate the diagnostic distributions in patients who were treated with ECT at a psychiatric clinic of a training and research hospital.

**Method:** The health records of inpatients treated in our clinic between the dates of Jan 1, 2007 and June 30, 2016 were evaluated retrospectively.

**Results:** A total of 174 patients underwent ECT within the specified time period. Of the total patients, 65.5% were female (n=114) and 34.5% were male (n=60). The average total number of ECT sessions was 7.7±4.4. The average number of ECT sessions in women was 7.2±1.9, while the average number in men was 8.6±7.1 (p=0.044). The diagnostic distributions of ECT patients were unipolar depression (63.8%), bipolar depression (18.4%), psychosis (14.9%) and bipolar mania (2.9%).

**Conclusion:** The frequency of ECT practice in our clinic was 6.13%. Our study showed that although ECT is known as an effective and reliable method, it is not applied in our clinic at the frequency that we expected. We believe that shedding light on the effectiveness of the ECT mechanism will render it less enigmatic and increase the scope and frequency of its use.

**Keywords:** Depression, electroconvulsive therapy, mania

**ÖZET**

## Bir eğitim ve araştırma hastanesi psikiyatri kliniğinde EKT uygulamaları

**Amaç:** Elektrokonvülzif tedavi (EKT) pek çok psikiyatrik hastalığın tedavisinde kullanılan etkin bir somatik tedavi yöntemidir. Ülkemizde yapılan çalışmalar EKT kullanım sıklığının oldukça geniş bir aralıkta olduğunu göstermektedir (%2.2-16.3). Bu çalışmada bir eğitim araştırma hastanesi psikiyatri kliniğinde yatarak tedavi gören ve EKT uygulanan hastalarda tanı dağılımlarının incelenmesi amaçlanmıştır.

**Yöntem:** Çalışmamızda kliniğimizde 01.01.2007-30.06.2016 tarihleri arasında yatarak tedavi gören hastaların sağlık kayıtları geriye dönük olarak değerlendirildi.

**Bulgular:** Belirtilen süre içerisinde toplam 174 hastaya EKT uygulanmıştı. Hastaların %65.5'i kadın (n=114), %34.5'i erkek (n=60) idi. Toplam EKT sayısı ortalama 7.7±4.4 idi. Kadınlarda EKT sayısı ortalama 7.2±1.9, erkeklerde EKT sayısı ortalama 8.6±7.1 idi (p=0.044). EKT uygulanan hastaların tanı dağılımları; unipolar depresyon hastaları (%63.8), bipolar depresyon (%18.4), psikoz (%14.9) ve bipolar mani (%2.9) idi.

**Sonuç:** Kliniğimizin EKT uygulama sıklığı %6.13 olarak bulundu. Çalışmamız EKT'nin etkin ve güvenilir bir yöntem olarak bilinmesine karşın kliniğimizde beklediğimiz sıklıkta uygulanmadığını gösterdi. EKT'nin etki mekanizmasının aydınlatılmasının, gizemini azaltıp kullanım alanının ve sıklığının artmasına yol açacağını düşünmekteyiz.

**Anahtar kelimeler:** Depresyon, elektrokonvülzif tedavi, mani

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## INTRODUCTION

Even though its application and method of application have been extensively disputed from its inception until now, ECT has maintained its place among the effective psychiatric treatment methods (1). ECT was first utilized in the 1930s, undergoing different applicational transformations with the development of psychopharmacology (2-4).

Today, there are various committees assessing the areas of use, effectiveness, and reliability of ECTs, continually updating information pertaining to these fields. The World Psychiatric Association (WPA), the American Psychiatric Association Task Force on ECT (APA-ECT Task Force), and the United Kingdom National Institute for Health and Care Excellence (NICE) are the leading organizations to have taken on this task (5-7). However, there are a number of differences among countries and even psychiatry clinics as well as between the suggestions made by these committees where the use of ECT is concerned. In our country, there are suggestions regarding ECT in treatment guidelines and various manuals created by our colleagues (8).

ECT was first used in a schizophrenia patient, followed by a period of exclusive application for patients suffering from this disorder (3,4). Over time, the scope of ECT use expanded, finding a place in the treatment of different illnesses. ECT can be used safely in schizophrenia during the period of flare-ups and under situations like catatonia and suicidal behavior (9,10). In depressive disorder and in situations where there is a high risk of suicide, when psychotic attributes emerge, or in physical illnesses where eating problems are at the center, ECT can be used if the there is a good previous response history or if the patient prefers this treatment. The same indications are also valid in the case of mania, and in cases involving intense agitation, ECT is a viable option. Depression, mania, and psychotic episodes experienced during pregnancy can also be treated with ECT. Furthermore, ECT may be utilized in cases of neuroleptic malign syndrome, delirium, epilepsy, and neuropsychiatric disorders (9,10).

Our clinic was established at the Haydarpasa Numune Research and Training Hospital in 2002 and ECT application has been administered since its foundation. Our hospital, which is located on the Asian side of Istanbul, serves a sizeable population as a tertiary healthcare facility. Our clinic is a single-bed psychiatry clinic in this state hospital comprising all medical departments. As from 2005, our ECT device was changed to the Thymatron system IV unit and ECT was administered under general anesthetics. In this study, we aim to assess the diagnostic characteristics of inpatients who were treated between June 30, 2006 and January 1, 2007 and received ECT treatment during this time.

## METHOD

The study included patients who were treated at our clinic between June 30, 2016 and January 1, 2007 and received ECT treatment. These patients' files were scanned retroactively, recording their diagnosis, age, gender, and number of ECT applications. In order to allow for an easy statistical assessment, each visit to the hospital as an inpatient was evaluated separately. The ethics committee approval for this work was received from the Haydarpasa Numune Training and Research Hospital.

Prior to ECT treatment, electrocardiography (ECG), pulmonary function testing, blood biochemistry, and a complete blood count were carried out routinely in all patients. Written informed consent was received from all patients and their first degree relatives. As part of a pre-treatment routine, all patients were assessed by the departments of internal medicine and of anesthesiology and reanimation to determine their suitability for ECT treatment, and some patients were assessed by other departments as was seen necessary. Patients were left without food for 12 hours prior to the application. The anesthetic agent and dose to be used during the ECT were coordinated with the anesthesia and reanimation department. Succinylcholine was used a muscle relaxant. The resting heart rate, blood pressure and oxygen saturation, as well as ECG of all patients were

monitored prior to, during, and after ECT. A bag-valve-mask system was used during the apneic period, allowing for 100% controlled breathing through O2 administration. When the fasciculation related to depolarizing muscle relaxants ended, the ECT was administered with a 200% ratio maximum output stimulant. ECT applications that lasted less than 20 seconds were considered unsuccessful and repeated. All patients were administered EEG monitorization during the ECT treatment. All patients were administered ECT using a bitemporal approach.

### Statistical Analysis

The findings were analyzed using the SPSS 13.0 package. Continuous data were given as average±standard deviation, while the discrete data were given as percentage (%). Student t test, Pearson's correlation analysis and ANOVA test were used in the findings that were consistent with categorical and normal distribution. A value of $p<0.05$ was considered statistically significant.

## RESULTS

A total of 2,223 patients received inpatient treatment at our clinic between June 30, 2016 and January 1, 2007. The complete data of 174 inpatients who received ECT treatment at our clinic was obtained. We found that 6.1% of patients of the inpatients in our hospital during this 8.5-year period were treated with ECT. The number of patients who underwent the application of ECT according to year can be seen in Figure 1. The percentage of ECT application to patients varies between 3.0% and 12.1% according to year.

While 65.5% (n=114) of the patients were women, men made up 34.5% (n=60) of the total group. The average age of patients was 42.3±13.6 years. The average total number of ECT sessions was 7.7±4.4. The number of ECT treatments in women averaged 7.2±1.9, while this average was 8.6±7.1 for men. There was a significant difference in the number of ECTs between sexes, the figures being notably higher for men (p=0.044).

Correlation tests determined no statistically significant relationship between age and the number of ECTs administered (p=0.633).

When the patients given ECTs are diagnostically examined, patients with unipolar disorder (63.8%) formed the largest group. The other diagnostic groups, in order of size, were as follows: bipolar depression (18.4%), psychosis (14.9%), and bipolar mania (2.9%) (Figure 2). No significant relationship was found between diagnostic groups and the number of ECTs administered. Because the number of patients diagnosed with bipolar mania was low (n=5), these patients were included with the depression group. Thus, there was no difference determined among the three diagnostic groups (bipolar disorder, unipolar depression, and the psychosis group) in terms of ECT numbers (p=0.144).

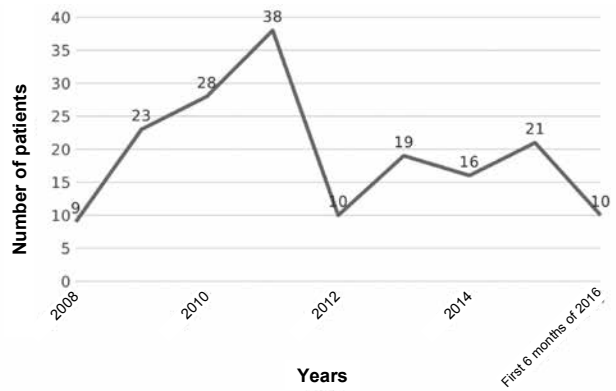



**Figure 1: The number of patients administered ECT according to year**

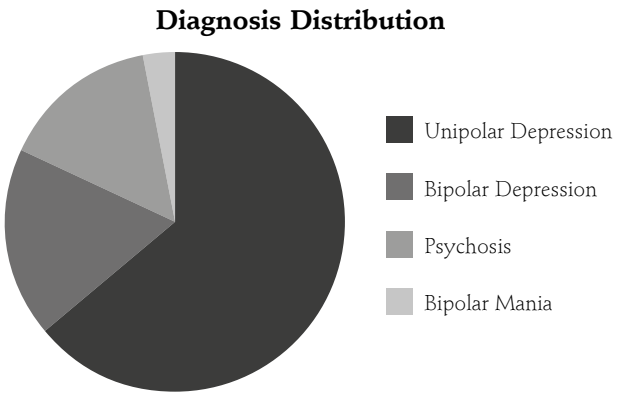



**Figure 2: The diagnostic distribution of patients administered ECT**

**Table 1: ECT studies in Turkey and determined percentages**

| Center where study is conducted | Date | Author | Percentage determined |
|---|---|---|---|
| Ordu University | 2016 | Demir et al. | 4.21% |
| Gulhane Military Medical Academy | 2013 | Balikci et al. | 2.2% |
| Dicle University | 2009 | Essizoglu et al. | 9.0% |
| Bakirkoy Training and Research Hospital for Psychiatry | 2008 | Saatcioglu et al. | 12.4% |
| Cukurova University | 2003 | Zeren et al. | 14.4% |
| Dokuz Eylul University | 2003 | Yildiz et al. | 16.3% |

## DISCUSSION

The rate of ECT application in our clinic over the 8.5-year period was found to be 6.1%. Studies conducted in other countries show that the frequency of ECT application varies between different countries over a very wide range. For example, university hospitals in the United States note a rate of 6-12%, but state hospitals 0.4-1.6%; in Pakistan, this figure is 29%, in Scandinavian countries 5%, and in Pacific countries 1-9% (2,11,12-16). The rate of ECT application in our study, when compared to other health centers in Turkey, is in the same range. In similar studies conducted in Turkey, ECT rates in inpatients are reported between 2.2 and 16.3% (Table 1) (17-22).

A large portion of patients in our study receiving ECT consisted of individuals with mood disorders (unipolar depression, bipolar disorder depressive episodes and bipolar disorder manic episodes) (85.9%). When each diagnostic group is examined individually, ECTs were most frequently administered to unipolar depression patients (63.8%), followed by bipolar depression patients (18.4%) These findings were parallel to the findings of other studies conducted in Turkey. In the study by Ozmenler et al. (23), which is among the oldest and most comprehensive studies on this matter, the data of 34 hospitals was evaluated, showing that the highest frequency of ECT recipients was among depression patients with 47%, followed by schizophrenia patients with 41%. In a study conducted at Dokuz Eylul University's Psychiatric Clinic, the diagnostic distribution of inpatients for two years was examined, showing the following rates: non-psychotic unipolar depression 42.9%, psychotic unipolar depression 12.5%, bipolar depression 10.7%, bipolar manic-mixed 12.5% (18). Of the patients administered ECT over a two-year period at Dicle University's Psychiatric Clinic, 66.7% were being monitored with a depression diagnosis (19). When 12-year ECT data of patients at Cukurova University were examined, it was reported that 33.4% were diagnosed with affective disorder and 26.2% with psychotic disorder (17). In another study conducted at the same center, 32.2% of the patients with mood disorder who had been inpatients at the clinic for one year were found to have received ECT treatment (24). The high rates of ECT treatment can be explained by the prevalence of mood disorder and particularly depressive disorder within society in comparison to other psychiatric disorders and the experience of suicidal thoughts, eating and drinking problems, and catatonic problems during the course of the disease. According to the diagnoses in Turkey, there are studies that demonstrate a variation in ECT rates. One such study is a research conducted at the Gulhane Military Medical Academy (GATA). This study indicates that ECT is most commonly administered to schizophrenia patients, with depression patients following in second place (21). The fact that GATA serves more frequently military personnel with patients of a young age may explain the reason behind the rise in psychotic disorder and thus ECT applications. In a study conducted at Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, we see that ECTs are most frequently used in the treatment of the manic phase of bipolar disorder patients (22). In another study conducted in the same hospital, 46.9% of the inpatients over a three-year period receiving ECT treatment were diagnosed with affective disorder and 52.1% suffered from psychotic disorder (25).

In our study, women make up the majority of the sample (65.5%). This is consistent with the

literature (17,18). The fact that women make up a higher percentage of psychiatric patients explains the higher prevalence of depressive disorder, which is among the illnesses given ECT treatment most frequently. Men were found to be the majority among patients receiving ECT treatment in only two studies conducted in Turkey (20,21). This can be attributed to the fact that GATA predominantly serves military personnel, which mostly consists of men, thus leading to a higher number of male patients.

The average ECT number in our study was 7.7±4.4, and there was no notable difference in the number of applications based on illnesses. This data, too, was found to be consistent with previous literature. There was an average number of 8.5±3.0 ECTs found in the work of Yildiz et al. (18); in the work of Balicik et al., this figure was found to be 9.1±4.2, also varying according to illness.

There was a significant difference in the average ECT treatment numbers between genders. According to our study, this number was significantly higher for men (p=0.044). In the work of Demir et al., there was no difference found in ECT numbers between genders (ECT session numbers were found to be 9.4±2.5 in male patients and 9.8±2.2 in female patients) (20). Another study previously conducted at GATA confirmed this result, finding that there was no difference found in men and women in terms of number of ECT treatments. The same study, however, found a difference between sexes in terms of the indications of ECTs: while women were administered ECT for major depression and suicidal thoughts, men were found to be treated more so for catatonia (26).

The main limitation in our study was the small sample size. Deficiencies in the archive system prevented us from accessing the complete information of all patients treated with ECT. For the same reason, detailed data on clinical features of the patients in our study could not be assessed. The retrospective design of the study was another limitation, preventing the further collection of data. Our hospital serves the general populace of Istanbul, as well as patients arriving from different regions in the country. As such, we hold that the variety of patients adds strength to our study and that the data is not limited to one geographic area.

We believe that despite the reliability and effectiveness of the ECT method, its inadequate use in our organization, in addition to many other organizations, stems from negative beliefs and stereotypes attached to the treatment. Its application, particularly under general anesthetics, may be creating fear and concern among patients. Doctors may be effective in overcoming these prejudices by sharing information with patients and their relatives about the treatment.

There is a continued debate about this treatment method, as its mechanism of action is not fully understood. Discussions include theories about ECTs effects on a slowing-down of the cerebral metabolism, an increase in seizure thresholds, anti-convulsive effects, neuroplastic effects, in addition to its effects on neurotransmitters. Methodical differences between studies, in addition to clinical differences between patients and varying medications used have all affected the findings of these studies, making it more difficult to understand ECT's mechanism of effect. Despite its current widespread use, defining its safety regulations and forming treatment protocols will pave the way for a more effective use of ECT in pregnant women, children, adolescents, and patients who suffer from accompanying medical problems. For these reasons, we are in need of more studies and a greater wealth of knowledge on ECT.

| **Contributions category** | **Authors name** |
|---|---|
| Development of study idea | M.Z.E., A.B.Y., T.D. |
| Methodological design of the study | M.Z.E., S.K. |
| Data acquisition and process | S.K., A.B.Y., T.D. |
| Data analysis and interpretation | S.K., T.D. |
| Literature review | T.D., A.B.Y. |
| Manuscript writing | M.Z.E. |
| Manuscript review and revisation | M.Z.E. |

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## REFERENCES


1. Tomruk NB, Oral T. Clinical use of electroconvulsive therapy: a review. Anatolian Journal of Psychiatry 2007; 8:302-309. (Turkish)

2. Fink M. Convulsive therapy: a review of the first 55 years. J Affect Disord 2001; 63:1-15. **[CrossRef]**

3. Shorter E. The history of ECT: unsolved mysteries. Psychiatric Times 2004; 21:2.

4. Cerletti U. Old and new information about electroshock. Am J Psychiatry 1950; 107:87-94. **[CrossRef]**

5. World Psychiatric Association-Consensus Statement of the use and safety of ECT, 2003.

6. American Psychiatric Association Task Force on Electroconvulsive Therapy. The Practice of Electroconvulsive Therapy: Recommendations for Treatment, Training, and Privileging. American Psychiatric Association, Washington, DC 2001.

7. National Institute for Clinical Excellence (NICE). Guidance on the use of electroconvulsive therapy. Technology Appraisal 59, London, NICE, 2003.

8. Tomruk NB, Kutlar MT, Menges OO, Canbek O, Soysal H. Handbook for the Clinical Application of Electroconvulsive Therapy. 1. ed., Istanbul, TC Ministry of Health, 2007.

9. Atagun MI, Yildirim MS, Canbek O. Electroconvulsive therapy: an update. Current Approaches in Psychiatry 2012; 4:350-370. (Turkish) **[CrossRef]**

10. Sayar GH, Ozten E, Eryilmaz G, Gogcegoz I, Ceylan ME. Electroconvulsive therapy: a current review. Current Approaches in Psychiatry 2014; 6:107-125. (Turkish) **[CrossRef]**

11. Sylvester AP, Mulsant BH, Chengappa KN, Sandman AR, Haskett RF. Use of electroconvulsive therapy in a state hospital: a 10-year review. J Clin Psychiatry 2000; 61:534-539. **[CrossRef]**

12. Minhas HM, Ostroff R. Practice of electroconvulsive therapy in a tertiary care hospital in Pakistan. J ECT 2012; 28:7-9. **[CrossRef]**

13. Andersson JE, Bolwig TG. Electroconvulsive therapy in Denmark 1999. A nation-wide questionnaire study. Ugeskr Laeger 2002; 164:3449-3452. (Danish)

14. Frederiksen SO, D'Elia G. Electroconvulsive therapy in Sweden. Br J Psychiatry 1979; 134:583-587. **[CrossRef]**

15. Heshe J, Roder E. Electroconvulsive therapy in Denmark. Br J Psychiatry 1976; 128:241-245. **[CrossRef]**

16. Gazdag G, Palinska D, Kloszewska I, Sobow T. Electroconvulsive therapy practice in Poland. J ECT 2009; 25:34-38. **[CrossRef]**

17. Zeren T, Tamam L, Evlice YE. Electroconvulsive therapy: assessment of practice of a 12-year period. Yeni Symposium 2003; 41:54-63. (Turkish)

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

19. Essizoglu A, Yasan A, Bulbul I, Akkoc H, Yildirim EA, Ozkan M. Relation between seizure duration, applied electrical dose and response speed to electroconvulsive therapy for patients with depression: a retrospective study. Anatolian Journal of Psychiatry 2009; 10:286-292. (Turkish)

20. Demir EY, Tas N. Characteristics of electroconvulsive therapy in a university hospital. Cukurova Medical Journal 2016; 41:242-247. (Turkish) **[CrossRef]**

21. Balikci A, Bolu A, Akarsu S, Kocak N, Erdem M, Aydemir E, Uzun O. Practice of electroconvulsive therapy between the years 2006-2011 at a university hospital in Turkey. Anatolian Journal of Psychiatry 2013; 14:340-346. (Turkish) **[CrossRef]**

22. Saatcioglu O, Tomruk NB. Practice of electroconvulsive therapy at the research and training hospital in Turkey. Soc Psychiatry Psychiatr Epidemiol 2008; 43:673-677. **[CrossRef]**

23. Ozmenler KN, Ozsahin A, Ceran A, Cansever A, Battal S. Application of electroconvulsive therapy in Turkish psychiatric clinics. XXXIV. National Psychiatry, Proceedings Book, 1998, 233-234. (Turkish)

24. Eroglu MZ, Icbay E, Tamam L. Demographic and clinical characteristics of the patients treated with electroconvulsive therapy in a university psychiatry clinic. Dicle Medical Journal 2012; 39:371-376. (Turkish) **[CrossRef]**

25. Canbek O, Ipekcioglu D, Menges OO, Atagun MI, Karamustafalioglu N, Cetinkaya OZ, Ilnem MC. Comparison of propofol, etomidate and thiopental in anesthesia for electroconvulsive therapy: a randomized, double-blind clinical trial. J ECT 2015; 31:91-97. **[CrossRef]**

26. Bolu A, Ozselek S, Akarsu S, Alper M, Balikci A. Is there a role of gender in electroconvulsive therapy response? Bulletin of Clinical Psychopharmacology 2015; 25:228-32. **[CrossRef]**