ORIGINAL ARTICLE

CLINICAL CHARACTERISTICS OF INPATIENTS UNDERGOING ELECTROCONVULSIVE THERAPY (ECT) IN A UNIVERSITY HOSPITAL, THAILAND

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Abstract

Objectives*: To review clinical characteristics of inpatients undergoing ECT at Ramathibodi Hospital, Bangkok**. ***Methods*: We performed a chart review of patients who received inpatient ECT from January 2013 to December 2014**. ***Results*: Between 2013 and 2014, fifty-eight acute courses of ECT and 499 ECT treatments were done**. **Ten percent (49/492) of psychiatric inpatients received ECT**. **Sixty percent were female**. **The mean ± SD (median) age was 46.0±16.5 (48.0) years**. **Psychiatric diagnoses were schizophrenia (32.7%), bipolar disorder (28.6%), schizoaffective disorder (20.4%), and major depressive disorder (14.3%)**. **The indications for ECT were nonresponse to psychotropic drugs (60.3%), agitation/aggression (32.8%) previous good response to ECT (20.7%), psychomotor retardation (8.6%), intolerance to psychotropic adverse effects (6.9%), high risk of suicide (3.4%) and refusal to take medication (1.7%), respectively**. **The time to ECT after admission was 14.9±16.9 (7.0) days; number of sessions was 8.6±3.7 (8.0)/patient**. **The most common adverse effects were forgetfulness (82.8%), headache (70.7%), and postictal confusion (62.1%)**. **Remission or plateau of symptoms occurred in 79.3% (46/58), whereas 20.7% (12/58) were discontinued for other reasons such as complications of ECT (10/58, 17.2%), patient preference (1/58, 1.7%), and changing of diagnosis from schizophrenia to substance induced psychosis (1/58, 1.7%)**. **There were no cases of ECT-related death**. ***Conclusions*: ECT treatment is more common than in the past for inpatients with affective disorder in Thailand and appears to be, overall, a useful and safe treatment for patients who do not respond to medication or need a rapid clinical response**. ***ASEAN Journal of Psychiatry, Vol. 17 (2): July – December 2016: XX XX.

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Introduction

Electroconvulsive therapy (ECT) has been used to treat psychiatric patients since 1938 [1]. Currently, application differs from country to country depending on resources, such as health personnel and devices, as well as varying indications [1]. Modified technique is standard of care in the North America and Europe while countries in Asia and Africa typically administer unmodified technique. Main diagnostic indications for ECT in Europe are mood disorders (unipolar depression, and bipolar depression), while in Asia, the main indication for ECT has been schizophrenia [1].

In Thailand, ECT has been used since 1945. Originally, it was used only in public mental hospitals. Later, ECT was performed in university hospitals, and currently in many general hospitals as well. A nationwide survey published in 2004 reported that 11.2 per 100,000 population received ECT treatment and 74.6% of them were diagnosed with schizophrenia [2]. Approximately 94.0% of administered treatments were in mental hospitals [2]. Both modified and unmodified techniques were used. Anesthetic drug was typically thiopental. If inadequate seizures were obtained with thiopental, ketamine or propofol were usually chosen. Only bilateral electrode placement was used. In 2005, an observational study was done in Chulalongkorn University Hospital and reported that during a 1 month period, 22 of 51 hospitalized patients (43.1%) received ECT. Among them, 16 had schizophrenia, 2 had bipolar disorder, 2 had acute psychosis and 2 had other diseases). The indications of ECT were severe violence (n = 9), suicide (n = 6) treatment resistance (n = 4) and other (n =3). The length of stay of the patients who received ECT was no longer than the patients who did not received ECT [3].

An ECT service has been established at the Department of Psychiatry, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, since 1970. Modified technique has been used since then. However, there was no consensus or guideline regarding the indication or standardized method for ECT so that the treatment varied depending solely on the experience of the psychiatrist. In 2012 an ECT treatment center was created to develop guidelines for pre-ECT evaluation, ECT method and post–ECT monitoring. The current report was completed in order to facilitate this effort.

Methods

Study design

This study is a retrospective-observational study. We performed chart reviews on all patients who received inpatient ECT from January 2013 to December 2014. This research was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee on Human Experimentation of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. Demographic data, clinical characteristics, both physical and mental illness, ECT data (*e.g.* indications, stimulus dose, and number of sessions), side effects and reason for termination of ECT were collected.

Setting

This study was conducted at Ramathibodi Hospital, a university hospital which has 1300 beds. There are 22 beds for general psychiatric patients, and 250 -300 patients are admitted per year [4].

ECT procedure

The ECT procedures are done in an operating room by the ECT team, which includes psychiatric staffs, psychiatric residents, anesthetic staff, psychiatric nurses, and anesthetic nurses. We use a modified technique, brief pulse wave generated by a Mecta Spectrum 5000Q (Mecta Corp, USA). Anesthetic drugs used routinely are thiopental, or propofol and the typical muscle relaxant is succinylcholine. ECT is performed 3 times per week. Seizure threshold (ST) is determined at the first ECT session by titration method. Stimulus intensity is then increased to 500% above ST for right unilateral (RUL) electrode placement and 50% above ST for bilateral (BL) electrode placement. Treatment is typically stopped when maximal improvement is reached or adverse effects limit further treatments.

Statistical analysis

All statistical analysis was performed by using SPSS 18.0 for Windows (IBM Corp., Armonk, NY, USA). Descriptive and analytic statistics were compiled. Continuous measures were compared with paired and unpaired t-tests. For non-normally distributed parameters, corresponding non-parametric tests (Wilcoxon sign rank and Mann-Whitney U tests), were used. Categorical parameters were compared using Chi-square and Fisher's exact tests. For all analyses, a significant threshold of $p < 0.05$ was used.

Results

Between January 2013 and December 2014, 49 of 492 psychiatric in-patients (9.96%) received ECT. A total of 58 acute ECT courses and 499 ECT treatments were administered. Seven patients (14.3%) received 2 courses and one patient (2.0%) received 3 courses of ECT. Socio-demographic data are shown in table 1. Approximately, 60 percent of patients were female. The mean and standard deviation age was 46.0±16.5 years at the time of ECT administration. There were 8 (16.3%) elderly patients (age > 60 years) who received ECT. More than half of these patients (53.1%) had at least one comorbid physical illness. Psychiatric diagnoses were schizophrenia (32.7%), bipolar disorder (28.6%), schizoaffective disorder (20.4%), major depressive disorder (14.3%) and other psychiatric disorders (4.1%), respectively. There were 12 (24.5%) patients who used substances.

Table 1. **Sample description**

Characteristics	**Sample Size, N** (%) **or Mean ± SD^**
Sex	
Male	19 (38.8)
Female	30 (61.2)
Age	
All	46.0±16.5
Education	
Uneducated	2 (4.1)
Primary school	3(6.1)
High school	19(38.8)
College	24(41)
Marital status	
Unmarried	24(49)
Married	16(32.7)
Divorced, widow	9(18.4)
Employment	
Unemployed	30(61.2)
Psychiatric diagnosis	
Schizophrenia	16 (32.7)
Schizoaffective disorder	10 (20.4)
Bipolar disorder	14(28.6)
Major depressive disorder	7(14.3)
Others	2(4.1)
Physical illness	
Yes	26(53.1)
No	23(46.9)

^SD = Standard deviation

1. Indication

Half of the patients had never received ECT before. The indications for ECT were nonresponse to psychotropic drugs (60.3%), agitation/aggression (32.8%) previous good response to ECT (20.7%), psychomotor retardation (8.6%), intolerance to psychotropic adverse effects (6.9%), high-risk high risk

suicidesuicidal behavior (3.4%) and refuse to medication refusal (1.7%), respectively.

2. Time to ECT

For all patients, the mean ± SD (median) time to ECT after admission was 14.9 ± 16.9 (7.0) days (range 1-65 days). The mean ± SD (median) time to ECT after admissionsadmission were 16.7±20.3 (6) days for the patients with nonresponse to psychotropic drugs, 12.0 ± 9.4 (11) days for agitation/aggression, 5.9±7.3 (4) thedays for previous good response, 10.0 ± 8.6 (7) days for psychomotor retardation, 18.3±15.6 (15) days for adverse effects intolerance, 12.5± 4.9 (12.5) days for high- risk suicide, and 7.0 days for refuse to the medication refusal.group.

3. Electrode placement

There were 15 courses (25.9%) starting) starting with RUL electrode placement and 43 courses (74.1%) with BL electrode placement. Almost half of patients with RUL (7/15, 46.7%) were switched to BL electrode placement because of inadequate non-response to treatment. One patient (2.32%) with BL was switched to bifrontal electrode placement because of memory impairment.

4. Number of ECT session

In 58 courses of ECT, the mean ± SD (median) numbers of session were 8.6 ±3.7 (8.0) sessions (range 1-24). The mean ± SD (median) number of session were 8.6 ± 2.9 (8.0) (range 1-13) for schizophrenia, 8.4±3.2 (8.0) (range 2-13) for schizoaffective disorder, 9.5 ± 4.5 (8.0) (range 6-24) for bipolar disorder, 6.7±3.9 (6.0) (range 2-14) for major depressive disorder, and 8.7±4.6 (6.0) (range 6-14) for other diagnosesis, respectively. Numbers of sessions werase statiscallystatically similar for theseacross diagnoseis ($F = 0.73$, $p = 0.58$).

5. Adverse effects

The adverse effects of ECT are shown in Table 2. The most common adverse effects were forgetfulness (82.8%), headache (70.7%), and postictal confusion (62.1%).

Table 2. Adverse effect of ECT

Adverse Effect	N	%
Forgetfulness	48	82.8
Headache	41	70.7
Postictal confusion	36	92.1
Fever	28	48.3
Dizziness	24	41.4
Transient hypertension	18	31.0
Body ache	14	24.1
Delirium	9	15.5
Hypoxia	8	13.8
Nausea/vomit	8	13.8
Cognitive impairment	7	12.1
Injury to the lips	2	3.4
Bradycardia	2	3.4
Nonspecific chest pain	2	3.4
Jaw ache	2	3.4
Others	3	5.2

6. Termination of ECT

From the total 58 courses of ECT, 79.3% (46/58) were stopped because the patient reached remission of symptoms or treatment response plateaued, whereas 20.7% (12/58) were discontinued due to other reasons such as complications of ECT (10/58, 17.2%), patient preference (1/58, 1.7%), and changing of diagnosis from schizophrenia to substance induced psychosis (1/58, 1.7%). A total of 10 courses were discontinued due to complications. The complications were delirium (4/58, 6.9%), other cognitive impairments such as forgetfulness, slow thought processing (5/58, 8.6%), and others (1/58, 1.7%).

Discussion

Between January 2013 and December 2014, approximately 10% of patients admitted in our psychiatric ward received ECT. This rate was about 5 times lower than those in a mental hospital in China [5] but much higher than the rate in a previous study of Thailand (0.01%) [6]. In our study, 60% of 49 patients were female whereas overall ECT-treated female patients in Asia had been reported to be only 38% [7]. In the previous study in Thailand in 2004, only 27.6% of patients were female [2].

The patients in our study were relatively older than other studies in Asia. Mean age in our study was 46.0 years compared to 35.1 years in Turkey [8], 34.9 years in Pakistan [9] and 39.6 years in India [10]. In Western countries 48-58% of patients who received ECT were elderly while in our study the elderly were only 16% of the sample. This may be due to the variation of diseases and/or indications for ECT. In Western countries the most common diagnosis is depression, while in this study the most common diagnosis was schizophrenia which has an earlier the age of onset.

A half of our patients had medical comorbidities (53.1%) which are higher than in other studies. For example, in a neuropsychiatric hospital in Nigeria, only 3.9% had underlying diseases [11]. This may be due to the difference in the healthcare systems. In Thailand, psychiatric hospitals refer patients with serious medical conditions to tertiary or medical school hospitals where the facilities and support teams are available. Some patients chose to follow up both their physical health and mental health at the same hospital. One study in China also reported lower medical comorbidity (15.9%) but the studied population was also younger (age 18-59 years) [5].

The patients who underwent ECT were more often diagnosed to have schizophrenia than mood disorders. This is similar to other Asian [1, 5, 12] and African[11] countries. In Thailand, both previous studies [2, 3] showed that the most common diagnosis was schizophrenia. But this differed from Western countries where the most common diagnostic indication was depression [1]. In our study, the most common indication for ECT was nonresponse to psychotropic drugs (60.3%). This is in accordance to the benefit of ECT in treating patients with pharmacotherapy-resistant psychiatric disorders. In one study [11], the most commonly stated indication for ECT was a poor response to treatment. Another study [3] showed the most common indication was severe violence. This discordance may be caused by the difference in practicing among psychiatrists in the world. Approximately half of patients in this study received ECT within the first week of admission. Some of these patients were admitted for ECT because they did not respond to medication and some of these patients had severe clinical symptoms such as aggressive behavior and high suicidal risk.

We used both bilateral (74.1%) and unilateral (25.9%) electrode placements. Only depression is indicated for unilateral electrode placement in our hospital while other diagnoses are indicated for bilateral placement. This result did not differ from other studies worldwide, including Asia [1, 7] where bilateral placement preferred. The average number of ECT sessions per patient was 8.6, which is similar to the global average, [1] including Turkey [8] (8.9) and India [10] (8.2). The range of ECT sessions varied between 1-24 which was similar to Nigeria(1-23) [11], 1-18 times in Turkey [8] and Pakistan (1-18) [9].

In the previous study, the mortality rate with ECT was estimated 0.08% in Thailand [2]. In our study, no patient died during the study period. The common adverse effects were forgetfulness (82.8%), headache (70.7%), and postictal confusion (62.1%). The results were in concordance with studies in Turkey [8] and India [10] where forgetfulness and headache were amongst the top three most common side effects. Most patients (79.3%) completed their courses of ECT whereas 20.7% discontinued due to several causes such as complications of ECT (17.2%), patient preference (1.7%), and detection of current substance use (1.7%). Complications of ECT was also the most common reason for termination in another study [11]. Only 1.7% of patients chose to stop treatment in our study whereas 16.7% of patients in tertiary care units in Pakistan [9] terminated their courses. This may be caused by differences in technique of ECT.

This study has noteworthy limitations.. This study was conducted in one tertiary hospital, and the patients in our Institute differ in terms of severity, gender, and underlying diseases from those typically seen in Thailand. Thus, multi-center data collection and analysis is needed .

Conclusion

In conclusion, ECT practice for inpatients in Thailand is more frequently used than previous study. It is usually effective and safe for the psychiatric patients who were not responding to medication or need rapid response.

Conflict of interests

All the Thai authors have received salary support from Mahidol University, Bangkok, Thailand. Morris B Goldman receives funding from Otsuka Pharmaceuticals. The authors report no conflicts of interest in this work. All authors declare that the funding source had no impact on the study design or the collection, analysis, and interpretation of data, writing on the report, or decision to submit the study for publication.

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