Original Article

Clinical outcome of patients with psychiatric illness following Electroconvulsive therapy in a teaching hospital in Kathmandu

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Abstract

Introduction: Electroconvulsive therapy (ECT) is a safe and effective procedure used for treatment of variety of psychiatric illness. In spite of its proven efficacy ECT is underutilized due to stigma and prejudice attached to it among patients, their families and even among mental health service providers. The purpose of the study was to evaluate the clinical outcome of patients diagnosed with psychiatric illness following electroconvulsive therapy.

Methods: This is a retrospective hospital based study of patients who underwent electroconvulsive therapy at department of Psychiatry and Mental health, Tribhuvan University Teaching hospital during 1 year duration. Pre-ECT and Post-ECT BPRS and GAF were obtained and the data were analyzed subsequently.

Results: A total of 39 patients underwent Electroconvulsive therapy during the study period. There were 16 males and 23 females. Among all cases receiving ECT, mean BPRS scores at the time of admission and discharge were 74.41±9.61 and 47.31±7.27 respectively whereas mean GAF scores at the time of admission and discharge were 20.21±6.03 and 57.95±11.05 respectively. The most common diagnosis for which ECT was used was Schizophrenia 14(35.89%). All patients showed statistically significant functional and symptomatic improvement except those with organic psychosis (GAF $p<0.05$ and BPRS $p<0.05$).

Conclusions: ECT is found to be effective in the treatment of patient diagnosed with various psychiatric illnesses.

Keywords: Brief Psychiatric Rating Scale, Electroconvulsive therapy, Global Assessment of Functioning

Introduction

Electroconvulsive therapy (ECT) involves the induction of a seizure for therapeutic purposes by the administration of electrical stimulus of various frequency to the scalp[1]. ECT is a safe procedure when used with brief-pulse stimulation techniques under anesthesia and muscle relaxant.[2] ECT is used in treatment of several psychiatric disorders, but it is most commonly used and most effective in treatment of severe depression episodes.[3] In hospitals providing psychiatric services in Nepal, ECT is found to be effective, safe and sometimes life-saving intervention for various psychiatric illness like severe depression with stupor and high suicidality, bipolar disorders, schizophrenia, catatonia and peri/post-natal mood and psychotic manifestations. In spite of its regular use and proven efficacy, ECT remains controversial due to negative publicity, stigma attached to it and prejudice even among medical authorities.[4] In most centers in Nepal, there is still use of direct ECT[5], but due to easy availability of anesthesia facilities and complying with WHO recommendation for ECT[2], most centers across the country, have now started using modified ECT with brief pulse administration as a standard methodology.

There are very few studies that have focused on clinical outcome after use of only modified ECT (mECT) for various psychiatric illness. This study was done to shed light on the clinical and functional outcome after use of mECT in a psychiatric in-patient setting of a tertiary level health center in Nepal.

Methods

This is a retrospective hospital based study including 39 patients receiving ECT during one-year study duration from 1st April 2016 to 31st March 2017.This study was carried out at department of Psychiatry and mental health at Tribhuvan University Teaching hospital (TUTH), Kathmandu which is a multispecialty teaching and tertiary care hospital in Nepal. Department of Psychiatry has two inpatients wards with a total of 22 inpatients beds. Informed consent was taken from each participant and their families. The indication for ECT was decided by consultant psychiatrist after detailed diagnostic evaluation and assessment of initial management outcomes. ECT as a first line treatment was used only for depressive stupor, catatonia and in cases of postpartum psychosis and depression where rapid relief of symptoms were desired and cases of pharmacotherapy resistance. Among other cases, ECT was also used based on case report, case series and reviews, such as treatment resistant OCD and cases of organic psychosis. A mere presence of violence and suicidality was not a first line indication for ECT in this study. No cases of ECT recipient were excluded from the study and regular pharmacotherapy was continued along with ECT.

ECT machine used delivered pulsed, bi-directional square wave stimulus where current was constant at 0.9 ampere and the voltage varied automatically by a built-in microcomputer as per the impedance of the patient. Using the manual mode however, frequency could be varied from 20-90 Hz and pulse width from 0.1-2.0 ms.

All 39 cases received mECT and the entire procedure was explained to the patient and their relatives before each ECT setting. Pre-anesthetic check up with relevant investigation was done before each ECT session and the procedure was done at operation theatre at TUTH. After preoxygenation with 100% oxygen, Propofol (0.75-2.5 mg/kg) was used for induction and succinylcholine (0.5 mg/kg) as a neuromuscular blocking agent. It was generally given two to three times a week. Minimum 4 to maximum 14 ECT sessions was used for individual patient during this study. The diagnosis of psychiatric illness was done using International Classification of Disease-10 Diagnostic criteria for research (ICD-10 DCR). Symptomatic and functional outcome was assessed using Brief Psychiatric Rating Scale (BPRS) and Global Assessment of functioning (GAF) respectively before application of first ECT and one day before discharge from hospital. Data were analyzed using SPSS version 16 (Chicago, Illinois, USA). Descriptive analysis was performed and mean, median and range were calculated. The data were explained as mean ± Standard deviation (SD) where ever suitable. Paired sample t-testwas used for assessing the statistical significance of the associations between the variables and p-value <0.05 were considered as statistically significant.

Results

Sample characteristics

There were 39 patients who underwent ECT during the period of one year from 1stApril 2016 to March 31st 2017. Total number of patients admitted to inpatient services of department of psychiatry during the study period was 530. Of these patients, 16 (41%) were male and 23 (59%) were female. Other socio-demographic profile of patients including marital status, education, occupation, religion, caste and family income are shown in Table 1. Mean age of the patient receiving ECT was 29.85±11.60. The minimum age of the patient receiving ECT was 14 and the maximum age of the patient in the study was 66 years.

Table 2 shows the distribution of family history of patients receiving ECT. Out of all patients receiving ECT, 10 (25.6%) were currently suicidal while 29 (74.4%) were not suicidal. Figure 1 shows the distribution of patient according to their diagnosis for which ECT was applied. The most common diagnosis for which ECT was used was Schizophrenia 14(35.89%). Among cases of Schizophrenia, nine were cases of paranoid schizophrenia, three were catatonic schizophrenia and two were cases of undifferentiated schizophrenia. Among cases of organic psychosis, two cases were organic catatonic disorder due to Wilson's disease and Posterior reversible encephalopathy syndrome and one

case of interictal psychosis. Among cases of catatonia three cases were of catatonic schizophrenia while one case of OCD with catatonia.

The mean duration of hospitalization for cases receiving ECT was 35.84 ±15.68 days ranging from 12 to 68 days. Mean number of ECT received by patient was 7.85±2.42 ranging from minimum of 4 to a maximum of 14 sessions. Medical comorbidity of patient is shown in table 3. One patient with WPW syndrome, one Wilson's disease, one interictal psychosis (Complex partial seizure), two pregnant women (2nd and 3rd trimester), 6 post-partum period (2nd to 5th) and one with 4th week post-partum period with Posterior reversible encephalopathy syndrome (PRES) were successfully treated with ECT. One patient with schizophrenia with hyperlipidemia had ST-elevated Myocardial infarction (STEMI) during 14th ECT for which emergency angioplasty with stenting was done. No further ECT was applied for the case and medical optimization was done for schizophrenic symptoms. There was no mortality associated with ECT during the study period.

Symptomatic and functional outcomes

Brief Psychiatric Rating Scale (BPRS) was used to measure the severity of psychopathology. BPRS contains 24-item and measure four factors like Negative symptoms, positive symptoms, Manic-hostility and Anxiety-Depression.[6]Global assessment of functioning is a brief, easy to use single-item scale with 100 points divided into 10-point intervals. It is a clinician-rated scale used to measure the overall functioning of the patients in three dimensions like psychological, social and occupational.[7]Brief Psychiatric rating scale (BPRS) scores significantly improved during hospitalization,with mean BPRS 74.41±9.61 at admission and 47.30±7.27 at discharge (p-value 0.000). Patients also experiencedsignificant mean improvements in Global assessment of functioning (GAF) from baseline to endpoint. GAF mean levels were 20.20±6.03at admission and at discharge 57.949±11.05 (p-value0.001).

ECT significantly improved the symptomatic and functional outcomes in patients diagnosed with BPAD episodes, Schizophrenia, Post-partum Psychosisand Severe depression. There was no statistical significant improvement in cases with organic psychosis. (Table 4).

Table 1: Socio-demographic profiles of patients receiving ECT

	Frequency	Percent
Sex		
Male	16	41.0
Female	23	59.0
Marital Status		
Single	19	48.7
Married	20	51.3
Education		
Illiterate	4	10.3
Primary (up to class 5)	3	7.7
Secondary (6 to 10)	12	30.8
Higher secondary	11	28.2
University	9	23.1
Occupation		
Agriculture	2	5.1
Business	2	5.1
Service	2	5.1
Housewife	16	41.0
Student	8	20.5
Unemployed	9	23.1
Religion		
Hindu	30	76.9
Buddhist	8	20.5
Christian	1	2.6
Caste		
Brahmin	16	41.0
Chhetri	8	20.5
Newar	4	10.3
Mongolian	8	20.5
Others	3	7.7
Family income		
6851 – 11450	3	7.7
11451 – 17150	14	35.9
17151 – 22850	9	23.1
22851 – 45750	10	25.6
≥45751	3	7.7

Table 2: Family history among ECT recipients

	Frequency	Percent
BPAD 1st degree relative	1	2.6
BPAD 2nd degree relative	1	2.6
Intellectual disability 3rd degree relative	1	2.6
Paranoid schizophrenia 1st degree relative	1	2.6
Post-partum psychosis 1st degree relative	1	2.6
Suicide 1st degree relative	1	2.6

Table 3: Comorbidity among ECT recipients

	Frequency	Percent
None	21	53.84
25 weeks period of gestation	1	2.6
34 weeks period of gestation	1	2.6
Post-partum condition	6	15.38
4th week post-partum with posterior reversible encephalopathy syndrome	1	2.6
Diabetes, Dyslipidemia, Hypertension	4	10.4
Hypothyroidism	2	5.2
Uncontrolled seizure (CPS)	1	2.6
Wilson's disease	1	2.6
WPW syndrome	1	2.6
Total	**39**	**100.0**

Table 4: Symptomatic and functional outcome

	BPRSad	BPRSd	p-Value	GAFad	GAFd	p-Value
BPAD episodes	74.41±9.62	47.31±7.27	0.000	20.20±6.04	57.95±11.05	0.000
Schizophrenia	75.86±8.67	47.86±7.70	0.000	21.43±5.23	58.50±8.82	0.000
Post-partum Psychosis	73.33±9.14	48.33±2.80	0.001	17.33±5.13	59.50±7.66	0.000
Organic psychosis	75.67±8.08	47.33±7.23	0.850	19.00±7.00	45.33±18.58	0.580
Severe depression	80.00±11.79	44.00±6.08	0.020	16.00±6.56	70.33±10.78	0.004
Others	69.00±8.77	45.25±9.99	0.000	19.38±7.73	51.00±9.75	0.000

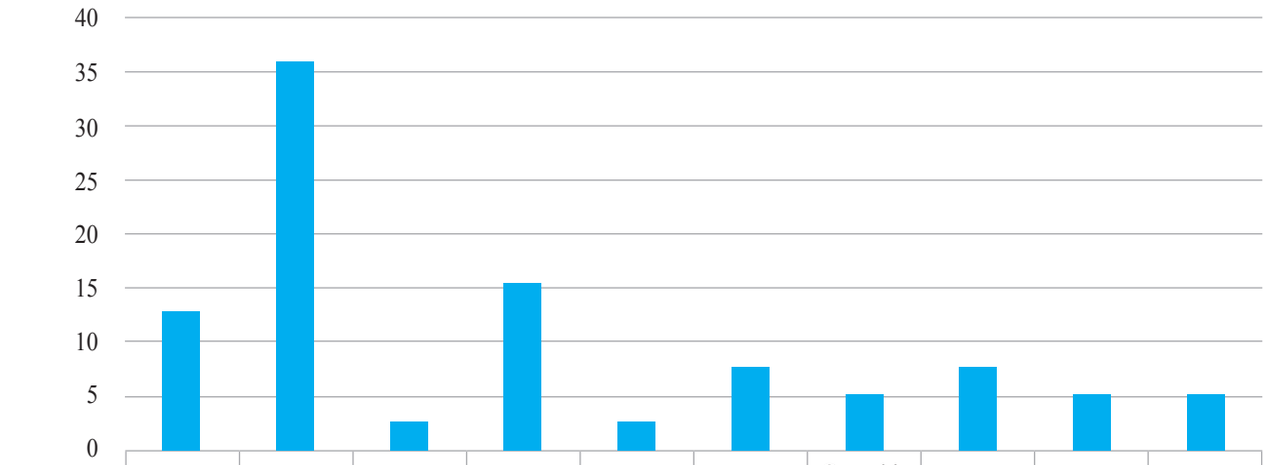

Fig 1: Diagnosis for ECT administration

Discussions

In the study 7.35% of all inpatients admitted for various psychiatric disorders were administered ECT. Inpatient prevalence of ECT use found is our study is comparatively less than one previous study done in Kathmandu[4], while similar to another psychiatry facility in western Nepal.[5] The inpatient prevalence was found to be similar to other Asian countries which ranged from 9-26%.[8]The socio-demographic profile of patients with psychiatric disorders who received ECT is similar to previous studies reported in Nepal[4,5,9]suggesting similar practice of ECT across all centers in Nepal. In this study mean age of the patient receiving ECT was 29.85±11.60, which is similar among most Asian studies but different to studies in western countries where more elderly cases receive ECT. This difference could be based on the common indication for ECT use which is depression in western context in comparison to schizophrenia in Indian and Asian context.[10] Only one case adolescent age group aged 14 was applied ECT for organic catatonic symptom due to Wilson's disease. Studies have demonstrated effectiveness of ECT for several psychiatric disorders among adolescents similar to adult population.[11] The reasons for less use among these population in our study may be due to lack of pediatric psychiatric inpatient services which led to few referrals.

Figure 1 shows the diagnosis for which ECT was used. The most common diagnosis among patients receiving ECT was Schizophrenia (35.89%) followed by post-partum psychosis (15.38%), BPAD episodes (12.8%) and severe depression (7.69%). The indication of ECT was similar to most previous studies done in Nepal and comparable to practice of ECT in Asian countries.[12] The reason for greater use of ECT among patients with schizophrenia in a study in India has mentioned augmentation of pharmacotherapy, rapid therapeutic response and treatment resistance as a common reasons.[13] Unlike our study finding, affective disorders were the most common indication for ECT use in USA, Europe and Australia.[8]The difference in indication for ECT in study in Thailand mentions differences in diagnostic practice, under recognition and undertreatment of depressive illness and less mental health care budget as a reason.[14]

Mean number of ECT received by patient in this study was 7.85±2.42, which is similar to other Asian countries where it was found to be 7.1.[12]The number of ECT session required was decided based on clinical improvement. ECT was continued until there was no improvement over last two sessions or obvious adverse effects. The mean duration of hospitalization for cases receiving ECT was 35.84±15.68 days. This is one factor that makes it difficult to convince patients and their families for ECT because of the cost implication due to long duration of hospitalization.

Table 3 shows the medical co-morbidity among recipients of ECT. Two pregnant females, one in 25 week

of gestation with paranoid schizophrenia and another in 34 week of gestation with BPAD 5th episode mania were administered ECT. There were no adverse maternal and fetal outcomes in both cases. Studies have shown that ECT is effective for treating major psychiatric illness during pregnancy with very low adverse events.[15] ECT can be given in patients with hypertension whether well or poorly controlled, implantable cardio-defibrillator and other cardiac conditions along with anti-hypertensives and other medications with avoidance of beta-blockers because of reduction of seizure duration and efficacy of ECT.[16,17]ECT can be administered safely in any neurological conditions including stroke, epilepsy, Normal pressure hydrocephalus, intra-cranial space occupying lesions, movement disorders, neurodegenerative and neurometabolic disorders. In such neurological conditions ECT is useful in controlling acute manifestations of psychosis, depression, catatonia and decrease the side-effects of psychotropics use to manage behavioral symptoms.[18,19]

Our study shows effectiveness in terms of improvement in psychopathology and functionality as measured by BPRS and GAF respectively (Table 4). Our study shows more than 50% reduction in symptoms from baseline in all enrolled patients. In Bipolar episodes, there was a statistically significant improvement in both the symptomatology and functional outcome (Table 4). One six-week randomized trial study showed that 79% of the patients showed improvement in ECT group against 35% of the patients who were only under psychopharmacology. [20,21] Improvement was greater in Bipolar mania patients as found in the randomized trial study comparing ECT with mood stabilizers.[22]

ECT in schizophrenia has been used in the background of acute management of psychosis and catatonic symptoms and as an augmentation in treatment resistance.[23,24] In our study we used ECT in schizophrenia to control acute psychosis because of which hospital stay could be shortened. Various case reports/series showed the effectiveness of ECT in the management psychosis and other behavioral problems arising in association with organic brain disorders including Wilson's disease as we found in this study too.[18,19] ECT is mostly administered in affective disorders in USA, Europe and other western countries. It provides rapid clinical response in severe depression associated with suicidality, severe psychosis and catatonia. Remission of depressive symptoms with ECT ranges from 76% to 93% as shown by different randomized trials.[12,13]

The major limitation of the study was that it was cross sectional study from one tertiary level hospital.The sample may be an over representation of complicated cases which were referred for diagnostic and management challenges.Hence, the sample cannot be representative of the general population. Patients who underwent ECT during hospitalization were also under psychopharmacological therapy. Comparison of clinical outcome between psychopharmacological alone therapy and both ECT and psychopharmacological therapy was not done in this study.

Conclusion

ECT is found to be effective in a wide range of psychiatric illness in terms of both improvement in psychopathology and psychosocial well-being. It can be administered safely in patients with most comorbid medical comorbidities. Few, if any, complications may arise which can be managed effectively in tertiary setting backup.

Conflict of interest: None declared

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