Efficacy of ECT in bipolar and unipolar depression in a real life hospital setting

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ABSTRACT

Background: It has been debated as to whether the polarity of mood disorder (bipolar versus unipolar) has prognostic significance for electroconvulsive therapy (ECT) outcome. In the treatment guidelines, ECT is recommended more readily for unipolar depression and not so for bipolar depression. This study aims to examine efficacy of bipolar and unipolar depression to ECT in a real life naturalistic setting.
Method: We studied the ECT parameters of all consecutive patients with a diagnosis of unipolar depression (recurrent depressive disorder, ≥2 episodes of depression) and bipolar depression referred for ECT between the months of July 2008 and December 2010 (BP-D: $n = 44$) and (UP-D: $n = 106$).
Results: When bipolar depression was compared to unipolar depression, the average motor seizure duration (mean = 46.9 and 46.7, $t = -0.06$, $p = 0.94$), number of ECTs required for improvement (mean = 6.4 and 6.5, $t = 0.17$, $p = 0.86$), duration of inpatient stay after ECT initiation in days (mean = 16.2 and 16.6, $t = 0.23$, $p = 0.81$) and improvement as assessed using a Likert scale (Mann–Whitney U, $Z = -0.09$, $p = 0.92$) were not statistically different between the groups.
Conclusions: We did not find any difference in efficacy of ECT between the two forms of depression in real life setting. This calls for justification of use of ECT in all patients with depression irrespective of the type of illness polarity and inclusion of ECT as a routine treatment option in bipolar depression guidelines.

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1. Introduction

Electroconvulsive therapy (ECT) is a somatic treatment option that has been extensively validated for the treatment of unipolar depression and has also been used for the treatment of both manic and depressive bipolar states. Mood disorders are divided into unipolar (UP) depression and bipolar (BP) depression according to the presence or history of a manic or hypomanic episode (APA, 1994). Based on the cross sectional clinical profile, there are no pathognomonic characteristics of bipolar depression compared to unipolar depression (Mitchell et al., 2008). However, the treatment guidelines for UP depression encourage the use of SSRIs as first line of treatment (APA, 2000). For BP depression mood stabilizers and atypical antipsychotics are considered primarily, while a word of caution is mentioned regarding antidepressant monotherapy for the fear of switch to the opposite pole (Suppes et al., 2002; Yatham et al., 2006).

In this manner, ECT does not form an important treatment option in bipolar depression according to the treatment guidelines. It is most often reserved for patients who do not respond to other forms of treatment and it figures at the end of the algorithm (APA, 2002; Fountoulakis et al., 2008). However, a recent body of evidence suggests that ECT could be useful in BP depression (Bailine et al., 2010; Sienaert et al., 2009). A recent meta-analysis which included six studies examining this aspect reveals that the response to ECT and the corresponding rates of remission was similar in bipolar and unipolar forms of depression (Dierckx et al., 2012). Hence there is a discrepancy in the evidence according to the literature and its translation into clinical guidelines. One also needs to examine this question without the stringent criteria of subject recruitment as seen with controlled trials, in order to interpret the results in a meaningful way closer to the clinical and real world scenario. In addition, there could be differences based on the different clinical populations between different parts of the world. For instance, indications for ECT (refractory depression vs. as a first line choice), age of the patient population etc. could be different across various study cohorts. In this study we sought to examine the efficacy of ECT in bipolar depression compared to unipolar depression in a larger sample of inpatients. More

importantly we sought to examine the benefit of ECT between both the types of depression in a hospital setting with ECT parameters supplemented with hospitalization indices. This would provide an understanding about the real life setting difference of the effectiveness of ECT between both the forms of depression.

2. Methods

2.1. Setting

National Institute of Mental Health and Neurosciences, Bangalore is a tertiary care psychiatric Institute in South India with a bed-strength of 550. Annually, about 500 patients are prescribed ECTs, of which most are inpatients. All patients are evaluated by a multi-disciplinary mental health team under the supervision of academic faculty. ICD-10 criteria are used to diagnose the psychiatric disorders. Consistent with the practice in the rest of the developing countries, the need to reduce the number of days of hospital stay with the hope of rapid response forms an important indication for starting ECTs (Chanpattana et al., 2005).

The ECT team consists of psychiatrists, anesthetists, ECT nurses, dedicated staff and a state-of-the-art ECT suite. Each patient undergoes a pre-ECT evaluation consisting of detailed psychiatric and medical history, clinical examination with particular emphasis on neuropsychiatric aspects, pertinent laboratory investigations and, where necessary, ECG as well as brain imaging. Seizure threshold is determined during the first ECT session by the titration method (Scott, 2005). During the course of ECT, if seizures are not elicited at electrical stimulus that was used during an earlier session, then the new threshold is determined by titration method again, starting from the previously used electrical dose. Treatment is administered using a NIVIQURE machine (Technonivilak, Bangalore, India). Brief-pulse stimulus is delivered with constant current at 800 mA, with a frequency of 125 pulses per second (62.5 Hz) and pulse width of 1.5 ms; the duration of train is altered to adjust the dose. All ECTs are administered under anesthetic modification (thiopentone 3–4 mg/kg and succinylcholine 0.5–1 mg/kg). Cuff-method is used to record the duration of motor seizures. The details of indications for ECT, seizure threshold, duration of seizures and ECT-related complications are documented in the case-records. Changes in the clinical picture of the patients are recorded by the nurses, psychiatry postgraduate resident doctors, senior registrars and consultant psychiatrists. The referring psychiatrists decide on the number of ECTs for each patient – the reason for stopping ECT (clinical improvement/complication/withdrawal of consent, etc.) are noted in the file.

2.2. Sample

We studied the records of patients with bipolar affective disorder in an episode of depression (BP depression, $n = 44$) and patients with recurrent depressive disorder (UP depression with ≥ 2 episodes of depression, $n = 106$) as per ICD 10, referred for ECT between the months of July 2008 and December 2010. All Patients received bilateral ECTs at 1.5 times the threshold stimulus dose.

2.3. Outcome measures

Clinical improvement and seizure parameters formed the measures of outcome. Two raters (JCN and BV) studied the records and rated the severity using the clinical global impressions scale (CGI). The overall improvement was rated using a five point Likert scale (1, 20% improvement or less; 2, 20–40% improvement; 3, 40–60% improvement; 4, 60–80% improvement; 5, 80–100% improvement) based on the CGI pre-post comparison. The inter-rater reliability between them was good on 20 randomly selected records (kappa = 0.67, $p < 0.01$). The number of ECT sessions received by the patients was used as a measure of speed of response, as the reason for stopping ECT was achievement of clinically significant improvement in all patients of both groups. An important reason for which ECT is prescribed in this setting is to shorten the hospital stay. In this background, the number of days of hospital stay following initiation of ECT was also considered as an outcome measure.

2.4. Statistical analysis

Statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 13.0 (SPSS Inc., Chicago, IL, USA). Continuous variables were analyzed using the independent sample t test; categorical variables were analyzed using the chi-square test. To control for the potential confounding effects of age of onset, concurrent use of anticonvulsants and severity measured by CGI on the outcome variable (number of ECTs), multiple linear regression analysis was used. The improvement level from the Likert scale was analyzed using the Mann–Whitney U test.

Table 1
Comparison of demographic and clinical variables between bipolar (BP) ($N = 44$) and unipolar (UP) ($N = 106$) depression.

	BP depression ($n = 44$), mean values (SD)	UP depression-($n = 106$), mean values (SD)	t/chi-square	p
Mean age in years (SD)	32.6 (10.9)	36.1 (13.5)	1.48	0.13
Mean age of onset of illness in years (SD)	24.3 (8.5)	30.3 (13.2)	2.79	0.001
Females [n (%)]	24 (54.5)	50 (47.2)	0.67	0.41
Bitemporal electrode placement (rest were bifrontal) [n (%)]	40 (90.9)	91 (86.7)	0.52	0.46
Comorbid psychiatric diagnoses [n (%)]	9 (20.5)	18 (17.0)	0.25	0.61
Melancholic symptoms [n (%)]	24 (54.5)	63 (59.4)	0.77	0.67
Suicidal ideations [n (%)]	25 (56.8)	80 (75.5)	5.15	0.23
Psychotic symptoms [n (%)]	29 (65.9)	52 (49.1)	3.55	0.06
Mean duration of treatment before ECT in days (SD)	4.2 (4.6)	4.8 (4.9)	0.76	0.44
Weight in kilograms (SD)	57.1 (12.9)	55.8 (14.1)	−0.52	0.59
Indications for ECT [n (%)]				
As a first line therapy	32 (72.5)	83 (78.3)	0.46	0.42
To augment pharmacotherapy/medication resistant	12 (27.3)	23 (27.1)		
Clinical global impression – severity at the start of ECT sessions (SD)	5.4 (0.6)	5.7 (0.6)	0.09	0.04
Thiopentone – mg (SD)	172.3(39.3)	163.4 (42.0)	−1.20	0.23
Succinylcholine – mg (SD)	29.6 (6.8)	29.5 (8.0)	−0.09	0.93
Concurrent use of anti-epileptics [n (%)]	6 (13.6)	1 (1.0)	11.14	0.001

P-value < 0.05 is considered statistically significant.
t-independent samples *t* test.