



## ORIGINAL RESEARCH ARTICLE

### ELECTROCONVULSIVE THERAPY IN MOOD DIORDERS

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#### ABSTRACT

Electroconvulsive therapy (ECT) is one of the less used somatic treatments in mood disorders, especially depressive phase. ECT use has importance during acute bipolar episode when patient extremely violent, suicidal and extreme psychomotor retardation. The aim of this study was to know about socio-demographic profile and therapeutic efficacy of the use of ECT in mood disorders. This is a prospective comparative study between patients who received ECT and who did not. Psychopathology was evaluated using Young Mania Rating Scale (YMRS) and Hamilton Depression Rating Scale (HDRS) between the groups at admission, at discharge, at 1st month, at 6th month and at 12th month. Modified ECT was performed using general anesthetic agent. Twenty five patients received ECT as compared to 32 patients who were non-receivers. There was significant decrease in HDRS in ECT receiver as compared to non-receivers in patients with depression (both unipolar and bipolar) at discharge, 1st month, and 12th month; in YMRS in patient with mania at discharge, 1st month and at 12th month. There was significant improvement in overall psychopathology and psycho-social status of patients who received ECT as compared to non-receivers. The improvement was shown by decrement in scores in HDRS and YMRS at the time of discharge, 1st month, 6th month and 1st year which were statistically significant.

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**Key Words:** *Neurocysticercosis, Risk factor, Seroprevalence*

#### INTRODUCTION

Mood disorders (both unipolar depression and bipolar disorders) are one of the commonest psychiatric conditions and cause serious problems throughout life. Electroconvulsive therapy (ECT) has been successfully used with very high efficacy in mood disorders, especially in depressive episode (of both unipolar disorders and bipolar depressive phase). The most important reason for the less use of ECT in modern days is due to availability of psychotropic drugs for mood disorders though ECT is still needed to have very quick response. Study shows nearly 80% efficacy in manic patients and rapid onset of actions in severe depression, mania and mixed affective states, suicidal patients and those patients with refractory illness.<sup>1,2</sup>

The mood disorder pharmacopoeia (for both mania / depression) has steadily increased over the past 10 years. With substantial clinical advances, it is often forgotten how effective ECT is for mood disorders variants- bipolar depression with a switch into mania, refractory mania, chronic refractory unipolar and maintenance ECT for bipolar disorder. Although it would be difficult to study with a controlled comparative design, many clinicians think that ECT is still the best mood stabilizer we have to date.

Current study will try to evaluate the efficacy of ECT use in mood disorders in Nepal. This will be the first effort in Nepal to

analyze the efficacy of ECT in mood disorders.

#### Methods:

**Study Design-** This was a naturalistic prospective study of patients who were admitted in the in-patient unit of medical college psychiatry department. Patients were assessed by qualified psychiatrists and diagnosis of schizophrenia was done as per ICD-10.<sup>3</sup>

#### INCLUSION CRITERIA:

- Patients and informants who were willing to participate in the study and gave consent.
- Patients diagnosed as mood disorders (depressive disorders and bipolar disorders) that had history of excitement /over activity / self-harm & harm to others and extremely difficult to manage in wards despite adequate psychotropic drugs. Patients who are refractory to medical treatments were also included. Final decision to give ECT was decided by psychiatrists.

#### EXCLUSION CRITERIA:

- Patients and informants who refused to give consent.
- Current history of alcohol and substance abuse.
- Other general medical conditions that led to psychotic symptoms.

Apart from informed consent from patients and relatives, ethical guidelines for biomedical research on human subjects by Nepal Health Research Council (NHRC) were also adhered to, in addition to principles enunciated in the “declaration of Helsinki”.

Sample consists of 57 patients admitted with mood disorders. Patients were of bipolar disorders- mania / depression/ mixed states and unipolar depression as their diagnostic variability’s are given in Table 2. Of them, 25 patients were given ECT (considered as ECT-receivers or ECT-R) and 32 patients did not receive ECT (considered as ECT-non-receivers or ECT-NR). They were assessed at the time of admission, at discharge, during first month / sixth month and at 12<sup>th</sup> month of follow-up.

### ASSESSMENT

- Demographic form: This form collected demographic variable- age, gender, educational level, marital status and occupation.
- Assessment of psychopathology was assessed by Hamilton Depression Rating Scale (HDRS) and Young Mania Rating Scale (YMRS) were used wherever they were needed.<sup>4,5</sup>

**ECT Technique:** Pre-anesthetic assessment was necessary a day prior to procedure from the anesthesia department. ECT was done under general anesthesia using anesthetic agents such as Propofol (2-5mg/kg) or Sodium Thiopentone (10-15mg/kg). Succinylcholine (20-30mg/kg) was used as a muscle relaxant after with above mentioned agents. Masked ventilation was also done using 100% oxygen and vital signs were monitored along with ECG throughout the procedure. One of the arms was spared with B.P. cuff before administrating muscle relaxant so that adequate convulsing can be seen during ECT. At least 15 seconds of convulsion was considered as an effective convulsion though it varies from 10 seconds to 120 seconds depending upon the dose of anesthetic agents and clamping of BP cuff. Upward titration of electrical dose was done according to clinical improvement of the patients. Patients were shifted to post-operative ward after they become conscious, they were kept there for at least 2 hours and shifted to psychiatric ward.

**ECT machine:** The machine used for administering ECT was ECTON constant current and brief pulse ECT which has been manufactured by RMS, Chandigarh, India. This machine has of two types of operations – Brief Pulse Mode 1(PLS1); Brief Pulse Mode 2 (PLS2); The Sine Wave. Almost all of the procedure used in this study was done using PLS-1 to maintain uniformity in the procedure.

**Concurrent medications:** All patients were continued on the same psychotropic drugs (antipsychotics and mood stabilizers) when they underwent ECT. Lithium was stopped during the ECT procedure. Other drugs were limited to trihexyphenidyl for extra pyramidal symptoms, benzodiazepines for sleep / anxiety and other medications for non-specific symptoms like body ache, headache. No other psychotropic other than mentioned above were used and no antidepressants were used. None of the patients in the study were on any long term medications for chronic medical illnesses.

**Statistical Analysis:** Statistical analysis was performed with SPSS program (version 12). Data interpretation was done along with mean, standard deviation. Chi-Square Test was used for assessing the statistical significance of the associations between the variables.

### RESULT

There were 25 patients who received ECT (as ECT receivers / ECT-R) compared with 32 patients who did not received ECT (as non-receivers / ECT-NR). These two groups of patients were compared in socio-demographic profile (age, gender, educational level, marital status and occupation) as shown in table 1.

Table 2 shows diagnostic variability of mood disorders, both unipolar depression and bipolar disorders (mania / depression / depression / mixed states). Table 3 gives technical details related of ECT receivers (N=25), mean number of ECT given, electric frequency used, pulse width, duration of current and duration of convulsion recorded. Table 4 shows psychopathological assessment of patients with depression [both unipolar depression and bipolar disorder (in depressive phase and mixed states)] using Hamilton Depression Rating Scale (HDRS) at admission, discharge, after 1<sup>st</sup> month, 6<sup>th</sup> month and 12<sup>th</sup> month of follow-up. HDRS was assessed in 16 ECT non-receiver and 12 ECT receiver patients. There was significant improvement in HDRS in ECT-R as compared to ECT non-R at the time of discharge, 1<sup>st</sup> month, 6<sup>th</sup> month and at 12<sup>th</sup> month of post discharge, also shown by statistical significance (p=0.000). Table 5 shows psychopathological assessment of patients with mania (mania / mixed states) using Young Mania Rating Scale (YMRS) at admission, discharge, after 1<sup>st</sup> month, 6<sup>th</sup> month and 12<sup>th</sup> month of follow-up. YMRS was assessed in 16 ECT non-receiver and 13 ECT receiver patients. There was also significant improvement at the time of discharge, 1<sup>st</sup> month, 6<sup>th</sup> month and 12<sup>th</sup> month of post discharge.

**TABLE 1: Socio-demographic Characteristics of Patients (sex, age, marital status, education and occupation)**

	ECT Non-receivers (N=32)	ECT Receivers (N=25)
<b>Gender</b>		
Male	19	14
Female	13	11
<b>TOTAL</b>	<b>32</b>	<b>25</b>
<b>Age</b>		
10-19 years	2	2
20-29 years	12	10
30-39 years	13	9
40-49 years	2	4
50-59 years	2	0
Above 60 years	1	0
<b>TOTAL</b>	<b>32</b>	<b>25</b>

Marital Status		
Married	15	11
Unmarried	13	9
Separated	3	3
Widowed	1	2
<b>TOTAL</b>	<b>32</b>	<b>25</b>
Education		
Illiterate	4	2
Primary	6	2
Middle	7	3
High School	7	11
Intermediate	5	4
Graduate	2	2
Post graduate	1	1
<b>TOTAL</b>	<b>32</b>	<b>25</b>
Occupation		
Business	1	0
Farmer	5	5
Labor	6	5
Service	3	1
Student	7	6
House wife	3	4
Unemployed	6	3
Others	1	1
<b>TOTAL</b>	<b>32</b>	<b>25</b>

**TABLE 2: Diagnostic variables of mood disorders (Based on ICD-10). (Diagnosis written above in the table are not exact in the words found in ICD-10 due to lack of space. Some modifications have been done)**

Psychiatric Diagnosis	ECT non-receivers (N=32)	ECT receivers (N=25)
1. F32.3 (severe depression with psychotic symptoms)	4	3
2. F31.2(bipolar mania with psychosis)	4	5
3. F32.2((severe depression without psychotic symptoms)	9	8
4. F30.2(mania with psychotic symptoms)	2	3
5. F31.5(bipolar disorder, severe depression with psychosis)	3	3
6. F31.6(bipolar disorder, mixed)	1	2
7. 33.3(recurrent depression, current severe with psychosis)	1	1
8. F30.1(mania, without psychosis)	2	0
9. 33.2(recurrent depression, current severe without psychosis)	2	0

10. F31.1(bipolar disorder, mania without psychosis)	2	0
11. F31.4(bipolar disorders, severe depression without psychosis)	2	0
<b>TOTAL</b>	<b>32</b>	<b>25</b>

**TABLE 3: Details of ECT MACHINE (N=25)**

	No. of ECT	Frequency (Hz)	Pulse width	Duration of current	Current	Duration of convulsion
Mean	5.85	70.50	1.756	1.779	740	27.55
Minimum	2	50	1.20	1.3	550	11
Maximum	11	85	2.00	2.0	800	35

**TABLE 4: Comparative scores, means and p values of Hamilton Depression Rating Scale (HDRS) between ECT non-receivers and receivers at admission, discharge, 1<sup>st</sup> month, 6<sup>th</sup> month and 12<sup>th</sup> month**

ECT Receivers vs. Non-receivers		HDRS at admission	HDRS at discharge	HDRS 1 month later	HDRS 6 months later	HDRS 12 months later
ECT non-receivers	Mean	41.92	26.33	18.71	14.08	9.67
	N	16	16	16	16	16
	Std. Deviation	2.430	2.632	3.277	2.717	2.316
ECT receivers	Mean	44.20	20.47	12.67	8.13	4.60
	N	12	12	12	12	12
	Std. Deviation	3.005	3.925	3.331	4.518	3.521
Statistical significance (p value)		0.013	0.000	0.000	0.000	0.000

**TABLE 5: Comparative scores, means and p values of Young Mania Rating Scale (YMRS) between ECT non-receivers and receivers at admission, discharge, 1<sup>st</sup> month, 6<sup>th</sup> month and 12<sup>th</sup> month**

ECT Receivers vs. Non-receivers		YMRS at admission	YMRS at discharge	YMRS 1 month later	YMRS 6 months later	YMRS 12 months later
ECT non-receivers	Mean	41.46	21.00	13.77	10.15	6.08
	N	16	16	16	16	16
	Std. Deviation	2.876	2.582	1.922	2.410	2.691
ECT receivers	Mean	44.38	15.85	8.62	10.23	3.00
	N	13	13	13	13	13
	Std. Deviation	2.844	5.857	5.042	12.788	3.240
Statistical significance(p value)		0.016	0.008	0.002	.983	0.015

**DISCUSSION**

In a survey of practice of ECT in Asia, schizophrenia (41.8%) was followed by major depression (called unipolar depression in this article) (32.4%) and mania (14%).<sup>6</sup> The available evidence shows that ECT is as effective as or more efficacious than medications, including lithium, typical / atypical antipsychotics and their combination. This study has also proven that ECT is not only effective in acute phase but also efficacious in maintaining the improvement in psychopathology, in both depressive phase

and manic phase. Studies have shown that ECT seems to reduce duration of hospitalization and to delay rehospitalization.<sup>7,8</sup> This study has similar findings with studies done in other countries like USA and Brazil where efficacy of ECT had shown in mania when patients are violent, severe manic symptoms, psychotic symptoms, worse chronicity predictors (longer duration, multiple episodes).<sup>9,10</sup> ECT administration becomes critical in a clinical set up like ours where faster onset of action is needed along for sustained improvement in clinical status of patients. As shown in this study and other studies, more than 80% patients improving clinically for a long period of time<sup>1,11,12,13,14</sup>.

As similar to this study and other studies, ECT has the highest response rate of all treatments for acute episodes of bipolar depression and major depression<sup>15, 16, 17</sup>. Guidelines (American Psychiatric Association, 2001<sup>12</sup>; National Institute of Clinical Excellence, 2003<sup>13</sup>; Scott, 2005<sup>14</sup>) do not differentiate bipolar from unipolar depression and the indications remain the same in both- emergency treatment needing rapid and definitive response, pregnant women with depression, high suicidal risk, patients with good response to ECT, severe psychomotor retardation, poor response of drugs in the past. Most importantly, patient and their relatives may also choose ECT as treatment for their depression.

ECT has been underutilized treatment in bipolar mixed states. As in this study along with other comparable studies<sup>18, 19, 20</sup>, it is also highly efficacious in Bipolar-mixed disorders.

ECT is also shown to be efficacious in unipolar depression, though response to ECT is equally advantageous in depression of unipolar and bipolar. This study also showed effectiveness of ECT for a long period of time, since patients were followed up for one year post discharge is comparable with other studies<sup>21,22,23,24,25</sup>. As depression is a debilitating illness with prolonged morbidity and suicidal risk, it is better to prescribe ECT to reduce future refractoriness and chronicity.

## CONCLUSION

There had been statistically significant decrement found in psychopathological aspects of patients who received ECT as compared to non-receivers of ECT in HDRS and YMRS. Their status were compared at the time of admission, discharge, at 1<sup>st</sup> month of follow-up, 6<sup>th</sup> month of follow-up and at the 12<sup>th</sup> month of follow-up. Duration of hospitalization was also decreased in patients who received ECT as compared to non-receivers. This study had covered all the diagnostic spectrum of mood disorders (severe depression, mania and mixed affective states, suicidal patients and those patients with refractory illness) and in all cases ECT was found to be equally effective. If patients are treated early in the course of illness, significant risk of chronicity and deterioration in personality could be avoided.

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