

Effectiveness of Electroconvulsive Therapy (ECT) in Patients with Psychiatric Disorders not Responding to Pharmacological Treatment: a Prospective Study

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ABSTRACT

Introduction: Despite considerable advancement in the pharmacotherapy of psychiatric disorders, there is still a sizeable population of psychiatric patients which does not respond to various psychotropic drugs. Further, no comprehensive study has been carried out in India or elsewhere, which assesses the effectiveness of electroconvulsive therapy (ECT) in pharmacotherapy resistant psychiatric patients. Aim: To assess effectiveness of ECT in pharmacotherapy resistant psychiatric patients at the end of ECT course.

Material and Methods: The study was a non-controlled prospective interventional study conducted in Institute of mental health and neurosciences (Government Medical College, Srinagar, India), comprising 56 patients of pharmacotherapy resistant psychiatric disorders. The patients were assessed by Clinical Global Impression (CGI), Montgomery Asberg Depression Rating scale (MADRS), Young Manic Rating Scale (YMRS) and Yale-Brown Obsessive Compulsive Scale (YBOCS) one day after last ECT. Improvement was defined with CGI subscale by comparing the position of patient at admission to projected condition with the therapy.

Results: CGI scale revealed that improvement in patients at the end of ECT course was 78%. Quantitative data was analysed by one way Analysis of Variance and qualitative by using Pearson's Chi square test. p value of < 0.05 was considered to be statistically significant.

Conclusion: ECT is an effective treatment in pharmacotherapy resistant psychiatric disorders.

Keywords: Electroconvulsive therapy (ECT), pharmacological resistant psychiatric disorders, Clinical Global Impression (CGI), Montgomery Asberg Depression Rating Scale (MADRS), Young Manic Rating Scale (YMRS), Yale-Brown Obsessive Compulsive Scale (YBOCS).

terms of dosage, duration, and compliance) fail to produce a significant clinical improvement.⁴ Further, mania is considered treatment resistant, when patients do not respond to combination of 2 standard medications for 6 weeks.⁵ On the other hand, treatment-refractory OCD generally applies to patients who have failed at least three therapeutic trials of Selective Reuptake Inhibitors [SSRI's + SNRI's] (with clomipramine being one of the SRI trials), the use of at least two atypical antipsychotics as augmenting agents, and treatment with behavioral therapy while on a therapeutic dose of an SRI.⁶ The consequences of treatment resistance are devastating for the patients, including poor quality of life, chronic disability, increased risk for medical illness, substance and alcohol abuse and suicide, as well as for families and societies who have to deal with the increasing psychological and financial burden.⁶

ECT is a therapeutic tool which is widely used in India, compared to western countries, especially for treatment resistant psychiatric disorders. Despite its high efficacy and low side effects, it has remained a very controversial treatment. The reason for this could be lack of awareness and knowledge about the use of ECT.¹⁻³ However in India, 13 to 14 % of patients receive ECT, which is quite greater than western countries. It is heartening to see that many of the psychiatrists in India have positive attitudes towards ECT use in various Psychiatric disorders.¹⁻³ Further the notion of prophylactic treatment is readily and widely applied to pharmacotherapy, but often ignored with ECT. Maintenance ECT (MECT) has no fixed endpoint, and its purpose is to prevent recurrence of separate episodes of the illness.⁷

The use of ECT has been among one of the main pivots of psychiatric services in the lone mental health institute of Kashmir (India). To the best of the knowledge of the authors, no

INTRODUCTION

Psychological as well as psychiatric disorders are on a rise in Kashmir from the last two decades. During this period, there have been periods of insurgency and political turmoil, which have further increased psychiatric morbidity.^{1,2} Although there have been considerable advances in understanding of pathophysiology of psychiatric disorders and availability of effective therapies for the same, there are still a sizeable number of psychiatric patients, that do not adequately respond to various approved medications. These patients are said to be treatment resistant.³

In psychiatry, treatment resistance is defined in different psychiatric disorders in different ways. Depression is usually considered resistant when at least 2 trials with antidepressants from different pharmacologic classes (adequate in

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comprehensive study has been done in India and elsewhere, which assesses effectiveness of electroconvulsive therapy in four groups of pharmacotherapy resistant psychiatric patients (Unipolar depression, bipolar depression, BPAD in mania and OCD) at post ECT follow up. However, Jain et al, 2008 looked at the response to ECT in elderly patients with psychiatric illness in a retrospective study and found that 80 to 90% patients had shown some improvement.³²

Materials and Methods:

Setting: This study was carried out in the Institute of mental health and neurosciences, Srinagar, an associated hospital of Government Medical College, Srinagar after getting ethical clearance from ethical committee of Government Medical College, Srinagar. The Hospital serves to whole Kashmir region, along with some adjoining areas of Jammu and Ladakh region, a population of about 12.5 million (census 2011).⁸

Study design: The study is a non-controlled prospective interventional study carried over a period of one year and two months (from March 2012 to April 2013).

Sample size: 56 patients of pharmacotherapy resistant psychiatric disorders. General information including age, sex, residence, occupation, socioeconomic status, etc. was recorded. The patients were assessed by Clinical Global Impression (Improvement subscale)⁹ one day after the last ECT. Individual scales like Montgomery Asberg Depression Rating Scale (MADRS),¹⁰ Young Manic Rating Scale (YMRS)¹¹ and Yale-Brown Obsessive Compulsive Scale (YBOCS)¹² were used one day before ECT and one day after ECT. Improvement was defined with CGI improvement subscale by comparing the position of patient at admission to projected condition with the therapy. Patient is said to be improved if he/she attains a score of 1 or 2 on CGI-I subscale.

Clinical Global Impression (CGI) is a 3-item observer-rated scale that measures illness severity (CGI-S), global improvement or change (CGI-I) and therapeutic response (efficacy index). The improvement section of the instrument has been used more frequently than the therapeutic response section in both clinical and research settings.⁹

Montgomery Asberg Depression Rating Scale (MADRS) is 10 point scale that measures the severity of depressive episodes. Each item yields a score of 0 to 6. The overall score ranges from 0 to 60.

Young Manic Rating Scale (YMRS) is 11-item scale used to assess disease severity in patients with mania.¹¹ The scores from each question are added together to form a total score ranging from 0 to 60, with higher scores indicating a greater severity of symptoms.

Yale-Brown Obsessive Compulsive Scale (YBOCS) is a 10-item balanced scale designed to rate both the severity and type of symptoms in patients with OCD.¹²

The socio-demographic and clinical data of the patients were recorded in a semi-structured case sheet.

The inclusion criteria included Patients of pharmacotherapy resistant psychiatric disorders (both males and females).

The Exclusion Criteria included patients who did not give consent, had never received a trial of pharmacotherapy, pa-

tients in whom general anaesthesia was contraindicated and age less than 13 years.

Electroconvulsive therapy administration: ECT was administered with brief-pulse, bilateral, modified ECT. Written informed consent was sought from patients and their relatives; those who were considered incapable of consenting had participated with the consent of their closest family member or custodian. Consenting patients underwent physical assessment and investigations as required and were also assessed by an anaesthetist. Motoric seizure of at least 15 seconds was considered to be an effective ECT.

A minimum of 6 and maximum of 12 sessions of ECT were given to patient. ECT was continued till the patient became asymptomatic and scored 1 or 2 on CGI-I, or had shown no further improvement over 2 consecutive ECTs, or did not give consent for further continuation of ECT or had completed a maximum of 12 sessions. All sedative/ hypnotic agents were withdrawn or the dose was reduced before administration of ECT.

STATISTICAL ANALYSIS

Quantitative data was analysed by using one way Analysis of Variance, Post Hoc tests were used for pairwise comparison of groups and qualitative data was analysed by using Pearson's Chi square test. The p value of < 0.05 was considered to be statistically significant. Data was analysed by using SPSS Version 20.0.

RESULTS

Table 1 shows age, gender and clinical diagnosis of the studied group and the number of ECTs received by the patients. The mean age of all the studied patients was 39.6(±11.76). 51% were males and 48.2% were females. The most common diagnosis was unipolar depression (53.6%), followed by BPAD in mania (19.7%). 34 (68%) patients had received

	No. of patients	Percentage
Age (in years)		
21-30	14	25%
31-40	15	26.8%
41-50	16	28.6%
51-60	9	17.8%
>60	1	1.8%
Mean = 39.6(±11.76)		
Sex		
Males	29	51.8%
Females	27	48.2%
Clinical Diagnosis		
Unipolar depression	30	53.6%
BPAD in depression	10	17.8%
BPAD in mania	11	19.7%
OCD	5	8.9%
No. of ECTs		
6-9	34	68%
10-12	16	32%
Total	50	100%
Mean=8.22(±2.073)		

Table-1: Age, gender and clinical diagnosis of the studied group and number of ECTs received by patients

	Total no. of patients	Improved	Not improved	Chi square	p value	MEAN SCORES (Pre-ECT Score = M1, Post-ECT Score =M2)	Comparison M1 vs. M2
All patients	50 (100%)	39 (78%)	11 (22%)	2.511	0.28		
Patients with Unipolar depression	27 (100%)	21 (77.8%)	6 (22.2%)	1.438	0.487	Mean MADRS M1 = 41.60+4.88(n=30)	Mean difference = 30.193
						Mean MADRS M2 = 11.41+8.13(n=27)	p value = ≤ 0.0001
Patients with Bipolar depression	9 (100%)	7 (77.8%)	2 (22.2%)	1.438	0.859	Mean MADRS M1 = 41.50+1.07(N=10)	Mean difference = 32.389
						Mean MADRS M2 = 9.11+7.11(N=9)	p value = ≤ 0.0001
Patients with BPAD in mania	9 (100%)	8 (88.9%)	1 (11.1%)	0.587	0.746	Mean YMRS M1 = 50.09+3.936(N=11)	Mean difference = 37.758
						Mean YMRS M2 = 12.33+8.10 (N=9)	p value = ≤ 0.0001
Patients with OCD	5 (100%)	3 (60%)	2 (40%)	2.4	0.301	Mean YBOCS M1 = 28.60+3.71(N=5)	Mean difference = 12.50
						Mean YBOCS M2 = 16.10+8.87(N=5)	p value = 0.044

Table-2: Global improvement of studied patients, and comparison of mean MADRS scores in unipolar and bipolar depression, YMRS score in mania and YBOCS score in OCD patients at pre ECT(M1) with end of ECT course(M2)

6-9 ECT's, whereas 16 (32%) patients had received 10-12 ECT's. The mean number of ECT's received was 8.22 (± 2.073).

Table 2 shows global improvement of studied patients, and comparison of mean MADRS scores in unipolar and bipolar depression, YMRS score in mania and YBOCS score in OCD patients at pre ECT(M1) with end of ECT course(M2) improvement of patients according to CGI at the end of ECT course. 39 (78%) patients were found to be improved as per CGI. The p value was 0.28 which is insignificant. Among patients with unipolar depression, 21 (77.8%) patients were found to be improved at the end of ECT course. The p value was 0.487 which is insignificant.

Likewise for patients with BPAD in depression (Bipolar depression), BPAD in mania, and OCD patients, a total of 7 (77.8%), 8 (88.9%), and 3 (60%) patients showed significant improvement, respectively, at the end of ECT as per CGI, with their respective p values being 0.859, 0.746 and 0.301. This table also shows mean MADRS scores in unipolar and bipolar depression, mean YMRS scores in BPAD in mania and mean(SD) YBOC scores in OCD patients.(at pre ECT and at end of ECT).The difference of mean MADRS in unipolar and bipolar depression and mean YMRS score in mania patients between pre ECT (M1) and at the end of ECT course (M2) was statistically significant (p value ≤ 0.0001). The difference of mean YBOCS score between pre ECT and at the end of ECT course is also significant (p value ≤ 0.044).

DISCUSSION

The mean age of the study population was 39.6 (± 11.76) years, approximately 10 years younger than people receiving ECT's in western world.¹³ In our study, out of 56 patients, 50 (89.28%) completed the course of ECT. It was noted that 78% of patients, who completed the course of ECT were reported as improved (as per CGI-I). The finding of the study is in agreement with Moksnes et al (2010)¹³, who found 85.1% of patients receiving ECT improved at the end

of the ECT course. In patients of BPAD in mania, 88.9% had shown improvement at the end of ECT course. The high effectiveness of ECT in mania can be explained by the powerful anticonvulsant properties of ECT. Mood stabilisers used for the treatment of mania have anticonvulsant activities and are quite effective in treatment of mania patients.¹⁴ Among patients with unipolar depression, 77.8% of patients were found to be improved at the end of ECT course. Controlled studies have suggested that up to 70% of patients who failed to respond to antidepressants may respond positively to ECT.¹⁵ However this finding is in contrast to Meddaa et al (2009)¹⁶, who showed more improvement in the studied group, compared to the findings of the study. The difference in response might be due to the fact that in the study, we had only pharmacotherapy resistant patients and response rate of pharmacotherapy treatment resistant patients to ECT might be low as compared to non pharmacotherapy resistant patients.^{17,18}

Among patients with Bipolar depression (BPAD in depression), 77.8% of the patients were improved at end of ECT course. The finding of the study suggests that ECT is highly efficacious in treating depressive symptoms of patients suffering from bipolar depression and not responding to adequate pharmacotherapy trial in the past. This finding of the study is supported by Dabrowski et al (2012)¹⁹, who found that 73% of the depressive patients with bipolar disorder were fully improved following the course of ECT. In every part of the world, OCD is quite a challenge to treat. It was a pleasant surprise to see that 60% of OCD patients had shown improvement after ECT course. A review of literature regarding OCD treatment shows that use of ECT in treatment resistant OCD is quite sparse. To the best of the knowledge of the authors, only isolated case reports showing efficacy of ECT in OCD have been reported. The primary indications in all case reports for ECT use would be OCD with severe depression.⁵ Our finding suggests that ECT is quite effective in controlling obsessive and compulsive symptoms of OCD.

The mechanism for this might be that ECT is believed to increase serotonergic functions, that suggests ECT might be useful treatment in refractory OCD.^{20,21} Osso et al (2005)²² stated that ECT has an anti-obsessional effect and that might explain improvement in symptoms in OCD in the study population.

It was also observed that at the end of ECT course there was significant decrease in mean YBOC score in OCD patients, mean MADRS score in unipolar and bipolar depression and YMRS scores in patients with mania (p value is ≤ 0.0001). This finding is in accordance with other studies, in which significant decrease of psychopathological symptoms occur in various psychiatric disorders at the end of ECT.^{22,23}

CONCLUSION

ECT is an effective treatment of pharmacological resistant psychiatric disorders. Further research in this field on a larger group of patients should be done which would reveal more hidden options for treating psychotherapy resistant psychiatric disorders through ECT.

Limitations

1. Small size of the study group, purposive sampling
2. Selection bias, as the study was conducted in one hospital only

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