Print ISSN: 2321-6379
Online ISSN: 2321-595X
DOI: 10.17354/ijss/2017/320

Original Article

Efficacy of Electroconvulsive Therapy in Treatment-Resistant Psychiatric Disorders - An Interventional Study from Jammu and Kashmir, North India

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Abstract

Background: Electroconvulsive therapy (ECT) is a biological therapy where seizures are induced under medical supervision by passing electric current across the scalp. Despite its unparalleled record of safety and efficacy, it is regarded as controversial treatment due to frequent misrepresentations of ECT in the media, and distorted information about ECT which was conveyed to public by various peoples having social and political agendas.

Objective: To study the efficacy of ECT in the treatment resistant psychiatric disorders.

Materials and Methods: This study which was prospective and interventional was conducted over a period of 1 year and 2 months on 56 psychiatric patients who were given ECT following treatment resistance. The patients were assessed by clinical global impression (efficacy subscale) 1 day after last ECT, at 3 months follow-up, and at 6-month follow-up.

Results: The *P* value of comparison of efficacy index between end of ECT course, at 3 and 6 months follow-up is ≤0.0001 which is highly significant as 50% of the studied patients attained score 1 on efficacy index at 3 months after ECT as compared to 12% at the end of ECT course and 39.5% at 6 months after ECT course.

Conclusion: ECT is very effective in treatment resistant psychiatric and its efficacy increases on follow-ups.

Keywords: Efficacy of electroconvulsive therapy, Electroconvulsive therapy, Treatment-resistant psychiatric disorders

INTRODUCTION

Psychiatric disorders are among the leading causes of morbidity and mortality worldwide. Despite considerable advances in the understanding of the pathophysiology and the availability of effective therapies that include pharmacological and non-pharmacological approaches (somatic and psychotherapeutic), there are still a sizeable number of patients that do not respond adequately to treatment, either in the magnitude of the response or the persistence of the response. Treatment resistance is variably defined in different psychiatric disorders, and there are multiple factors that contribute to it, among them genetic, environmental, medical, and psychiatric comorbidities. 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 to families and societies who deal with the increasing psychological and financial burden. Careful diagnostic reevaluation of patients who appear treatment resistant must be conducted and the most effective evidence-based strategies applied to their care.[1]

Access this article online

www.ijss-sn.com

Month of Submission : 04-2017
Month of Peer Review : 05-2017
Month of Acceptance : 06-2017
Month of Publishing : 06-2017

Electroconvulsive therapy (ECT) has been used throughout the world since 1938 despite many pharmaceutical treatment advances. It is the oldest method of somatic treatment; long before chlorpromazine and lithium came.[2] It is the only form of physical treatment which has survived the

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advent of psychopharmacology. The survival of ECT over the years is only because of its time-tested efficacy in ameliorating and reducing psychiatric symptoms.[3] Despite its high efficacy and very low side effects, it has remained very controversial treatment due to negative publicity, stigmatizations attached to it and lack of awareness even among medical professionals. Due to these reasons, ECT has received low acceptability in the medical community and is one of the most underutilized biological treatments.[2] The standards and practices of ECT across the globe is strikingly diverse and different. In the developing countries like ours conditions though non-ideal is based on the practical issues especially the factors such as poverty and poor infrastructure. The ECT as a therapeutic tool is used widely in India may be even more than in the west. ECT is used for the same very indications in India as in the West with similar results.[3] The case of ECT is strengthened by its remarkable record of safety. ECT compares favorably with any procedure in all of medicine for its low morbidity and mortality. With recent advances in ECT technique, the safety profile of the treatment continues to be refined, and ECT is emerging a mainstream treatment in the psychiatric armamentarium. Furthermore, it has a predictably rapid onset of effect and can be performed in both inpatient and outpatient settings.[4]

MATERIALS AND METHODS

This study was conducted at Postgraduate Department of Psychiatry of Government Medical College, Srinagar over a period of 1 year and 2 months during which all the patients of treatment resistant psychiatric disorders who were taken for ECT were included whereas those patients who had never received drug trail and in whom ECT was given as acute management were excluded from the study. Pharmacotherapy to these patients was continued during as well as post-ECT. Patients were allowed to participate in the study only after written consent either from themself or from their legal caretaker. Overall, 56 patients were included in the study. The patients were assessed by clinical global impression (CGI) efficacy subscale[5] 1 day after last ECT, at 3 months follow-up and at 6 month follow-up. Efficacy was defined with CGI efficacy subscale by comparing the degrees of therapeutic effect and side effects due to ECT and following scores were attained. (0) Not assessed, (1) vast improvement with no side effects, (2) vast improvement with side effects which do not significantly interfere with patients functioning, (3) vast improvement with side effects which significantly interfere with patients functioning, (4) vast improvement with side effects which outweighs therapeutic effects, (5) marked improvement with no side effects, (6) marked improvement with side effects which do not significantly interfere with patients functioning, (7) marked improvement with side effects which significantly interfere with patients functioning, (8) marked improvement with side effects which outweighs therapeutic effects, (9) moderate improvement with no side effects, (10) moderate improvement with side effects which do not significantly interfere with patients functioning, (11) moderate improvement with side effects which significantly interfere with patients functioning, (12) moderate improvement with side effects which outweighs therapeutic effects, (13) minimal improvement with no side effects, (14) minimal improvement with side effects which do not significantly interfere with patients functioning, (15) minimal improvement with side effects which significantly interfere with patients functioning, and (16) minimal improvement with side effects which outweighs therapeutic effects.

Statistical Analysis

Quantitative data were analyzed using one-way analysis of variance, *post hoc* tests were used for pairwise comparison of groups, and qualitative data were analyzed using Pearson's Chi-square test. The $P \leq 0.05$ was considered to be statistically significant. Data were analyzed using SPSS Version 20.0.

OBSERVATION AND RESULTS

During the study following observations were made.

Table 1 and Graph 1 shows that maximum patients, i.e., 53.6% were of unipolar depression.

Table 2 and Graph 2 shows efficacy index at the end of ECT course, at 3 months follow-up and at 6 months follow-up of the studied patients. At the end of ECT course 6 (12%) patients attained score 1, 11 (22%) patients attained score 2, 9 (18%) patients attained score 3, 3 (6%) patients attained score 5, 7(14%) patients attained score 6, 3 (6%) patients attained score 7, 1 (2%) patient attained score 8, 3 (6%) patients attained score 9, 2 (4%) attained score 10, 4 (8%) patients attained score 11, and 1 (2%) patient attained score 13. At 3 months follow-up 25 (50%) patients attained score 1, 2 (4%) patient attained score 2, 5 (10%) patients attained score 5, 1 (2%) patient attained score 6, 11 (22%) patients attained score 9, 5 (10%) patients attained score 13, and 1 (2%) attained score 14. At 6 months follow-up 17 (39.5%) patients attained score 1, 12 (27.9%) patients attained score 5, 9 (20.9%) attained score 9, and 5 (11.6%) attained score 13. The *P* value of comparison was ≤0.0001 which was highly significant.

DISCUSSION

ECT was introduced to psychiatric practice in 1934. It was widely hailed as an effective treatment for schizophrenia and quickly recognized as equally effective for the affective disorders. Like other somatic treatments, it was replaced

Table 1: Clinical diagnosis of the studied patients

Clinical diagnosis	Number of patients (%)
Unipolar depression	30 (53.6)
BPAD in depression	11 (19.7)
BPAD in mania	10 (17.8)
OCD	5 (8.9)

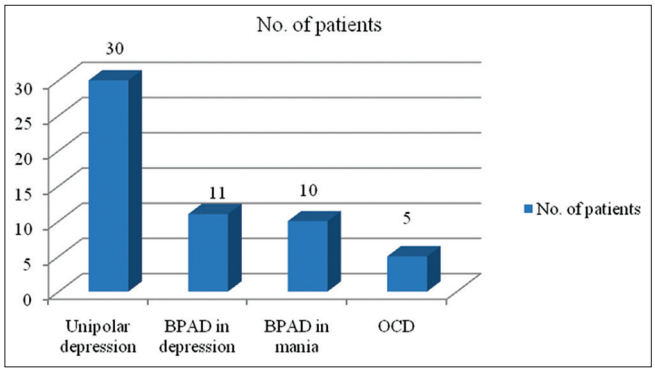
Table 2: Efficacy index of the studied patients

Efficacy index score	End of ECT course (%)	3 months follow-up (%)	6 months follow-up (%)
1	6 (12)	25 (50)	17 (39.5)
2	11 (22)	2 (4)	0 (0)
3	9 (18)	0 (0)	0 (0)
4	0 (0)	0 (0)	0 (0)
5	3 (6)	5 (10)	12 (27.9)
6	7 (14)	1 (2)	0 (0)
7	3 (6)	0 (0)	0 (0)
8	1 (2)	0 (0)	0 (0)
9	3 (6)	11 (22)	9 (20.9)
10	2 (4)	0 (0)	0 (0)
11	4 (8)	0 (0)	0 (0)
12	0 (0)	0 (0)	0 (0)
13	1 (2)	5 (10)	5 (11.6)
14	0 (0)	1 (2)	0 (0)
15	0 (0)	0 (0)	0 (0)
16	0 (0)	0 (0)	0 (0)
Total	50 (100)	50 (100)	43 (100)

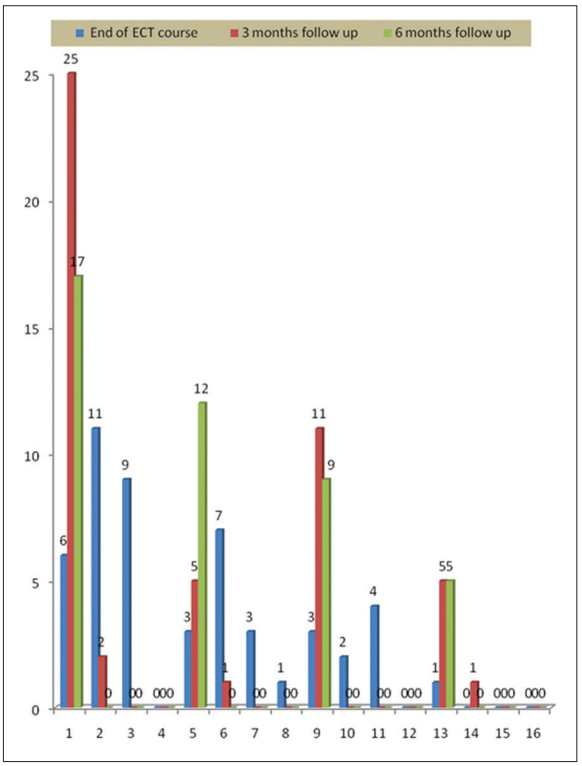
Chi-square=94.420, $P \leq 0.0001$, ECT: Electroconvulsive therapy

by psychotropic drugs introduced in the 1950s and 1960s. However, two decades later, ECT was recalled to treat pharmacotherapy-resistant cases. Experiments to sustain its benefits with medications and with continuation ECT are underway.[6]

The exact mechanism of action of ECT is not known, but there is focus on change in neurotransmitter receptors and second messenger systems. Nearly, every neurotransmitter is affected by ECT, but downregulation of postsynaptic beta-adrenergic receptors was seen following a series of ECT sessions. ECT may cause an increase in postsynaptic serotonin receptors, no change in serotonin receptors, and a change in the presynaptic regulation of serotonin release. ECT has also been reported to effect changes in the muscarinic, cholinergic, and dopaminergic neuronal systems. In second-messenger systems, ECT has been reported to affect coupling of G-proteins to receptors, the activity of adenylyl cyclase and phospholipase C, and the regulation of calcium entry into the neurons.[7] It may cause increased concentrations of the neurotransmitters dopamine, gamma-aminobutyric acid, and glutamate in certain areas of the brain.[8] A course of ECT may affects brain-derived neurotrophic factor, but the findings have been inconsistent as it remains to be established that an increase in the production of growth factors is relevant to the mode of action of ECT, but the suggestion merits further research.[9] The full impact of ECT as an intervention is yet to



Graph 1: shows clinical diagnosis of the studied patients



Graph 2: Shows efficacy index of the studied patients

be felt.[6] This study was conducted to find efficacy of ECT in treatment-resistant psychiatric disorders.

In our study majority our patients, i.e. 53.6% were of unipolar depression as the prevalence of depression (55.72%) is high in Kashmir and the high rates of the prevalence in the valley were largely attributed to continuing conflict in Kashmir during the past 20 years which has resulted in a phenomenal increase in psychiatric morbidity especially depression.[10] Other studies too had found similar results.[11,12]

Efficacy Index of the Studied of the Studied Patients

No literature was found regarding the use of efficacy index. This might be due to the fact that the improvement sections of the CGI scale are used more frequently than

the therapeutic response (efficacy index) section in both clinical and research setting.[5]

Out of 56, 50 patients completed ECT course. All 50 patients who had completed a course of ECT were followed up to 3 months whereas only 43 patients were followed up to 6 months.

At the end of ECT course 6 (12%) patients attained score 1, 11 (22%) patients attained score 2, 9 (18%) patients attained score 3, 3 (6%) patients attained score 5, 7 (14%) patients attained score 6, 3 (6%) patients attained score 7, 1 (2%) patient attained score 8, 3 (6%) patients attained score 9, 2 (4%) attained score 10, 4 (8%) patients attained score 11, and 1 (2%) patient attained score 13.

At 3 months follow-up 25 (50%) patients attained score 1, 2 (4%) patient attained score 2, 5 (10%) patients attained score 5, 1 (2%) patient attained score 6, 11 (22%) patients attained score 9, 5 (10%) patients attained score 13, and 1 (2%) attained score 14.

At 6 months follow-up 17 (39.5%) patients attained score 1, 12 (27.9%) patients attained score 5, 9 (20.9%) attained score 9, and 5 (11.6%) attained score 13.

The *P* value of comparison of efficacy index between end of ECT course, at 3 and 6 months follow-up is ≤0.0001 which is highly significant as 50% of the studied patients attained score 1 on efficacy index at 3 months after ECT as compared to 12% at the end of ECT course and 39.5% at 6 months after ECT course. The reason for this might be that the side effects due to ECT are usually mild and gets reversed in few days to few weeks. The most severe side effect, i.e., memory loss generally improves few weeks after ECT whereas other side effects such as nausea, vomiting, headache, body aches, attention, and concentration problems are temporary side effects that nearly always go away within hours to days after ECT.[13] As a result side effects due to ECT usually wanes of within few days to few weeks after ECT course and thus maximum number of improved patients attains Grade 1, i.e., vast improvement with no side effects at follow-ups. Moreover, we were using pharmacotherapy aggressively in our patients during and post-ECT which helps in increasing the therapeutic effects of ECT and thus prevents relapse in patients treated with ECT. Various researchers had also found that psychotropic medications are safer in combination with ECT and may augment antidepressant effects of ECT and helps to prevent relapses after ECT.[14] The finding can further be supported by Nordenskjold[15] who found that at 2 months only 18% of patients whereas at 6 months only 29% of patients treated with ECT plus pharmacotherapy were relapsed and thus therapeutic effects of ECT were maintained insignificant number of patients.

CONCLUSION

From this study, we are able to counsel that ECT is an efficient modality for treatment-resistant psychiatric disorders with delicate side effects that typically wanes off in few days to few weeks so increasing efficacy of ECT in follow-ups. However, there's little knowledge accessible relating to efficacy of ECT using CGI-E subscale, and therefore additional analysis during this field must be done using CGI-E subscale.

ACKNOWLEDGMENT

Authors thank from the core of my heart to GOD and my family for their blessings.

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How to cite this article: Manhas RS, Dar MM, Manhas A, Manhas GS. Efficacy of Electroconvulsive Therapy in Treatment-Resistant Psychiatric Disorders - An Interventional Study from Jammu and Kashmir, North India. Int J Sci Stud 2017;5(3):315-318.

Source of Support: Nil, **Conflict of Interest:** None declared.