

Efficacy and Safety of Maintenance ECT For Symptom Resolution of Aggression in Schizoaffective Disorder

Nayana S. Naik¹, Sneha B. Suresh², Shreelakshmi Malliya³

^{1,2,3}Institute of Psychiatry and Human Behaviour, Bambolim Goa

Corresponding author: Nayana S.Naik

Email – nnaik2002@yahoo.co.in

ABSTRACT

Electroconvulsive therapy (ECT) remains as one of the most effective treatments for the patient with Major depressive disorder, schizophrenia and schizoaffective disorder. Many Patients relapse after successful course of ECTs despite the continuation of pharmacotherapy. ECT is the only treatment in Psychiatry that is stopped when patient gets better. Despite its high efficacy, a major downside of ECT is the high rate of relapse after treatment ranging from 50% to 80% relapse within a year. Continuation (C-ECT) and maintenance ECT (M-ECT) is used to reduce the risk of relapse and recurrence of illness in patients who do not respond adequately to pharmacotherapy. ECTs also avoid long term adverse physical health effects of drug treatment. Although maintenance ECT can be useful and cost-effective treatment to prevent relapse and recurrence, there are no definitive recommendations regarding choice, frequency, duration of continuation ECT (C-ECT) and Maintenance ECTs (M-ECT) following acute ECTs. Recent studies show that ECT may be safe and effective way to address behavioural and psychological symptoms of Dementia. Despite the positive clinical experience of more than 75years, C-ECT and M-ECT are still underused mode of treatment.

We describe a case of 66-year-old female patient with the history of schizoaffective illness with poor response to pharmacotherapy treated effectively with alternating acute and maintenance ECT trials. She has been receiving ECTs since 1985 till date. It is estimated that she has received up to 450 ECTs during last 40-41 years. Despite the extensive use of ECTs there is negligible cognitive impairment and excellent safety record. Our case report may add to the existing literature supporting maintenance ECT as safe and beneficial treatment to be offered on case-to-case basis.

Key Words: Maintenance ECT, cognition, aggression, schizoaffective disorder.

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INTRODUCTION

Electro convulsive therapy, the most widely available non-pharmacological treatment for severe mental illness. Since the development of Pharmacological convulsive therapy in 1934 and of electroconvulsive therapy (ECT) in 1938, ECT has proven far more valuable than just the intervention of last resort. In comparison with psychotropic medications, ECT can act more effectively, and rapid, clinical improvement seen after only a few treatments especially for severely ill patients with severe major depression with psychotic features, acute mania with psychotic features, or catatonia. For patients who are physically debilitated, elderly, or pregnant, ECT is also safer than psychotropic medications. After the introduction of effective psychotropic medications in the 1950s, there was a gradual decline in the use of ECT. However, over the years, there has been some disillusionment regarding the limited success of pharmacological treatments in psychiatry. Even today, 30%–40% of patients who suffer from depression and 20%–40% of those with schizophrenia do not reach remission with pharmacological treatment [1-2].

Continuation(C)-ECT and Maintenance (M) - ECT is used to reduce the risk of relapse and recurrence of illness in patients who do not respond adequately to pharmacotherapy. The frequency of C/M-ECT is reduced after the index ECT, lengthening the intervals between treatments from weekly to fortnightly, then monthly to prevent relapse or recurrence [3].

Indeed, ECT has an effect of reducing agitation and aggression in general. In view of the chronic characteristics of major mental illnesses, high recurrence rates, and high rates of resistance to drug therapy, some patients require multiple sessions of ECT. These treatments include continuation and maintenance ECT. C-ECT is provided immediately after achieving remission, with a gradual reduction of frequency and designed to reduce the possibility of rapid recurrence of symptoms. In practice, the literature infrequently distinguishes between these two forms of ECT [4]. Maintenance ECT (M-ECT), however, has an unlimited duration and is intended to reduce the likelihood of new episodes (recurrences) [5]. While the use of ECT in the acute phase of major mental illnesses is well established and evidence-based, there is dearth of information on continuation/maintenance ECT(C/M-ECT) and most of the existing research is anecdotal and methodologically problematic. Hustig and Onilov in their study found that some patients who were resistant to pharmacotherapy beforehand responded well after C-ECT [6].

ECT proves beneficial not only for the affective condition of patients with schizophrenia, but also for positive symptoms and Brief Psychiatric Rating Scale indices of hostility, anxiety, and activation. [7] C/M-ECT may be useful in combination with medication in patients who have responded well to ECT during the acute phase, if medication at the stable stage has not been effective, and in patients who cannot tolerate other treatments because of side effects or medical conditions [8].

Authors have reviewed the literature on continuation and maintenance ECT in different patient groups in 1997. They concluded that both continuation and maintenance ECT were efficacious, safe and well tolerated and cost effective [9]. Authors have studied 2279 patients, given 17,394 ECTs. There were no deaths reported and only transient cardiac arrhythmias in 9 patients were observed [10]. Adverse effects related to anesthesia are short and today it is practically without any danger of mortality. Headache is one of the common symptoms which have been observed. There has been some literature reporting transient memory impairment during the time of series of ECTs [11]. A researcher reported 3 cases where patients received 180 ECTs over 4 years. The initial worsening of some cognitive functions in the patient improved above pretest level. A review on cognitive functioning in elderly concluded that global cognition remained stable whereas learning verbal information and executive function was impaired [12].

Electroconvulsive therapy (ECT) has been used for many years, there is not sufficient data regarding the indications for continuation/maintenance (C/M)-ECT, its safety and efficacy. The indication for ECT around the world differs. Therefore, we feel our study would contribute to the existing literature. We report a case study of a patient with severe mental illness received over 450 ECTS for more than 40 years.

CASE REPORT

A 65-year-old woman has been treated for schizoaffective disorder with depressive, manic and psychotic delusional episodes since she was 25 years of age. Born out of full-term normal delivery, her milestones were normal. She studied till 8th standard, discontinued due to financial constraints. She has one brother and four sisters. Mother had psychiatric illness. Both parents expired years ago. Patient got married at the age of 28 years but soon got separated. She has one daughter but has no contacts with her or other family members. Her illness started at the age of 25 years and from that age onwards she has had many admissions at the acute care psychiatric hospital. For a long period, she did function well on antipsychotics and mood stabilizers albeit with hospitalization each year.

Currently she is an inpatient in tertiary care psychiatric hospital since 2005 as there is poor social support from family. Earlier she lived with her maternal uncle after death of her parents and separation from her husband. Her medical history included Diabetes mellitus, hypertension with hypercholesterolemia, Ischemic heart diseases, Chronic obstructive pulmonary disease and chronic hyponatremia. She is stable with the medications for medical problems. She developed side effects with medications like lithium and antipsychotics and showed good response to ECTS, but several series of ECTS had to be given over the years to maintain partial remission. From the year 2014 onwards, she is receiving maintenance ECTS.

Investigations: Series of mini mental state examination (MMSE) done till date did not detect any cognitive impairment. Her score remains constant around 27-28/31 on the MMSE scale.

Physical examination, routine blood investigations are done every 6 months and as and when required. Her serum sodium and potassium level are estimated before every M-ECT as she is known to develop hyponatremia. Her ECG shows evidence of Ischemia for which she is under treatment from cardiologist. Her blood sugars and lipid profile are under control with oral hypoglycaemic medications and regular statins for abnormal lipid profile. Her recent CT scan of brain shows age related changes.

Differential Diagnosis: During earlier presentation there would be diagnostic migration from acute psychosis to bipolar disorder to schizophrenia to schizoaffective disorder. A final diagnosis of schizoaffective disorder as per ICD -10 classifications was considered.

Treatment Details: Between 1985 and 2005 our patient had 14 psychiatric admissions. The first admission for acute psychosis presented with aggression, wandering tendencies, sleep disturbances and disorganized behavior. Her subsequent admissions were mainly for aggression, disorganized behavior, irrelevant talk and loosening of associations. Paranoid ideations with auditory hallucinations were also present. During few other exacerbations she also had symptoms of mania and depression for which she was treated with pharmacotherapy and ECTs. A diagnosis of schizoaffective disorder was given based on ICD -10 diagnostic classifications. From 1985 to 1993 she received total of 16 direct ECTs as there was no anesthetist in the hospital. Modified ECTS with anesthesia were started from the year 1993 and have been continued till date. The ECT machine used earlier was sine wave, but now it is brief pulse.

Acute course of ECT was routinely given three times per week until clinical remission was obtained in every single hospitalization as she showed good response in ameliorating her symptoms. She also received pharmacotherapy along with ECT. Between 1993 and February 2005, she has had 11 admissions for acute excitement and other psychotic behavior. She received around 57 ECTs along with pharmacotherapy.

She became noncompliant with the medications and relapsed within two months and was admitted in May 2005 with a Magistrate order of mental health act 1985. She has remained as Inpatient till date as there is poor social support and frequent relapse due to noncompliance with the medications. Repeated attempts were made to discharge the patient by the treating psychiatrists without success.

Between 2005 and 2013 she was maintained on Pharmacotherapy with partial remission and was under continuous supervision. She developed side effects to the medications and developed medical co morbidities like hypertension, Diabetes mellitus and IHD and hyponatremia. During her stay she would require a course of acute ECTs followed by continuation and maintenance ECTs. Since 2014 onwards she has been managed with weekly maintenance ECT along with minimum dose of antipsychotics

During Covid-19 period from 2020-2022, spacing out of ECTs were tried but she showed only partial response. It has been estimated that she has received up to 450 ECTs till now. Maintenance ECT on weekly basis along with medical therapy did appear to prevent relapse. It appears that the ECT did not have a major effect on her cognition despite the treatment for last 40 years. We summarize the medical therapy tried with minimal success over the past 35 years of our patient's life in box 1 as well as the adverse reactions experienced to ECT.

Year	Medications tried
1985	Trifluoperazine, Chlorpromazine, Trihexiphenidyl, Haloperidol
1986-1993	Lithium, Chlorpromazine, Trifluoperazine
1999	Trifluoperazine, Chlorpromazine, Valparin 600 mg day
2000	Fluphenazine Depot 25 mg fortnightly, Haloperidol, Chlorpromazine
2001-2003	Haloperidol 40mg/day, Chlorpromazine 200mg
2005	Haloperidol 30mg, Carbamazepine 400mg
2006-2007	Haloperidol, Carbamazepine, Chlorpromazine, Amlodipine 5mg
2011	Risperidone, Carbamazepine, Chlorpromazine, Metformine 1gm/day, Amlodipine
2012	Risperidone 6mg, Quetiapine 250 mg, Chlorpromazine 500mg, Metformine, Amlodipine
2013	Risperidone 4mg, Chlorpromazine 600mg, Quetiapine 600mg, Metformine 1.5gm, Amlodipine 10mg, Valparin 600mg, Olanzapine 20mg, Inj. Zuclopenthixole depot 200mg every 15 days
2016	Risperidone 2mg, Olanzapine 30mg, Valparin 600mg, Inj. Fluphenazine decanoate 25 mg monthly, Trihexiphenidyl, Metformin 2gms/day, Losartan 100mg, Metoprolol 25mg, Ecospirin 75mg, Statins 10mg
2017	Risperidone 2mg, Olanzapine 30mg, Valparin 600mg, Trihexiphenidyl, Metformin 2gms/day, Losartan 100mg, Metoprolol 25mg, Ecospirin 75mg, Statins 10mg, Deriphylline 300mg, Glimiperide 1mg
2018	Amisulpride 900—1200mg, Risperidone 4mg, Valparin 600mg, Trihexiphenidyl 2mg, Metoprolol 12.5mg, Amlodipine 5mg, Ecospirin 150mg, Statins 10mg, Metformin 2gms, Glimiperide 1mg
2020	Amisulpride 900—1200mg, Risperidone 4mg, Valparin 600mg, Trihexiphenidyl 2mg, Metoprolol 12.5mg, Amlodipine 5mg, Ecospirin 150mg, Statins 10mg, Metformin 2gms, Glimiperide 1mg, Salt capsules

2021	Amisulpride 600mg, Risperidone 5mg, Valparin 600mg, Trihexiphenydl 2mg, Amlodipine 10mg, Ecospirin 150mg, Statins 10mg, Metformin 2gms, Glimiperide 1mg, Salt capsules Deriphylline 300mg
2023	Amisulpride 400mg, Risperidone 3mg, Valparin 600mg, Trihexiphenydl 2mg, Amlodipine 5mg, Ecospirin 150mg, Statins 10mg, Metformin 1.5gms, Glimiperide 2mg, Salt capsules, Deriphylline 300mg., Clonazepam 0.5mg

Adverse reaction to ECT: no significant cognitive disturbances soon after ECT. Occasional headaches and body malaise experienced.

ECT Therapy Procedure

ECT is performed in a dedicated ECT room in acute psychiatric department with a hospital consultant psychiatrist and anesthesiologist. Bitemporal ECT using brief pulse constant device was delivered using Mecta Spectrum 5000Q ECT machine. As part of the hospital's routine clinical practice, seizure threshold was determined by the dose titration for first treatment and subsequent treatment were given at 1.5 times the seizure threshold to maximum capacity of 599 mill coulombs (mC).

Anesthesia: 250-350 mg thiopental and 50-60mg of succinylcholine has been used over the years and no change in anesthetics was needed. Venepuncture on both forearms has been possible during all treatments. When patient showed adequate muscle relaxation was preoxygenated, and the manually ventilated using valve mask and 100% oxygen.

Outcome and Follow Up: At present she is still under inpatient care due to social reasons. She is doing her activities of daily living without assistance. She still receives M- ECT every 10-15 days along with pharmacotherapy. Targeted behavior of agitation, aggression, and disinhibition remains improved. She attends occupational therapy unit of the hospital and is engaged in tailoring and crochet making. Attempts are being made to space out her ECT to 4 weekly bases depending on the response. Also, active social intervention has been ongoing to reunite with her family.

DISCUSSIONS

The current patient report adds information regarding the benefit of C/M-ECT with regard to the most severe and chronic schizoaffective disorder who has been hospitalized for a long duration.

This report also adds necessary information on the impact of the ECT treatments not only on general clinical condition but also specifically on aggression and overall function. It showed beneficial effects on verbal/physical aggression, self-injury, disinhibitory behavior and overall level of functioning. Bilateral ECTS were well tolerated and did not cause side effects in this patient in spite of medical co morbidities. This case study found no significant reduction in patient's abilities to execute instrumental and basic activities of daily living. Furthermore, there is no deterioration in her cognitive functioning. Patient is still active in occupational therapy unit and involved in tailoring and making crochets with good visual-motor coordination.

She has received over 450 ECTs with little or no worsening of cognitive functions, assessed with serial examination with MMSE scale of Global cognitive functioning.

Various studies in the form of case reports, case series, review articles and Meta analysis have shown similar findings of little or no effects on cognitive functioning.

Luccarelli J .et al conducted a retrospective cohort study of 100 patients receiving ECT at a freestanding psychiatric hospital and who received at least 50 treatments during a single treatment series. They examined the effects of maintenance ECT on depression and cognition and found no change in cognitive functioning as measured by the Montreal Cognitive assessment (MoCA) scale, also the improvement in depression was sustained [13]

Selvadurai MI, treated a 64-year-old person with major neuro -cognitive disorder with behavior symptoms with acute and maintenance ECT with little or no aggravation of neurocognitive symptoms [14]. Another authors, Carney S, Sami MB described an 89-year-old patient (Deceased) with 60 years of history with depressive disorder treated with ECTs. She received up to 400 ECTS over her life course as her symptoms would not respond to oral medication. They report that she had excellent safety record even in later life in spite of multiple co morbidities [15]

Barnes RC, Hussein A, Anderson in his single case report of 74-year-old lady with unstable bipolar illness received 400 ECT treatments as a single maintenance treatment. Serial testing for cognition did not demonstrate progressive cognitive deterioration but consistent cognitive deficit typical of acute treatment was evident [16].

Some authors also proposed that M-ECT can be effective and safe treatment modality in combination with medication to manage resistant and recurrent schizoaffective illness in selected patients [17].

Study by Lorena Rami examines the cognitive impairment profile of schizophrenia patients during maintenance electroconvulsive therapy (M-ECT). Ten schizophrenia patients treated with M-ECT and ten control patients matched for diagnosis, sex, and age that had never been treated with ECT were assessed with a comprehensive neuropsychological battery. M-ECT patients did not show a higher level of memory, attention, or frontal function impairment than the control group. The absence of additional memory dysfunction may favor the functional adaptation of these patients during M-ECT [18].

In addition, a case report from 1985 showed that following 1250 ECT treatments, no observable gross or histological evidence of brain damage was found at postmortem [19]

As per various studies, side effects and complications are not common with C/M-ECTs, and minor if they do occur, even in elderly patients and in many cases patients who are physically ill. Minor side effects, such as headaches, nausea, and muscle pain, are no different from those reported following acute ECT treatments; they pass rapidly and are well tolerated. Major complications, including falls, prolonged apnea, cardiac dysarrhythmias, and status epileptics or delirium, are very rare. All the above require close monitoring by a skilled team during and after each ECT treatment.

Some studies indicate that, unlike acute ECT treatments, C/M-ECT does not cause objective cognitive impairment, probably because of the longer time interval between treatments [20]

LIMITATION / STRENGTH

Our study has several limitations. 1: this was a retrospective study, based on clinical impressions of the treating doctors who decided to administer ECT treatments to the patient. Therefore, their impression with regard to clinical improvement could be affected by their expectations of the impact of treatment and thus could have biased their objectivity regarding evaluation.

CONCLUSIONS

The present study demonstrates the efficacy and safety of C/M-ECT in adult patients with schizoaffective disorder, with a significant positive effect seen for some indices of aggression, psychosis and disinhibition behaviors, as well as on the functioning of patients.

Despite the limitations of this study, it is important research because information regarding C/M-ECT in patients with schizoaffective disorder is limited. Larger studies are required to answer the questions that were beyond the scope of this study. ECT, the most widely available non-pharmacological treatment for severe mental illness, still holds considerable promise for patients with schizoaffective disorders.

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