

Current status of electroconvulsive therapy for mood disorders: a clinical review

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ABSTRACT

Electroconvulsive therapy (ECT) is an effective treatment for mood disorders and a viable treatment option especially when urgency of clinical situation requires a prompt treatment response. After acute series of ECT, the ECT long-term treatment may be considered, although this practice may vary significantly between countries or even within the same country, because there is no universal consensus about its indications, duration and frequency of administration. Continuation or maintenance ECT is common in routine clinical practice and clinicians should be aware of the risks of using ECT long term. Neuropsychological assessment should be an essential part of a good clinical practice in ECT services. Cognitive side effects of ECT are sometimes underestimated and may last much longer after completed treatment than it is usually expected. These cognitive impairments associated with ECT may cause significant functional difficulties and prevent patients to return to work. Cognitive assessment during ECT treatment is usually not comprehensive enough and is limited to bedside assessment. A more proactive approach to careful neuropsychological assessment and consideration of combined maintenance medication treatment after ECT are essential.

INTRODUCTION

Electroconvulsive therapy (ECT) has been used in the treatment of patients with severe and treatment refractory mood disorders and other severe mental illnesses from 1938. ECT is an effective treatment and response rates to ECT in depression are in the range from 70% to 80% and are much higher than response rates to antidepressant treatment.^{1 2} ECT is usually conceptualised as an effective and safe treatment, although there are a lot of debates about significant cognitive impairments as a result of receiving ECT. Duration of ECT treatment is a controversial topic and some clinicians may consider 6–10 treatments and then consider medication maintenance, while others will continue prescribing ECT only for months or even years.³ In this clinical review, the indication for ECT, controversies about continuation/maintenance ECT, cognitive side effects of ECT and the importance of cognitive assessment will be discussed.

METHODS

To identify relevant evidence for the current status of indications, benefits and side effects of ECT, we searched PubMed, PsycINFO, Ovid Medline, Google Scholar and Cochrane Library for systematic reviews and meta-analyses of randomised controlled trials in major depression and bipolar disorder, published in the past 10 years (between 2006 and 2016). The literature on cognitive side effects of ECT and maintenance ECT is sparse and there is a lack of randomised data. In case of multiple publications on the same topic, only the most recent or most comprehensive article was considered. The reference lists of reports identified were used to find additional publications.

RESULTS

Indications for ECT and maintenance ECT

The acute ECT has an essential role when the urgency of the clinical situation (an increased risk of suicide, treatment resistant catatonia, malnutrition, etc) demands a treatment with a rapid onset of therapeutic action.² Acute series of ECT may be warranted in all mental illnesses with a rapid deterioration and significantly compromised sleep, food and fluid intake as well as a high suicide risk.⁴ Patients with severe treatment-resistant depression, particularly those with melancholic type of depression and depression with psychotic symptoms usually benefit of acute series of ECT.

Continuation ECT is the administration of ECT treatments during the 6-month period after remission⁵ and maintenance ECT is continuing with ECT beyond 6 months,⁶ although are frequently used interchangeably.⁷ Continuation and maintenance ECTs are a reasonable treatment

options to prevent relapse and recurrence for patients with depression who have responded well to ECT,⁵ particularly if treatment is not accompanied with a significant cognitive impairment. ECT clinicians are aware that a gradual discontinuation of ECT may decrease the risk of early relapse. However, there is a lot of controversy about continuation/maintenance ECT, and there are no clear guidelines about the nature of continuation/maintenance ECT.^{8 9} Unfortunately, there is a tendency of prescribing a long-term maintenance ECT for patients who are good responders for an extended period of time with no enough effort to establish medication maintenance over time.

Indications for ECT, duration of treatment and consideration of continuation/maintenance ECT may differ significantly from country to country or even within the same country. To illustrate these differences around the world, it is worth to mention the National Institute for Health and Care Excellence (NICE) guideline,¹⁰ the College of Psychiatry of Ireland 2011 Position Statement (The College of Psychiatry of Ireland. Electroconvulsive therapy (ECT) Position Statement. Approved by the College of Psychiatry of Ireland, 2011 (reviewed in 2014)), New Zealand Ministry of Health recommendation released in 2004,¹¹ the American Psychiatric Association (APA) Task Force Report on ECT¹² and the Canadian Network on Mood and Anxiety Disorders (CANMAT).¹³ In some countries, guidelines on ECT and presumably the ECT as a treatment option seem to be not a priority among other psychiatric treatments. In other countries such as Canada, there is a renaissance of ECT, and the usage of ECT is increasing over time.¹³

The UK NICE depression guideline published in 2003 with an update in 2009 recommends that ECT should be used for severe major disorder (if not responded to medication trials and psychotherapy), prolonged or severe mania, and catatonia. NICE does not recommend the use of ECT in the treatment of schizophrenia or the use of maintenance ECT.¹⁰ The College of Psychiatry of Ireland Position Statement released in 2011 and updated in 2014 provides the framework for using ECT in Ireland. ECT is used rarely for treating individuals with severe depression, catatonia and treatment-resistant mania and only for cases where other treatments have failed or where treatment is life-saving. ECT should be given twice weekly and usual treatment course would be 6–8 treatments. Maintenance is not considered in this Position Statement (The College of Psychiatry of Ireland, 2011 (reviewed in 2014)). New Zealand Ministry of Health guideline for the use of ECT in New Zealand¹¹ is a very comprehensive document that explores the efficacy, safety and a legal regulation of the ECT practice. ECT should be considered for depression, mania, schizophrenia and catatonia if there is clear evidence of resistance to medication, a considerable safety risk or a need for

rapid therapeutic action due to suffering. Maintenance antidepressant medication is discussed as preferable treatment option after the course of ECT while maintenance ECT is suggested only for carefully selected group of patients such as older people who are not tolerating medications or pharmacotherapy is ineffective. The APA Task Force Report on ECT concludes that medication continuation therapy is a prevailing practice whereas continuation ECT is a viable form of continuation management for patients with a history of recurrent illness currently responding to ECT and for patients with conditions refractory to medications or intolerance to pharmacotherapy.¹² California, Texas and New York have legislative requirements that are more restrictive than the APA recommendations. California requires that even for voluntary patients consenting to ECT, three physicians have to agree that ECT is indicated and the patient has capacity to consent to the treatment.⁴ CANMAT clinical guidelines for the neurostimulation therapies recommends ECT in all subtypes of major depressive disorder, but ECT is especially effective for psychotic depression, depression with prominent suicidal ideation, and treatment-resistant depression. Catatonia and rapidly deteriorating physical status are also indications for ECT as a first-line treatment, but at the level 3 of evidence. Maintenance ECT is recommended as a possible option for relapse prevention in depression.¹³

Cognitive side effects of ECT

As it is well known, the cognitive side effects of ECT could be divided into postictal disorientation, anterograde amnesia, retrograde amnesia and non-memory cognitive impairments.¹⁴ Postictal confusion is usually short-lived and does not present any significant clinical problem. Anterograde amnesia may last for a couple of weeks or couple of months after treatment. However, retrograde amnesia for autobiographical information is a potentially persistent cognitive side effect of ECT.¹⁵ The APA Task Force Report from 2001 strongly recommended to reflect this perspective of possible permanent gaps in memory in the consent form for ECT.¹² Cognitive side effects are usually dependent on factors such as electrode placement, electrical dosage, stimulus parameter configuration and frequency of treatment sessions. The adverse cognitive effects are usually reduced with using brief or ultrabrief pulse stimulation and right unilateral instead of bilateral electrode placement, particularly not bitemporal electrode placement.^{16 17} Sackeim and *et al*¹⁸ conducted the first large prospective long-term study of cognitive outcomes following ECT in a community sample including 398 participants. The results of this study demonstrated that sine wave stimulation and bilateral ECT are associated with more severe and persisting retrograde amnesia. Cognitive side effects were detected 6 months after the acute treatment course. This is the first study that provides clear evidence that cognitive side effects of ECT can persist for an extended period of time. In contrast, a meta-analysis found that cognitive impairment associated with ECT was limited to a post-treatment period of 3 days.¹⁹ Processing speed, working memory, anterograde memory and some aspects of executive function improved beyond baseline levels 15 days after ECT. Sackeim¹⁵ has an opposite view and emphasises that it is 'inaccurate and inadvisable to deny' that ECT can cause long-term adverse cognitive effects. He strongly recommends using the Columbia University Autobiographical Memory Interview (CUAMI) to detect retrograde amnesia for autobiographical information. The loss of autobiographical memory has not been adequately investigated. Robertson and Pryor consider that patients should be told that permanent amnesia is one of possible, frequent and serious side effects of ECT which affects at least one-third of patients.²⁰

Cognitive assessment of ECT patients

Neuropsychological assessment should be a part of good clinical practice in the ECT units. However, this is not universally used in a routine clinical practice and a significant number of patients do not complete cognitive

assessment. The standardised cognitive assessment is time consuming, expensive, requires specially trained personnel and it is not always available in a routine clinical practice. There is no clear answer on what type of cognitive assessment should be the part of routine ECT practice. Rasmussen¹⁴ recommends including the following cognitive domains in routine neuropsychological testing: global cognition, attention/concentration, memory, language, visuospatial function and executive functions. There is also a good recommendation of using Mundane Memory Questionnaire and Everyday Memory Interview to measure everyday memory functioning in patients who are receiving ECT.²¹ However, the lack of availability of standardised cognitive testing may limit clinician in considering the maintenance ECT. Montreal Cognitive Assessment (MoCA), a cognitive screening test for mild cognitive impairment, is usually used in a routine clinical practice and it can be useful for assessing the long-term cognitive side effects of ECT. However, this instrument was designed to detect dementia-related mild cognitive impairment, but not ECT-related cognitive impairment.²² The lack of neuropsychological services available to ECT psychiatrists may have negative impact on identifying and assessing cognitive effects of ECT. This may also significantly delay the process of post-ECT cognitive rehabilitation.^{20 21}

What would be the optimal usage of ECT?

ECT is one of the most controversial treatments in medicine,²³ particularly because of still unknown mechanism of action and uncertainty about cognitive side effects.²⁴ The use of ECT has declined in the UK since 2001/2002²⁵ as continuation/maintenance ECT is not recommended by the NICE guidelines. Although ECT is a safe treatment with a low risk of physical complications, there is still a risk of cardiovascular side effects such as severe bradycardia and asystole, particularly in patients with pre-existing cardiac diseases, status epilepticus or aspiration pneumonia in less compliant patients in terms of following the pre-ECT instructions.^{26 27} Preliminary data of the study on continuation ECT in geriatric depression (PRIDE study) demonstrated that continuation ECT is safe and effective in preventing relapse of major depression.²⁸ The frequency of ECT sessions was four continuation ECT treatments over 1 month, plus additional ECT as needed.²⁸ Most of the research studies favouring continuation/maintenance ECT are coming from geriatric psychiatry and these research data cannot be simply translated to general adult population of patients with depression, particularly those in a working age group.

The four principles of medical ethics, beneficence, non-maleficence, respect for autonomy and justice are central to ethical conduct.²⁹ Beneficence is a group of norms for providing benefits, and balancing benefits against risks and costs is essential to medical care.²² There is no doubt that ECT is effective and life-saving for a selected population of patients. However, a good balance of sustained benefits and possible risks or serious cognitive side effects is not always reached. Non-maleficence is a norm of avoiding a causation of harm. ECT is generally a safe treatment, but we cannot always rule out the risk of more prominent cognitive side effects and other serious side effects.³⁰ Autonomy respects the right of each person to decide whether to accept or reject treatment. There is a general consensus that it is a patient's decision to accept or not accept physician's recommendation about the ECT treatment, and patients can be treated only if they signed a consent form. Informed consent enables patients to make autonomous decision. There is some disagreement among clinicians over the requirements about informed consent and some of them would not agree that the consent form should address all uncertainties about the treatment, such as the mechanism of therapeutic action of ECT has not yet been established, since it could be misleading and discouraging for patients.³¹ Sometimes patients may have easier access to a long-term maintenance ECT than to other types of multimodal treatment, such as a regular follow-up in specialised mood disorder

centres and a combination of medication and psychotherapy, but there are no research data and quality improvement studies on this issue. Maintenance ECT is a reasonable treatment option for carefully selected patients with severe and frequent major depressive episodes unresponsive to medication treatment and responding up to full remission with ECT. However, it is not rare in a clinical practice to see patients who are receiving maintenance ECT weekly or biweekly for an extended period of time without enough trials to readjust pharmacotherapy and consider medication maintenance as a viable treatment option.

CONCLUSIONS

For many patients with treatment refractory mood disorders, ECT is still a more effective option than medication treatment. As long as an equally effective and less controversial treatment than ECT would have been found, ECT will have an important role in treating patients with most severe and treatment-resistant psychiatric disorders. However, uncritical prescribing ECT and prescribing maintenance ECT without considering other available treatment options may ruin the credibility of ECT. Finally, a thorough cognitive assessment of patients treated with ECT is crucial in providing ECT.

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