



## ORIGINAL ARTICLE

# Clinical usefulness and economic implications of continuation/maintenance electroconvulsive therapy in a Spanish National Health System public hospital: A case series<sup>☆</sup>



Roberto Rodriguez-Jimenez<sup>a,b,\*</sup>, Alexandra Bagney<sup>a,b</sup>, Iosune Torio<sup>a</sup>,  
Montserrat Caballero<sup>a</sup>, Pedro Ruiz<sup>c</sup>, Francisco de Paula Jose Rivas<sup>d</sup>,  
Miguel Angel Jimenez-Arriero<sup>a,b</sup>

<sup>a</sup> Servicio de Psiquiatría, Instituto de Investigación Hospital 12 de Octubre (i+12), Madrid, Spain

<sup>b</sup> Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Instituto de Salud Carlos III, Madrid, Spain

<sup>c</sup> Unidad de Calidad, Hospital Universitario 12 de Octubre, Madrid, Spain

<sup>d</sup> Subdirección Médica, Hospital Universitario 12 de Octubre, Madrid, Spain

Received 6 February 2014; accepted 2 October 2014

Available online 14 May 2015

### KEYWORDS

Electroconvulsive  
therapy;  
Continuation;  
Maintenance;  
Cost-effectiveness;  
Quality

### Abstract

**Introduction:** Continuation/maintenance electroconvulsive therapy has been shown to be effective for prevention of relapse in affective and psychotic disorders. However, there are a limited number of studies that investigate clinical management, associated costs, and perceived quality variables.

**Material and methods:** A series of 8 cases included during the first 18 months of the continuation/maintenance electroconvulsive therapy programme of the Psychiatry Department at 12 de Octubre University Hospital is presented. Clinical variables (clinical global impression-improvement scale, length of hospitalisation, number of emergency department visits, number of urgent admissions) before and after inclusion in the continuation/maintenance electroconvulsive therapy programme were compared for each patient, as well as associated costs and perceived quality.

**Results:** After inclusion in the programme, 50.0% of the patients reported feeling “much better” and 37.5% “moderately better” in the clinical global impression-improvement scale. In addition, after inclusion in the continuation/maintenance electroconvulsive therapy programme, patients were hospitalized for a total of 349 days, visited the Emergency Department on 3 occasions, and had 2 urgent admissions, compared to 690 days of hospitalisation ( $p = 0.012$ ),

<sup>☆</sup> Please cite this article as: Rodriguez-Jimenez R, Bagney A, Torio I, Caballero M, Ruiz P, Jose Rivas FP, et al. Utilidad clínica e implicaciones económicas de la terapia electroconvulsiva de continuación/mantenimiento en un hospital público del Sistema Nacional de Salud español: serie de casos. Rev Psiquiatr Salud Ment (Barc.). 2015;8:75–82.

\* Corresponding author.

E-mail address: [roberto.rodriguez.jimenez@gmail.com](mailto:roberto.rodriguez.jimenez@gmail.com) (R. Rodriguez-Jimenez).

26 Emergency Department visits ( $p=0.011$ ) and 22 urgent admissions ( $p=0.010$ ) during the same period before inclusion in the programme. Associated direct costs per day of admission were reduced to 50.6% of the previous costs, and costs associated with emergency department visits were reduced to 11.5% of the previous costs. As regards perceived quality, 87.5% of the patients assessed the care and treatment received as being "very satisfactory", and 12.5% as "satisfactory".

**Conclusions:** This continuation/maintenance electroconvulsive therapy programme has shown to be clinically useful and to have a favourable economic impact, as well as high perceived quality.

© 2014 SEP y SEPB. Published by Elsevier España, S.L.U. All rights reserved.

## PALABRAS CLAVE

Terapia electroconvulsiva;  
Continuación;  
Mantenimiento;  
Coste-efectividad;  
Calidad

## Utilidad clínica e implicaciones económicas de la terapia electroconvulsiva de continuación/mantenimiento en un hospital público del Sistema Nacional de Salud español: serie de casos

### Resumen

**Introducción:** La terapia electroconvulsiva de continuación/mantenimiento ha demostrado su eficacia en la prevención de recaídas tanto en cuadros afectivos como psicóticos. Sin embargo, existen pocos estudios sobre variables de gestión clínica, costes asociados y calidad percibida.

**Material y métodos:** Se presenta una serie de 8 casos incluidos en el Programa de terapia electroconvulsiva de Continuación/Mantenimiento del Servicio de Psiquiatría del Hospital Universitario 12 de Octubre durante los primeros 18 meses de su funcionamiento. Para cada paciente se compararon variables clínicas (Escala de Impresión Clínica Global-Mejoría Global, días de ingreso, visitas a Urgencias, ingresos urgentes) antes y después de su inclusión en el programa, así como costes asociados y calidad percibida.

**Resultados:** Tras su inclusión en el programa, el 50,0% de los pacientes refirió encontrarse «mucho mejor», y el 37,5% «moderadamente mejor» en la Escala de Impresión Clínica Global-Mejoría Global. Además, una vez incluidos en el programa de terapia electroconvulsiva de continuación/mantenimiento, los pacientes tuvieron un total de 349 días de ingreso, 3 visitas a Urgencias y 2 ingresos urgentes, frente a los 690 días de ingreso ( $p=0,012$ ), 26 visitas a Urgencias ( $p=0,011$ ) y 22 ingresos urgentes ( $p=0,010$ ) en el mismo periodo, antes de su inclusión en el programa. Los costes directos asociados por estancia/día tras su inclusión en el programa se redujeron al 50,6% del coste previo, y los costes asociados a visitas a Urgencias disminuyeron al 11,5% del coste previo. Respecto a la calidad percibida, un 87,5% de los pacientes evaluaron la atención y tratamiento recibido como «muy satisfactorio», y un 12,5% como «satisfactorio».

**Conclusiones:** El programa de terapia electroconvulsiva de continuación/mantenimiento estudiado ha demostrado utilidad clínica, repercusión económica favorable, así como una elevada calidad percibida.

© 2014 SEP y SEPB. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

## Introduction

Electroconvulsive therapy (ECT) was used for the first time by Cerletti and Bini in Italy in the year 1938 to treat a psychotic patient. Since then, it has been used in a varied and sometimes controversial way. Nowadays, ECT has become established as an effective technique for the treatment of acute affective and psychotic disorders.<sup>1,2</sup>

Once remission of the acute stage is obtained through ECT, most of the patients are directed to undergo pharmacological treatment. In spite of this, during the first months after finalising ECT, many patients experience a relapse. For these patients who respond well to ECT but experience affective or psychotic relapses in spite of taking the

right medication, we propose the use of said technique in the medium to long term as a treatment to prevent the aforementioned relapses/recurrences.

The *American Psychiatric Association* defines "continuation" ECT as the use of ECT during the 6 months after concluding the acute treatment to prevent relapses after the index episode. "Maintenance" ECT is defined as the use of ECT after those 6 months to avoid recurrences.<sup>3</sup> However, this distinction is rarely made in practice, and literature often refers to it as "continuation/maintenance ECT" (ECT-c/m).

Even though some clinical guidelines are conservative when suggesting said therapy,<sup>4</sup> there are several studies which indicate that ECT-c/m is an effective and safe

therapy tool for affective disorders.<sup>5-8</sup> It seems to have a similar efficacy as pharmacotherapy alone, and the efficacy of the combination of ECT-c/m and drugs is higher than any of these 2 treatments separately. Literature also points out that the combination of ECT-c/m and antipsychotic treatment would be better than pharmacological treatment alone in schizophrenic disorders.<sup>2,9</sup>

There have been several reviews about ECT-c/m in the last few years.<sup>10-14</sup> These indicate the use of ECT-c/m in case of good response to ECT in acute stages, lack of efficacy or intolerance to pharmacological strategies to prevent relapses, and patient's preference to said technique.

During these last few years, some naturalistic papers have been released. These address the performance of ECT-c/m programmes in different countries, with favourable results in patients with unipolar depression, bipolar disorders and schizophrenia.<sup>15-18</sup>

We only know one study that tackles naturalistic ECT-c/m.<sup>19</sup> In said study, 127 patients were monitored. These patients had received ECT plus pharmacotherapy due to a major depressive episode. After remission was achieved, all patients continued with pharmacological treatment, and 44 of them were also included in an ECT-c/m programme. There was a follow-up of 2 years after the depressive episode, and their evolution during the 2 previous and subsequent years from that episode was compared in both groups. We discovered that after implementing ECT in the acute stage, clinical evolution improved in both groups, with regard to their condition before and after ECT (fewer episodes, less number of admissions and less admission days). There were no meaningful differences in the progress of the 2 groups (medication vs medication and ECT-c/m). However, we must point out that since this was a naturalistic study, patients who were included in the ECT-c/m and pharmacotherapy programme showed more elements of clinical severity than those who only continued with pharmacotherapy.

Nevertheless, even though there are numerous studies in which the efficacy of ECT-c/m is verified for the upkeep of the patients with affective and psychotic disorders, very few have taken into consideration the variables concerning clinical paperwork (like the total number of admission days, the number of visits to the emergency department or the number of emergency admissions), related costs, or the quality perceived by patients and family members. Besides, to this date we are not aware of any study that addresses the Spanish public healthcare system.

We submitted a series of 8 cases included in the continuation/maintenance ECT programme from the Psychiatric Department of the Hospital Universitario 12 de Octubre during the first 18 months of operation. We analysed each patient's clinical variables before and after their inclusion in the continuation/maintenance ECT programme, as well as direct related costs and perceived quality.

## Material and methods

This was a prospective, naturalistic and pragmatic study. We analysed a period of 18 months. Throughout this period, we included 8 patients in the continuation/maintenance ECT programme. These patients were reluctant to pharmacological treatments and had many severe affective or psychotic

episodes and, frequently, a high risk of autolysis. All of them had a history of receiving ECT for acute treatment, with good responses, but with a subsequent relapse in less than 6 months in spite of the maintenance pharmacological treatment.

We submitted an extensive and comparative study of each patient with themselves between the previous and the subsequent periods for their inclusion in the programme (mirrored). With the purpose of studying its clinical usefulness, we used the clinical global impression scale-global improvement provided to the physician in charge of the case, the patient and a family member (main caregiver). In addition, we studied the variables related to the clinical progress: need to change the pharmacological treatment, programme desertion, number of visits to the emergency department, number of emergency hospitalisations, and number of admission days. We also calculated the direct costs related to hospitalisations and emergency consultations before and after the patients were incorporated to the ECT-c/m programme. Finally, we assessed the perceived quality through a survey on the quality of assistance.

## Electroconvulsive therapy procedure

We used a MECTA spECTrum 5000Q<sup>®</sup> device. During the sessions for ECT-c/m, we kept positioning the electrodes in the same place used during acute treatments, which was effective and well-tolerated (bifrontotemporal in all), unless there was any relevant cognitive side effect (not shown in any patient of the series). Since we have data for every patient regarding the efficacy and tolerance of ECT in acute treatments, the aforementioned data was used to calculate the load for the ECT-c/m sessions (in addition to age and other determinants, such as the pharmacological treatment). The main criterion for effective convulsion was that the convulsion should last more than 25 s in the electroencephalographic record. The average frequency for the ECT sessions was every 4.4 weeks.

## Instruments

### Clinical global impression scale-global improvement

It is a subscale of the clinical global impression scale<sup>20</sup> that provides data about the change experienced by the patient in relation to his condition prior to the intervention. It comprehends a single item that assesses the change experienced using a Likert scale. We asked, "Compared to the initial state, how is the patient now? (Rank the overall improvement regardless of whether you believe it is due to the treatment or not)." Possible answers include: (1) "Much better"; (2) "Moderately better"; (3) "Slightly better"; (4) "No changes"; (5) "Slightly worse"; (6) "Moderately worse"; and (7) "Much worse". This scale was provided to the patient, a family member (main caregiver) and the physician in charge of the case.

### Perceived quality survey

We provided patients and family members with a satisfaction and perceived quality scale designed by the Psychiatric Department and the Quality Unit as part of

the Continuation/Maintenance ECT Programme of the Hospital Universitario 12 de Octubre. This survey is shown in [Annex 1](#).

### Costs assessment

Through the Hospital Universitario 12 de Octubre's Data and Management Control Department we obtained the costs per stay/day in Psychiatry (€480.51), and per consultation in the emergency department (€123.50). These costs are within the range of the resolution dated July 19, 2013 from the National Institute of Health Management, of the Spanish Ministry of Health, Social Services and Equality,<sup>21</sup> which marks out the prices to be applied at healthcare centres of the National Institute of Health Management, and within order 731/2013 of the Madrid Regional Ministry of Health dated September 6, 2013, which determines public prices for the provision of services and activities related to healthcare in the Madrid Regional Centres Network.<sup>22</sup>

### Statistical method

To describe quantitative variables, we used mean and standard deviation, and for qualitative variables, percentage. To compare the group of patients in 2 temporal times (before and after their inclusion in the ECT-c/m programme) we used the non-parametric test from Wilcoxon test. We used the SPSS® Statistics programme version 20.

### Results

Out of the 8 patients, 5 had affective disorders and 3 had schizophrenic disorders. [Table 1](#) shows the main clinical and socio-demographic characteristics of the 8 patients, as well as the pharmacological treatment at the moment of their inclusion in the programme. It also shows the comparison period of each patient with themselves.

In reference to the clinical global impression scale-global improvement scores, according to the patients, 50.0% were "much better" after their inclusion in the programme, 37.5% were "moderately better" and 12.5% were "slightly better." Family members rated 75.0% as "much better," 12.5% as "moderately better," and 12.5% as "slightly better." Finally, the physicians in charge of the patients' treatment rated 50.0% as "much better," 37.5% as "moderately better," and 12.5% as "slightly better."

All the patients, with the exception of one, continued with their pharmacological treatment without significant changes. None of the patients deserted the ECT-c/m programme. As shown in [Table 2](#), once included in the ECT-c/m programme, patients had a total of 349 admission days, 3 visits to the emergency department and 2 emergency admissions, compared to 690 admission days ( $p=0.012$ ), 26 visits to the emergency department ( $p=0.011$ ) and 22 emergency admissions ( $p=0.010$ ) during the same period, before their inclusion in the programme.

The direct related costs are shown in [Table 2](#). The direct related costs per stay/day for patients prior to their inclusion in the ECT-c/m programme were €331,551.90, and after their inclusion in the programme it was €167,697.99 ( $p=0.012$ ). The total direct costs related to visits to the emergency department were €3211.00 during the period

prior to their inclusion in the programme, and €370.50 after their inclusion in the programme ( $p=0.011$ ).

Regarding the perceived quality in relation to the global question: "On the whole, how satisfied are you with the attention you received?" 87.5% of the patients pointed out they were "Very satisfied" and 12.5% were "satisfied." The rest of the answers are shown in [Table 3](#). In general, they reflect a favourable judgement.

### Discussion

The ECT-c/m programme under study shows distinct usefulness and therapeutic benefit. In the assessments carried out through the clinical global impression scale-global improvement, the appraisals performed by patients, their family members (main caregiver), as well as the physicians in charge of the case coincided in that 87.5% of the patients were "much better" or "moderately better" after their inclusion in the ECT-c/m programme. We must point out that the impressions from patients and physicians in charge of the cases fully coincide, and the improvements referred by family members are slightly higher. These ECT-c/m programme results are within the line of previous studies performed by other groups. Among them, there are several controlled and randomised trials in which ECT-c/m has demonstrated to be effective in the prevention of relapses in patients with affective and psychotic disorders.<sup>5,6,8,9</sup> In fact, it has been pointed out that ECT would be the only somatic treatment in Psychiatry that is usually interrupted when it has demonstrated effectiveness,<sup>23</sup> instead of assessing its continuation.

In addition to the clinical impressions of favourable progress calculated through scales, we have obtained a series of objective results regarding some parameters for clinical progress, which also have great impact in the clinical management of the Spanish National Health System. Thus, we notice a clear reduction in the total number of admission days, a decrease in the number of visits to the emergency department and fewer emergency admissions.

Regarding the economic aspects, the related direct costs per stay/day after their inclusion in the ECT-c/m programme were reduced from €331,551.90 to €167,697.99, which represents a 50.6% reduction from the costs prior to their inclusion in the programme. Additionally, costs related to visits to the emergency department went from €3211.00 in the period prior to their inclusion in the programme to €370.50 after their inclusion in the programme, which represents an 11.5% reduction from the previous cost. Even though these numbers cannot be taken into consideration in isolation and without keeping in mind other important variables used in any cost-efficacy analysis, they are relevant enough to be contemplated, both in healthcare management approaches and future specific studies. In this sense, studies about cost-efficacy related to ECT are very limited,<sup>24</sup> and there are very few publications that have studied the cost-efficacy in ECT-c/m programmes.<sup>25-27</sup> In these published studies, cost-efficacy had a positive result in favour of ECT-c/m programmes. We are not aware of any publications about this matter, but our results indicate that the ECT-c/m programme could be clearly cost-effective and encourage further future studies in this regard.

**Table 1** Socio-demographic and clinical variables for the series of patients.

Patient	Age (years)	Gender	Main diagnosis (code CIE-10)	Pharmacological treatment	Comparison period (months previous to the ECT-c/m programme vs months in the ECT-c/m programme)
1	62	Female	Recurring depressive disorder (F33.2)	Venlafaxine retard 300 mg/day Agomelatine 50 mg/day Lorazepam 1.5 mg/day	18/18
2	23	Male	Paranoid schizophrenia (F20.0)	Clozapine 450 mg/day Amisulpride 400 mg/day Reboxetine 4 mg/day Venlafaxine retard 300 mg/day Lorazepam 3 mg/day	18/18
3	84	Female	Recurring depressive disorder (F33.2)	Venlafaxine retard 150 mg/day Mirtazapine 30 mg/day Agomelatine 50 mg/day Pregabalin 75 mg/day	18/18
4	72	Female	Non-specified psychotic disorder (F29)	Risperidone 2 mg/day Quetiapine 150 mg/day Venlafaxine retard 225 mg/day Mirtazapine 15 mg/day Lorazepam 3 mg/day	18/18
5	48	Male	Paranoid schizophrenia (F20.0)	Clozapine 400 mg/day Clotiapine 20 mg/day Lorazepam 15 mg/day	18/18
6	81	Female	Recurring depressive disorder (F33.2)	Venlafaxine retard 300 mg/day Mirtazapine 30 mg/day Quetiapine 100 mg/day Pinazepam 10 mg/day	18/18
7	79	Male	Recurring depressive disorder (F33.2)	Nortriptyline 75 mg/day Bupropion 150 mg/day Quetiapine 50 mg/day Zolpidem 10 mg/day	18/18
8	47	Female	Recurring depressive disorder (F33.2)	Venlafaxine 150 mg/day Mirtazapine 30 mg/day Lorazepam 3 mg/day	16/16

**Table 2** Clinical progress and related costs variables.

	Before ECT-c/m	During ECT-c/m	<i>p</i>
Total admission days	690	349	0.012
Number of visits to the emergency department	23	3	0.011
Number of emergency admissions	22	2	0.010
Cost per stay/day (€)	331,551.90	167,697.99	0.012
Cost per visit to the emergency department (€)	3211.00	370.50	0.011



**Table 3** Results of the perceived quality survey.

After your admission and treatment with "Electroconvulsive Therapy", to what extent do you think your problem has improved?	Completely: 12.5% Quite enough: 75.0% Some: 12.5% Slightly: 0% Nothing: 0%
How does your family assess the effect obtained with the treatment?	Completely beneficial: 12.5% Quite beneficial: 75% Somewhat beneficial: 12.5% Slightly beneficial: 0% Not beneficial: 0%
<i>What do you think about the information given by your doctor?</i> He/she told you about the treatment you should follow at home	Yes: 100% No: 0% Partially: 0%
He/she told you what symptoms you should monitor at home	Yes: 100% No: 0% Partially: 0%
He/she told you about the follow-up treatment you should do	Yes: 100% No: 0% Partially: 0%
He/she gave you a discharge report for your general practitioner	Yes: 100% No: 0% Partially: 0%
If your psychiatrist suggested you should repeat the treatment with Electroconvulsive Therapy, would you be willing to follow through with said suggestion?	Yes: 100% No: 0% I would think about it: 0%
On the whole, what is your level of satisfaction with the assistance you received?	Very satisfied: 87.5% Satisfied: 12.5% Neither satisfied, nor unsatisfied: 0% Unsatisfied: 0% Very unsatisfied: 0%

Finally, we must point out that the quality perceived by patients and family members is high, since 87.5% assessed the care and the treatment received as "very satisfying," and 12.5% as "satisfying." These data clearly show that the procedure is very well assessed by patients and family members, and they are similar to the data obtained in recent studies about ECT satisfaction.<sup>28</sup> If we pay attention to the results for the rest of the items in the survey, we can observe that patients have been adequately informed as a whole and that it is very likely that their expectations have been fulfilled within the ECT-c/m programme.

Our study bears the typical limitations of a series of cases, such as a reduced size of the sample. However, this is not a study designed to assess the efficacy of this type of programmes, but a study that presents another series of elements of interest related to clinical, economic and perceived quality variables that could be important in regard to our public healthcare system.

In conclusion, the ECT-c/m programme under study has demonstrated its distinct clinical usefulness assessed not only by the physician in charge, but also by the patient

himself and his family members. This fact, together with the rest of the submitted positive clinical results, the favourable economic repercussion, and the high level of quality perceived by patients and family members, supports that ECT-c/m programmes should be considered as an important therapeutic option within our healthcare system, and it aims at the need to perform further cost-efficacy studies.

### Ethical responsibilities

**Protection of persons and animals.** Authors state that no experiments were performed on human beings or animals as part of this investigation.

**Data confidentiality.** Authors state they have followed the protocols of their workplace about the data publication of patients.

**Right to privacy and informed consent.** Authors have obtained the informed consent from the patients and/or

subjects referred to in the article. This document is in possession of the corresponding author.

## Conflict of interest

The authors declare that there are no conflicts of interest.

## Acknowledgements

The Institute of Investigation of the Hospital 12 de Octubre (i+12) and the Mental Health Biomedical Research Networking Centres (Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM) from Institute of Health Carlos III (Instituto de Salud Carlos III).

## Annex 1. Perceived quality survey

1. After your admission and treatment with "Electroconvulsive Therapy", to what extent do you think your problem has improved?

Completely  
Quite enough  
Some  
Slightly  
Nothing  
No response

2. How does your family assess the effect obtained with the treatment?

Completely beneficial  
Quite beneficial  
Somewhat beneficial  
Slightly beneficial  
Not beneficial  
No response

3. What do you think about the information given by your doctor?

He/she told you about the treatment you should follow at home  
Yes  
No  
Partially  
No response

He/she told you what symptoms you should monitor at home

Yes  
No  
Partially  
No response

He/she told you about the follow-up treatment you should do

Yes  
No  
Partially  
No response

He/she gave you a discharge report for your general practitioner

Yes  
No  
Partially  
No response

4. If your psychiatrist suggested you should repeat the treatment with Electroconvulsive Therapy, would you be willing to follow through with said suggestion?

Yes  
No  
I would think about it

5. On the whole, what is your level of satisfaction with the assistance you received?

Very satisfied  
Satisfied  
Neither satisfied, nor unsatisfied  
Unsatisfied

## References

1. UK ECT Review Group. Efficacy and safety of electroconvulsive therapy in depressive disorders: a systematic review and meta-analysis. *Lancet*. 2003;361:799–808.
2. Tharyan P, Adams CE. Electroconvulsive therapy for schizophrenia. *CDS Rev*. 2005;18:CD000076.
3. American Psychiatric Association. The practice of electroconvulsive therapy: Recommendations for treatment, training, and privileging. 4th ed. Washington, DC: American Psychiatric Association; 2001.
4. National Institute for Health and Clinical Excellence. Guidance on the Use of Electroconvulsive Therapy. Technology Appraisal, vol. 59. London: National Institute for Excellence; 2003.
5. Kellner CH, Knapp RG, Petrides G, Rummans TA, Husain MM, Rasmussen K, et al. Continuation electroconvulsive therapy vs pharmacotherapy for relapse prevention in major depression: a multisite study from the Consortium for Research in Electroconvulsive Therapy (CORE). *Arch Gen Psychiatry*. 2006;63:1337–44.
6. Navarro V, Gastó C, Torres X, Masana G, Penadés R, Guarch J, et al. Continuation/maintenance treatment with nortriptyline versus combined nortriptyline and ECT in late-life psychotic depression: a two-year randomized study. *Am J Geriatr Psychiatry*. 2008;16:498–505.
7. Smith GE, Rasmussen KG Jr, Cullum CM, Felmlee-Devine MD, Petrides G, Rummans TA, et al. A randomized controlled trial comparing the memory effects of continuation electroconvulsive therapy versus continuation pharmacotherapy: results from the Consortium for Research in ECT (CORE) study. *J Clin Psychiatry*. 2010;71:185–93.
8. Nordenskjöld A, von Knorring L, Ljung T, Carlborg A, Brus O, Engström I. Continuation electroconvulsive therapy with pharmacotherapy versus pharmacotherapy alone for prevention of relapse of depression: a randomized controlled trial. *J ECT*. 2013;29:86–92.
9. Chanpattana W, Chakrabhand ML, Sackeim HA, Kitaroonchai W, Kongsakon R, Techakasem P, et al. Continuation ECT in treatment-resistant schizophrenia: a controlled study. *J ECT*. 1999;15:178–92.
10. Trevino K, McClintock SM, Husain MM. A review of continuation electroconvulsive therapy: application, safety, and efficacy. *J ECT*. 2010;26:186–95.
11. Petrides G, Tobias KG, Kellner CH, Rudorfer MV. Continuation and maintenance electroconvulsive therapy for mood disorders: review of the literature. *Neuropsychobiology*. 2011;64:129–40.
12. Martínez-Amorós E, Cardoner N, Gálvez V, Urretavizcaya M. Effectiveness and pattern of use of continuation and maintenance electroconvulsive therapy. *Rev Psiquiatr Salud Ment*. 2012;5:241–53.
13. Van Schaik AM, Comijs HC, Sonnenberg CM, Beekman AT, Sienaert P, Stek ML, et al. Efficacy and safety of continuation and maintenance electroconvulsive therapy in depressed

- elderly patients: a systematic review. *Am J Geriatr Psychiatry*. 2012;20:5–17.
14. Rabheru K. Maintenance electroconvulsive therapy (M-ECT) after acute response: examining the evidence for who, what, when, and how? *J ECT*. 2012;28:39–47.
  15. Suzuki K, Awata S, Takano T, Ebina Y, Iwasaki H, Matsuoka H. Continuation electroconvulsive therapy for relapse prevention in middle-aged and elderly patients with intractable catatonic schizophrenia. *Psychiatry Clin Neurosci*. 2005;59:481–9.
  16. Odeberg H, Rodriguez-Silva B, Salander P, Mårtensson B. Individualized continuation electroconvulsive therapy and medication as a bridge to relapse prevention after an index course of electroconvulsive therapy in severe mood disorders: a naturalistic 3-year cohort study. *J ECT*. 2008;24:183–90.
  17. Minnai GP, Salis PG, Oppo R, Loche AP, Scano F, Tondo L. Effectiveness of maintenance electroconvulsive therapy in rapid-cycling bipolar disorder. *J ECT*. 2011;27:123–6.
  18. Rapinesi C, Kotzalidis GD, Serata D, del Casale A, Scatena P, Mazarini L, et al. Prevention of relapse with maintenance electroconvulsive therapy in elderly patients with major depressive episode. *J ECT*. 2013;29:61–4.
  19. Martínez-Amorós E, Cardoner N, Soria V, Gálvez V, Menchón JM, Urretavizcaya M. Long-term treatment strategies in major depression: a 2-year prospective naturalistic follow-up after successful electroconvulsive therapy. *J ECT*. 2012;28:92–7.
  20. Guy W. Early Clinical Drug Evaluation (ECDEU) assessment manual. Rockville, MD: National Institute of Mental Health; 1976. p. 218–22.
  21. Boletín Oficial del Estado. Resolución de 19 de julio de 2013, del Instituto Nacional de Gestión Sanitaria. BOE núm. 180, de 29 de julio de 2013. Sec. I. p. 55225–51.
  22. Boletín Oficial de la Comunidad de Madrid. ORDEN 731/2013, de 6 de septiembre, del Consejero de Sanidad. BOCM núm. 215, de 10 de septiembre de 2013. p. 8–30.
  23. Sackeim HA. Continuation therapy following ECT: directions for future research. *Psychopharmacol Bull*. 1994;30:501–21.
  24. Greenhalgh J, Knight C, Hind D, Beverley C, Walters S. Clinical and cost-effectiveness of electroconvulsive therapy for depressive illness, schizophrenia, catatonia and mania: systematic reviews and economic modeling studies. *Health Technol Assess*. 2005;9:1–156.
  25. Bonds C, Frye M, Coudreaut MF, Cunningham M, Spearing M, McGuire M, et al. Cost reduction with maintenance ECT in refractory bipolar disorder. *J ECT*. 1998;14:36–41.
  26. McDonald WM, Phillips VL, Figiel GS, Marsteller FA, Simpson CD, Bailey MC. Cost-effective maintenance treatment of resistant geriatric depression. *Psychiatr Ann*. 1998;28:47–52.
  27. Aziz M, Mehringer AM, Mozurkewich E, Razik GN. Cost-utility of 2 maintenance treatments for older adults with depression who responded to a course of electroconvulsive therapy: results from a decision analytic model. *Can J Psychiatry*. 2005;50:389–97.
  28. Rajagopal R, Chakrabarti S, Grover S. Satisfaction with electroconvulsive therapy among patients and their relatives. *J ECT*. 2013;29:283–90.