Review of recent ECT research papers

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Disclosures: none
METHOD

• Pubmed search

  • “Electroconvulsive therapy, ECT, 2013” → 316 papers
  
  • “Electroconvulsive therapy, ECT, 2013, Trial”
    → 24 papers → 9 RCTs
  
  • “Electroconvulsive therapy, ECT, 2013, Meta-analysis”
    → 5 papers → 4 Meta-analyses
RCTs

- Pubmed search
  - Anaesthetics x 3
  - Isoflurane vs ECT
  - ECT ± sodium valproate for mania (N/A)
  - Bifrontal vs bitemporal ECT for schizophrenia
  - Autobiographical memory in RUL UBP vs BP (6 x ST)
  - C-ECT + pharma vs pharma for relapse prevention
  - BT ECT (1.5xST) vs RUL ECT (6xST) ± placebo/NT/Ven, followed by addign in Li post ECT: relapse over 6 months
Anaesthesia RCTs (1)

• Begec et al *J ECT* 2013: n=39

• Propofol (1 mg/kg) vs Propofol (0.5 mg/kg) + remifentanil (1 ug/kg) vs sevoflurane 6%

• Then changed after each session

• Result: seizures were longer in P and R than in S (p <0.001)
  • EEGs did not differ
Effect of Propofol Versus Sodium Thiopental on Electroconvulsive Therapy in Major Depressive Disorder
A Randomized Double-Blind Controlled Clinical Trial

Tarık Purtuloğlu, MD, * Barbaros Özdemir, MD, † Murat Erdem, MD, † Süleyman Deniz, MD, *
Adem Balıkçı, MD, † Gazi Ünlü, MD, † and Taner Öznur, MD †

N = 96; BT ECT; HDRS before and after 6 ECTs

TABLE 2. Demographic Characteristics and HDRS Score of the Patients in the Sodium Thiopental and Propofol Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Propofol Group (n = 48)</th>
<th>Sodium Thiopental Group (n = 48)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), yrs</td>
<td>35.4 (7.7)</td>
<td>33.7 (4.9)</td>
<td>1.25</td>
<td>0.21</td>
</tr>
<tr>
<td>Weight, mean (SD), kg</td>
<td>70.1 (6.3)</td>
<td>71.9 (3.5)</td>
<td>-1.7</td>
<td>0.87</td>
</tr>
<tr>
<td>BMI</td>
<td>23.8 (2.4)</td>
<td>24.1 (0.9)</td>
<td>-0.82</td>
<td>0.4</td>
</tr>
<tr>
<td>HDRS score at baseline, mean (SD)</td>
<td>37.3 (2.2)</td>
<td>36.7 (1.2)</td>
<td>1.4</td>
<td>0.16</td>
</tr>
<tr>
<td>HDRS score at postintervention, mean (SD)</td>
<td>10.7 (1.8)</td>
<td>13.4 (3.3)</td>
<td>-4.8</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*Statistical significance level is P < 0.001.
† indicates Student t test value.
Anaesthesia RCTs (3)

Comparing Effects of Ketamine and Thiopental Administration During Electroconvulsive Therapy in Patients With Major Depressive Disorder
A Randomized, Double-Blind Study

Abolghasem Yoosefi, MD,* Amir Sasan Sepehri, PharmD,† Mona Kargar, PharmD,‡ Shahin Akhondzadeh, PhD.§ Majid Sadeghi, MD,‖ Ali Rafei, MSc,¶ Abbas Alimadadi, MS,# and Padideh Ghaeli, PharmD**

N= 31; HDRS and MMSE before and after 1st and 6th ECT and 1 mth later
Isoflurane vs ECT

N = 28; BF ECT (N=20) vs isoflurane (n=8)
**Bifrontal vs BT ECT for schizophrenia**


Double-blind randomized controlled study showing symptomatic and cognitive superiority of bifrontal over bitemporal electrode placement during electroconvulsive therapy for schizophrenia.

Phutane VH, Thirthalli J, Muralidharan K, Naveen Kumar C, Keshav Kumar J, Gangadhar BN.

**N= 122; BPRS after last ECT**

At the end of 2 weeks (after 6 ECT sessions) 63% and 13.2% of BFECT and BTECT patients respectively had met the response criterion for BPRS (40% reduction in total score; OR = 20.8; 95% CI = 3.61-34.33).
Autobiographical memory: UBP vs BP ECT

Autobiographical and Subjective Memory With Right Unilateral High-Dose 0.3-millisecond Ultrabrief-Pulse and 1-millisecond Brief-Pulse Electroconvulsive Therapy
A Double-blind, Randomized Controlled Trial

Prashanth Mayur, FRANZCP,*† Karen Byth, PhD,†‡ and Anthony Harris, PhD, FRANZCP§¶

N= 20 per group (1.0 vs 0.3 msec); 6 X ST , thrice weekly; Kopelman AMI at baseline/8 sessions/end/ 3 mths

Conclusions: Clinically meaningful and significant improvement in semantic autobiographical memory occurred in ultrabrief treatment vis-à-vis brief-pulse ECT after 8 treatments. Ultrabrief treatment offered a small but significant advantage over 1-millisecond brief-pulse high-dose right unilateral ECT with early adult semantic autobiographical memory, which persisted up to 3 months.
ECT: relapse rates

Continuation Electroconvulsive Therapy With Pharmacotherapy Versus Pharmacotherapy Alone for Prevention of Relapse of Depression

A Randomized Controlled Trial

Axel Nordenskjöld, MD,*† Lars von Knorring, MD, PhD,*‡
Tomas Ljung, MD,§ Andreas Carlborg, MD, PhD,∥∥ Ole Brus, Msc,*#
and Ingemar Engström, MD, PhD*†

Pharmacological Strategies in the Prevention of Relapse After Electroconvulsive Therapy

Joan Prudic, MD,* Roger F. Haskett, MD,† W. Vaughn McCall, MD,‡ Keith Isenberg, MD,§
Thomas Cooper, MA,* Peter B. Rosenquist, MD,‡ Benoit H. Mulsant, MD, FRCPC,†∥∥
and Harold A. Sackeim, PhD*
**DISCUSSION:**
The results indicate that the efficacy of rTMS is tied to its stimulus parameters. Varying stimulus parameters can result in varying antidepressive effects. Consequently, future research on rTMS or rTMS versus ECT should take the influence of rTMS stimulus parameters into consideration.
Depress Anxiety. 2013 Jul;30(7):614-23.
Efficacy and acceptability of high frequency repetitive transcranial magnetic stimulation (rTMS) versus electroconvulsive therapy (ECT) for major depression: a systematic review and meta-analysis of randomized trials.

Berlim MT, Van den Eynde F, Daskalakis ZJ.
Source: Neuromodulation Research Clinic, Douglas Mental Health University Institute, Montréal, Québec H4H 1R3, Canada. nrc.douglas@me.com

In conclusion, ECT seems to be more effective than HF-rTMS for treating MD, although they did not differ in terms of dropout rates. Nevertheless, future comparative trials with larger sample sizes and better matching at baseline, longer follow-ups and more intense stimulation protocols are warranted.
LIMITATIONS: ... A statistical meta-analysis was not possible, because of the heterogeneity of outcome measures and the small amount of studies.

CONCLUSION: The literature shows no clear advantage for the efficacy of ultrabrief pulse over brief pulse ECT using unilateral as well as bilateral electrode placement. The increasing use of unilateral brief pulse ECT as first line method for depression is not supported by the current evidence.
Relapse Following Successful Electroconvulsive Therapy for Major Depression: A Meta-Analysis

Ana Jelovac¹, Erik Kolshus¹,² and Declan M McLoughlin*¹,²

¹Department of Psychiatry, Trinity College Dublin, St. Patrick's University Hospital, Dublin, Ireland; ²Trinity College Institute of Neuroscience, Trinity College Dublin, Dublin, Ireland
6 months

(a) **34.0%** (95% CI=27.2-41.5%, I²=76%) of patients (N=844) treated with continuation pharmacotherapy relapsed.

NB: historical trend effects

(b) post DSM-III era (N=710): **37.7%** (95% CI=30.7-45.2%, I²=70%)

• No effect of tx resistance (p=0.43)

• Lower relapse with:
  - Psychosis (p=0.004)
  - Age (p=0.04)

Jelovac et al (2013) *Neuropsychopharmacology*
Relapse rates: (a) 3, (b) 12 and (c) 24 months

3 months
27.1% of patients (N=350) on continuation pharmacotherapy had relapsed (95% CI=20.5-34.8%, $I^2=48\%$)

12 months
51.1% (95% CI=44.7-57.4%, $I^2=27\%$) (N=348)

24 months
50.4% (95% CI=41.2-59.6%, $I^2=0$) (N=111)
Relapse rates with continuation ECT

6-months

37.2% (95% CI=23.4-53.5%, $I^2=57\%$), four eligible C-ECT samples (N=146), i.e. same as modern-era AD-treated patients (37.7%).

39.5% (95% CI=31.9-47.7%, $I^2=81\%$) for any form of recognised continuation therapy across 19 eligible studies (N=1001).

45.4% (95% CI=35.2-55.9%, $I^2=0$), two studies of C-ECT only (N=86).

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Relapse rates in untreated samples

Unmedicated patients

• 3 months
  ➢ 47.9% (95% CI=38.1-57.9%, I²=0); two studies (1973).

Placebo-treated samples

• 3 months
  ➢ 62.7% (95% CI=47.6-75.8%, I²=0); three RCTs (1996-2010)

• 6 months
  ➢ 65.5% (95% CI=49.7-78.5%, I²=72%); seven RCTs (1965-2006)

  ➢ 78.0% (95% CI=66.1-86.5%, I²=0); four RCTs (N=65) (1984-2006)
Relative risk of relapse on continuation antidepressants vs. placebo

3 months
Any AD vs placebo; 3 studies
\[ \text{RR} = 0.56 \quad (95\% \text{ CI} = 0.38 - 0.81, \quad p = 0.002, \quad \text{NNT} = 3.5, \quad I^2 = 0) \]

6 months
Any AD vs placebo; 7 studies (n=402)
\[ \text{RR} = 0.49 \quad (95\% \text{ CI} = 0.39 - 0.62, \quad p < 0.0001, \quad \text{NNT} = 3.3, \quad I^2 = 0) \]
Conclusions

1. **Trust nobody**

2. **Relapse rates** following ECT are high, 40% at 6 mths and 50% at 12 mths
   - similar to STAR*D Study which had lower remission rates
   - but don’t forget superior remission rates with ECT

   • relapse rates have increased over time

   • vigorous maintenance therapy required post ECT
     - not yet clear what is best
     - most studies on older TCAs
     - C-ECT to be optimised