Cognitive effects and ECT-related anxiety during Maintenance ECT

Jasmien Obbels

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- High response and remission rates (Kellner et al., 2020)
- Older age predicts better outcome (van Diermen et al., 2018)
- Safe and well-tolerated (Kellner et al., 2020)

- ECT remains stigmatised!
- Cognitive side-effects
- Anxiety of patients for their treatment
Clinical practice

“My memory is already so bad…

...And will M-ECT not only…?

Dementia?

I know… but I am so anxious…?”

“M-ECT will worsen patients’ experience or side effects”
Improving care of ECT: A better understanding of cognitive effects and ECT-related anxiety

Jasmien Obbels

Pascal Sienaert

Esmée Verwijk
Part 1: Cognitive effects

• Permanent memory loss
• Temporary memory loss
• Brain damage


Cognitive effects

Semkovska & McLoughlin, 2010; Landry et al., 2020

Significant cognitive impairment within days of finishing an ECT-course

Deficits resolve during subsequent 2 weeks

cognitive functions improve thereafter or return to baseline levels

ECT

4-6 W

2 W


During M-ECT?

- Kirov et al. (2016)
- Luccarelli et al. (2020)
- Lisanby et al. (2022)
- Obbels et al. (2018;2020)
- Clinical message
During M-ECT?

*Kirov et al. (2016)*

- N=119 (depressive episode)
- 10 years of follow-up
- Cognitive testing: pre-ECT, 1w and 3m post-ECT, yearly during M-ECT
- “*Repeated courses of ECT do not lead to cumulative cognitive deficits.*”

During M-ECT?

*Luccarelli et al. (2020)*

- Retrospective cohort study
- N=100
- at least 50 treatments as part of a single treatment course
- QIDS & MoCA: baseline, every 10 treatments

Luccarelli J, McCoy TH, Seiner SJ, et al. (2020). Maintenance ECT is associated with sustained improvement in depression symptoms without adverse cognitive effects in a retrospective cohort of 100 patients each receiving 50 or more ECT treatments. *J Affect Disord* 271, 109-114.
“Improvement in depression was sustained and adverse cognitive effects were not detected, supporting the utility of maintenance ECT.”

During M-ECT?

Lucarelli et al. (2020)
During M-ECT?

**Lisanby et al. (2022)**

- PRIDE Study (Phase 2): multicenter, randomised trial
- 6 M follow-up after remission: STABLE ECT + pharmacotherapy vs. only pharmacotherapy
- \( N=120 \) (60Y and older, unipolar major depressive episode)
- Extensive cognitive testing: baseline, 6M follow-up

“Our key finding is that neurocognitive function improved over the 6M follow-up period. Regardless of which prolonging remission strategy was used, patients demonstrated recovery of the mild-to moderate neurocognitive impairments they experienced after the acute course of RUL-UB ECT + VLF. For the group as a whole, performance on most neurocognitive measures returned to the average range.”
During M-ECT?

**Obbels et al. (2018), Obbels et al. (2020)**

- **MODECT** (Mood Disorders in Elderly treated with ECT Study): UPC KU Leuven + GGZinGeest Amsterdam
  - N = 110, ≥ 55Y
  - Unipolar depression
  - ECT: twice a week RUL
  - Stop ECT: Remission


During M-ECT?

Obbels et al. (2018), Obbels et al. (2020)

- MMSE
- Neuropsychological battery
- Depression severity

- Pre-ECT
- Weekly during ECT
- 1 week post-ECT
- 6 months post-ECT
- 1 —> 4 years post-ECT
During M-ECT?

Obbels et al. (2018), Obbels et al. (2020)

N = 110

73Y 66% female
During M-ECT?

Obbels et al. (2018), Obbels et al. (2020)

• NO correlation between number of ECT sessions and cognitive performance

• “M-ECT/higher number of ECT-sessions does not cause additional negative effects on cognition!”
Clinical message

“Maintenance ECT is effective in prolonging remission without resulting in additional adverse cognitive effects.”
Clinical message

Caution!

• Autobiographical memory
• Normative data from healthy control group
• Individual differences
• Subjective experience
Clinical message

Autobiographical memory

• More research needed
Clinical message

Normative data

• Normative data: Comparing with non-depressed group: poor performance

• “Scare hypothesis” (Lewinsohn)
  = each depressive episode might leave a cognitive scare whereby each episode increases the likelihood of developing cognitive problems and relapse
Clinical message

Individual differences

GROUP level VS INDIVIDUAL level
Individual differences in cognitive performance on Visual Association Test

*Baseline - 6 months after ECT*

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<table>
<thead>
<tr>
<th></th>
<th>Declined Frequency</th>
<th>Neutral Frequency</th>
<th>Improved Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAT A</td>
<td>3</td>
<td>56</td>
<td>9</td>
</tr>
<tr>
<td>TMT A</td>
<td>3</td>
<td>56</td>
<td>2</td>
</tr>
<tr>
<td>TMT B</td>
<td>3</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Semantic fluency</td>
<td>0</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Clock</td>
<td>13</td>
<td>45</td>
<td>7</td>
</tr>
<tr>
<td>Meander Luria</td>
<td>15</td>
<td>38</td>
<td>14</td>
</tr>
</tbody>
</table>
Objective vs. subjective cognitive complaints

Systematic review & meta-analysis (Semkovska et al., 2022):
  —> 48% reported subjective complaints
  —> improvement depressive symptoms: strongest predictor

During M-ECT?
Clinical message

• Group/subgroup
• Impact depression
• Subjective experience
Three patients show a cognitive decline.

Nine patients show a cognitive improvement.

Most patients show a stable cognitive trajectory.
Part 2: ECT-related anxiety

“the most distressing psychological complication of ECT” (Ayd, 1956)

hardly studied
low methodological quality
highly prevalent (14-75%)

NO data about ECT-related anxiety trajectories during M-ECT

Prospective study: Research questions

• How do ERA trajectories develop during M-ECT (and differ from acute course?)

• How do ERA trajectories relate to depression severity trajectories during M-ECT?

• Which clinical and demographic characteristics are related to the course of ERA during M-ECT?

Obbels et al., 2022. ECT-related anxiety during maintenance ECT: a prospective study (under review).
Methods

Participants

- in-and outpatients of UPC KU Leuven (Belgium)
- ≥ 18Y
- Dutch-speaking
- referred for ECT for unipolar or bipolar major depressive episode
- received M-ECT after their acute ECT course
- written informed consent
Methods
Assessment

- Quick Inventory of Depressive Symptomatology -Clinician Rated (QIDS): depressive symptom severity
- ECT-related anxiety Questionnaire (ERAQ): severity of ECT-related anxiety
Methods

**ERAQ**

- Dutch
- 17-items
- self-report
- 4 point-scale

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<tr>
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<tbody>
<tr>
<td>1</td>
<td>I am anxious about temporary memory loss due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>I am anxious about permanent memory loss due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>I am anxious about brain damage due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>I am anxious about personality changes due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>I am anxious about having a headache after the ECT treatment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I am anxious about feeling nauseous after the ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>I am anxious about damage to my teeth due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>I am anxious about the narcotics (complete anesthesia).</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>I am anxious about the needle that is used during anesthesia.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>I am anxious about being surrendered to the medical staff during anesthesia.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>I am anxious about doing embarrassing things during anesthesia.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>I am anxious about not waking up after the anesthesia.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>I am anxious about dying due to ECT.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>I am anxious about the use of electricity during the ECT procedure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>I am anxious about the convulsion during the ECT procedure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>I am anxious to have to wait a long time for my treatment on the morning of the ECT treatment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>I am anxious about what others would think of my treatment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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Results

Patients screened for eligibility \( n = 92 \)

- Not willing to participate \( n = 6 \)
- Not eligible for inclusion \( n = 12 \):
  - non-Dutch speaking \( n = 6 \)
  - other primary diagnosis \( n = 6 \)
- No maintenance ECT \( n = 35 \)

Eligible for study inclusion and analysed \( n = 39 \)
## Results

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<table>
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<tbody>
<tr>
<td>Mean age, year (SD, min-max)</td>
<td>49.82 (11.82, 21-74)</td>
</tr>
<tr>
<td>Gender, female, n (%)</td>
<td>26 (66.67)</td>
</tr>
<tr>
<td>DSM-IV diagnosis, n (%)</td>
<td></td>
</tr>
<tr>
<td>Unipolar depression</td>
<td></td>
</tr>
<tr>
<td>With psychotic features</td>
<td>14 (35.90)</td>
</tr>
<tr>
<td>Without psychotic features</td>
<td>17 (43.59)</td>
</tr>
<tr>
<td>Bipolar depression</td>
<td>8 (20.51)</td>
</tr>
<tr>
<td>With psychotic features</td>
<td>2 (5.13)</td>
</tr>
<tr>
<td>Without psychotic features</td>
<td>6 (15.38)</td>
</tr>
<tr>
<td>Mean number of ECT sessions during acute course (SD, min-max)</td>
<td>11.90 (5.39, 3-29)</td>
</tr>
<tr>
<td>Mean number of ECT sessions during acute course and M-ECT (SD, min-max)</td>
<td>17.87 (7.91, 6-34)</td>
</tr>
</tbody>
</table>
Results

• **Acute course**: ERA and depression severity declined significantly

• **M-ECT**: ERA and depression severity remained stable
Results

Correlation between QIDS & ERAQ

• **During acute course:**
  larger decline in depression severity was associated with a larger decline in ERA

• **During M-ECT:** no association between ERA and depression severity
Results

Covariates

• No effect of age, gender, number of ECT session during acute course, total number of ECT sessions during acute and M-ECT

• Pyschotic features
Results

Psychotic features

• Psychotic depression:
  - more ERA before start ECT
  - significant decline during acute course
  - evening out into a plateau during M-ECT

• Non-psychotic depression:
  - less ERA before start ECT
  - stable ERA during acute and M-ECT
Results

Psychotic features

• Psychotic depression:
  - more severely depressed before start ECT
  - significant decline during acute course
  - stable during M-ECT

• Non-psychotic depression:
  - less severely depressed before start ECT
  - significant but smaller decline during acute course
  - stable during M-ECT
Results

Psychotic features

• changes in ERA: related to an improvement of depression severity or the disappearance of psychotic symptoms?
Clinical message

Number of ECT sessions

- No association between ERA trajectories and total number of ECT sessions
- Despite large total number of ECT sessions during M-ECT: no panic mode, not becoming more anxious over time!
Clinical message

Changing old ideas

“Cognitive side-effects and ECT-related anxiety will not escalate during M-ECT!”

Maintenance ECT is a valid treatment option!
Family-centered ECT-care
Coffey & Coffey (2019)
Thanks to…

Academic Centre for ECT and Neuromodulation (AcCEN$t$)

ResPECT - Research in Psychiatry & ECT
Flemish-Dutch ECT consortium

ECT team
UPC KU Leuven