

Autobiographical Memory and Electroconvulsive Therapy: A Systematic Review and Meta-Analysis



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BACKGROUND

Electroconvulsive therapy (ECT) is the most acutely effective treatment of major depression (1). However, cognitive adverse effects remain a key limitation to its use (2). Autobiographical memory (AM) loss is the adverse effect of greatest concern to patients (3).

A systematic review (4) suggests that AM loss after ECT does occur, but primarily concerns relatively recent episodic memories. However, the exact nature, extent, and permanency of the AM deficits after ECT are still debated (e.g. 5), primarily due to methodological problems concerning the validity of the tests used to assess AM, the influence of the passage of time, depression itself, and ECT treatment parameters.

In the current systematic review and meta-analysis, we provide an updated overview of the effect of ECT on AM in patients with depression.

OBJECTIVES

The primary aims were to answer the following research questions:

1. Is AM affected by ECT?
2. What is the extent of the effect?
3. Is the effect temporary or permanent?

METHOD

This systematic review adheres to the PRISMA rules and was registered on Prospero before data extraction. ID: CRD42021267901.

We searched for studies in PubMed, EMBASE, Web of Science and PsycINFO with no restrictions to language, type of study or year. The following search string was performed: (ECT OR "electroconvulsive therapy" OR "electroshock therapy" OR "convulsive therapy") AND (autobiographical OR retrograde) AND (memory OR amnesia). The last search was performed on April 4th, 2023. On this date, "OR remote" was added to the second parenthesis of the search string, however not yielding any additional relevant studies in any of the databases.

Reference lists of obtained articles were scrutinized for studies not found in the electronic databases. If necessary, authors of included articles were contacted to obtain additional information.

RESULTS

The meta-analysis revealed a significant moderate effect of ECT on AM consistency. This represented a mean of 13.3 % (SD = 17.4) larger reduction in AM consistency compared to healthy controls, and 9.9 % (SD = 8.0) when compared to clinical control groups with depression.

Electrode placement was the only significant moderator.

- The effect was large for bilateral ECT.
- The effect was medium when bilateral and unilateral ECT were mixed.
- The effect was small for right unilateral ECT.

Only a few studies ($n = 4$) conducted both short- and long-term follow-up assessments (≤ 1 year). At the long-term follow-ups AM consistency was either stable or showed further deterioration.

SUPPLEMENTARY MATERIAL

Table 1. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
- English language.	- Animal studies.
- Prospective or retrospective longitudinal studies measuring AM and antidepressant effect, before and after ECT.	- Gray literature.
- The intervention must be a series of ECT sessions.	- Comments or letters to editors.
- Subjects: $n \geq 5$, ≥ 18 years old, moderate to severe MDD/bipolar depression according to DSM-III, ICD-8 or later versions.	- Conference abstracts.
- Healthy controls or same patient groups receiving non-ECT treatment.	- Maintenance ECT.
- Cognitive outcomes CAMI, CAMI-SF or Kopelman AMI.	
- Affective outcomes HAM-D or MADRS.	
- ECT-pulse: BP or UBP, independent of electrode placement.	

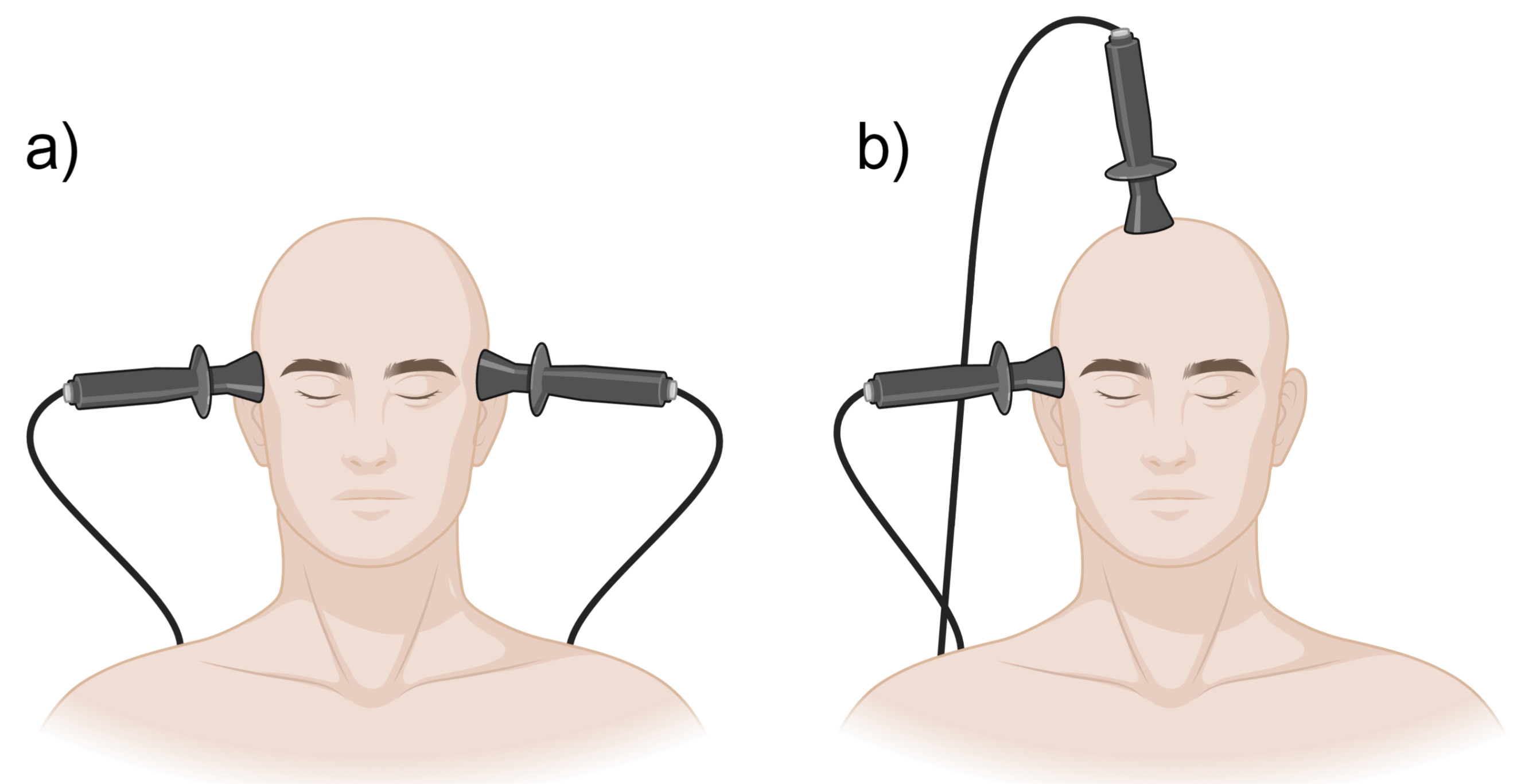
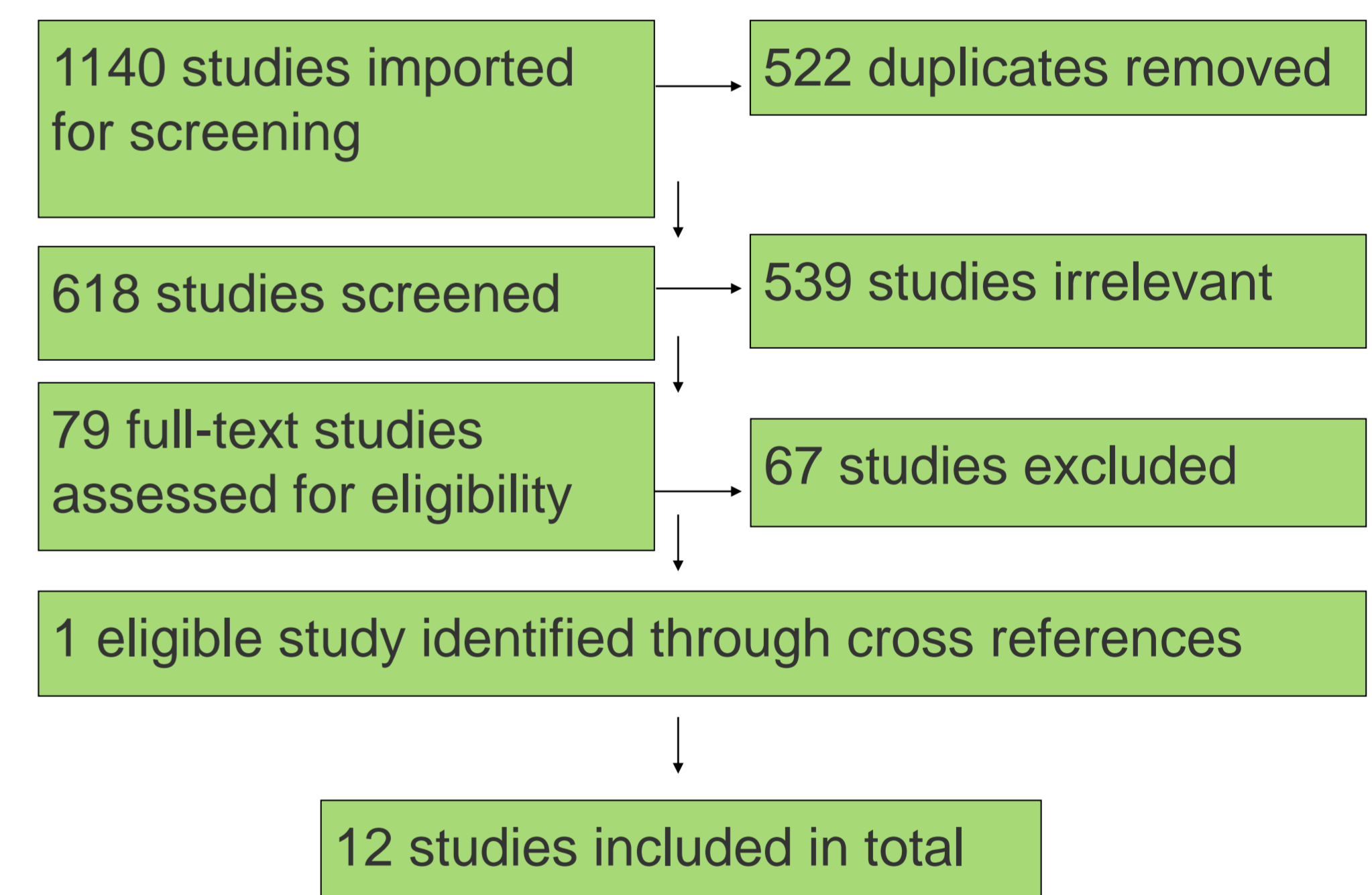


Figure 1. Electrode placement: a) Bilateral ECT. b) Right unilateral ECT. Created with BioRender.com.

Figure 2. Flowchart of the study selection process



CONCLUSION

AM consistency was moderately affected by ECT in the included studies. The extent of the effect depended on electrode placement, favoring right unilateral electrode placement.

The loss of AM was permanent in the few studies conducting both short- and long-term follow-ups.

Future studies should prioritize conducting long-term follow-up assessments of AM consistency in ECT patients paired with a matched patient control group with similar depressive severity. This is crucial to further uncover the permanency of AM deficits following ECT and potentially additional deterioration.

- References:
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