ECT – An Update

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Overview

- Focus on clinical aspects
- Newer developments in ECT for depression
- Role of ECT in schizophrenia
- Cognitive adverse effects of ECT

ECT in Depression

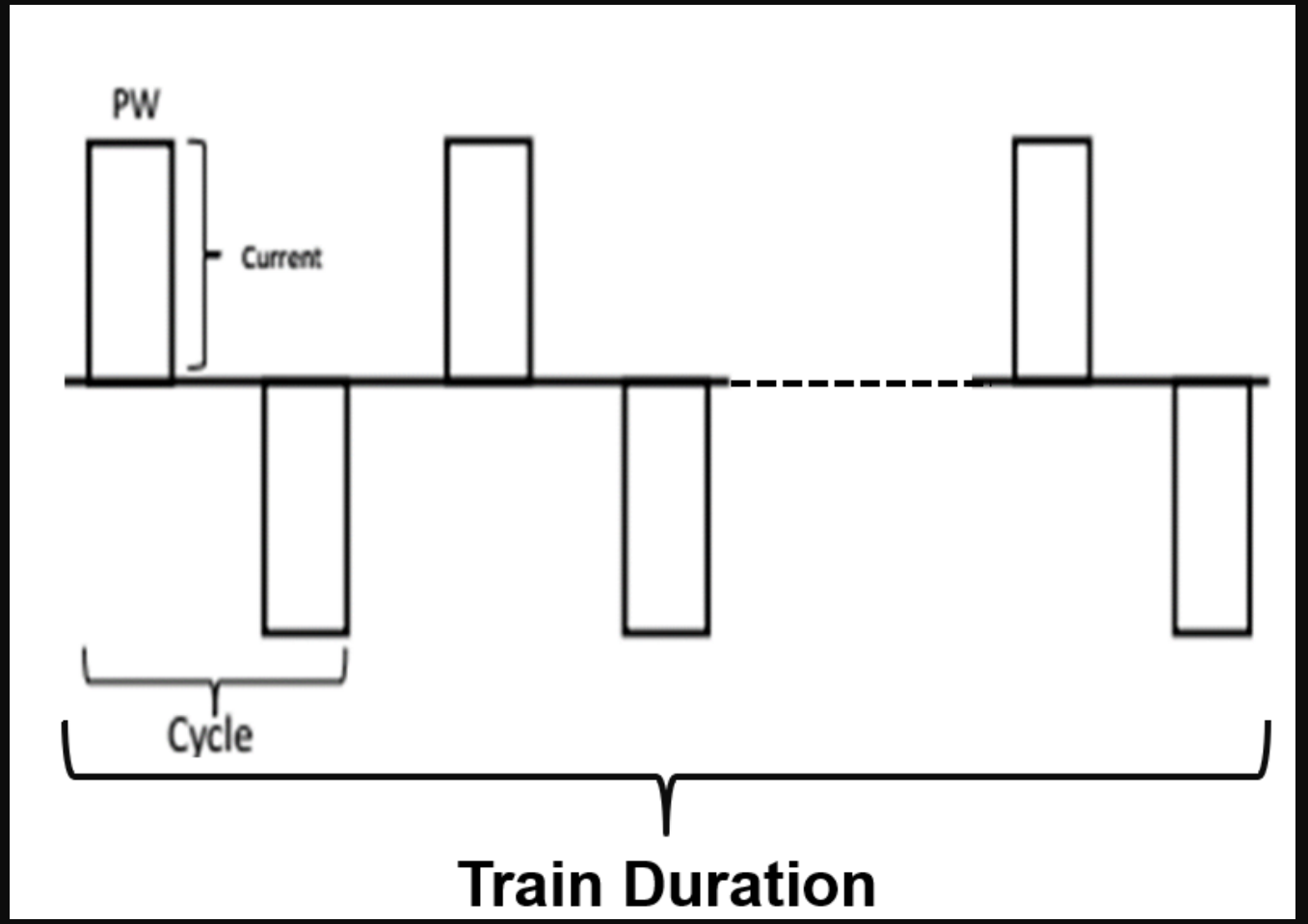
- Robust evidence
- Meta-Analysis by the UK-ECT Review Group (*Lancet* 2003; 361: 799–808)
  - *"ECT is an effective short-term treatment for depression, and is probably more effective than drug therapy."*
- 'Best evidence': Clear superiority of high-dose right unilateral ECT and bilateral ECT over low/moderate-dose unilateral ECT (Sackeim et al., *Arch Gen Psychiatry. 2000;57:425-434*)
- Nearly all guidelines recommend ECT in depression
  - Minor differences about when it should be used

ECT in Depression – What's New?

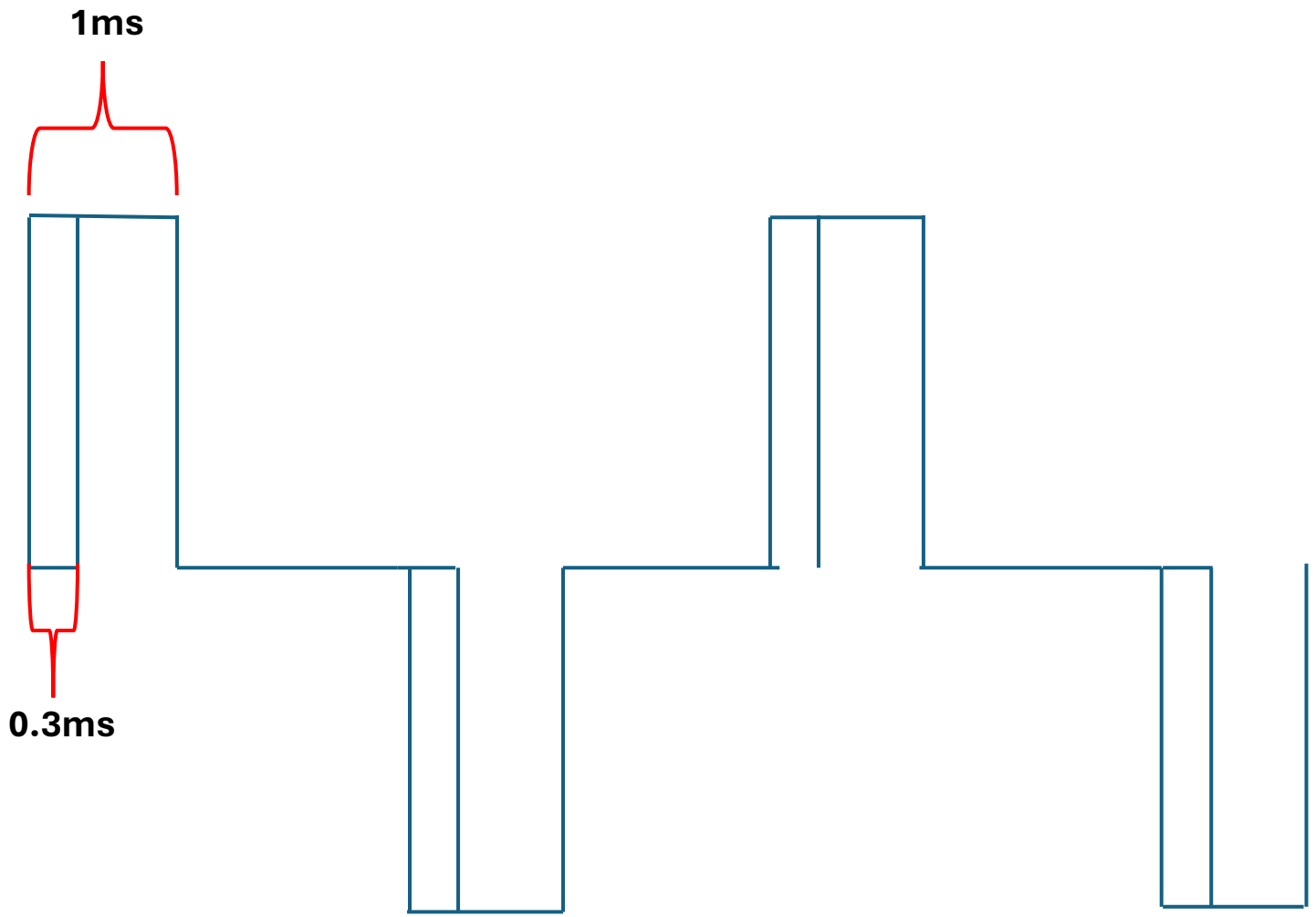
- Ultrabrief ECT
- ECT vs ketamine in depression
- ECT + ketamine in depression
- ECT vs Magnetic Seizure Therapy
- Focal Electrically Administered Seizure Therapy (FEAST)

Ultrabrief ECT

Parts of the Electrical Stimulus



Brief vs ultrabrief pulse ECT



- **0.3 ms** is close to the natural excitability window of neurons responsible for seizure induction
- Wider pulses may stimulate neurons beyond this window and may add to adverse effects

Meta-Analysis > J Clin Psychiatry. 2015 Sep;76(9):e1092-8. doi: 10.4088/JCP.14r09145.

A Systematic Review and Meta-Analysis of Brief Versus Ultrabrief Right Unilateral Electroconvulsive Therapy for Depression

Phern-Chern Tor, Alison Bautovich, Min-Jung Wang, Donel Martin, Samuel B Harvey, Colleen Loo

PMID: 26213985 DOI: 10.4088/JCP.14r09145

- 6 studies (689 participants) comparing brief-pulse and ultrabrief-pulse ECT
- Efficacy was better with brief-pulse ECT:
  - Depression scores at the end of acute course of ECT (SMD: 0.25)
  - Remission rates (OR: 1.41; NNT: 12.1)
  - Number of ECTs administered (on average, 1 session less)

Tor et al., (2015) Meta-analysis

- Cognitive adverse effects were significantly less with Ultrabrief-pulse ECT:
  - Global assessment
  - Retrograde memory
  - Anterograde memory

- Ultrabrief-pulse ECT –
  - Saves short-term cognitive deficits at the cost of efficacy
  - Preferred in those who are concerned about cognitive deficits

Ultrabrief ECT – Other Considerations

- Bilateral ECT with ultrabrief ECT had unusually low response rate (35%) – complex interplay of electrical parameters on the size and location of neurons may explain this loss of efficacy (Sackeim et al., Brain Stimulation (2008) 1, 71–83)

- About 50 – 60% of patients who receive ECT do so for indications other than depression in Asia including India (Eranti et al., J ECT 2011;27: 275; Chanpattana et al., J ECT 2010;26: 5)
  - Unilateral ECT is not well studied in these indications – most clinicians prefer bilateral ECT
  - Ultrabrief bilateral ECT, being of inferior efficacy, is of concern in our settings

Ultrabrief Pulse ECT – Summary

- Excellent cognition-sparing effect – both in short- & long-term
- Slight reduction in efficacy with high-dose unilateral ECT in depression
- Substantial reduction in efficacy with bilateral ECT in depression
  - Possibly so with other indications too?

How does ECT Compare with Ketamine for Depression?

- Ketamine is becoming popular as treatment for depression
- Several routes – IV, IM, Intranasal, oral, subcutaneous
- Fast anti-suicidal effect
- Can it replace ECT?

Direct Comparisons (RCTs)

Patients who were otherwise referred for ECT

Author	Year	N	Age	Blind-ing	Psychotic sx	IP/OP	TRD	Follow up	Conclusions reg efficacy
Ghasemi	2014	18	38	Y	0%	IP	NA	2wk	**ECT=Ketamine; Ketamine acts faster**
Kheirabadi	2019	22	39	Y	0%	IP	NA	3m	**ECT = Ketamine**
Kheirabadi	2020	39	41	N	0%	IP	NA	7wk	**ECT = Ketamine; Ketamine more anti-suicidal**
Sharma	2020	25	39	Y	36%	IP	NA	2wk	**ECT more rapid and better than Ketamine**
Ekstrand	2022	186	53	N	17%	IP	NA	13m	**ECT better than ketamine in remission rates**
Anand	2023	365	46	N	0%	IP/OP	Y	6m	**Ketamine better than ECT in response rates**

Quality of RCTs

Journal of Affective Disorders 371 (2025) 45–53

	Random sequence generation (selectio bias)	Allocation concealment (selection bias)	Blinding of participants and personnel	Blinding of outcom assessment (Symptom reductior response)	Incomplete outcom data addressed (attrition bias)	Selective reporting (reporting bias)	Other sources of bias
Anand et al., 2023 (USA)	+	?	-	-	+	+	?
Ekstrand et al., 2022 (Sweden)	+	+	-	-	+	+	?
Ghasemi et al., 2014 (Iran)	?	?	-	+	+	+	?
Kheirabadi et al., 2019 (Iran)	+	?	-	+	+	+	?
Sharma et al., 2020 (India)	+	+	-	+	+	+	?

None were participant-blinded

There is reason to believe that this may not have affected the outcomes

Meta-analyses Galore!

Reference	Studies included	Outcome measure	Inference	Remarks
Rhee 2022	All but Anand	• SMD for depression scores	**ECT > Ketamine**	Also included a non-randomized study
Menon 2023	All but Anand	• SMD for depression scores • Proportion of response and remission	**ECT > Ketamine in both measures**	Primary outcome significant only when 'weaker' trials were removed (Sharma and Ekstrand were included)
Petrucci 2024	All 6 studies	• SMD for 'change in depression' scores • Proportion of response	**ECT = Ketamine in response in all patients** **ECT > Ketamine in SMD and among inpatients in both measures**	No difference in 1m, 3m and 6m relapse rates
Shi 2025	All but Kheirabadi 2020	• SMD for depression scores	**ECT = Ketamine in final scores**	Ketamine > ECT in outcomes within 2 weeks

Adverse Effects

- Nearly consistent across all studies
- Headache, muscle pain and cognitive complaints higher with ECT
- Dissociative experience, giddiness / vertigo commoner with ketamine

Notes about Anand et al., 2023 Study

- Largest study (N=365)
- Patients with TRD (Failure of at least 2 Ads)
- Non-inferiority study: Ketamine is not inferior to ECT
  - Actually, ketamine was superior to ECT
- Unusual characteristics:
  - Nearly 90% were outpatients
  - Response (~40%) and remission rates (~20%) with ECT are much lower than all other ECT studies
  - Number of antidepressant failures not provided

Not representative of typical ECT patients?

ECT vs Ketamine: Beyond Numbers

- All RCTs included ‘consenting’ patients
  - Ethically sound
  - Many patients receive ECT with ‘100% support’
    - Depression with severe psychomotor retardation / agitation
    - Depression with catatonia
    - Psychotic depression
    - Refusal of fluids and medications (particularly elderly)

- How does ketamine compare with ECT in such patients?

ECT vs Ketamine – Summary

- Ketamine seems to be equivalent to ECT in relatively less severely ill, non-psychotic, patients with depression
  - For severely ill patients ECT may be better?
  - Suicidality may be an exception to this?

- Cognitive vs dissociative / cardiovascular adverse effects need to be weighed against each other

ECT vs Ketamine

OR

ECT with Ketamine?

Ketamine Anesthesia for ECT

- Used alone or with others (propofol – ‘ketofol’)
- Advantage: Useful in cases where seizure elicitation is hard
- Disadvantage: Hypertension
- Is there therapeutic advantage?

Meta-Analysis > Ann Pharmacother. 2025 Mar;59(3):250-261. doi: 10.1177/10600280241260754. Epub 2024 Jun 19.

The Impact of Ketamine–Based Versus Non–Ketamine–Based ECT Anesthesia Regimens on the Severity of Patients' Depression and Occurrence of Adverse Events: A Systematic Review with Meta–Analysis

Dakota J Sicignano [1], Rohan Kantesaria [1], Matthew Mastropietro [1], Ava Sedensky [1], Roslyn Kohlbrecher [1], Adrian V Hernandez [1 2 3], C Michael White [1 2]

- 17 RCTs comparing ketamine vs other agents for ECT
- 12 with low risk of bias
- 1181 participants
- Those receiving ketamine + ECT experienced higher remission (OR 1.8)

Sicignano et al., 2025

- Only 3 studies compared ketamine alone vs other agents
- Other 6 used ketamine with another anesthetic agent
- No separate meta-analysis of ketamine alone vs other agents

Sicignano et al., 2025

- Ketamine group has significant advantage by 3rd ECT
- Only a few trials included participants with TRD
- Adverse effects: Ketamine group had higher rates of:
  - “Fear with Hallucinations”
  - Hypertension
  - Delirium
- Other meta-analyses have reported no significant difference between ketamine and other agents

Ketamine for ECT

- Therapeutic advantage present – evidence is inconsistent
- Comes at the cost of adverse effects
- Unclear if ketamine used alone is beneficial
- Clinicians should weigh pros and cons in their patients

How Does rTMS Compare with ECT for Depression?

Caveat: ‘ECT’ and ‘TMS’ are not monolithic treatments

- ECT:
  - Electrode placement
  - Stimulus strength relative to seizure threshold
  - Frequency of sessions (2 / 3 times a week)
  - With or without medications
- TMS:
  - Conventional or patterned (theta burst)
  - Superficial / deep; target areas
  - Amplitude (relative to MT), frequency, number of pulses
  - Frequency of sessions

Meta-Analysis > Depress Anxiety. 2013 Jul;30(7):614-23. doi: 10.1002/da.22060. Epub 2013 Jan 24.

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

Marcelo T Berlim [1], Frederique Van den Eynde, Zafiris J Daskalakis

- 7 RCTs
- 294 participants with depression
- Average of 15.2 HF-rTMS and 8.2 ECT sessions
- No head-to-head comparison after this

ECT vs rTMS Meta-Analysis

- Remission with
  - rTMS: 33.6%
  - ECT: 52%
  - OR = 2.17; p = 0.04; NNT = 6
- Reduction of depressive symptomatology was significantly more pronounced in the ECT group
  - Large effect size: Hedges' g = -0.93

ECT vs rTMS

- Efficacy of rTMS in depression is unquestionable – several studies and meta-analyses have shown this
- Superiority of efficacy of ECT over rTMS is also unquestionable
- Both have their place – one may not replace the other

ECT vs Magnetic Seizure Therapy

JAMA Psychiatry | Original Investigation

JAMA Psychiatry. 2024;81(3):240-249.

Clinical Outcomes of Magnetic Seizure Therapy vs Electroconvulsive Therapy for Major Depressive Episode
A Randomized Clinical Trial

Zhi-De Deng, PhD; Bruce Luber, PhD; Shawn M. McClintock, PhD, MSCS; Richard D. Weiner, MD, PhD; Mustafa M. Husain, MD; Sarah H. Lisanby, MD

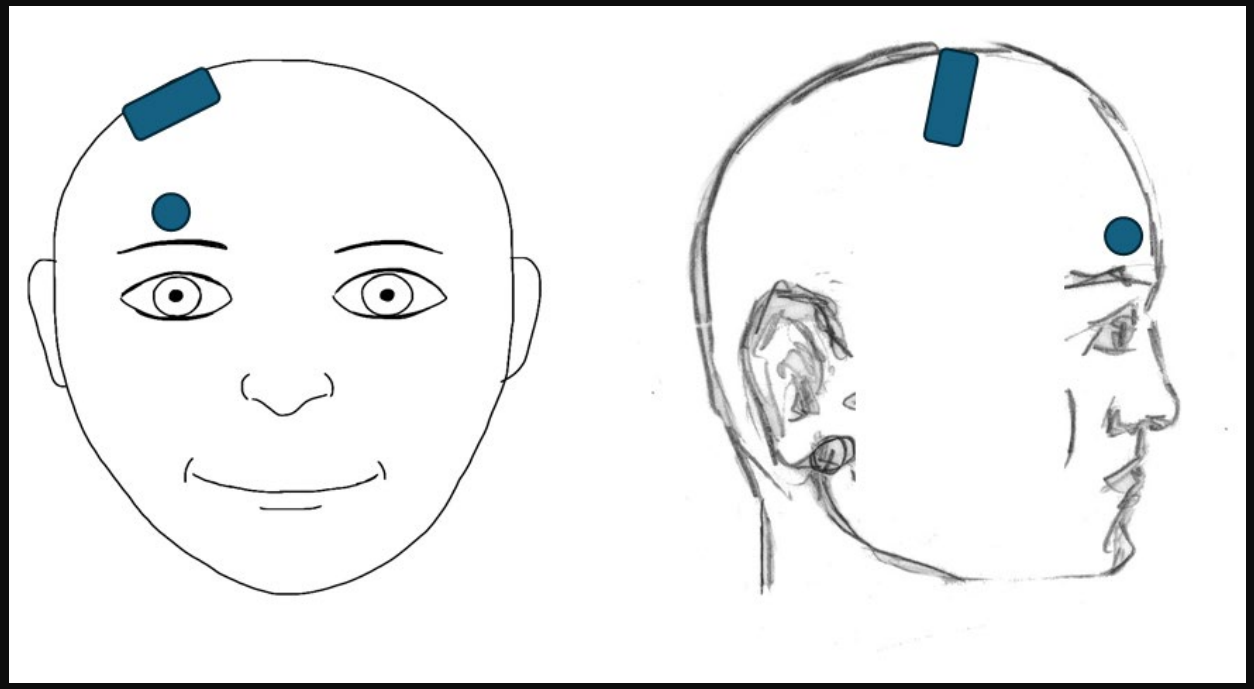
- 35 and 38 patients ‘referred for ECT’ randomized to MST and ECT
- Comparable response and remission rates
- Number of sessions to reach remission: MST > ECT
- Time to reorientation, autobiographical memory, subjective adverse effects – MST was safer than ECT

MST vs ECT

- More frequent application of MST possible?
  - May reduce number of days of treatment but not costs
- MST may replace ECT in cases where cognition is a concern
  - Hugely expensive
  - Longevity of device / risk of damage
- Participants ‘referred for ECT’:
  - Representation of real-life ECT patients? – Catatonic / suicidal / aggressive / food refusal

Focal Electrically Administered Seizure Therapy (FEAST)

- Three key aspects:
  - **Electrode placement**: Anterio-posterior – Just above the right eyebrow – just anterior to vertex
  - **Electrode size and shape**:
    - Anterior: Small, circular
    - Posterior: Large, oblong
  - **Direction of current**: Unidirectional – posterior to anterior



Clinical Trial > Brain Stimul. 2020 Sep-Oct;13(5):1416-1425. doi: 10.1016/j.brs.2020.07.015. Epub 2020 Jul 29.

A two-site, open-label, non-randomized trial comparing Focal Electrically-Administered Seizure Therapy (FEAST) and right unilateral ultrabrief pulse electroconvulsive therapy (RUL-UBP ECT)

Gregory L Sahlem [1], William V McCall [2], E Baron Short [3], Peter B Rosenquist [2], James B Fox [3], Nagy A Youssef [2], Andrew J Manett [3], Suzanne E Kerns [3], Morgan M Dancy [3], Laryssa McCloud [2], Mark S George [4], Harold A Sackeim [5]

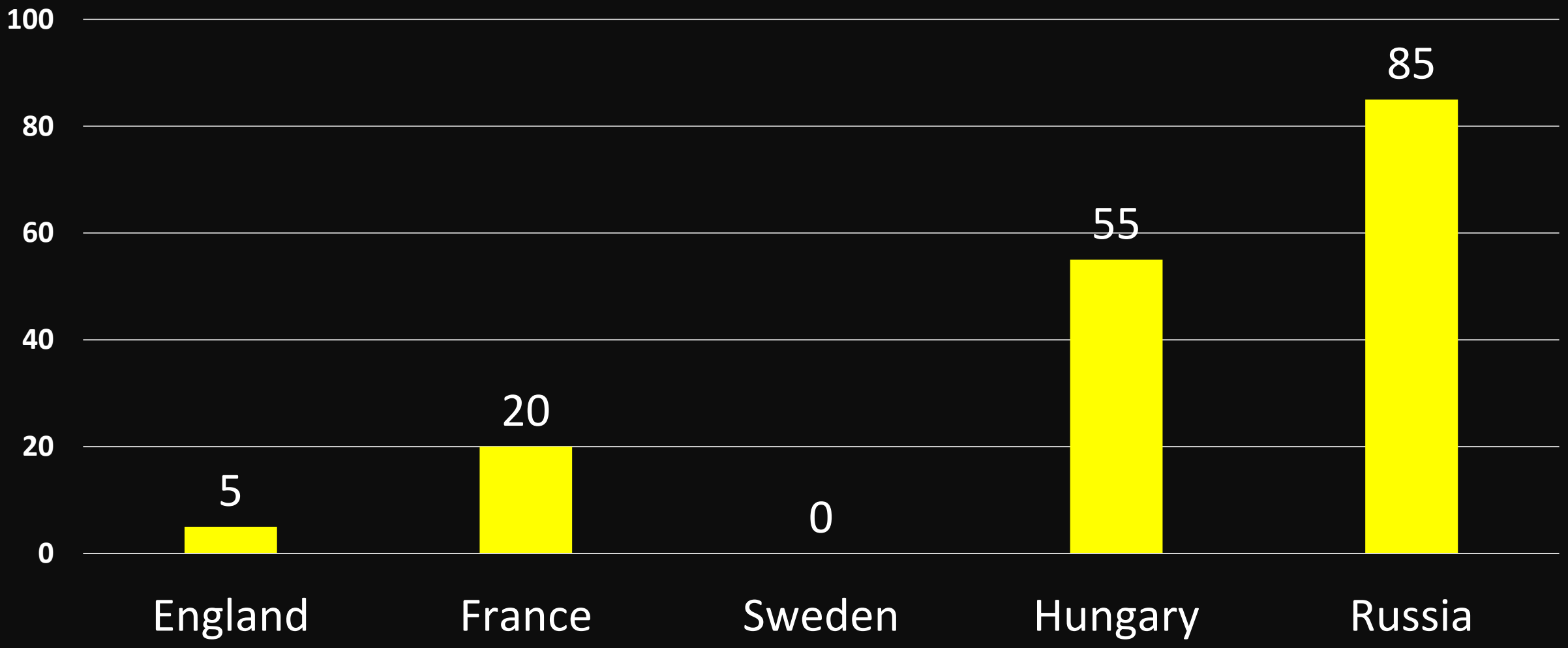
- Comparable efficacy with ultrabrief right unilateral ECT
- Much better cognitive effects
- Open-label, non-randomized trial
  - Definitive large-scale, double-blind RCTs are needed

ECT in Schizophrenia

ECT in Schizophrenia

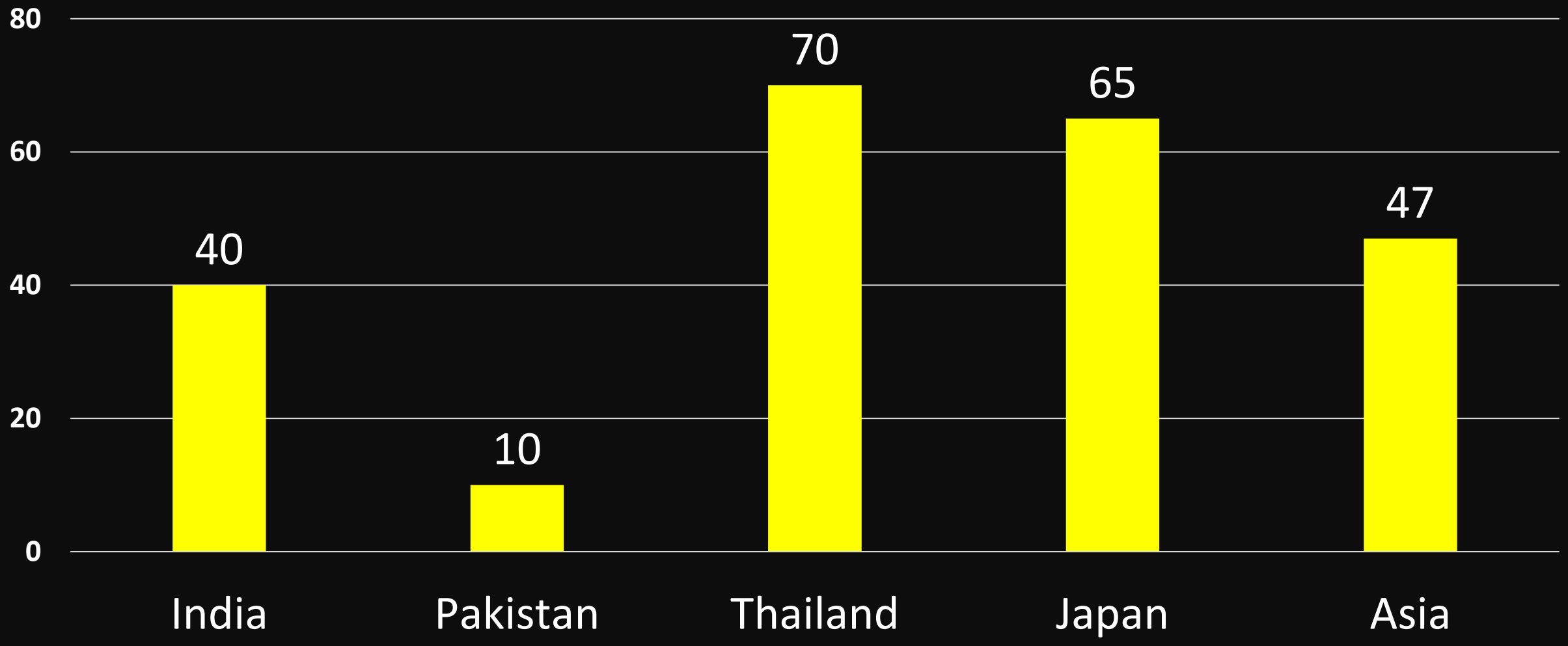
- Why is this important?
- Probably, more patients with schizophrenia receive ECT than those with depression
- What percentage of patients that receive ECT do so for schizophrenia?

Europe



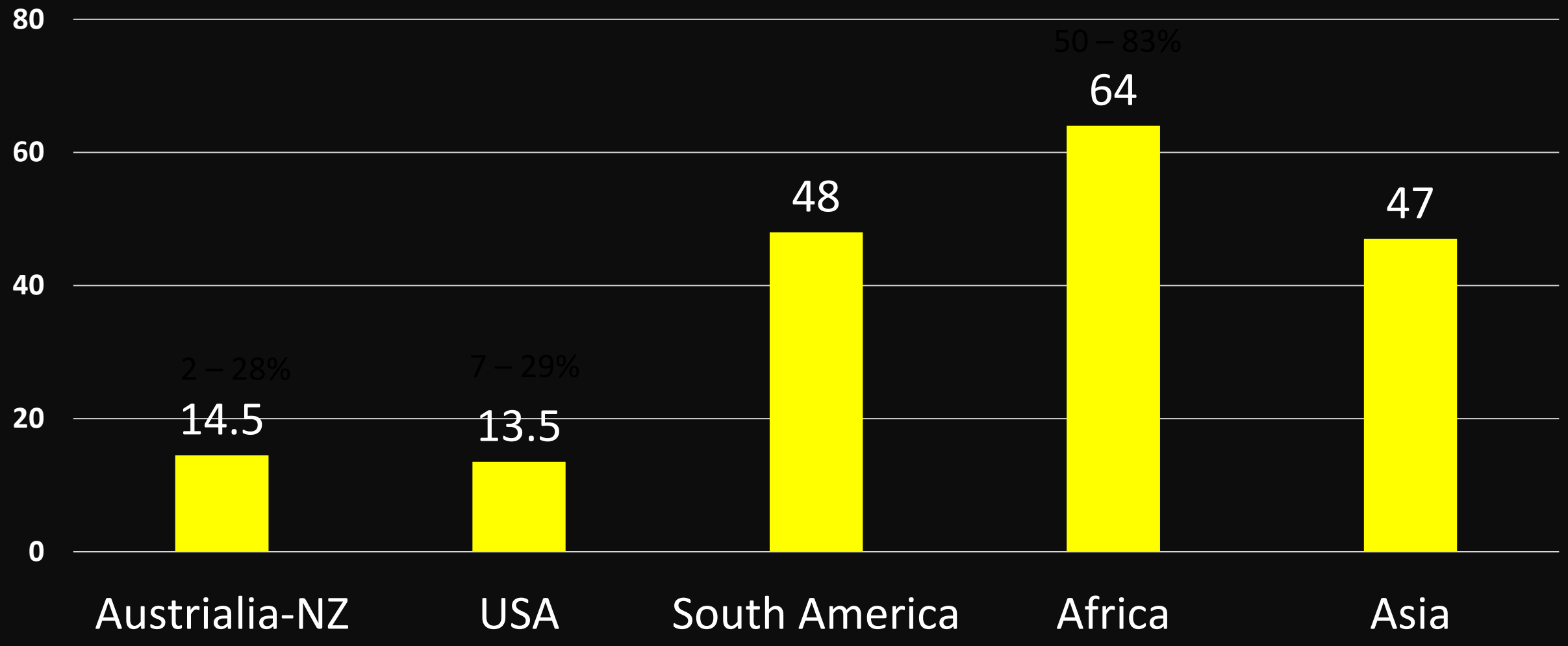
Leiknes et al., Brain & Behavior 2012, 2(3) 283-345

Asia



Leiknes et al., Brain & Behavior 2012, 2(3) 283-345

Other countries / continents



Leiknes et al., Brain & Behavior 2012, 2(3) 283-345

Summary

- Highly varied:
  - USA and UK and some western European countries: 0-15%
  - Eastern Europe and most of Asia and Africa: > 40%
  - Caveat: Wide variations are present within countries

- In most populous regions of the world, nearly half of patients who receive ECT, do so for schizophrenia.

ECT Practice vs. Research

- Probably, more number of patients with schizophrenia receive ECT than those with depression

- What about research?

The World Journal of Biological Psychiatry, 2010; 11: 997–998

LETTER TO THE EDITOR

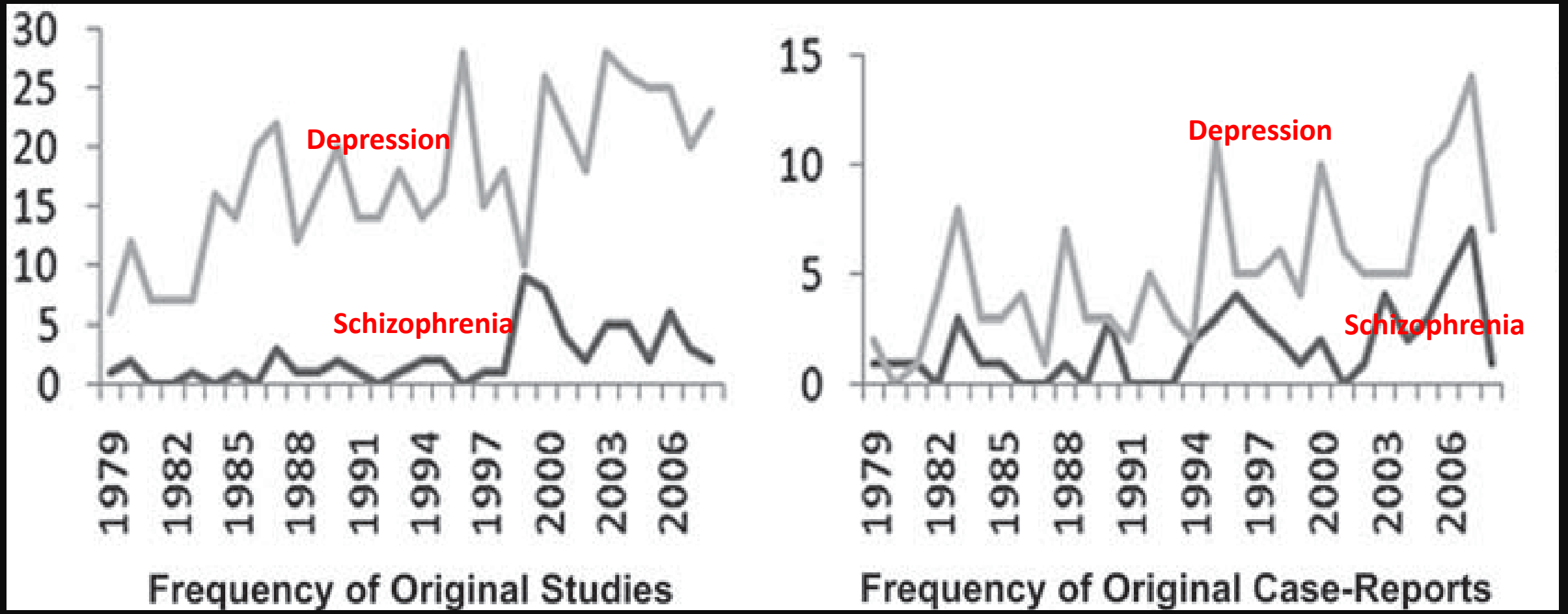
Discrepancy in research on ECT in schizophrenia and depression: A global perspective

MAHESH MAHADEVAIAH, JAGADISHA THIRTHALLI & BANGALORE. N. GANGADHAR

- Bibliographic analysis of published data
- PubMed database for MeSH term, electroconvulsive therapy
- English language, human subjects
- Published between 1979 – 2009

Discrepancy in research on depression vs. schizophrenia

Of the 829 research papers, 65% on depression; 8.5% on SZ



Why is there dearth of research in schizophrenia?

- Schizophrenia patients receive more ECT in LAMI countries
  - Only a small proportion of all biomedical research publications are from these countries (Patel and Kim 2007)

- Ethical and pragmatic concerns
  - Poor capacity to consent
  - Cooperativeness to go through rigorous research assessments

Contrast between practice and research

- Most guidelines and systematic reviews comment on this.

"***Thousands of schizophrenia patients continue to receive ECT with few attempts to optimize this treatment***"

Cochrane Review (2005)

- RCTs of Schizophrenia (26 studies)

- ECT of any dose, frequency, level of stimulus vs.
  - Sham or simulated ECT / Placebo
  - ECTs varying in stimulus dose, frequency of use, laterality number of sessions
  - Antipsychotics
  - Non-pharmacological treatments

Results

- ECT better than sham ECT / placebo at least in short run
- Antipsychotics better than ECT
- "…ECT, combined with treatment with antipsychotics, may be considered an option, particularly when rapid global improvement and reduction of symptoms is desired…"
- "This is also the case for those with schizophrenia who show limited response to medication alone"

Authors' Cautions

- These data are so limited that they should only be considered as **hypothesis generating**

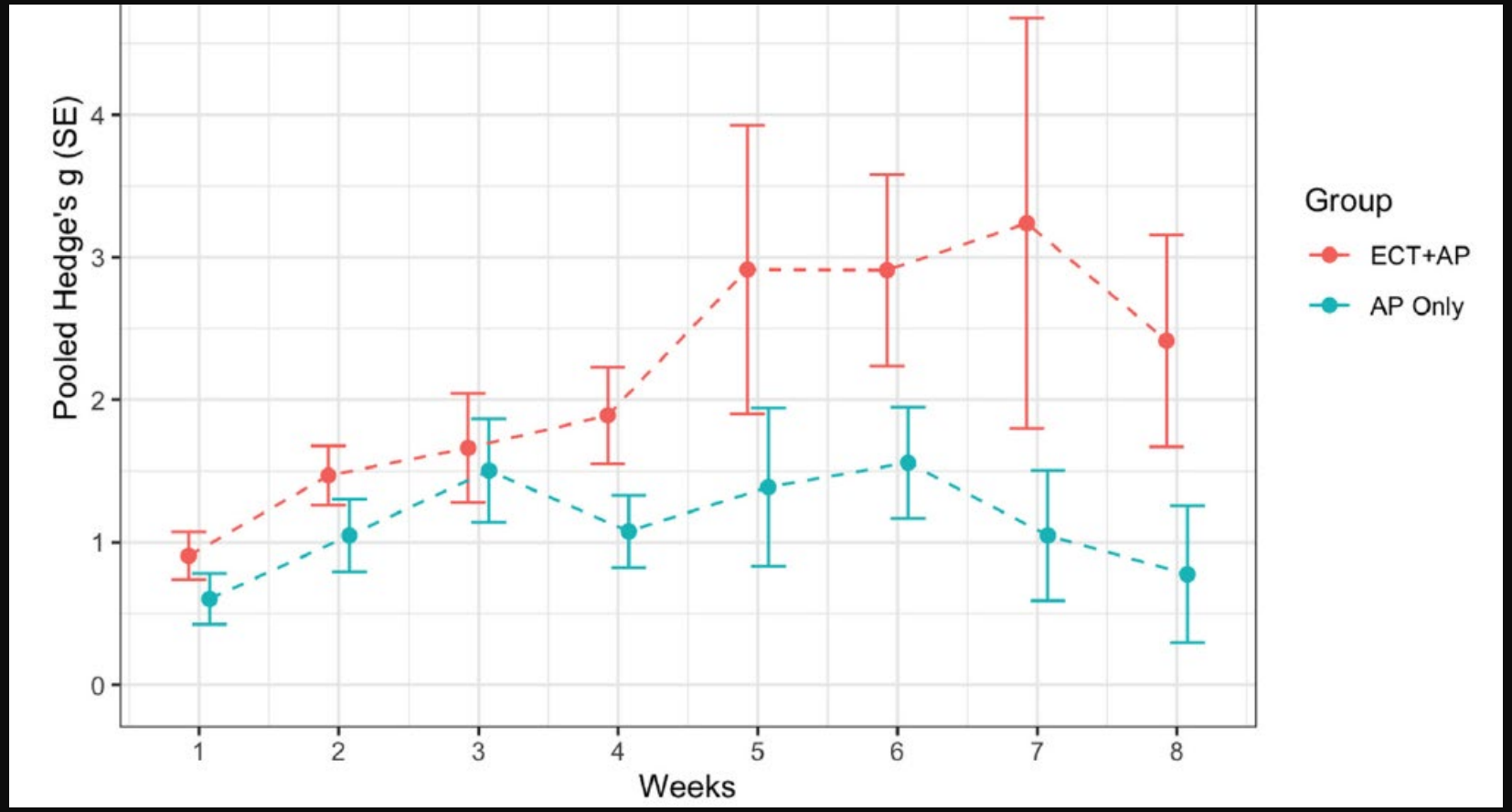
- The results "…do suggest a role for the addition of ECT for people who show limited response to antipsychotic medication, **but this needs further evaluation**"

Does adjunctive electro-convulsive therapy improve the speed of treatment response in schizophrenia? A systematic review and week-by-week meta-analyses of controlled clinical trials

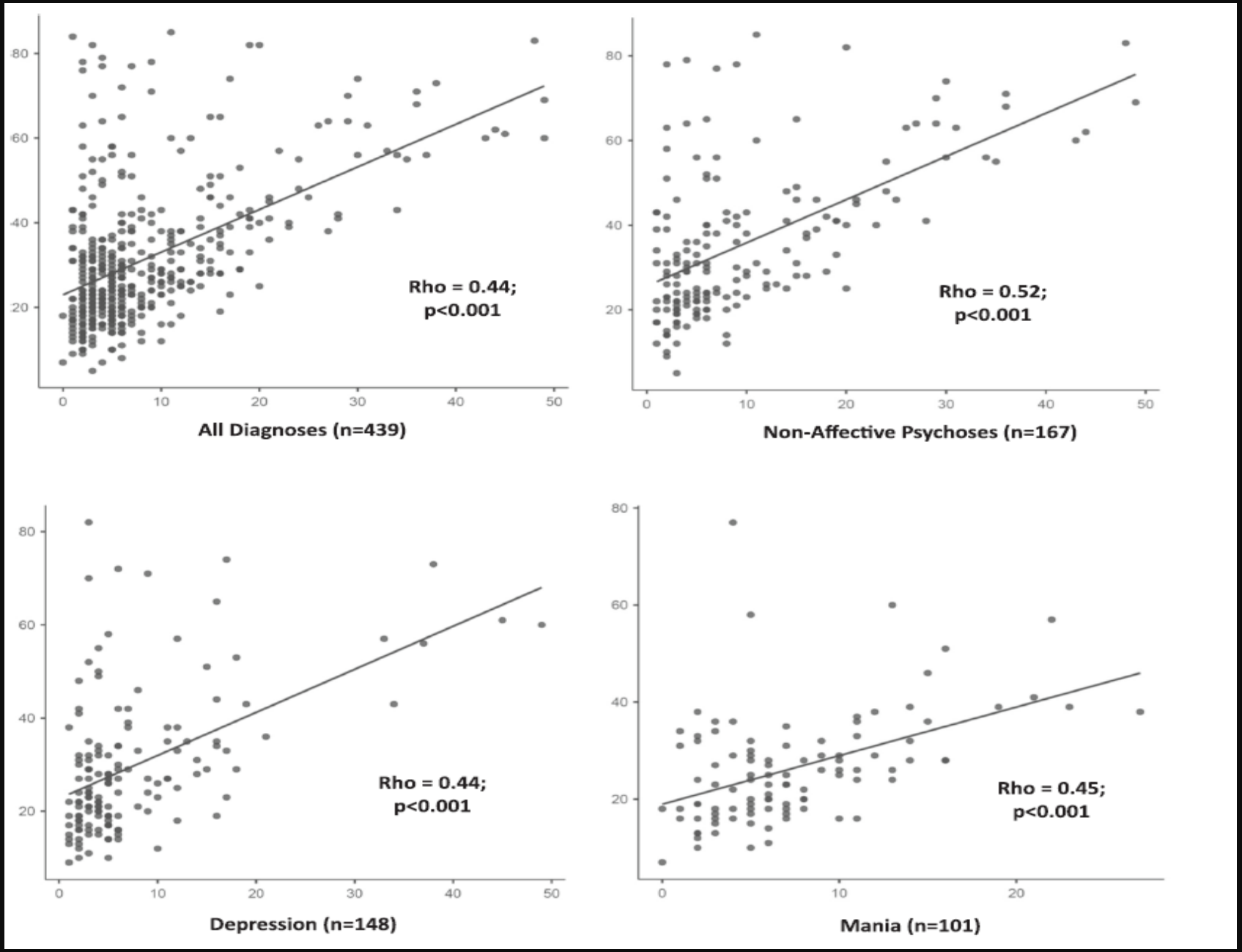
Schizophrenia Research 285 (2025) 114–123

Makarand Pantoji, Srinivas Balachander*, Palash Prajapati, Shyam Sundar Arumugham, Ganesan Venkatasubramanian, Jagadisha Thirthalli

- 12 RCTs
- Comparison between ECT + AP and AP alone
- Significant difference in weeks 1, 2 and 4



Prabhu et al., Schizophrenia Research 2024



- X-Axis: Number of days after admission
- Y-Axis: number of inpatient days

- Replicates what was found in several US studies

ECT in Treatment Resistant Schizophrenia

- About a third of patients with schizophrenia have TRS; About half of them do not respond to clozapine
- Hardly any evidence-based treatment for them
- Most guidelines suggest ECT in clozapine resistant schizophrenia as an option
- What is the evidence for ECT in TRS?

"Claims for the efficacy of ECT in treatment-resistant schizophrenia would perhaps best be described as a triumph of anecdote over empiricism" (ECT Handbook, Royal College of Psychiatrists, 2013)

Randomized Controlled Trial > Schizophr Bull. 2022 Jun 21;48(4):814-825.
doi: 10.1093/schbul/sbac027.

Comparison of Acute Followed by Maintenance ECT vs Clozapine on Psychopathology and Regional Cerebral Blood Flow in Treatment–Resistant Schizophrenia: A Randomized Controlled Trial

Biswa Ranjan Mishra [1], Kanhaiyalal Agrawal [2], Tathagata Biswas [1], Debadatta Mohapatra [1], Santanu Nath [3], Rituparna Maiti [4]

- 30 TRS patients each randomized to receive clozapine or acute, followed by maintenance ECT for 24 weeks
- Through 6th – 24th week, across several clinical domains, ECT group had better scores
- **First treatment shown to be better than clozapine in TRS**

Asian J Psychiatr. 2023 Dec:90:103798. doi: 10.1016/j.ajp.2023.103798. Epub 2023 Oct 11.

Is ECT better than clozapine for treatment-resistant schizophrenia?

Chithra Uppinkudru [1], Vanteemar S Sreeraj [1], Shyam Sunder Arumugham [1], Samir K Praharaj [2], Nishant Goyal [3], Preeti Sinha [1], Jagadisha Thirthalli [4]

- Participants were not blinded; rater blinding was not objectively tested
- Allocation concealment not reported – Selection bias?
- Some patients in ECT arm received clozapine
- Large effect size – methodological explanations?

Encouraging results – needs replication

ECT in Clozapine-Resistant Schizophrenia

- An open-label trial of clozapine vs clozapine + ECT – Significant advantage for clozapine + ECT (Petrides 2015)
  - No sham-ECT arm

- A sham-controlled trial of ECT in clozapine resistant schizophrenia from Brazil showed no advantage of ECT over sham-ECT (Melzer-Rebeiro et al., 2024)

- There is clear clinical equipoise

> Wellcome Open Res. 2022 Oct 5:7:212. doi: 10.12688/wellcomeopenres.18028.2. eCollection 2022.

Clinical efficacy and neurobiological correlates of electroconvulsive therapy in patients with clozapine-resistant/intolerant schizophrenia: study protocol of multi-site parallel arm double-blind randomized sham-controlled study

Shyam Sundar Arumugham [# 1], Samir K Praharaj [# 2], Umesh Shreekantiah [# 3], Vanteemar S Sreeraj [1], Chandramouli Roy [3], Sonia Shenoy [2], Abhiram Narasimhan Purohith [2], Uppinkudru Chithra [1], Kiran Basawaraj Bagali [1], Sudhir Venkataramaiah [4], Gopala Krishna Kadarapura Nanjundaiah [4], Kandavel Thennarasu [5], Channaveerachari Naveen Kumar [1], Nishant Goyal [3], Basudeb Das [3], Urvakhsh Meherwan Mehta [1], Kesavan Muralidharan [1], Ganesan Venkatasubramanian [1], Preeti Sinha [1], Jagadisha Thirthalli [1]

- 60 patients with Clozapine-resistant/intolerant schizophrenia randomized to receive true / sham ECT
- Recruitment is nearly complete
- Longitudinal follow up to study relapse

ECT in Schizophrenia – Summary

- ECT is superior to sham-ECT but inferior to antipsychotics
- ECT added to antipsychotics expedites improvement
- Role of ECT in TRS is promising but still not clearly established
- A substantial proportion of patients with schizophrenia receive ECT because of catatonia, suicidality, refusal of food / medication
  - Hard for including them in clinical trials
  - Generalizability of recent RCTs to clinical situation is doubtful

Cognitive Adverse Effects

Cognitive Adverse Effects

- One of the most important concerns related to ECT
- Most clinical research in ECT has focused on reducing this adverse effect while keeping efficacy constant
  - Unilateral placement
  - Square-wave
  - Ultrabrief-pulse
  - Twice weekly vs thrice weekly
- What are the recent developments in this aspect?

Acute Effects

Objective Cognitive Performance Associated with Electroconvulsive Therapy for Depression: A Systematic Review and Meta-Analysis

Maria Semkovska and Declan M. McLoughlin

BIOL PSYCHIATRY 2010;68:568–577

- 84 studies (2981 participants)
- Indication for ECT: Depression
- both baseline and post-ECT measures studied
- 22 standardized neuropsychological tests

Semkovska et al ., 2010

Numbers=Effect-size; **Bold-red=Significant**; +ve = Better; -ve = Worse

Domain	Test	0-3 days	4-15 days	> 15days
Cognitive status screening	MMSE	**-.28**	**.46**	**.51**
Processing Speed	Digit symbol	**-.35**	.14	**.40**
	Trail Making Test A (time)	.33	-.06	**.37**
Attention / Working Memory	Digit span forward	.11	.11	.08
	Digit Span Backward	-.11	.08	**.37**
	Mental Control		**.45**	**.45**
	Spatial span		.15	
Verbal Episodic Memory	Word list learning	**-.66**	.15	**.40**
	Word list delayed recall	**-1.12**	.10	**.35**
	Story memory immediate recall	*-.04*	**.51**	**.50**
	Story memory delayed recall	**-.45**	**.61**	
	Verbal paired associates learning	**-.57**	.02	.22
	Paired associates delayed recall	**-.69**	**-.36**	.18

Semkovska et al ., 2010

Numbers=Effect-size; **Bold-red=Significant;** +ve = Better; -ve = Worse

Domain	Test	0-3 days	4-15 days	> 15days
Visual Episodic Memory	Figure reproduction immediate recall	**-.21**	**.28**	**.45**
	Figure reproduction delayed recall	**-.60**	.04	**.62**
Spatial Problem Solving	Design copy	**-.27**		.02
Executive Functioning	Trail Making Test B (time)	**-1.10**	.10	**.46**
	Stroop Color-Word condition (time)		.28	**.75**
	Stroop Color-Word condition (errors)		.06	.33
	Semantic Fluency	**-.71**	-.06	.17
	Letter Fluency	**-.79**	-.07	.11

- Most cognitive domains showed significant worsening in 0 – 3 days
- Nearly all improved within 15 days
- Most were significantly better; none was worse than pre-ECT by 15 days

Schizophrenia

- Bifrontal ECT better than bitemporal ECT in symptomatic and cognitive outcomes
- HMSE total, speed of processing, sequencing, spatial & working memory & verbal fluency **showed recovery in 3 months**

Brain Stimulation 6 (2013) 210–217

Contents lists available at SciVerse ScienceDirect

Brain Stimulation

journal homepage: www.brainstimjrnl.com

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

Vivek Haridas Phutane [a], Jagadisha Thirthalli [b,*], Kesavan Muralidharan [b], Channaveerachari Naveen Kumar [b], Janakiprasad Keshav Kumar [b], Bangalore N. Gangadhar [b]

Indian J Psychol Med. 2017 Jul-Aug;39(4):488-494. doi: 10.4103/IJPSYM.IJPSYM_75_17.

Resolution of Cognitive Adverse Effects of Electroconvulsive Therapy in Persons with Schizophrenia: A Prospective Study

Channaveerachari Naveen Kumar [1], Vivek Haridas Phutane [2], Jagadisha Thirthalli [1], Naveen Jayaram [3], Muralidharan Kesavan [1], Urvakhsh Meherwan Mehta [1], Vidhi Tyagi [4], Bangalore N Gangadhar [1]

Clinical Assessment Tools

› Asian J Psychiatr. 2013 Jun;6(3):243-8. doi: 10.1016/j.ajp.2012.12.010. Epub 2013 Feb 19.

Battery for ECT Related Cognitive Deficits (B4ECT-ReCoDe): development and validation

Biju Viswanath [1], Shashidhara N Harihara, Abhinav Nahar, Vivek Haridas Phutane, Aarati Taksal, Jagadisha Thirthalli, Bangalore N Gangadhar

- Brief (20 – 25min; further briefer version in the pipeline)
- Covers domains most likely to be affected: Orientation, verbal, visual, working and autobiographic memory, sustained attention, psychomotor speed and subjective memory impairment

Clinical Assessment Tools

J Affect Disord. 2020 May 15:269:36-42. doi: 10.1016/j.jad.2020.03.010. Epub 2020 Mar 4.

ElectroConvulsive therapy Cognitive Assessment (ECCA) tool: A new instrument to monitor cognitive function in patients undergoing ECT

Adriana P Hermida [1], Felicia C Goldstein [2], David W Loring [2], Shawn M McClintock [3], Richard D Weiner [4], Irving M Reti [5], A Umair Janjua [6], Zixun Ye [7], Limin Peng [7], Yi-Lang Tang [6], Gail C Galendez [6], Mustafa M Husain [3], Daniel F Maixner [8], Patricio Riva-Posse [6], William M McDonald [6]; National Network of Depression Centers ECT Task Group [9]

- Even briefer (10 min)
- Does not cover visual memory and psychomotor speed; has factual knowledge

Autobiographical Memory

- Does ECT cause permanent loss of some personal memory?
  - Important while discussing consent for ECT
  - Not well covered in Semkovka meta-analysis, 2010
  - Loss of personal memories - greatest concern to patients

- Methodological issues:
  - Effect of depression
  - Effect of time
  - Validated tools

Review > Br J Psychiatry. 2025 May 13:1-11. doi: 10.1192/bjp.2025.2. Online ahead of print.

Autobiographical memory after electroconvulsive therapy: systematic review and meta-analysis

André Beyer Mathiassen [1 2], Maria Semkovska [3], Christoffer Cramer Lundsgaard [1 2], Krzysztof Gbyl [1 2], Poul Videbech [1 2]

- 9 studies (432 patients; 173 controls)
- Post-ECT: ECT patients had larger autobiographical memory loss than controls; SMD = 0.55
  - Right unilateral ECT (SMD = 0.32)
  - Bilateral ECT (SMD = 0.82)
- Abstract: "The studies suggest that ECT causes autobiographical memory loss in patients with depression. ***Results also suggest that lost memories are not regained***"

A Closer Look at this Meta-Analysis

- Meta-analysis clubbed short-term and long-term effects
  - Clubbed data from different time points of same participants in the meta-analysis

- Closer look long-term studies: 4 studies
  - 2 that showed significant effect of ECT had healthy controls (not controls with depression; effect of depression on memory?)
  - 2 that had controls with depression did not show significant difference between ECT and controls
  - 1 study that was excluded for lack of raw data recovery of personal memories (not memory for public events) to baseline level in 2 months

Mathiassen et al., 2025

- Excerpts from conclusion section:
  - “*estimation of the long-term autobiographical memory loss should be considered tentative*”
  - “*future studies should prioritise conducting long-term follow-up assessments of autobiographical memory in ECT patients compared with control groups with similar depression severity*”

- The evidence for ‘permanent loss’ of memory attributable to ECT is tentative at this stage

Concern about Training and Accessibility of ECT

Guest Editorial

Underutilization of Electroconvulsive Therapy (ECT): A Call for Urgent Attention

Jagadisha Thirthalli[1]

Indian J Psychol Med. 2025;XX:1–5.

Letters to the Editor

Electroconvulsive Therapy (ECT): Reiterating the Call for Urgent Attention

Charles H. Kellner

Concerns about declining training and access to ECT for deserving patients

Case

- 63-year-old highly accomplished Indian-origin finance professional working in a South Asian country
- Two-year H/O low mood, anhedonia, agitation, social withdrawal, severe anxiety and panic attacks, delusions of nihilism & persecution and passive death wishes.
- Resigned from his high-paying job; shifted to India
- Diagnosed to have depression / bipolar disorder / schizophrenia by high-profile psychiatrists including leading academic institute

…continued

- Combinations of antidepressants & antipsychotics; very little improvement; rather worsened
- Refusal of food; worsening of agitation
- Severe EPS; serotonin syndrome; seizures
- Severe constipation on clozapine >>> intestinal obstruction, altered sensorium, aspiration pneumonia.
- Multiple medical and surgical interventions and ICU stay
- No psychiatrist considered ECT!

…continued

- Evaluated by geriatric psychiatry team at NIMHANS
- Diagnosed to have severe depression with psychotic symptoms and suggested ECT straightaway
- Family refused:
  - “Major intervention reserved for only the worst patients,”
  - Concerns about adverse effects, including cognitive deficits
  - Several other negative remarks found on the internet
- Further worsening

…continued

- Agreed for ECT
- Dramatic improvement after 3 sessions
- 75% improvement after 11 sessions
- Improvement in cognitive symptoms: Addenbrooke's cognitive examination (ACE) 65/100 >>> 83/100!
- Started to lead independent life

Reflections

- A highly accomplished person flourishing in his profession prematurely resigned from his post, made a major decision to migrate to India, experienced potentially fatal medical conditions secondary to depression and its treatment, and improved substantially with ECT

- Timely use of ECT could have prevented these major events and provided a much better quality of life for him & family

Experience of a Psychiatrist from Australia (Mayur, personal communication)

- Patient-1: RDD
  - 64yrs lady on maintenance ECT for 7 years (once in 6 wks)
  - Attempt to stop ECT failed utterly; relapsed and attempted suicide – nearly fatal.
  - Back on maintenance ECT – doing well
- Patient-2: Schizophrenia
  - Clozapine resistant – stabbed self in the abdomen
  - On maintenance ECT
  - ECT disrupted due to surgery for adhesions >>> Relapsed into bad catatonia >>> almost died >>> now on M-ECT and well

Reasons for Underutilization of ECT

- Stigma:
  - Media >>> Public
  - Professionals including psychiatrists!
- Need for anesthesia:
  - Significant logistic difficulties – especially in government settings and medical colleges
  - Adds to expenses
- Cognitive effects:
  - Many refinements have improved the outlook

Reasons for Underutilization of ECT

- Legislation:
  - Relatively better in India except in children
  - In many states in the US patients travel to other states to receive ECT
    - Similar barriers in Australia and European countries
- Training:
  - Poor exposure to ECT in many PG centers
  - Breed of young psychiatrists with little confidence & skills regarding ECT

Take Home

- ECT is becoming safer
- Remains an important method of treatment in a substantially high proportion of severely ill patients
- Cognitive effects are reversible
  - Newer tools for rapidly assessing cognitive deficits available
- Logistic difficulties and lack of training may deny deserving patients an important clinical tool

Thank you!