ECT: AN ELECTRIFYING REVIEW

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DISCLOSURES

• We have no disclosures or conflicts of interest to report
LEARNING OBJECTIVES

• Explore the history and stigma associated with ECT
• Review ECT indications and contraindications associated with modern use
• Understand the potential mechanisms of action, efficacy, and side-effects of ECT
• Demonstrate ECT in a video of a patient undergoing the procedure and discussing his experience with it
HISTORY and STIGMA of ELECTROCONVULSIVE THERAPY
Hippocrates observes that malaria-induced seizures cured some mentally insane patients.

English physician Oliver publishes first report of treatment of mania with camphor-induced convulsion.

Italian psychiatrists Cerletti & Bini develop first ECT protocol.

Swiss alchemist Paracelsus cures "lunacy" by inducing convulsions with camphor oil.

Hungarian psychiatrist von Meduna treats catatonic schizophrenia with IM camphor then metrazol.
April 1938

- 39-y.o. Engineer arrested in Milan railway station: He spoke in a kind of jargon and complained about being “telepathically influenced”
- He received 11 applications of ECT
- Discharged 1 month later: “in good condition and well-oriented; ideation and memory perfect.”

Source: Shorter 1997
First ECT in the US: New York’s Columbus Hospital, Chicago’s Parkway Sanitarium, Cincinnati’s Longview State Hospital. Spreads across the US

Muscle relaxant Succinylcholine introduced leading to “modified” ECT

The rise of first generation antidepressants and antipsychotics

Multiple RCTs showing ECT with significantly higher response rate than medications in treatment of depression

The Film One Flew Over the Cuckoo’s Nest is released

Payne et al 2009
HISTORY OF ECT IN OREGON

1944
First recorded use of ECT at the Oregon State Hospital (OSH)

1952-54
Dr. Blachly at U of O Health Sciences Center produces the first monitored (EEG/ECG) brief pulse ECT device

1973
Height of ECT use at OSH: 22,387 treatments over 2 years
Paul Blachly attends University of Oregon Medical School

1975
Dr. Dean Brooks, OSH superintendent, announces filming of Cuckoo’s Nest

1986
All state hospital in the Pacific Northwest no longer offer ECT

Shorter & Healy 2007, Goeres-Gardner 2013
THE ANTIPSYCHIATRY MOVEMENT

• Scientology established in 1954: dianetics as alternative to psychotherapy & lobbying opposition to ECT

• 1960s Anti-psychiatry literature: Foucault’s *Madness and Civilization*, Szasz’s *The Myth of Mental Illness*, Goffman’s *Asylums*

• 1962 fictional novel: Kesey’s *One Flew Over the Cuckoo’s Nest*
REHABILITATION OF ECT

- 1974: APA task force gives green light to ECT with caution
- 1981: Max Fink, psychiatrist at SUNY Stony Brook, argues compelling case for superiority of ECT over anti-depressants
- 1985: NIH consensus- medical schools should restore ECT training to psychiatry curriculum
- 1990: APA task force “ECT is an effective treatment for all subtypes of…”
STIGMA OF ECT

- Convulsions & bone fractures as side effects prior to muscle relaxants
- Severe cognitive deficits prior to optimizing of dosing
- Early exploratory use and issues of autonomy
- Unknown mechanism contributes to unscientific perception
- Negative and/or inaccurate depictions by media, film, and internet
- Anti-ECT lobbying coalitions not countered by a public education campaign

Payne et al 2009
Kellner 2011
STIGMA OF ECT

• Results in the US:
  • 1960s: 300,000 patients treated with ECT per year
  • 2000s: 100,000 patients treated with ECT per year
  • Limited ECT availability & poor regard for the treatment persists

• Clinicians can play a vital role in advocating for this treatment modality & providing education to patients, their families, and their communities

Payne et al 2009
Kellner 2011
INDICATIONS and EFFICACY of ECT
ECT INDICATIONS

- Depression (unipolar & bipolar)
- Catatonia
- Bipolar Mania
- Bipolar Mixed episode
- Schizophrenia or schizoaffective
  - Especially for prominent affective symptoms
  - Acute psychosis
- Neuroleptic Malignant Syndrome
- Status Epilepticus
Many studies document efficacy of ECT for depression (ECT vs “sham”)

- Remission rates
  - Up to 86% for nonpsychotic depression
  - Up to 95% for psychotic depression
- Response rate improves with symptom severity
- Fairly rapid response – within the first 4-6 treatments

A meta analysis reported an average response rate to ECT that was 20% higher than TCAs and 45% higher than MAOIs

No trials have ever found an antidepressant medication regimen to be more effective than ECT

Weiner et al
Kellner 2006
Janicak et al
ECT – EFFICACY IN DEPRESSION

• Factors that predict a **good** response:
  • Psychomotor retardation
  • Psychotic depression > depression without psychosis
  • Older > younger
  • Catatonic symptoms

• Factors that predict a **poor** response:
  • Longer index episode of depression
  • History of medication resistance

Weiner et al
ECT – EFFICACY IN DEPRESSION

- Factors that are not reliable predictors of response:
  - Melancholic Vs Vegetative
  - Unipolar Vs Bipolar
  - Gender, race, socioeconomic status

Weiner et al
• Equivalent or superior to lithium or chlorpromazine
• A review found 80% remission or marked clinical improvement (n = 589) in mania
• Also effective in manic delirium and rapid cycling
ECT – EFFICACY IN SCHIZOPHRENIA

- Second most common indication for ECT in the USA
- Most effective for acute exacerbations in combination with antipsychotics
- Can be effective in patients who do not respond to antipsychotics
- Positive predictors of response include:
  - Shorter episode
  - First episode
  - Preoccupation with delusions and hallucinations
  - Catatonic symptoms
- Positive symptoms respond better to ECT than negative symptoms

Weiner et al
ECT – EFFICACY IN CATATONIA

• Effective in treating symptoms regardless of etiology, including malignant catatonia

Weiner et al
ECT AS A FIRST-LINE TREATMENT

- When rapid improvement is needed
  - Catatonia
    - MGH SURVIVAL STUFF
  - Suicidality
  - Malnutrition
  - Severe psychosis with agitation

- When other treatments are riskier
  - Pregnancy
  - Elderly

- When the patient prefers ECT and it’s appropriate
ECT CONTRAINDICATIONS

Absolute contraindications:
• Lack of informed consent
  • In Oregon, family cannot consent for pt
  • Involuntary ECT requires legal process

Relative contraindications:
• CNS
  • Brain tumors
  • Increased Intracranial Pressure
• Recent Stroke
• Aneurysm

• Cardiovascular
  • Recent MI
  • Unstable Angina
  • Conduction defects

Kellner
WHY ECT WORKS
ECT: MECHANISM OF ACTION

• Myriad of changes in the CNS
  • Releases monoamines (DA, 5HT)
  • Enhances monoamine transmission by desensitizing presynaptic adrenergic autoreceptors
• Neuroendocrine
  • Increased release of central neuropeptides: corticotrophin releasing factor, somatostatin, neuropeptide Y
• Anticonvulsant
  • Enhances GABA transmission
ECT: MECHANISM OF ACTION

- Reduced plasma levels of tumor necrosis factor
- Increase in endogenous opioids
- Trophic effects:
  - Increase levels of brain derived neurotrophic factor
    - Induces neurogenesis?
- PET
  - Increased metabolic activity in the frontal and cingulate cortex after ECT
The PROCEDURE