

Interventional Psychiatry

Electroconvulsive Therapy

Alison Sikes. M.D.

People often have strong feelings about ECT.

History

Paracelsus, a Swiss doctor, used camphor to elicit seizures to treat diseases in the early sixteenth century.

1785 The London Medical Journal reported the use of seizures induced by camphor to treat mania.

1935 Insulin was used to induce hypoglycemia resulting in seizures.

1938 Cerletti and Bini, Italian scientists, used electricity to induce seizures to treat catatonia

1940 ECT was introduced to the United States and was used widely to treat numerous Psychiatric illnesses

Indications

Major Depression

Bipolar Disorder

Mania (regardless of cause)

Schizophrenia

Schizoaffective Disorder

Catatonia and Neuroleptic Malignant Syndrome

Parkinson's Disease

Status epilepticus and intractable seizures

How Does ECT Work?

No one really knows!

Work up required for ECT

Psychiatric diagnostic evaluation and medication history

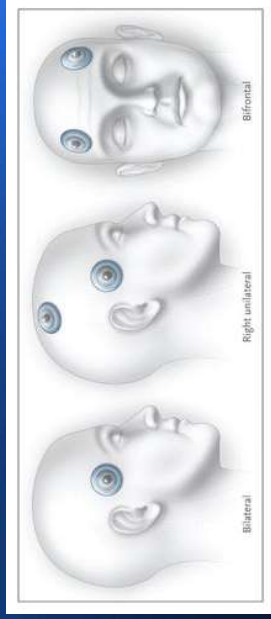
Beck Depression Inventory

Baseline cognitive assessment

EKG, hemoglobin and potassium

Consider brain imaging

Types of ECT



The Procedure

General anesthesia
Depolarizing agent, Succinylcholine
Hyperventilation
Energy titration

Typical Treatment Course

6-12 ECT sessions over 2 - 4 weeks followed by tapering of treatments.

If the patient relapses after discontinuing ECT a second ECT treatment course may be undertaken with a slower taper.

If the patient relapses after a slower taper off of ECT, then maintenance therapy should be considered.

Clinical Predictors of a Good Response

Older age
Major depression with psychotic symptoms
Catatonic symptoms
Response by session 3 of ECT may predict long-term efficacy

Biological Markers of Response

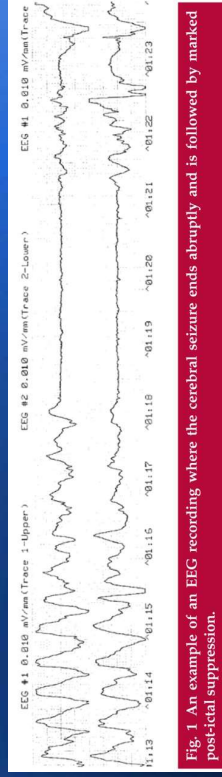


Fig. 1 An example of an EEG recording where the cerebral seizure ends abruptly and is followed by marked post-ictal suppression.

Negative Predictors of Response

Failure of several antidepressant trials
Personality disorders
Longer current episode of depression
Periventricular hyperintensities on MRI
Substance abuse
Younger age
Not achieving remission during first course of ECT

Medications and ECT

Take cardiac medications and pulmonary medications except for ACE inhibitors, ACE receptor blockers, and Theophylline

Hold seizure medications and benzodiazepines the night before ECT and until afterwards

Diabetic patients should hold hypoglycemic agents the morning of the treatment

Complications

Nausea

Headache

Myalgias

Memory impairment

Post-ictal agitation

Delirium

Cardiac

Pros of ECT

Highly effective for numerous psychiatric illnesses.

Side effects are mild and transient with the exception of possible memory loss.

Cons of ECT

Need a driver to and from the procedure and should not drive while receiving an acute course of ECT

Need to take off from work at least the day of treatment (during the maintenance phase)

The procedure is given under general anesthesia so someone should stay with the patient the day of the procedure

ECT can cause memory loss

ECT requires vascular access

Involuntary ECT

Price-Sheppard

Overall...

Patients who received ECT were satisfied with their treatments and had more favorable attitudes towards ECT than patients who did not have ECT.

85 % of patients who received ECT would agree to a second course of ECT if needed.

Transcranial Magnetic Stimulation

How does TMS work?

Approved by the FDA to treat major depression, OCD, migraines, and for smoking cessation.
Uses a powerful magnet to deliver pulses to stimulate nerve cells.

No one really knows!

TMS contraindications

Epilepsy
Metal or implanted medical devices in your body

TMS side effects

Jaw and / or scalp discomfort
Headache
Tingling or spasms of the facial muscles
Lightheadedness
Mania, seizures, and hearing loss are uncommon.
Hearing loss only occurs if hearing protection is not used during the treatments.

TMS pros and cons

Non-invasive
No anesthesia
No memory issues
Can drive yourself to and from
Can continue working while receiving treatment

Five days a week for 4-6 weeks

Deep Brain Stimulation

Small holes are drilled into the skull and electrodes are implanted into the brain.
Additionally, a device that contains batteries is inserted under the skin of the chest.
Used for treatment-resistant OCD (also Parkinson's, essential tremor, dystonia, Tourette syndrome, and epilepsy).

DBS risks

Misplacement of the leads
Brain hemorrhage
Stroke
Infection
Seizure
Hardware complications – eroded wires, need for battery replacement

Vagus Nerve Stimulation

FDA approved for treatment-resistant depression

How VNS works

Increases levels of norepinephrine and serotonin in the brain.

VNS risks

Pain
Infection
Difficulty swallowing
Vocal cord paralysis

VNS side effects

Voice changes
Hoarse voice *
Throat pain *
Cough *
Headaches
Shortness of breath *
Trouble swallowing
Tingling of the skin
Trouble sleeping
Worsening of sleep apnea

VNS is not approved in patients with:

Pregnancy
Asthma, sleep apnea, COPD
Active ulcer disease
Insulin dependent diabetes mellitus
Only one vagus nerve
Dysautonomia
Receiving other forms of brain stimulation
Arrhythmias
Schizophrenia, schizoaffective disorder, delusional disorder, rapid cycling bipolar disorder
Previous surgery to the left side of the neck

VNS pros and cons

Takes a long time for response but the response is enduring versus ECT.

Works for both MDD and Bipolar depression but is not FDA approved for psychotic depression or the depressed phase of Schizoaffective disorder.

Case study 1

DS is a 78-year-old who was admitted to the inpatient unit with severe depression with psychotic features. He believed that he was a burden to his family, was being watched by the FBI for past crimes, and that the sheriff was tracking him after planting bugs and cameras in his house. He had lost 30 pounds in the past 2 months and endorsed not wanting to live like this any longer. His creatinine and BUN were elevated and prealbumin was low indicating both dehydration and malnutrition. He refused to take medications by mouth because he felt that "nothing will work."

Case Study 2

BL is a 28-year-old with chronic depression. His PHQ9 score is typically 14-16. He has tried upwards of 20 different medications combinations including most of the common antidepressants as well as augmentation with Abilify, stimulants, Lithium, and thyroid hormone. He remains able to work and to enjoy some activities but feels down all of the time. He adamantly declines ECT but wonders what else can be done for his depression.

Case study 3

LC is a 32-year-old with bipolar disorder, type I and severe OCD. The treatment of his OCD has been limited by his coexisting Bipolar disorder as the treatment of choice for OCD is high dose SSRIs on which he became manic in the past. His OCD is so severe that he cannot hold a job because he cannot use restrooms that others use due to fears of contamination. He's engaged in potentially harmful behaviors to avoid contamination such as snorting soap. He is often depressed to the point of being suicidal but it's hard to know if this is from bipolar disorder or from OCD.

Case study 4

In 25 years, I have never seen a patient with a vagal nerve stimulator except for one non-verbal patient with autism for whom it is used for uncontrolled seizures.

The end!

References

Lisanby SH N Engl J Med 357;19 November, 2007

Tess AV N Engl J Med 360;14 April, 2009

American Psychiatric Publishing Textbook of Psychopharmacology, third edition. Chapter 44