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Electroconvulsive Therapy: History, Efficacy, Adverse Effects and its Non-Psychiatric Applications

Ala Oluwapelumi A.[1]
[1]500 level Medical Student, University of Ibadan, Ibadan (at time of writing).

ABSTRACT

Electroconvulsive therapy (ECT), a somatic treatment involving controlled electrical stimulation to induce seizures, has evolved significantly since its introduction in 1938 by Cerletti and Bini. This review examines the historical development, therapeutic efficacy, and current applications of ECT in non-psychiatric medicine. Originally developed as an alternative to treatments like lobotomy and insulin therapy, ECT has proven particularly effective in treating severe depression, bipolar disorder, schizophrenia, and catatonia. While the precise mechanism remains incompletely understood, ECT is believed to modify brain chemistry through neurotransmitter modulation and hippocampal neurogenesis. The review addresses common adverse effects, which are typically mild and transient, including temporary confusion, memory loss, and physical discomfort. Beyond its established psychiatric applications, emerging evidence suggests potential benefits in treating non-psychiatric conditions such as Parkinson's disease, chronic pain, and eating disorders. Despite its demonstrated efficacy, ECT remains underutilized due to public misconceptions, highlighting the need for improved education and awareness among both medical practitioners and the general public.

Correspondence to:
oluwapelumiala@gmail.com;
+234 813 286 8208

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INTRODUCTION

The concept of inducing convulsion by the use of drugs such as camphor is a medical practice adopted years ago. Although, such methods are now becoming outdated due to the advent of better therapy with less side effects. Electroconvulsive therapy (ECT), however, is a form of convulsion-inducing treatment that has proven effective in treating several psychiatric disorders. It is a somatic therapy that entails the purposeful passing of electrical currents to the brain to provoke a transient seizure. It has evolved to become one of the mainstays of physical therapy in neuropsychiatry. This paper aims to give a brief overview of the history of ECT, its efficacy, and its adverse effects. It also provides insight into non-psychiatric applications and recent trends in the application of ECT as a form of somatic therapy for medical conditions.

BRIEF HISTORY OF ELECTROCONVULSIVE THERAPY

It was first introduced by Italian neuropsychiatrists Lucio Cerletti and Ugo Bini in 1938 as an alternative treatment for schizophrenia (1). The development of ECT was motivated by the need for a better, safer and more practical treatment for severe mental illnesses that did not respond to other treatment methods, such as medication or psychotherapy. Before the emergence of ECT, the treatments available for mental illness at the time included lobotomy, insulin therapy, and other experimental treatments, which often caused severe side effects (2).

ECT was initially used to treat severe depression but later expanded to other psychiatric conditions such as bipolar disorder, schizophrenia, and catatonia (3). The procedure was initially done without anaesthesia, which caused significant discomfort to the patients, but later, anaesthesia and muscle relaxants were

introduced to make the procedure more tolerable. Since its introduction, the use of ECT as a form of therapy for mental illness has been controversial due to concerns about its potential adverse effects on memory and cognition (4). However, modern ECT techniques have been refined and made safer, and it remains an effective treatment option for patients with severe mental illnesses who do not respond to other treatments.

EFFICACY OF ECT

ECT has proven effective in managing several psychiatric conditions, including depression, bipolar disorder, and schizophrenia. Studies have shown that ECT can produce more rapid improvement in mood, reduce suicidal thoughts and behaviours (5).

The precise method by which ECT operates remains incompletely known; nevertheless, it is thought to modify brain chemistry and enhance the synthesis of neurotransmitters, including serotonin and norepinephrine (6). ECT is believed to affect the proliferation of new neurons in the hippocampus, a brain area associated with memory and emotional control (7).

ECT is often reserved for instances when alternative therapies have failed or where there is a significant risk of patient harm. While ECT is generally safe, there are risks associated with the procedure, including short-term memory loss and confusion immediately following the treatment (8). Overall, ECT is considered a safe and effective treatment option for carefully selected patients suffering from severe psychiatric symptoms.

ADVERSE EFFECTS OF ECT

Electroconvulsive therapy (ECT) can have some adverse effects, although typically mild and short-lived. ECT's most common side effects include temporary confusion, memory loss, headache, muscle aches, and nausea (8). However, these effects usually only last for a short period and do not cause any long-term damage or harm (9). In some cases, patients may experience more severe side effects, such as breathing difficulties or heart problems. Still, these are rare and usually occur in patients with pre-existing medical conditions (10). It is important to note that ECT is a highly effective treatment for severe depression, and the potential benefits often outweigh the risks of these side effects (11).

NON-PSYCHIATRIC APPLICATIONS OF ECT

While ECT is primarily used for psychiatric conditions such as depression, bipolar disorder, and schizophrenia, it has also been used for non-psychiatric conditions. Here are some examples:

- **Parkinson's Disease:** ECT has been used to treat Parkinson's disease, especially in patients who have manifested psychotic and depressive symptoms. Aside from treating psychotic and depressive symptoms, it also involves placing electrodes in the brain to stimulate specific areas that control movement (12).
- **Chronic Pain:** ECT has been used to treat chronic pain, especially for patients who do not respond well to other treatments. The treatment involves passing electrical currents through the brain to numb pain-associated areas (13).
- **Eating Disorders:** ECT has been used to treat eating disorders such as anorexia nervosa and bulimia nervosa. The treatment involves passing electrical currents through the brain to reduce symptoms such as food restriction, binge eating, and purging (14).

It is worth noting that while ECT has shown some benefits for non-psychiatric conditions, it has yet to be widely accepted as a standard treatment and more research is needed to determine its effectiveness.

RECENT TRENDS IN ECT

Electroconvulsive therapy (ECT) has been used for many years in treating psychiatric conditions such as depression, bipolar disorder, and schizophrenia. In recent years, there have been some trends in using ECT for these conditions. Here are a few:

- **Modified ECT techniques:** ECT techniques have evolved to improve the safety and effectiveness of the treatment. For instance, researchers have been experimenting with ultra-brief pulse stimulation, which is thought to reduce adverse cognitive side effects, such as memory loss, associated with traditional ECT (15).
- **Integration of ECT with other treatments:** ECT is increasingly seen as a complementary treatment that works well with other interventions. For instance, it may be used with medication, psychotherapy, or other types of brain stimulation.
- **Greater acceptance of ECT:** There has been

a growing recognition of the effectiveness of ECT and a corresponding decline in the stigma associated with the treatment. This has led to increased use of ECT in some areas (16).

- **Research into new uses of ECT:** Researchers are exploring new applications of ECT beyond its long-standing use for depression and other psychiatric conditions. For instance, ECT has shown promise in the treatment of movement disorders and chronic pain.

Overall, electroconvulsive therapy continues to be a valuable tool in the treatment of psychiatric conditions, with ongoing advancements in its techniques and applications.

CONCLUSION

Although using electricity to induce seizure is effective, it is still significantly tainted. ECT's efficacy in treating potentially life-threatening psychiatric conditions cannot be overemphasized. Hence, the onus lies on the psychiatric community to help overcome the misconceptions perceived by the public and even parties in medical practices so that prospective patients can enjoy the benefits of this effective but underused therapy.

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