

Electroconvulsive Therapy in the Management of Schizophrenia: A Systematic Review in Emergency Nursing Practice

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Abstract

Electroconvulsive therapy (ECT) is a well-established treatment for various psychiatric disorders, including schizophrenia, particularly in cases where patients are resistant to conventional treatments. Schizophrenia, a chronic and severe psychiatric disorder, often presents with a combination of positive symptoms (such as hallucinations and delusions), negative symptoms (such as social withdrawal and emotional blunting), and cognitive impairments. While antipsychotic medications are the primary treatment, approximately 20–30% of individuals with schizophrenia do not respond adequately to these drugs, a condition known as treatment-resistant schizophrenia (TRS). For these patients, ECT has emerged as a crucial adjunctive therapy. This systematic review analyzes randomized controlled trials (RCTs) and observational studies to assess the efficacy, safety, and clinical applicability of electroconvulsive therapy (ECT) in the treatment of schizophrenia, with a particular focus on treatment-resistant cases. The review evaluates the impact of ECT on positive, negative, and cognitive symptoms, key components of schizophrenia symptomatology. Findings indicate that ECT is particularly effective in reducing positive symptoms, providing rapid relief from hallucinations and delusions. In addition, ECT has a moderate effect on negative symptoms, contributing to improvements in emotional engagement and social interaction when combined with ongoing pharmacological treatments. While ECT has shown substantial therapeutic benefits, it is not without risks. Cognitive side effects, particularly short-term memory loss, remain a primary concern. However, recent advancements in ECT technique, such as the use of anesthesia and refined electrode placement, have reduced the incidence of these adverse effects, making ECT a safer option than in the past. This review emphasizes the importance of ECT as an adjunctive treatment in cases of treatment-resistant schizophrenia, while also highlighting the need for further research to optimize treatment protocols and minimize cognitive side effects.

Keywords: Electroconvulsive therapy, schizophrenia, treatment-resistant, psychosis, systematic review, cognitive side effects

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INTRODUCTION

Schizophrenia is a severe and chronic psychiatric disorder that affects approximately 1% of the global population. It is marked by a complex interplay of positive, negative, and cognitive symptoms that significantly impair an individual's ability to function in daily life. Positive symptoms include hallucinations (perceptions without real external stimuli) and delusions (false beliefs), which can lead to distorted thoughts and perceptions of reality. Negative symptoms involve a decrease in emotional expression, motivation, and social engagement, with anhedonia (lack of interest or pleasure in

activities) being a prominent feature. Cognitive impairments, such as deficits in attention, memory, and executive function, often exacerbate the impact of schizophrenia on daily life. These symptoms make it difficult for individuals to maintain relationships, hold jobs, or care for themselves independently [1].

Pharmacological treatment, particularly the use of antipsychotic medications, has been the cornerstone of schizophrenia management for decades. These medications primarily target the dopamine system, which is thought to be dysregulated in the brains of individuals with schizophrenia. While antipsychotics are effective for many patients in reducing the severity of positive symptoms, approximately 20–30% of individuals with schizophrenia experience treatment resistance. This means that despite multiple trials of different antipsychotic medications, their symptoms do not improve significantly, leading to ongoing distress and disability. Treatment-resistant schizophrenia (TRS) is particularly challenging and requires alternative therapeutic options to manage the symptoms and improve patients' quality of life. In recent years, Electroconvulsive Therapy (ECT) has re-emerged as a promising treatment option for those with treatment-resistant schizophrenia. ECT is a neuromodulatory intervention that involves the application of carefully controlled electrical currents to the brain, inducing a generalized seizure. This process is believed to alter neurochemical pathways in the brain, particularly by enhancing the release of neurotransmitters such as serotonin, dopamine, and gamma-aminobutyric acid (GABA). These neurochemical changes are thought to play a critical role in improving the symptomatology of various psychiatric disorders, including schizophrenia. Historically, ECT has been associated with stigma due to concerns about its safety and its portrayal in media and public discourse. Early forms of ECT were associated with significant side effects, including memory loss, cognitive deficits, and physical discomfort. However, modern advancements in ECT, such as the use of anesthesia and muscle relaxants during the procedure, as well as refined techniques for electrode placement and stimulation, have drastically improved its safety and tolerability. As a result, ECT has become a more viable and effective treatment option for patients with severe psychiatric disorders, particularly for those with treatment-resistant schizophrenia [2].

REVIEW OF LITERATURE

Schizophrenia is a severe psychiatric disorder characterized by symptoms such as delusions, hallucinations, and disorganized thinking. It can lead to significant functional impairment and poses a major challenge for healthcare professionals, especially in emergency and trauma settings. In critical situations, where patients may be uncooperative, violent, or at risk of self-harm, prompt intervention is crucial. The role of Electroconvulsive Therapy (ECT) in managing schizophrenia, particularly in emergency situations, has been explored in several studies, as it is recognized as a potentially life-saving treatment when other therapeutic approaches fail [3].

Electroconvulsive Therapy: Definition and Mechanism of Action

Electroconvulsive Therapy (ECT) involves the application of brief electrical impulses to the brain to induce a controlled seizure, which is thought to alter brain chemistry and alleviate symptoms of psychiatric disorders. While traditionally associated with depression, ECT is increasingly used in the management of schizophrenia, particularly for acute episodes that are refractory to pharmacological treatments or in cases of catatonia, severe agitation, or suicidal ideation. The mechanism by which ECT exerts its effects on schizophrenia is not fully understood, though it is believed to involve changes in neurotransmitter activity, including dopamine, serotonin, and glutamate, which are implicated in the pathophysiology of the disorder [4].

ECT in Schizophrenia: Efficacy and Safety

A number of studies have demonstrated the efficacy of ECT in managing schizophrenia, particularly in patients with treatment-resistant symptoms or those experiencing severe exacerbations. According to a study, ECT has shown significant efficacy in improving positive symptoms, such as delusions and hallucinations, and in reducing agitation and aggression in patients with schizophrenia. Furthermore, the combination of ECT with antipsychotic medications is often more effective than medications alone, especially in acute episodes.

The safety profile of ECT has improved over the years, with modern techniques such as bilateral and right unilateral electrode placement, minimizing side effects. However, the procedure is still associated with transient memory loss, confusion, and the potential for more severe cognitive side effects in some individuals. The risk-benefit ratio must be carefully evaluated, particularly in patients with other comorbidities that may complicate the procedure, such as cardiovascular issues [5].

Role of Emergency Nurses in ECT Administration

In emergency settings, the role of nursing professionals, especially emergency nurses, becomes pivotal in the administration and management of ECT. Emergency nurses must be equipped with the skills to assess patients for ECT suitability, prepare them for the procedure, and monitor their post-treatment recovery. A study emphasized the need for specialized training for emergency nurses in dealing with patients undergoing ECT, particularly in terms of pre-ECT assessment, management of potential adverse effects, and ensuring a safe and comfortable environment during the procedure [6].

Emergency nurses must also collaborate with psychiatrists, anesthesiologists, and other healthcare professionals to ensure that patients receive comprehensive and holistic care. For example, sedation and anesthesia management are critical components of ECT, and emergency nurses must remain vigilant for any adverse reactions, such as hypotension or airway complications, during the procedure. Post-ECT, nurses are responsible for monitoring vital signs, ensuring patient orientation, and providing education to patients and families regarding potential cognitive changes [7].

ECT in Acute Schizophrenic Episodes: Case Studies and Clinical Insights

Several case studies have demonstrated the utility of ECT in acute psychotic episodes of schizophrenia, where patients are at risk of harm due to their symptoms. One case study examined a patient with schizophrenia who was experiencing severe catatonia and had failed to respond to antipsychotic medications. The administration of ECT resulted in rapid improvement of the patient's symptoms, allowing for a reduction in the intensity of the psychotic episode and a subsequent decrease in the risk of self-harm.

Moreover, in trauma and emergency nursing practice, ECT is increasingly being considered for patients with schizophrenia who present in crisis situations, such as when they exhibit violent behavior or severe agitation. In these cases, ECT offers a quicker resolution compared to pharmacological interventions, which may take longer to show therapeutic effects. Emergency nurses are central to facilitating these interventions in a timely manner, ensuring that the treatment is administered safely, and supporting both the patient and their family through this critical period [8].

Ethical and Practical Considerations in Emergency Settings

While ECT offers significant benefits, its application in emergency settings also raises ethical concerns. The decision to administer ECT in such circumstances requires careful consideration of patient consent, especially in patients who are agitated or unable to provide informed consent due to the severity of their symptoms. In some cases, emergency nurses and psychiatrists may need to make decisions based on the principle of beneficence, prioritizing the patient's safety and well-being over formal consent in life-threatening situations. The American Psychiatric Association (2013) provides guidelines for ethical practice, including a focus on patient autonomy, informed consent, and the need for a clear, documented rationale for the use of ECT in emergency situations [9].

DISCUSSION

Efficacy of ECT in Schizophrenia

- *Positive Symptoms:* Multiple studies have demonstrated that ECT is particularly effective in reducing positive symptoms of schizophrenia, such as hallucinations and delusions. Randomized controlled trials indicate that when combined with antipsychotic medications, ECT significantly enhances symptom reduction compared to medication alone.

- *Negative Symptoms:* While ECT's efficacy in addressing negative symptoms is less pronounced, some studies suggest a moderate improvement, particularly in social withdrawal and emotional blunting. Adjunctive ECT appears to enhance the therapeutic effects of antipsychotics in this domain.
- *Cognitive Symptoms:* The impact of ECT on cognitive symptoms remains controversial. Although transient cognitive side effects, such as memory impairment, are common, some evidence suggests that improvements in overall symptomatology may indirectly enhance cognitive function.

Safety and Side Effects

- The primary concern associated with ECT is cognitive impairment, particularly retrograde and anterograde amnesia. However, advances in electrode placement (e.g., unilateral versus bilateral) and stimulation parameters have reduced these risks.
- Other side effects, including headache and muscle soreness, are typically mild and self-limiting.

Clinical Applications

- ECT is most commonly utilized in treatment-resistant schizophrenia or in cases with severe catatonia or suicidality. It is also considered for patients who cannot tolerate pharmacological therapies due to adverse effects or medical contraindications.

Optimization of ECT Protocols

- Recent studies focus on optimizing stimulation parameters to maximize efficacy while minimizing side effects. Innovations such as ultrabrief pulse stimulation and personalized electrode placement show promise in improving outcomes [10].

CONCLUSION

Electroconvulsive therapy (ECT) has re-emerged as a valuable therapeutic intervention in the treatment of schizophrenia, particularly for those individuals suffering from treatment-resistant cases. Schizophrenia, a chronic and often debilitating psychiatric disorder, presents a complex array of symptoms that are not always effectively managed with conventional antipsychotic medications. For a significant subset of patients, estimated to be around 20–30%, pharmacological treatments do not produce adequate symptom relief, resulting in persistent distress, impaired functioning, and a poor quality of life. In such cases, ECT offers a promising alternative, especially when other options have failed.

The efficacy of ECT in treating schizophrenia, particularly in reducing positive symptoms such as hallucinations and delusions, is well-documented. Research has consistently shown that ECT can produce rapid and significant reductions in these symptoms, which are often the most distressing and impairing for patients. Positive symptoms tend to respond better to antipsychotic medications, but ECT offers an option for those whose symptoms remain severe and unresponsive to drug treatments. Beyond the positive symptoms, ECT has also demonstrated moderate effects on negative symptoms, such as anhedonia, social withdrawal, and emotional blunting. Although the effect on negative symptoms may not be as robust as on positive symptoms, it still represents an important therapeutic gain, especially considering the difficulty of treating these symptoms pharmacologically.

However, one of the most significant concerns with ECT remains its potential for cognitive side effects, particularly memory impairment. Historically, patients undergoing ECT experienced significant cognitive deficits, including problems with short-term memory and sometimes more persistent memory loss. These side effects led to stigma and hesitancy surrounding the use of ECT. In recent years, however, advancements in ECT techniques, such as more precise electrode placement, the use of anesthesia, and muscle relaxants, have significantly reduced these adverse effects. Modern ECT is much safer and more tolerable, with patients reporting fewer cognitive issues compared to earlier forms of the therapy. The cognitive side effects that do occur are typically short-lived and tend to resolve in the

weeks following treatment. Nevertheless, clinicians must carefully weigh these potential risks when considering ECT, particularly for patients who may already have pre-existing cognitive vulnerabilities or those for whom cognitive function is a key concern.

Despite these advancements, there remains a need for further research to refine ECT protocols and gain a deeper understanding of its long-term impact on cognitive function. Future studies should focus on optimizing the parameters of ECT, such as the frequency and duration of treatments, the specific brain regions targeted, and the ideal patient population for this therapy. There is also a need for more research into how ECT interacts with other forms of treatment, such as pharmacotherapy, psychotherapy, and social rehabilitation, to better understand how it fits into a comprehensive treatment plan for schizophrenia. Additionally, ongoing investigation into the mechanisms by which ECT improves symptoms in schizophrenia, whether through changes in neurochemical pathways, neuroplasticity, or other processes, could help to identify ways to maximize its therapeutic potential while minimizing side effects.

In clinical practice, ECT should be considered on a case-by-case basis, with clinicians carefully evaluating the patient's overall treatment history, the severity of their symptoms, and their individual response to previous therapies. For patients who have not responded to pharmacological treatments or have experienced intolerable side effects, ECT may be a critical adjunctive therapy. Given its efficacy in alleviating both positive and negative symptoms of schizophrenia, it remains an important tool in the psychiatrist's therapeutic arsenal. Ultimately, clinicians must balance the potential benefits of ECT, such as symptom improvement and enhanced quality of life, with its risks, particularly the possibility of cognitive side effects. By individualizing treatment plans and considering ECT as part of a holistic, comprehensive approach to schizophrenia care, healthcare providers can maximize outcomes for patients struggling with this challenging disorder.

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