

Integrating Non-invasive Brain Stimulation with Evidence-based Psychosocial Approaches in Schizophrenia

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Introduction

Schizophrenia is a complex and chronic psychiatric disorder that affects approximately 1% of the global population. Characterized by symptoms such as delusions, hallucinations, cognitive impairments, and social withdrawal, schizophrenia severely impacts an individual's ability to function in everyday life. Despite advances in pharmacological treatments, many patients with schizophrenia continue to experience persistent symptoms, particularly cognitive and negative symptoms, which are less responsive to traditional medications. As a result, there is growing interest in exploring alternative and adjunctive therapeutic options, such as Non-Invasive Brain Stimulation (NIBS), combined with evidence-based psychosocial interventions, to enhance treatment outcomes [1].

Non-invasive brain stimulation techniques, such as Transcranial Magnetic Stimulation (TMS) and transcranial Direct Current Stimulation (tDCS), have shown promising results in modulating brain activity and improving various symptoms in patients with schizophrenia. On the other hand, psychosocial interventions like Cognitive Behavioral Therapy (CBT), supported employment, and family therapy are well-established treatments that aim to address the social and cognitive deficits of schizophrenia. The integration of NIBS with these psychosocial approaches offers an innovative, holistic treatment model that may improve outcomes, enhance cognitive functioning, and reduce the burden of illness [2].

Description

Schizophrenia is a heterogeneous disorder, meaning it can present in various forms, with a combination of positive (e.g., hallucinations, delusions), negative (e.g., social withdrawal, flat affect), and cognitive (e.g., impaired attention, memory, executive function) symptoms. These symptoms can significantly impair the quality of life and interfere with an individual's ability to work, maintain relationships, and live independently. The pathophysiology of schizophrenia is still not fully understood, but it is believed to involve a complex interplay of genetic, neurodevelopmental, and environmental factors. Brain imaging studies have revealed structural and functional abnormalities in areas such as the prefrontal cortex, hippocampus, and thalamus, which are associated with cognitive and negative symptoms of the disorder. Moreover, dysregulation of neurotransmitters like dopamine, glutamate, and serotonin contributes to the psychotic symptoms of schizophrenia. The brain's inability to process and integrate sensory information efficiently likely underlies the cognitive impairments that are often more disabling than psychotic symptoms. Despite the availability of antipsychotic medications, which primarily target the

dopaminergic system, these treatments are often inadequate in addressing the full spectrum of symptoms, especially cognitive and negative symptoms. As a result, there is a need for complementary therapies that can help alleviate the functional impairments associated with schizophrenia [3].

Non-invasive brain stimulation techniques aim to modulate neuronal activity by applying electrical or magnetic fields to specific areas of the brain. These approaches do not require surgery or implantation of electrodes, making them relatively safe and accessible. The two most studied NIBS methods in schizophrenia are Transcranial Magnetic Stimulation (TMS) and transcranial Direct Current Stimulation (tDCS). TMS involves the use of a magnetic field to induce small electric currents in the brain. The magnetic coil is placed on the scalp over a specific region, typically the prefrontal cortex, which is implicated in the cognitive deficits of schizophrenia. Repetitive TMS (rTMS) involves delivering a series of magnetic pulses at a high frequency, while low-frequency rTMS can inhibit activity in overactive brain regions. Research has shown that rTMS can improve cognitive functioning and reduce symptoms in individuals with schizophrenia, particularly those with negative and cognitive symptoms. Studies have found that high-frequency rTMS (around 10 Hz) over the left Dorsolateral Prefrontal Cortex (DLPFC) can enhance cognitive functions such as working memory, attention, and executive function. It has also shown promise in alleviating negative symptoms such as social withdrawal and lack of motivation. These cognitive and negative symptoms are often resistant to pharmacological treatments, making rTMS an attractive option for improving overall functioning [4].

Social deficits are a hallmark of schizophrenia, and these deficits often prevent individuals from reintegrating into society and maintaining employment. Supported employment programs, such as the Individual Placement and Support (IPS) model, have been shown to significantly improve vocational outcomes in individuals with schizophrenia. These programs provide individualized support in obtaining and maintaining employment, helping individuals overcome barriers to work and social interaction. Similarly, social skills training focuses on teaching individuals with schizophrenia the basic skills necessary for interacting with others, such as making eye contact, initiating conversations, and responding appropriately in social situations. These interventions are effective in improving social functioning and reducing isolation [5].

Conclusion

Schizophrenia is a debilitating disorder with a profound impact on individuals, families, and society. While pharmacological treatments remain the cornerstone of management, there is a growing need for complementary therapies that address cognitive and negative symptoms, which are often less responsive to medication. Non-invasive brain stimulation techniques like TMS and tDCS offer a promising avenue for modulating brain activity and enhancing cognitive functioning, while evidence-based psychosocial interventions such as CBT, supported employment, and family therapy remain essential for improving psychological, social, and vocational outcomes. The integration of NIBS with psychosocial approaches represents a novel, comprehensive treatment model that targets multiple aspects of schizophrenia. By combining neurobiological and psychological interventions, clinicians can offer a more holistic approach that improves the chances of recovery and enhances

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Received: 02 October, 2024, Manuscript No. jbr-24-152863; Editor Assigned: 04 October, 2024, PreQC No. P-152863; Reviewed: 18 October, 2024, QC No. Q-152863; Revised: 23 October, 2024, Manuscript No. R-152863; Published: 30 October, 2024, DOI: 10.37421/2684-4583.2024.7.278

quality of life. Although more research is needed to determine the optimal combination and timing of these interventions, the evidence thus far supports the potential benefits of this integrated approach.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Kang, Dongyu, Yi Zhang, Guowei Wu and Chuhan Song, et al. "The effect of accelerated continuous theta burst stimulation on weight loss in overweight individuals with schizophrenia: A double-blind, randomized, sham-controlled clinical trial." *Schizophr Bull* 50 (2024): 589-599.
2. Kang, Dongyu, Chuhan Song, Xingjie Peng and Guo Yu, et al. "The effect of continuous theta burst stimulation on antipsychotic-induced weight gain in first-episode drug-naive individuals with schizophrenia: A double-blind, randomized, sham-controlled feasibility trial." *Transl Psychiatry* 14 (2024): 61.
3. Su, Xiuru, Xuan Wang, Xiuling Pan and Xuan Zhang, et al. "Effect of repetitive transcranial magnetic stimulation in inducing weight loss in patients with chronic schizophrenia: a randomized, double-blind controlled 4-week study." *Curr Neuropharmacol* 21 (2023): 417-423.
4. Nijman, Saskia A., Wim Veling, Elisabeth CD van der Stouwe and Gerdina HM Pijnenborg. "Social cognition training for people with a psychotic disorder: A network meta-analysis." *Schizophr Bull* 46 (2020): 1086-1103.
5. Cole, Eleanor J., Katy H. Stimpson, Brandon S. Bentzley and Merve Gulser, et al. "Stanford accelerated intelligent neuromodulation therapy for treatment-resistant depression." *Am J Psychiatry* 177 (2020): 716-726.

How to cite this article: Hickey, Franklin. "Integrating Non-invasive Brain Stimulation with Evidence-based Psychosocial Approaches in Schizophrenia." *J Brain Res* 7 (2024): 278.