

The Effects of NeuroOptimal Neurofeedback on a Clinical Case of Cerebral Vascular Narrowing: A Case Study

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Abstract

This case study explores the effects of NeuroOptimal neurofeedback therapy on a 27-year-old female patient with a history of cerebral vascular narrowing, resulting in physical and emotional challenges. Following neurosurgery at a young age, the patient exhibited significant motor difficulties and emotional distress, exacerbated by the COVID-19 pandemic. This study documents the administration of 12 NeuroOptimal sessions, highlighting improvements in physical function, emotional regulation, and overall well-being. The findings suggest that NeuroOptimal neurofeedback may serve as an effective intervention for individuals with complex neurological histories.

Introduction

NeuroOptimal neurofeedback is an emerging therapeutic modality designed to enhance brain function by providing real-time feedback on neural activity. This case study focuses on a 27-year-old woman who experienced cerebral vascular narrowing resembling a stroke at the age of 9-10, leading to significant physical and psychological challenges. The objective of this study is to evaluate the impact of NeuroOptimal neurofeedback on her condition, particularly in terms of reducing physical symptoms and improving emotional well-being.

Background

The subject of this case study is a 27-year-old woman who underwent neurosurgery following cerebral vascular narrowing. Post-surgery, she experienced a decline in physical functions, including slowed movement in her left hand and difficulties in ambulation. In 2023, she began experiencing cramping, attributed to neurotransmitter imbalances. The pandemic disrupted her access to occupational therapy (OT) and physical therapy (PT), contributing to her withdrawal from social settings, including the Day Activity Centre (DAC). Her reluctance to engage with others raised concerns about her mental health, prompting a psychiatric evaluation that suggested a potential psychotic disorder. Following medication, her condition improved, yet she remained resistant to returning to DAC, leading to the recommendation of alternative therapeutic options.

Methodology

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Intervention

The patient participated in 12 sessions of NeuroOptimal neurofeedback, each designed to assess and improve her mental and physical well-being. The sessions varied in duration, ranging from 20 to 33 minutes, and were conducted in a controlled clinical environment. The patient's progress was monitored through qualitative observations and feedback from family members and caregivers.

Session Overview

1. Session 1: Introduction to NeuroOptimal; the patient appeared relaxed and cheerful post-session.
2. Session 2: Full session; no cramps reported.
3. Session 3: One cramping incident; positive emotional response observed.
4. Session 4: Notable improvement in hand movement; emotional state enhanced.
5. Session 5: Emotional outbursts noted; no cramps reported.
6. Session 6: Positive non-verbal interactions; no cramps reported.
7. Session 7: Crying episodes reported; no cramps.
8. Session 8: Engaged with video content; no cramps.
9. Session 9: Tired but positive interaction; no cramps.
10. Session 10: One cramping incident; positive engagement.
11. Session 11: No cramps; continued positive interactions.
12. Session 12: One cramping incident during travel; positive engagement with nostalgic video content.

Results

The results of the NeuroOptimal sessions indicate a significant reduction in the frequency of cramping episodes, decreasing from 4-5 times per month to only 1 time per month. Emotional regulation improved, with the patient exhibiting emotional outbursts that appeared to facilitate the processing of past traumas. Additionally, there was an observable enhancement in physical abilities, particularly in the movement of her non-dominant hand, and an increase in social engagement and empathy towards others.

Discussion

The findings from this case study suggest that NeuroOptimal neurofeedback may be a beneficial intervention for individuals with complex medical histories, particularly those experiencing both physical and emotional challenges. The reduction in cramping incidents and the improvement in emotional regulation underscore the potential of neurofeedback as a therapeutic tool (Hammond, 2005; Hammond, 2011; Baehr & Baehr, 2006; Duncan & Tharp, 2017; Baker, 2020). However, further research with larger sample sizes and controlled studies is necessary to validate these findings and explore the long-term effects of NeuroOptimal therapy.

Conclusion

This case study illustrates the positive impact of NeuroOptimal neurofeedback on a patient with a history of cerebral vascular narrowing. The significant reduction in physical symptoms and improvements in emotional well-being highlight the need for further exploration of neurofeedback as a viable therapeutic option in clinical settings. Ongoing monitoring and support, including occupational and physical therapy, are recommended to sustain the patient's progress and enhance her quality of life.

Recommendations

1. Ongoing NeuroOptimal Sessions: To maintain and further enhance improvements in emotional regulation and physical function.
2. Occupational and Physical Therapy: Continued support for physical abilities and social engagement.
3. Emotional Support Strategies: Incorporation of creative activities to assist in managing emotional outbursts and idle times.

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