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Case Report

Combining neurofeedback training and dhikr as adjuvant therapy for treating adolescent depression: a case report

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ABSTRACT

Depression in adolescents is a significant mental health issue requiring effective therapeutic approaches. This case report evaluates the effectiveness of neurofeedback training and dhikr as adjuvant therapies for a 17-year-old female adolescent diagnosed with bipolar affective disorder, current episode severe depression with psychotic features. The subject underwent eight sessions of combined neurofeedback and dhikr therapy, which showed positive results. Initially, the subject experienced severe sadness, guilt, suicidal ideation, and auditory hallucinations. After the therapy, there was a significant reduction in depressive symptoms and an improvement in mental well-being. Evaluations using quantitative electroencephalography (QEEG) and PHQ-A assessments showed improvements in brain wave activity and a reduction in depression scores from 16 (moderate to severe depression) to 8 (mild to moderate depression). The subject reported feeling calmer, less sad, and showed increased academic and social motivation. These results indicate that the combination of neurofeedback and dhikr can be an effective approach in managing adolescent depression by addressing both psychological and spiritual aspects. Further studies are needed to confirm these findings and explore the underlying mechanisms of this therapy's effectiveness.

Keywords: Adolescent depression, Neurofeedback training, Dhikr therapy, Adjuvant therapy, QEEG

INTRODUCTION

Depression affects an estimated 3.8% of the global population, including 5% of adults, with a higher prevalence among women (6%) compared to men (4%). Additionally, 5.7% of adults over the age of 60 experience depression, accounting for approximately 280 million individuals worldwide. Depression is a widespread mental health disorder that significantly impacts individuals, leading to severe suffering and diminished performance in educational and occupational settings.[1]

Addressing depression in adolescents has become particularly challenging. The 2019 guidelines from the national institute for health and care excellence (NICE) suggest psychotherapy as the primary treatment for mild depression.[2] For moderate to severe cases, they recommend combining psychotherapy with medication. Selective serotonin reuptake inhibitors (SSRIs) are commonly used as the first-line medication but have serious side effects, such as stomach pain, restlessness, and suicidal thoughts. Additionally, about 50% of adolescents do not respond well to these medications, and adherence to completing psychotherapy sessions among teenagers is generally low.[3,4]

In light of these challenges, alternative and complementary therapies are being explored to enhance the effectiveness of traditional treatments. Neurofeedback training, which involves monitoring brain activity and providing real-time feedback to help patients regulate their brain function, has shown promise as an adjunctive treatment for depression.[5,6] Similarly, spiritual practices such as dhikr, a form of meditative repetition of divine names or phrases in Islam, have been associated with

reduced stress and improved mental well-being.[7] This case report examines the effectiveness of combining neurofeedback training and dhikr as adjuvant therapies for treating adolescent depression, aiming to provide a holistic approach that addresses both the psychological and spiritual needs of patients.[8]

CASE REPORT

Subject B, a 17-year-old female, was admitted through the clinic with primary complaints of intense sadness, guilt, and suicidal thoughts for the past month. The subject experienced auditory hallucinations blaming herself. These complaints were episodic and recurrent, with a history of previous treatment for similar complaints. The subject dropped out of school in the second grade of high school due to decreased concentration, learning motivation, and relationship problems with classmates.

Medical history

The subject frequently argued with friends because she felt cornered and mocked due to poor performance. The patient had a history of manic phases where she felt more confident, had many ideas, and increased activities outside the home. The subject was diagnosed with bipolar affective disorder, current episode severe depression with psychotic features, by a child and adolescent psychiatrist. After being given an injection, the subject's sleep improved and the whispering voices disappeared, but she still experienced strong depressive symptoms and suicidal thoughts. The PHQ-A examination showed a score of 16 (moderate to severe depression).

Therapy and treatment

The patient received medication therapy from a psychiatrist consisting of escitalopram 1×10 mg, quetiapine XR 1×200 mg, and Lorazepam 1x0.5 mg, and had been treated with a diagnosis of severe depression for the past year with a PHQ score of 16. The subject and family agreed to neurofeedback and dhikr therapy for eight sessions. During the pre-treatment interview, the subject reported difficulty concentrating in class, irritability, and frustration during depressive episodes, which led to decreased learning motivation and dropping out of school.

Initial stage

Procedure explanation: The procedure was explained to the subject and guardian, accompanied by signing an informed consent.

Initial examination: Brain mapping/QEEG and PHQ-9 examinations were conducted at the electrophysiology clinic of Soeharto Heerdjan mental hospital, Jakarta, with the assistance of a child and adolescent psychiatrist. The PHQ-9 examination was conducted with self-assessment accompanied by the researcher.

In-depth interview: The subject was interviewed about affective, cognitive, irritability, and daily as well as academic motivation symptoms. Interviews were also conducted with the caregiver for data triangulation.

Middle stage

Detailed explanation of neurofeedback: The subject was given an explanation of the neurofeedback procedure, including preparation and therapy implementation.

Neurofeedback therapy: Training was conducted with tetha/betha training protocols focusing on reducing beta and high beta waves with training targets at F3 and F4. The tetha protocol did not increase target achievement because the subject did not experience disturbances in tetha waves. Training was conducted for 15 minutes with sessions divided into three parts.

Dhikr implementation: The subject listened to dhikr audio recited by Sheikh Hasan Ali for 15 minutes, whispered dhikr, and was given an explanation of the meaning of dhikr before the session began.

Session replication: Neurofeedback and dhikr sessions were repeated up to eight times, with the task of increasing dhikr at home/in the inpatient room.

Final stage

Re-examination of QEEG and PHQ-A: The second QEEG and PHQ-A examinations were conducted at the electrophysiology clinic of Soeharto Heerdjan mental hospital, Jakarta, with interpretation by a child and adolescent psychiatrist.

Second in-depth interview: The subject was re-interviewed about depressive symptoms, irritability, and daily as well as academic motivation. Interviews were also conducted with the family as informants for data triangulation.

Therapy termination: Therapy was terminated after the final evaluation.

Evaluation results

At the end of the therapy sessions, QEEG examination showed improvement in beta and high beta wave activity returning to normal within standard deviations. There was a reduction in beta and high beta wave activity in the occipital and frontal areas. PHQ-A score evaluation showed a score of 8 (mild to moderate depression), along with an improvement in the subject's general condition. The subject felt calmer, and sadness and suicidal thoughts improved. The patient stated that dhikr made her feel calmer and more resigned. The family also reported that

the subject no longer isolated herself, was willing to help with household chores, and considered returning to school. With a systematic approach, neurofeedback and dhikr therapy showed significant improvement in the subject's condition.

Assessment

Subject (Overall depression symptoms, motivation, irritability): No longer sad, no suicidal thoughts. Calmer and less irritable compared to before. Considering going back to school.

Caregiver: No longer isolates herself in her room. Willing to help parents at home.

QEEG: Improvement in beta and high beta wave activity.

PHQ-A: Score reduction from 16 (moderate to severe depression) to 8 (mild to moderate depression).

Application of neurofeedback therapy model for adolescent depression patients

In this patient, neurofeedback and dhikr therapy showed significant improvement in adolescent depression patients, with the following results:

Improvement in overall depressive symptoms, particularly a reduction from moderate-severe depression to mild-moderate according to the PHQ-A instrument. Improvement in the subject's motivation both in helping parents and in academics. Improvement in brain waves, particularly alpha, tetha, and beta waves as evidenced by QEEG recordings.

The subject showed improvement with varying degrees of therapy success based on interviews, instruments, informants, and QEEG recordings.

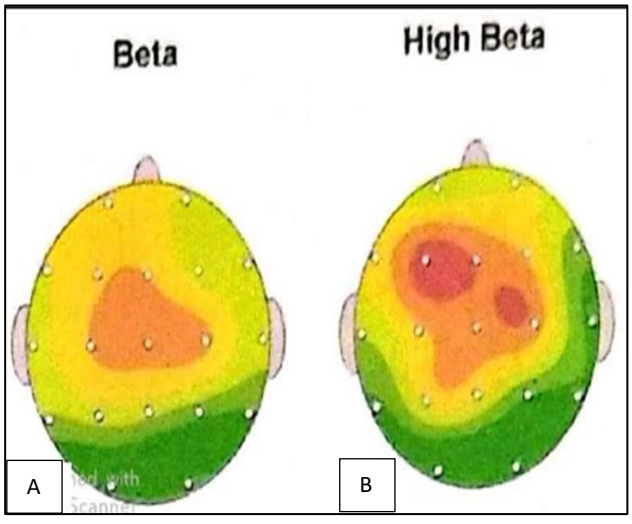

Figure 1 (A and B): QEEG results pre-treatment: beta and high beta waves in subject B.

Figure 1 illustrates the QEEG results obtained before the treatment began. The scan highlights elevated activity in the beta and high beta wave bands, particularly in the frontal and occipital regions of the brain. These heightened levels of beta activity are often associated with increased anxiety, stress, and depressive symptoms, which correspond with the subject's reported condition of severe depression. The abnormal wave patterns indicated a dysregulated brain state, reinforcing the need for neurofeedback and dhikr interventions aimed at normalizing brain wave activity and alleviating depressive symptoms.

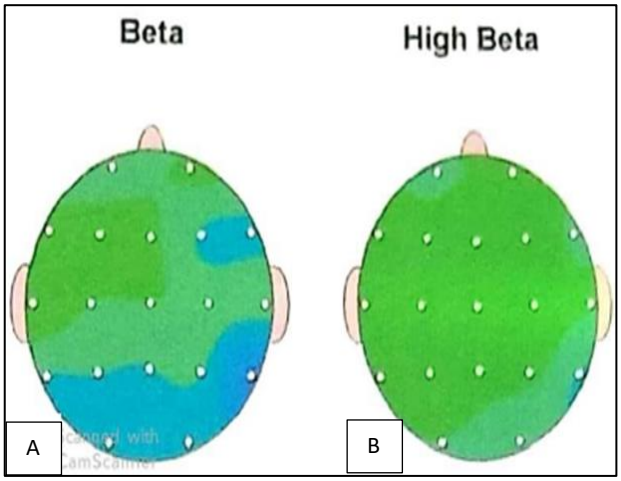

Figure 2 (A and B): QEEG results post-treatment: beta and high beta waves in subject B.

Figure 2 presents the QEEG results following the completion of the treatment sessions. The scan demonstrates a significant reduction in beta and high beta wave activity compared to the pre-treatment results shown in Figure 1. The normalization of these wave patterns, particularly in the frontal and occipital regions, indicates an improvement in the subject's brain function. This reduction in abnormal Beta activity is associated with decreased anxiety, stress, and depressive symptoms, suggesting that the combined neurofeedback and dhikr therapy effectively contributed to the regulation of brain activity and the alleviation of the subject's depressive symptoms.

DISCUSSION

Depression in adolescents is a significant mental health issue that requires an effective and holistic therapeutic approach.[9] Based on this case report, neurofeedback and dhikr therapy as adjuvant treatments show promising results in managing depressive symptoms in adolescent subjects.[10]

Neurofeedback is a therapeutic method that involves monitoring brain activity and providing real-time feedback to help patients regulate their brain function. Research indicates that Neurofeedback can help reduce

depressive symptoms by enhancing self-regulation of brain activity.[11] In this case, the subject showed significant improvement in beta and high beta wave activity on QEEG examination after therapy, which is associated with a reduction in depressive and irritability symptoms.[12]

Dhikr, as a spiritual practice in Islam, involves the meditative repetition of divine names or phrases, which has been associated with reduced stress and improved mental well-being. In this case report, the subject experienced calmness and a reduction in sadness after performing dhikr sessions. This suggests that dhikr can be an important component in a holistic approach to managing depression by combining psychological and spiritual aspects.[13]

The approach combining neurofeedback and dhikr shows comprehensive results in improving the mental condition of the subject. Neurofeedback helps regulate abnormal brain activity, while dhikr provides the emotional and spiritual support needed for mental recovery. The final evaluation showed improvements in various aspects, including a reduction in PHQ-A scores from 16 to 8, indicating a decrease from moderate-severe depression to mild-moderate depression. Additionally, improvements in motivation and social interaction were observed, as reported by the subject and family.[10]

These findings suggest that the combination of neurofeedback and dhikr therapy can be an effective approach for managing depression in adolescents. This approach not only focuses on clinical symptoms but also considers the emotional and spiritual well-being of the patient, which is important for long-term recovery. Further studies with larger samples are needed to confirm these findings and explore the mechanisms underlying the effectiveness of this combination therapy.[10,12,13]

CONCLUSION

This case report concludes that the combination of neurofeedback training and dhikr as adjuvant therapy are effective in improving depression in adolescents.

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