

Efficacy of Loretta and tDCS on the treatment of depression and anxiety in youth

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Abstract

Cognitive methods have found a good place among treatment options due to their lack of side effects and effectiveness. Loretta has been the focus of therapists and researchers as deep neurofeedback and due to the type of network function. The main research question is to what extent Loretta's combined method is effective in treating depression and anxiety disorders? In this research, the sampling was based on the depressed and anxious people of the counseling center, who were diagnosed by the million three test and brain map, and the effectiveness of the treatment before and after the treatment was measured by brain map. For treatment, Loretta and tDCS treatment protocols described in the article have been used to treat depression and anxiety for 20 sessions, and the results show that this method has had a great effect on the treatment of depression and anxiety disorder in the study.

Keywords: depression treatment, anxiety treatment, Loretta, TDCS, cognitive psychology

Introduction

Anxiety is one of the most common and debilitating psychiatric conditions (disorders) worldwide (Dirson João Stein

et al, 2020). According to DSM-V, anxiety disorders include those that have the common features of fear and excessive anxiety and behavioral disorders. Related to these disorders are: separation anxiety disorder, selective muteness, specific phobia, social anxiety disorder (social phobia), panic (Dirson João Stein et al, 2020)

Not all people respond to common treatments such as antidepressants and antipsychotics. In a study of 3,000 depressed patients, only %3.1 of them, after 14 weeks of using citalopram (a type of it is an anti-depressant drug) had recovered (Roshank Khodabakhsh Pirkalani et al., 2018)

The World Health Organization (WHO) estimates that approximately 300 million people worldwide suffer from depression, resulting in a global prevalence of %4.4, with significant costs to regional health systems and high disability-adjusted life years (Pedraz-Petrozzi et al. et al., 2023)

Direct electrical stimulation from the skull is a neurological treatment method that introduces a direct and weak current to the cortical areas and facilitates or inhibits spontaneous nerve activity (Mirmaradzehi Sibi et al., 1401).

tDCS is a simple and inexpensive technique using two electrodes applied to the scalp. The anode (positive) depolarizes the threshold of the nerve membrane, while the cathode (negative) hyperpolarizes it (Dirson João Stein et al, 2020).

Rather than directly inducing neural activity, tDCS is thought to increase or decrease its probability (Bas Labree et al, 2022).

Direct current stimulation (tDCS) has emerged as a promising tool and has proven to be safe and tolerable for the treatment of many diseases, including chronic pain, depression, and anxiety. (Dirson João Stein et al, 2020) The results show showed that tDCS has a significant

effect on both depression and anxiety, and these effects are strong for different populations and treatment parameters (Ying-Chih Cheng, 2021).

Depression usually includes feelings of sadness, loss of interest and concentration, insomnia, guilt, and suicidal thoughts, among others. Although the course of depression is variable and most people recover from their initial episode, repeated episodes throughout life (Burcusa and Iacono, 2007, Solomon et al., 2000, Judd et al., 2000), especially for women (Essau et al., 2010) is common.

The effect of neurofeedback training is considered as a model of operant conditioning in which participants learn to influence the electrical activity of their brain. It was shown in the research of Ansari Hosseini et al. that neurofeedback improved cognitive flexibility and selective attention and reduced depression symptoms in the experimental group and led to an increase in left hemisphere activity (Samadi and Shahrini, quoted by Ansari Hosseini et al., 2020).

EEG NF is characterized by a simultaneous learning process in which both the patient and the computer are involved in modifying neural activity or connectivity, thereby improving symptoms associated with anxiety or hyperarousal. (J. A. Micoulaud-Franchi et al. , 2021) The use of tDCS in clinical research for anxiety has a short history compared to other interventions such as drug therapy and psychotherapy, despite the small number of studies conducted so far in this field, some are promising (Dirson João Stein et al, 2020).

The combined treatment protocol of Loretta and TDCs has a great effect in the treatment of depression, and after 20 sessions, the client has experienced a large part of the treatment process and will be better prepared for counseling (Dadkhah et al., 2020).

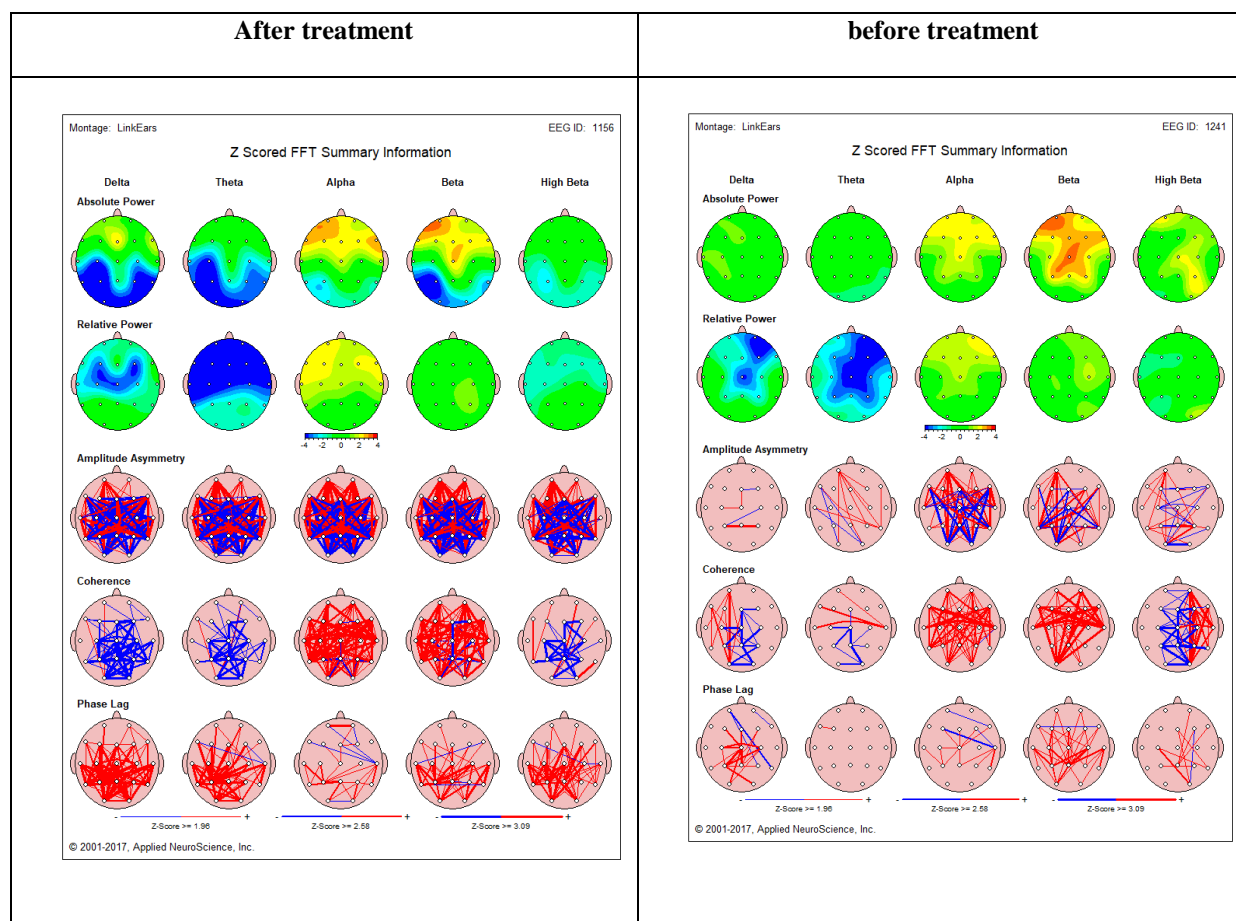
research method

A 21-year-old man was randomly selected from among the clients of Setarean Iranian Counseling Center, who underwent the miller three test and brain mapping (QEEG) and had depression and anxiety and did not have a psychotic mental disorder.

A brain map was taken from them pre-test and post-test and their depression disorder was investigated before and after the test. The treatment protocol for him included 20 Loretta sessions (Depression=8, Anxiety=8) for 40minutes including 8 steps of 5minutes and then TDCS was used in F3 and FP2 areas. Its amount was one ampere for 20minutes. The existence of a control group and the number of samples are the limitations of this research, which was not done due to time and cost.

Data analysis

The results of the research compared to the conducted research and similar treatment protocols have had good effectiveness and the brain map of the subjects in the delta, theta, alpha, beta and high beta areas shows that the areas involved in depression have experienced great improvement.



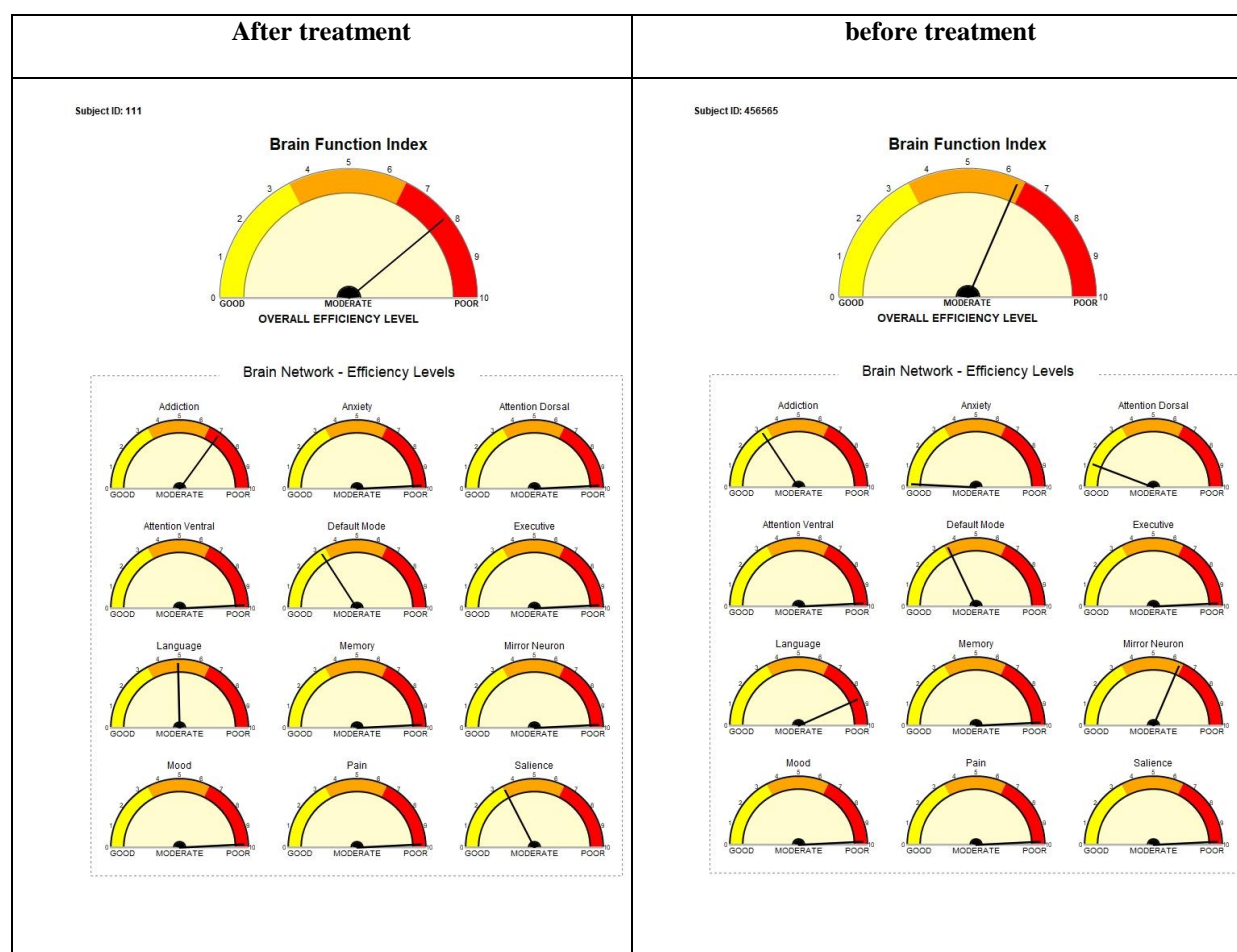
As indicated in the brain map, a part of depression and anxiety remains, and it should be investigated in the next research if this disorder can be fully treated by increasing the number of sessions.

Effect on other disorders

Based on the results of the brain map, some other disorders have also improved,

However, the client has experienced very few symptoms of depression in his clinical report, and this emphasizes the effectiveness of this treatment method.

and this treatment method has also affected their improvement, which can provide more accurate effectiveness by increasing the number of samples.



It has affected the client's anxiety and depression and has also improved his appetite system. Installation to ventral attention has a greater effect on dorsal

attention. But it has not affected executive functions. It has not affected the mood. On the other hand, it has increased the role model of the person.

Discussion

The combined treatment protocol of Loretta and TDCs has a great effect in the treatment of depression and anxiety, and after 20 sessions, the client has experienced a large part of the treatment

References

- Burcusa SL, Iacono WG. Risk for recurrence in depression. Clin Psychol Rev. 2007 Dec;27(8):959-85. doi: 10.1016/j.cpr.2007.02.005. Epub 2007 Mar 3. PMID: 17448579; PMCID: PMC2169519
- Cheng Y-C, Kuo P-H, Su Min-I, Huang W-L (2022). The efficacy of noninvasive, non-convulsive electrical neuromodulation

process and will be better prepared for counseling. On the other hand, it is better to measure the effectiveness of this installation method using non-combined methods in an experiment so that more accurate results can be obtained.

on depression, anxiety and sleep disturbance: a systematic review and meta-analysis. Psychological Medicine 52, 801–812. <https://doi.org/10.1017/S003329172100556>

- Dadkhah, Mohsen, Dadkhah, Yaser and Shabnam Debiri (1402). Effectiveness of Loretta and TDCS combination therapy in the treatment of depression. The 12th International Conference on Psychology,

Educational Sciences and Lifestyle:
Georgia.

- Dirson João Stein, Liciane Fernandes Medeiros, Wolnei Caumo & Iraci LS Torres (2020) Transcranial Direct Current Stimulation in Patients with Anxiety: Current Perspectives, Neuropsychiatric Disease and Treatment, , 161-169, DOI: 10.2147/NDT.S195840
- Essau CA, Lewinsohn PM, Olaya B, Seeley JR. Anxiety disorders in adolescents and psychosocial outcomes at age 30. J Affect Disord. 2014 Jul;163:125-32. doi: 10.1016/j.jad.2013.12.033. Epub 2014 Jan 2. PMID: 24456837; PMCID: PMC4028371
- Fingelkurts AA, Fingelkurts AA, Kallio-Tamminen T. EEG-guided meditation: A personalized approach. J Physiol Paris. 2015 Dec;109(4-6):180-190. doi: 10.1016/j.jphysparis.2015.03.001. Epub 2015 Mar 21. PMID: 25805441.
- Izutsu N, Yanagisawa T, Fukuma R, Kishima H. Magnetoencephalographic neurofeedback training decreases β -low- γ -phase-amplitude coupling of the motor cortex of healthy adults: a double-blinded randomized crossover feasibility study. J Neural Eng. 2023 May 9;20(3). doi: 10.1088/1741-2552/acd0d6. PMID: 37105162.
- Jog, M.A., Anderson, C., Kubicki, A. et al. Transcranial direct current stimulation (tDCS) in depression induces structural plasticity. Sci Rep 13, 2841 (2023). <https://doi.org/10.1038/s41598-023-29792-6>
- Khodabakhsh Pirkalani, Roshank, Taqvi, Khatereh and Farideh Rastago 2018, comparison of the effectiveness of cognitive-behavioral therapy and neurofeedback on major depression in adult women, 9th year, number 36, Allameh Tabatabaie University Clinical Psychology Quarterly
- Labree, B.; Hoare, D.J.; Gascoyne, L.E.; Scutt, P.; Del Giovane, C.; Sereda, M. Determining the Effects of Transcranial Direct Current Stimulation on Tinnitus, Depression, and Anxiety: A Systematic Review. Brain Sci. 2022, 12, 484. <https://doi.org/10.3390/brainsci12040484>
- Micoulaud-Franchi, J. A. C. Jeunet, A. Pelissolo & T. Ros .(2021). EEG Neurofeedback for Anxiety Disorders and Post-Traumatic Stress Disorders: A Blueprint for a Promising Brain-Based Therapy
- Mirmaradzehi Sibi, Mojdeh. Shirazi, Mahmoud. Kehrzaei, Farhad. 0530. Investigating the effect of tDCS transcranial direct electrical stimulation and NLP neural programming on reducing depression, anxiety and stress in women. Applied Family Therapy Quarterly, (1.484-494)
- Newson JJ, Thiagarajan TC. EEG Frequency Bands in Psychiatric Disorders: A Review of Resting State Studies. Front Hum Neurosci. 2019 Jan 9;12:521. doi: 10.3389/fnhum.2018.00521. PMID: 30687041; PMCID: PMC6333694.
- Pedraz-Petrozzi, B., Sardinha, H., Gilles, M. et al. Effects of left anodal transcranial direct current stimulation on hypothalamic–pituitary–adrenal axis activity in depression: a randomized controlled pilot trial. Sci Rep 13, 5619 (2023). <https://doi.org/10.1038/s41598-023-32531-6>
- Samadi Taher Gourabi, Maryam, Shahrinia, Iraj, 1400, The effectiveness of neurofeedback on working memory and cognitive flexibility of patients suffering from mild depression, Journal of Gilan University of Medical Sciences.