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Commentary

Transcranial Direct Current Stimulation (TDCS) to Reduce the Psychological Symptoms in Benign Paroxysmal Positional Vertigo

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DESCRIPTION

Transcranial Direct Current Stimulation (TDCS) is a common brain stimulation method used to regulate cortical excitability, thereby providing a facilitative or inhibitory effect on a variety of behaviors. However, there is currently a lack of consensus between studies, and there are many findings suggesting that it is difficult to achieve polarity-specific effects. In this article, we will look at some of these differences and focus on the experimental parameters that may underlie their occurrence. This includes its intended use, method of use, and considerations for designing effective and safe experiments. Our goal is to researchers unfamiliar with TDCS with basic knowledge so that they can make informed decisions when designing and performing successful experiments. This article aims to inform future TDCS studies in different areas by summarizing different approaches, stimulus parameters. During stimulation, current flows between the electrodes and through the brain to complete the circuit. It is generally believed that a positive anode current temporarily promotes movements associated with the cortical region below the target electrode, and a negative cathode current inhibits movements. Benign Paroxysmal Positional Vertigo (BPPV) is one of the most common causes of vertigo the sudden sensation of spinning or that the inside of head is spinning. Prevalence of BPPV has been found with high range in elderly patients (60 years or above). In clinical practice vertigo or dizziness are reported as the common complains of this patient population, whereas available literature also implicated some psychological factors such as anxiety or depression affect the recovery from these symptoms of BPPV or recurrence was reported. Similar to Transcranial Magnetic Stimulation (TMS), active stimulation can be compared to sham protocols. The direction of the current distinguishes between anodic and cathodic stimuli by adjusting the resting membrane potential of the stimulated neuron. Anodic stimulation depolarizes neurons and increases the action of potentials, while cathodic stimulation hyperpolarizes neurons and reduces the action of potentials.

These polarity-specific effects have been demonstrated in multiple paradigms, both during and after stimulation of TDCS, a non-convulsive brain stimulation technique, injects a low-amplitude (usually 12 mA) direct current flowing from the anode of the cerebral cortex to the cathode using two surface electrodes on the scalp, thereby causing the membrane potential of neurons. To measure the spontaneous velocity changes to depolarization. The anode region is hypopolarized and the cathode region is hyperpolarized. A well-known hypothesis of depression is hypoactivity in the left Dorsolateral Prefrontal Cortex (DLPFC), which leads to psychomotor disorders and higher brain dysfunction. Researchers hypothesize that anodic TDCS stimulation to the left DLPFC increases its cortical activity, which leads to amelioration of depression. In recent years, several randomized studies have confirmed the antidepressant effect of TDCS in patients with BPPV. Another promising study conducted by Ferrucci applied the same TDCS protocol to in patients with severe BPPV. Improvements were observed on day 5 after 10 TDCS sessions and continued until the end of the 5 weeks. The effects of brain stimulation can be delayed, and it has been observed that the effects appear beyond the duration of treatment.

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