



Transcranial Direct Current Stimulation and Meditative Exercise for Osteoarthritis Knee Pain

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Introduction

Transcranial direct current stimulation (tDCS) involves a directed low amplitude electrical current to affect the activity of the motor cortex and supraorbital region in the brain. In this study, subjects with chronic osteoarthritis knee pain utilized self-administered tDCS and performed meditative exercise to treat their pain symptoms.

Methods

Subjects: Twenty 50- to 85-year-old adults being treated for osteoarthritis

- Average age- 61.5
- 75% female, 25% male
- Average duration of osteoarthritis- 29.6 months

Pain, pressure, and heat measurement indexes:

- Visual Analog Scale
- Western Ontario and McMaster Universities Osteoarthritis Index
- Short-Form McGill Pain Questionnaire
- Quantitative Sensory Testing measures

tDCS Administration

All 20 subjects wore caps with electrodes connected and received a 10 2 mA 20-minute tDCS treatment from a mini-CT device at home.

Remote Monitoring

The researchers provided the subjects with a password to turn on the device and monitored the treatment remotely over the course of two weeks.

Data Collection

Data was collected before the first and after the last tDCS sessions.

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Results

The improvement between baseline and final self-reported pain and osteoarthritis symptom scores was statistically significant. No patients reported any adverse effects from the tDCS treatment (i.e. itching, burning, headache, fatigue, nervousness, dizziness, or difficulty concentrating). Participants reported high satisfaction with the use and preparation of the device (9.57 out of 10 and 9.67 out of 10 respectively). Pressure pain thresholds increased by 0.75 +/- 1.29 kgf/cm² in the active group and decreased in the placebo group decreased by an average of 0.71 +/- 0.82 kgf/cm². Cold pain intensity decreased by 15.33 +/- 22.40°C in the active group, and it increased by 9.67 +/- 19.32°C in the placebo group. The results of this study are consistent with the results of similar studies that use tDCS with other methods to affect cognition and behavior. The significance of the self-administration feature of this treatment is that it extends osteoarthritis symptom treatment to patients who may not have access to transportation or are unable to endure relocation to a treatment center due to their pain levels. Long-term follow-up data should be collected to ensure continuous and significant improvement in osteoarthritis pain symptoms.

References

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