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Efficacy of Cranial Electrotherapy Stimulation on Cognition Among Perimenopausal Women: A Quasi-experimental Pilot Study

Naveeta Thakur, Postgraduate Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Nidhi Sharma, Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Prachi Ranjan, Postgraduate Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Nidhi Sharma,

Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.

E-mail: Sharma.nidhi.physio@mmumullana.org

ABSTRACT

Introduction: Cognitive alterations are common in clinical practice during menopausal transition time, with subjective reports of "cerebral fog" impairing daily cognitive performance. Cranial Electrotherapy Stimulation (CES) is a neuromodulation approach that delivers pulsed, alternating microcurrent (<1000 μA) to the head via electrodes placed on the earlobes or scalp. It is used to treat anxiety, depression, insomnia, cognition, and headaches.

Aim: To explore the efficacy of CES on cognition among perimenopausal women.

Materials and Methods: This quasi-experimental pilot study was performed in 16 perimenopausal women, aged between 40-55 years. Ethical approval was obtained from the Institutional Ethical Committee with the registration number MMDU/ IEC-267. The trial was registered with the Clinical Trials Registry-India (CTRI) with the identification number CTRI/2024/04/066346. All participants received active CES for 30 minutes, for 4 days a week for 4 weeks. Pre and post assessments of all participants were performed using Montreal cognitive assessment scale (MoCA) to test cognitive function. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS Version 26.0). The Shapiro-Wilk test was used to determine the normality of the demographic and baseline characteristics. A paired t-test was used to compare the pretest and post-test results.

Results: The MoCA score at baseline was significantly deviated from a normal distribution. For within-group analysis paired t-test was used, MoCA score at baseline was 21.125±2.09 and that after intervention was 22.187±1.64. The result exhibited a significant improvement (p=0.001) when comparing the baseline values to after four weeks of intervention with an effect size of 0.56.

Conclusion: CES significantly improved cognitive performance (delayed recall and attention) among perimenopausal women. No study-related adverse events were reported. It would be valuable to further explore or confirm the effects of CES on cognition.

Keywords: Attention, Memory, Menopause