DOI.10.7860/JCDR/2026/90859.24085 Abstract No.: PT 38

Time Effect of Transcranial Direct Current Stimulation during Trunk Targeted Neuromuscular Facilitations on Stability and Sitting Balance among Subjects with Stroke

NIRAJ KUMAR MEHTA[1], CHANDAN KUMAR[2], DHARAM PANI PANDEY[3]

ABSTRACT

Introduction: Trunk control and sitting balance are fundamental components of functional recovery following stroke. Transcranial Direct Current Stimulation (tDCS) has emerged as a promising neuromodulatory technique capable of enhancing cortical excitability, thereby potentially augmenting the effects of Proprioceptive Neuromuscular Facilitation (PNF)- based trunk rehabilitation. Despite growing evidence, the optimal timing of stimulation- whether delivered before or concurrently with exercise-remains uncertain.

Aim: This study aimed to evaluate the time-dependent effects of tDCS combined with trunk-targeted PNF on trunk stability and sitting balance in individuals with subacute stroke.

Materials and Methods: A single-blind randomised controlled trial was conducted with 54 individuals in the subacute stage of stroke, randomly assigned into three groups: pre-tDCS with PNF, during-tDCS with PNF, and sham tDCS with PNF. The intervention involved 30 sessions over six weeks, with anodal tDCS applied at 2 mA for 20 minutes in the active groups. All participants performed standardised trunk-focused PNF exercises under supervision. Outcomes were measured using the Trunk Impairment Scale (TIS) and Function in Sitting Test (FIST) at baseline and post-intervention.

Results: All groups showed significant improvements, with the group receiving stimulation during exercise demonstrating the greatest gains, followed by the group receiving stimulation before exercise, while the sham group exhibited comparatively modest improvements. Mixed ANOVA revealed a significant Time×Group interaction ($p<0.001$). Post-hoc Bonferroni analysis confirmed the superiority of Group B over A and C (all $p<0.001$).

Conclusion: Concurrent application of tDCS during trunk-targeted PNF yields the most pronounced improvements in trunk stability and sitting balance, supporting activity-dependent neuroplasticity as a key mechanism for functional recovery.

Keywords: Function in Sitting Test, Neuroplasticity, Trunk stability.

PARTICULARS OF CONTRIBUTORS:
1. MPT Student, Department of Physiotherapy, Amity Institute of Health Allied Sciences, Amity University, Noida, Uttar Pradesh, India.
2. Professor, Department of Physiotherapy, Amity Institute of Health Allied Sciences, Amity University, Noida, Uttar Pradesh, India.
3. Physiotherapist, APARC Health and Motion, Physiotherapy and Neuro-rehabilitation Centre, Janakpuri, New Delhi, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Prof. (Dr.) Chandan Kumar,
Professor, Department of Physiotherapy, Amity Institute of Health Allied Sciences, Amity University, Sector-125, Noida-201313, Uttar Pradesh, India.
Email: ptchandan221@gmail.com