

Effects of Pulsed Electromagnetic Field Therapy on Motor Function in Post-stroke Patients: A Randomised Controlled Trial

ANJALI KUMARI¹, KAVITA SHARMA²

ABSTRACT

Introduction: Stroke is a leading cause of long-term disability worldwide, commonly resulting in motor impairment, cognitive deficits, and diminished quality of life. Despite advances in conventional physiotherapy, a substantial proportion of stroke survivors experience persistent functional limitations, highlighting the need for adjunctive neuroplasticity-targeted interventions. Pulsed Electromagnetic Field (PEMF) therapy has emerged as a non-invasive modality with plausible multimodal mechanisms — including attenuation of oxidative stress, upregulation of Brain-Derived Neurotrophic Factor (BDNF), modulation of nitric oxide pathways, and anti-inflammatory effects — that may enhance neural repair and functional recovery.

Aim: To evaluate the effectiveness of PEMF therapy as an adjunct to conventional physiotherapy in improving motor function in post-stroke patients over four weeks, and to compare outcomes with conventional physiotherapy alone.

Materials and Methods: A parallel-group randomised controlled trial was conducted on 22 post-stroke patients (aged 30-60 years) with unilateral ischemic stroke. Participants were randomly allocated in a 1:1 ratio to an experimental group (PEMF+conventional physiotherapy, n=11) or a control group (conventional physiotherapy alone, n=11). The experimental group received PEMF via the

DIAMAG (ALMAG-03) device at approximately 40 Hz and 5-7 mT for 10 minutes per session, five sessions per week for four weeks. Outcome measures — Fugl-Meyer Assessment Upper Extremity (FMA-UE), Fugl-Meyer Assessment Lower Extremity (FMA-LE), were assessed at baseline and post-intervention. Statistical analysis was performed using paired samples t-tests (within-group) and independent samples t-tests on change scores (between-group); significance was set at $p < 0.05$.

Results: Both groups demonstrated significant within-group improvements across all outcome measures ($p < 0.05$). However, the experimental group showed significantly greater improvements in FMA-UE (7.55 vs. 3.18 points) and FMA-LE (8.45 vs. 4.00 points), all $p < 0.001$. Large effect sizes were observed across all outcomes (Cohen's d : -1.358 to -2.485). No adverse events were reported.

Conclusion: PEMF therapy as an adjunct to conventional physiotherapy produces statistically significant and clinically meaningful improvements in motor function in post-stroke patients, with a favourable safety profile. These findings support PEMF as a promising, non-invasive neurorehabilitation strategy warranting large-scale, multi-centre trials.

Keywords: Cognitive recovery, Neuroplasticity, Stroke Rehabilitation, Quality of life.

PARTICULARS OF CONTRIBUTORS:

1. MPT Student, Department of Physiotherapy, Amity Institute of Health Allied Sciences, Amity University, Noida, Uttar Pradesh, India.
2. Assistant Professor, Department of Physiotherapy, Amity Institute of Health Allied Sciences, Amity University, Noida, Uttar Pradesh, India.

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

Dr. Kavita Sharma,
Assistant Professor, Department of Physiotherapy, Amity Institute of Allied Health Sciences, Amity University, Sector-125, Noida-201313, Uttar Pradesh, India.
Email: kavitasharma8@amity.edu