

Effectiveness of Motor Re-Learning Programme along with Functional Electrical Stimulation on Functional Mobility and Quality of Life in Subjects with Sub-Acute Stroke - An Experimental Study

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Method Article

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Abstract

Background: The cerebrovascular episode is one of the significant causes of adult injury. This research will aim to investigate the effect of MRP along with FES on ankle dorsiflexors of improving gait parameters for functional mobility and enhancing quality of life in stroke survivors.

Method: The participants will be enrolled in experimental or control groups with a ratio of 1:1 allocation. The study group members would receive MRP along with FES following baseline tests over a span of 6 weeks. Conventional participant will experience only FES. Both participants were measured with outcome measures and Gait parameters for pre-treatment and post-treatment.

Discussion: Most research indicated that MRP is successful because it takes a lengthy period of time; however in the case of FES it is known that it is not efficient without some physiotherapy intervention. The results of the analysis will benefit stroke survivors, and provide a newly developed recovery process.

The clinical trial registry-India(CTRI) registration number for this trial is CTRI/2021/05/033578.

Introduction

Reagents

Equipment

Procedure

1. 70 participants meeting the inclusion criteria and willing to participate will be involved in this study.
2. Single blinded random sampling will be done and two groups will be formed in an experimental group independently designed to examine the combined effect of MRP along with FES and in a conventional group where only MRP is given. After screening 70 participants (35 in each group).
3. Following the baseline evaluation, participants who fulfill the requirement of inclusion will then be assigned randomly to either group (GROUP A or GROUP B) by simple random sampling.
4. **Group A:** This group will consist of 35 patients of both genders and they will receive MRP along with a FES.
5. In patients first the Target Analysis and then Practicing missing components then the whole task is practiced and then training is transferred and through FES stimulation of dorsiflexors will facilitate reduction in spasticity and reduces foot drop
6. This group received MRP of 30 minutes duration and it will be given in a single session of 30 minutes along with FES for 40 Hz of current for 25 min with 8 sec of contraction and relaxation will be given.

7. The total treatment duration of group A will be 55 min combining MRP along with FES. All the participants will be assessed pre-treatment and post-treatment using scales (FMA-LE, OLST, MAS, FRT, QOLS, and BI) and Gait parameters (Speed, Cadence, Step length, Stride length).
- 8. Group B:** This group will consist of 35 subjects of both genders and they will receive MRP treatment.
9. In the Motor Relearning programme the motor task shall be offered to improve the relearning after the stroke. The task shall be for the purposes of appraisal and preparation.
10. The tasks will be given in three positions i.e., in the supine hip, knee flexed and ankle dorsiflexion. At various angles of hip knee flexion the ankle dorsiflexion is performed. Sitting there is hip knee flexion along with ankle dorsiflexion. And at various angles of knee extension the ankle dorsiflexion shall be performed. Standing up and sitting down. In standing there is minimal hip flexion, knee flexion and ankle dorsiflexion. Normal standing with feet a few inches apart, one step forward with intact legs and then backward, forward bending and dorsiflexion, standing against the wall , feet a few inches away from it , backward walking , climbing up and down stairs.
11. On the basis of the task MRP includes as per the treatment planned.
12. STEP NO.1 THE TASK ANALYSIS: Observing, comparing, and analyzing will be done.
13. STEP NO.2 PRACTICE OF THE COMPONENT MISSING: Explanation and Goal Recognition, instructions, Work with visual or Verbal responses with or without Documentary assistance.
14. STEP NO.3. PRAT ICES OF THE TASK: Explanation and identification of the target, Instructions How to, work with visual or Verbal responses with Documentary assistance, Reappraisal and Encourages flexibility
15. STEP NO.4. TRANSLATION OF TRAINING: Practical continuity, coordination of self-monitored instruction, organized learning environment, participation of family members and workers. Studies with stroke populations have shown that Motor Relearning Program (MRP)/ task specific training /Task-related training (TRT) with specific strengthening exercises for paretic muscles leads to improvement in locomotion, bearing lower limb weight in sitting, standing erect and improving gait parameters to enhance quality of line.
16. All the participants will be assessed pre-treatment and post-treatment using Scales (FMA-LE, OLST, MAS, FRT, QOLS and BI) and Parameters for gait (Speed, Cadence, Step length, Stride length).
17. Data Analysis will be done after the collection of the data

References

1. Singha R, Gt HLN-, VLCC International, Dhabi A, Khalidia, box- PO, et al. Motor Relearning Program Versus Proprioceptive Neuromuscular Facilitation Technique For Improving Basic Mobility In Chronic Stroke Patients-A Comparative Study [Internet]. Vol. 5, International Journal of Physiotherapy and Research. 2017. p. 2490–500. Available from: <http://dx.doi.org/10.16965/ijpr.2017.235>
2. World Health Organization. World Health Statistics 2015. World Health Organization; 2015. 161 p.
3. Ernst E. A review of stroke rehabilitation and physiotherapy [Internet]. Vol. 21, Stroke. 1990. p. 1081–5. Available from: <http://dx.doi.org/10.1161/01.str.21.7.1081>
4. Tan Z, Liu H, Yan T, Jin D, He X, Zheng X, et al. The effectiveness of functional electrical stimulation based on a normal gait pattern on subjects with early stroke: a randomized controlled trial. Biomed Res Int. 2014 Jul 10;2014:545408.
5. Bhalerao G. Effect of Shoe Raise along with Motor Relearning Programme (MRP) on Ambulation in Chronic Stroke [Internet]. Vol. 3, International Journal of Physiotherapy. 2016. Available from: <http://dx.doi.org/10.15621/ijphy/2016/v3i3/100831>
6. Chung Y, Kim J-H, Cha Y, Hwang S. Therapeutic effect of functional electrical stimulation-triggered gait training corresponding gait cycle for stroke. Gait Posture. 2014 Jul;40(3):471–5.
7. Sabut SK, Kumar R, Lenka PK, Mahadevappa M. Surface EMG analysis of tibialis anterior muscle in walking with FES in stroke subjects [Internet]. 2010 Annual International Conference of the IEEE Engineering in Medicine and Biology. 2010. Available from: <http://dx.doi.org/10.1109/iembs.2010.5627503>
8. Eng JJ, Tang P-F. Gait training strategies to optimize walking ability in people with stroke: a synthesis of the evidence [Internet]. Vol. 7, Expert Review of Neurotherapeutics. 2007. p. 1417–36. Available from: <http://dx.doi.org/10.1586/14737175.7.10.1417>
9. Kim J-H, Chung Y, Kim Y, Hwang S. Functional electrical stimulation applied to gluteus medius and tibialis anterior corresponding gait cycle for stroke [Internet]. Vol. 36, Gait & Posture. 2012. p. 65–7. Available from: <http://dx.doi.org/10.1016/j.gaitpost.2012.01.006>
10. Park J, Yoo I. Relationships of Stroke Patients' Gait Parameters with Fear of Falling [Internet]. Vol. 26, Journal of Physical Therapy Science. 2014. p. 1883–4. Available from: <http://dx.doi.org/10.1589/jpts.26.1883>
11. Blackburn M, van Vliet P, Mockett SP. Reliability of measurements obtained with the modified Ashworth scale in the lower extremities of people with stroke. Phys Ther. 2002 Jan;82(1):25–34.
12. Blackburn M, van Vliet P, Moore P, Mockett S. Reliability of the Modified Ashworth Scale in the Assessment of Lower Limb Spasticity in Stroke Patients [Internet]. Vol. 85, Physiotherapy. 1999. p. 371. Available from: [http://dx.doi.org/10.1016/s0031-9406\(05\)67191-x](http://dx.doi.org/10.1016/s0031-9406(05)67191-x)

13. Burckhardt CS, Anderson KL. The Quality of Life Scale (QOLS): reliability, validity, and utilization. *Health Qual Life Outcomes*. 2003 Oct 23;1:60.
14. Della Pietra GL, Savio K, Oddone E, Reggiani M, Monaco F, Leone MA. Validity and reliability of the Barthel index administered by telephone. *Stroke*. 2011 Jul;42(7):2077–9.
15. Raut A, Risaldar P, Naqvi WM, Wane M, Sahu A. Case report of a spastic diplegic cerebral palsy patient: Clinical decision making in physical therapy. Published online 2020:5.
16. Goyal C, Naqvi W, Sahu A. Xia-Gibbs Syndrome: A Rare Case Report of a Male Child and Insight into Physiotherapy Management. *Cureus*. 12(8). doi:10.7759/cureus.9622
17. Vaidya L, Kumar K, Naqvi W, Narang S, Pisulkar G, Dadlani M. Revision of total hip replacement surgery in elderly patient and its recovery based on periprosthetic fracture rehabilitation. Published online 2020:11.
18. Goyal C, Naqvi WM, Sahu A. An atypical case of febrile infection-related epilepsy syndrome following acute encephalitis: impact of physiotherapy in regaining locomotor abilities in a patient with neuroregression. *Pan Afr Med J*. 2020;36. doi:10.11604/pamj.2020.36.101.23855
19. Wane M, Naqvi WM, Vaidya L, Kumar K. Kinesiophobia in a Patient With Postoperative Midshaft Fracture: A Case Report of Its Impact on Rehabilitation in a 16-Year-Old Girl. *Cureus*. 2020;12(11). doi:10.7759/cureus.11333