



The Effect of Tasks Related Training and Motor Imagery Training on Hand Function in Post Stroke Patients

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ABSTRACT

INTRODUCTION: Stroke is major cause of disability in adults. One direct consequence of stroke is the loss of upper limb (UL) function. Whereas up to 83% of stroke survivors learn to walk again, it is estimated that only 5 to 20% of stroke survivors attain complete functional recovery of their affected UL. Approximately 70% to 80% of people sustain a stroke have upper extremity impairment.

Task- specific exercise (TSE) is defined as 'a training or therapy where patient has to practice context-specific motor tasks and receive some form of feedback; with regard to skill learning, it may be associated with different practice conditions, feedback and conditions of transfer. there is evidence for functional redistribution following motor imagery training in healthy volunteers, demonstrating that motor imagery training is also help full in promoting the modulation of neural circuits leading to the same plastic changes in the motor system as those following repeated physical practice. is motor imagery (MI).MI was initially developed to improve the performance of athletes and has been adopted in rehabilitation programs for persons with stroke to support motor recovery .mental imagery refers to the active process by which humans experience sensations with or without external stimuli. it is an active process during which a specific action is reported within working memory without any real movement.

METHODOLOGY: The subjects are divided into two groups

EXPERIMENTAL OR GROUP A: Received task related training with conventional physiotherapy sessions

CONTROLLED OR GROUP B: Received motor imagery training with conventional physiotherapy sessions

The two groups received the treatment for 45 minutes in 5 days in a week in the period o f two months. Outcome measures were taken from the patient.

RESULTS: Experimental group has decreased time for completing the task. it indicates the improvement in the performing the task. As lower the score indicates the greater the function, so the experimental group shows the better improvement when compared to the controlled group.

CONCLUSION: It is evidence from the result that task related training shown significant level of improvement in function of upper limb, when compared with motor imagery training. In stroke patients quantified to fuagl meyer scale and jebesen hand function test, showed greater improvement when their outcome (difference of pre and post) was compared with the other group.

INTRODUCTION

Stroke is major cause of disability in adults. One direct consequence of stroke is the loss of upper limb (UL) function. Whereas up to 83% of stroke survivors learn to walk again, it is estimated that only 5 to 20% of stroke survivors attain complete functional recovery of their affected UL. Approximately 70% to 80% of people sustain a stroke have upper extremity impairment. many of them do not regain functional use of the paretic UL, which can lead to difficulties in activities of daily living (ADLs) and to participate in community life at 6 months post stroke, a substantial proportion (25%-53%) of people remain dependent in at least ADL task, which often involves the use of unilateral or bilateral UL movement. despite of these statistics, fortunately it is encouraging that, recent studies capitalizing on the concept of experience-induced neural-plasticity have produced promising results using specific interventions aimed at UL improving function. one such intervention is task specific exercise.

Relatively new intervention to improve UL function is motor imagery training. The technique, which has the evidence to suggest that mental rehearsal of movement can produce effect normally attributed to practicing the actual movements, is motor imagery training. Imagining hand movements could stimulate the redistribution of brain activity, which accompanies recovery of hand function, thus resulting in a reduced motor deficit

During mental practice correlative activation occur at the cortical level as well in the musculature imagined as being used. Mental practice also has been suggested to be a viable tool for improving motor learning and performance in rehabilitative settings.

The general idea is that motor imagery is part of a border phenomenon (the motor representation) related to intending and preparing movements.

Evidence for the idea that motor imagery training could enhance the recovery of hand function comes from several lines of research; health

psychology research; as well as preliminary findings using motor imagery technique in stroke patients. a recent study compare motor imagery training and physical training and found enhanced performance in both.

Different rehabilitation approaches used for post stroke treatment. one of them is motor imagery (MI).MI was initially developed to improve the performance of athletes and has been adopted in rehabilitation programs for persons with stroke to support motor recovery .mental imagery refers to the active process by which humans experience sensations with or without external stimuli. it is an active process during which a specific action is reported within working memory without any real movement.

OBJECTIVES

The objective of the study is to know the effect of tasks related training and motor imagery training on hand function in post stroke patients.

SOURCE OF DATA: inpatient and outpatient department of Narayana medical college and hospital, Nellore.

METHOD OF DATA COLLECTION

POPULATION: post stoke patients

The populations for the study were unilateral stroke subjects.

SAMPLE SIZE: 30 subjects. Each includes 15 in each group.

SAMPLING DESIGN: simple random sampling.

RESEARCH DESIGN: comparative study.

DURATION OF STUDY: 3 months

MEASUREMENT TOOLS:

- 1) Fugl Meyer scale for hand
- 2) jebesen hand function test.

METHODOLOGY

The subjects are divided into two groups

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The two groups received the treatment for 45 minutes in 5 days in a week in the period of two months. Outcome measures were taken from the patient.

EXPERIMENTAL GROUP

- Patients in this group received task specific exercises for 30 minutes per day 5 days in a week for 12 weeks.
- This intervention focused on repetitive practice of meaning full tasks for patient by using affected hand. It included,

- 1) Grasping
- 2) Lifting
- 3) Placing objects
- 4) Counting with fingers

- Each of these tasks was performed for 20 minutes.
- These tasks were performed with participant seating and objects placed over the table if suitable height provided. Participants had sufficient movement in their affected hand to attempt the functional tasks.
- For those participants who did not have sufficient movement in their affected hand to practice such tasks, therapist assisted the participant by guiding the limb through the tasks with the help of manual contact.
- The difficulty level of practiced task was increased gradually, with the goal being set just above the patient's ability level to perform.
- Difficulty level was progressed by increasing the distance between participant and object and increasing the object.

it starts from

Grasping (cylindrical object)

Lifting

Placing the objects

Counting the fingers

STEP 1:

GRASPING: Patient sits at table with forearm resting on the table. Therapist places cylindrical object, therapist assist the movement (if needed). Extension of patient hand and followed by mass flexion of fingers and hand.

STEP 2:

LIFTING OBJECTS AND PLACING: Patient is asked to lift the objects placed on the table. Patient is asked to placing these objects on the other side

STEP 3:

COUNTING: Ask the patient to opposition of thumb and each finger in turn tapes the thumb, starting with index finger.

CONTROLLED GROUP:

STEP 1: TASK ANALYSIS: The primary objective was task analysis enhancement.

Patient had to identify each step of the task with help of motor imagery (picture cards showing the task).

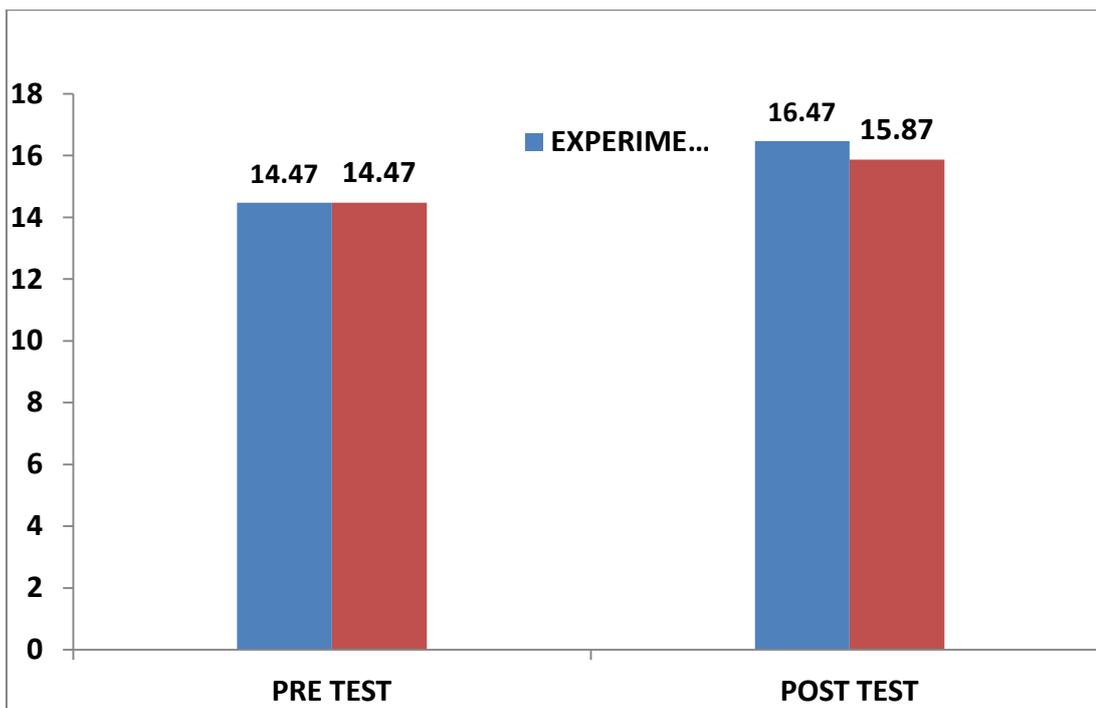
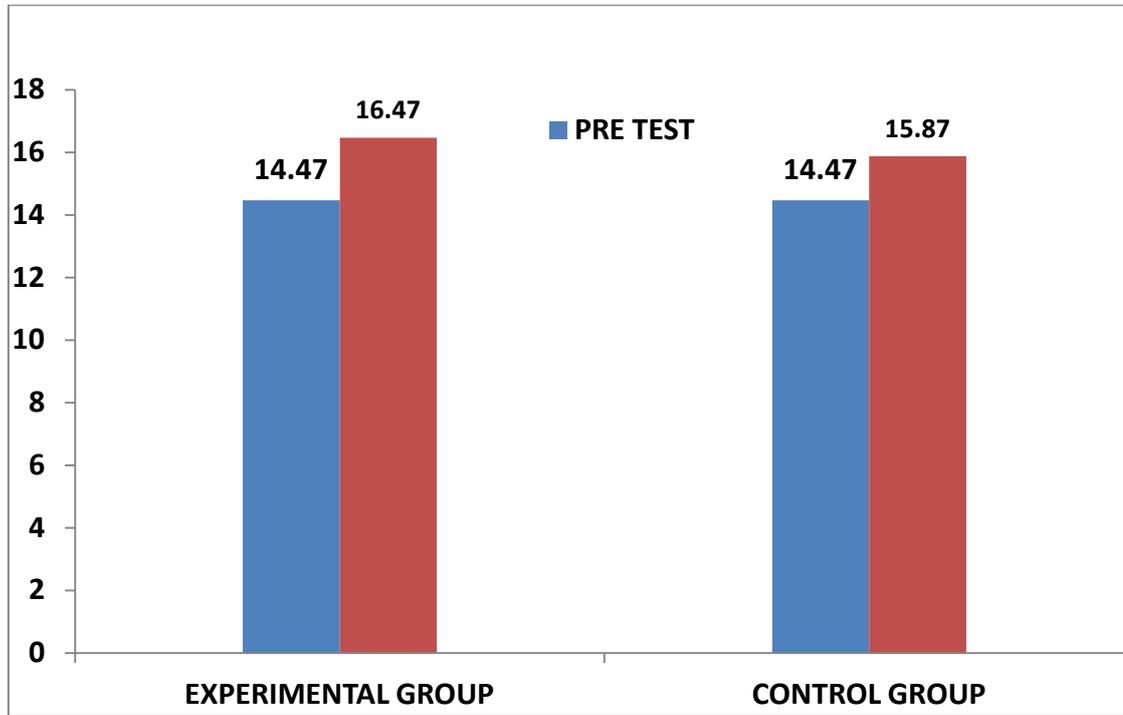
STEP 2: PROBLEM IDENTIFICATION: In this objective was problem identification.

Patient had to visualize their own performance and identify the problems encountered and the solutions in each task step by step by means of MI.

STEP 3: FOCUSED ON TASK PERFORMANCE: Patients had to imagine performing the task and demonstrated the same tasks as used in the MI training.

STEP 4: PATIENTS HAD TO PRACTICE THIS DEMONSTRATED TASK: Patients had to listen to audio tape with an introduction on relaxation, some suggestions for external, cognitive visual images and instructions to refocus into the room.

Duration of the audio tapes varied from 10 to 30 minutes. And followed with conventional physiotherapy program.



RESULTS

FMA score levels for experimental pre test mean is 14.47 and post test score of mean is 16.47. For controlled group results mean for pre test 14.47 and post test is 15.87. correlation value for experimental group pre and post test is 707, significance is 003.correlation value for controlled group pre and post test is 684 and significance is 005.

DISSCUSSION

Hand function impairment is one of the main contributing factor after stroke. Which last the functional capacity of the hand. Task related training and motor imagery training is used in this study.

Physiotherapeutic approaches are aiming to compare different interventions such as task related training and motor imagery training, it is

qualitative evaluation to integrate into protocol to gain in depth knowledge of treatment of stroke patients.

A comparison of task related training and motor imagery training in stroke population sample will contribute to a broader understanding and more focused design of interventions in stroke patients.

In controlled group which has given motor imagery training with conventional physiotherapy and other is experimental group which has given task related training with conventional physiotherapy treatments and jebsen hand function test and FMA scales are taken as measurement tools.

FMA score reveals for experimental pre test mean is 14.47 and post test score of mean is 16.47. for controlled group results mean for pre test 14.47 and post test is 15.87.correlation value for experimental group pre and post test is 707,significance is 003.correlation value for controlled group pre and post test is 684 and significance is 005.

When 't' test is applied for experimental group pre and post test the 't' value is -11.832.and controlled group pre test and post test the 't; value is -8.573.

CONCLUSION

It is evidence from the result that task related training shown significant level of improvement in function of upper limb, when compared with motor imagery training. In stroke patients quantified to fugl meyer scale and jebsen hand function test, showed greater improvement when their outcome (difference of pre and post) was compared with the other group.

Hence this study can be concluded as task related training has more effect than that of giving alone on improving hand function in subjects with post stroke and hence can be used in clinical set up.

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