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Effect of task oriented training on upper extremity function in chronic stroke patient by using fugl Meyer scale: A cross sectional interventional study

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Abstract
Background & Purpose: The loss of upper extremity control is common after stroke, with 88% of the survivors having some level of upper extremity dysfunction. Post stroke therapeutic intervention leading to functional improvement emphasizes intensive task- specific practice reported to facilitate training - induced plasticity. This study determine the effect of task oriented training on arm function in chronic stroke patients by using Fugl Meyer arm scale.
Materials and Method: Study included 30 chronic stroke patients. Age of the patient was between 35 to 65 years. Task oriented training was applied to them and duration was 4 weeks, 5 days per week. Upper extremity function was assessed by Fugl Meyer scale.
Result: The results were analysed using Wilcoxon Test for within the group analyses. In which there were significant difference in Fugl Meyer arm scores after training session in all age group.
Conclusion: Present study concluded that there were significant effect of task oriented training to improve upper extremity function in chronic stroke patients.

Keywords: task oriented training, chronic stroke patients, upper extremity function

Introduction

Stroke or brain attack is the sudden loss of neurological function by an interruption of the blood flow to the brain. Clinically, a variety of focal deficits are possible, including changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual and language functions [1]. A stroke is a medical emergency that requires immediate attention. Stroke is the fifth leading cause of death in the United States, according to the centres of disease control and prevention [2]. it is likely that this is an underestimate of the absolute level of functioning that is lost, especially in developing countries.

Stroke Prevalence 2015, According to a recent study published in the Journal of Stroke by two experts, the prevalence rate of strokes is 84-262 per 100,000 population in rural India and 334-424 out of 100,000 population in cities India reported 1.6 million cases of stroke annually, at least one third of whom will be disabled [4].

After stroke the motor recovery of hand and improve the fine motor activity of hand is the major challenge for patients. Chronic arm hand performance problems are present in over 50% of the stroke patients, limiting the use of their arm and hand in everyday life activities, but also limiting engagement in social life and quality of life in general [5].

Post stroke therapeutic intervention leading to functional improvement emphasizes intensive task- specific practice reported to facilitate training - induced plasticity [6, 7]. Task oriented training is used as a rehabilitation strategy to improve motor skill and as a rehabilitation program for improvement of muscle strength or function it should include specific tasks to improve function as an effective treatment for functional improvement of balance and other physical activity [8]. The previous research of GUI bin song in 2015, he concluded that task oriented training gives greater improvement than repetitive bilateral arm training. The aim of this study is to determine the effects of task-oriented training on upper extremity function in chronic stroke patients. To determine whether task oriented training improves upper extremity function in chronic Stroke patients. And To evaluate whether there is a subjective improvement in upper extremity function in chronic stroke patients.

Materials and Methodology

After obtaining the ethical clearance the study was carried out. Total 30 patients were selected for study according to inclusion and exclusion criteria. Subjects were Included with Non traumatic stroke >6 month. Patients Can communicate with therapist, Spasticity grade ≤ 2 (According to modified Ashworth scale) for upper limb, Age – 35 to 65, MMSE Score -24-30 (no cognitive impairment), Both the gender will be included in the study, Will voluntarily agree to participate in study after receiving an explanation of studies aim, and patients with Severe comorbidity, Perceptual, Apraxic or major cognitive deficits, LML lesion, Any neurological and orthopaedic condition were excluded.

Then consent form and patient information form was fill up. Then pre assessment and Fugl Meyer scale was taken. After taking all those thing study was started. All subjects receiving

general physical therapy for 1 hour and task oriented training for 45 to 50 minutes. General physical therapy consist of stretching, AROM and PROM and balance training and task oriented training included 9 different tasks. The following tasks were included in intervention: Exercise board activity for supination and pronation as well as finger extension, walking and reach object with affected hand, cones activity, therapeutic putty exercises, writing, open and fix clip, strengthening exercises with weight cuff and dumbbell, Hold a plastic shopping bag in affect hand and carry it across the room and the last was Carry light objects supporting than against your body with your upper and lower arm. Total 9 task were performed by patients. Each activity was performed for 5 minutes, except in 7th task which was strengthening task. If patient was unable to perform given task then proper stabilization was given to complete the task.

Results and statistical analysis

The participants consisted of 22 males and 8 females; the affected side in 13 patients was the right side, and in 17 the left. The numbers of cerebral haemorrhage and cerebral infraction patients were 3 and 27 respectively. The study was analysed with Wilcoxon test. In the table no.1 shows the age group wise gender distribution and in Table no.2 – shows the mean value of Fugl Meyer score before and after the task oriented training. Improvements were shown for most component in fugl Meyer arm scale. Hand function ($p< 0.001$) was improved after the training.

Table 1

	FM Pre	FM Post
Mean	30.6667	35.8333
Std. Deviation	6.91492	6.56576

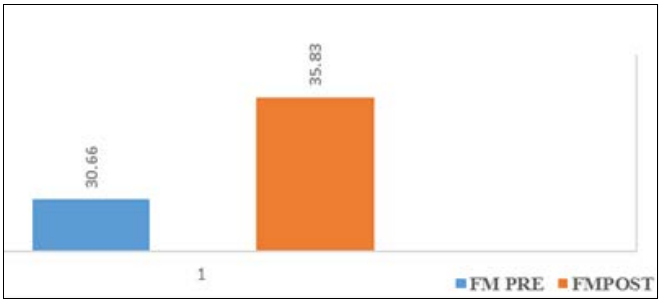

Fig 1: mean differences of FM pre and FM post

Table 2: Wilcoxon test and P Value

	FM Pre and FM Post
Z	4.800
P value	0.001

Discussion

The primary purpose of the present study was to know the effect of task oriented training on upper limb function in chronic stroke patients with the use of Fugl Meyer arm scale. It is known that 80% of stroke patients have problems with hand function due to hemiplegia [11]. The task oriented approach is based on motor learning and involves repeat training with task oriented activities. It is effective for improvement of the functional performance of a patients with stroke. In addition, it is a training method for encouraging functional movement while providing patients with an interesting task. In present study the task oriented training was designed for chronic stroke patients in whom there was determination of upper limb function by using Fugl Meyer arm scale.

When task oriented training or arm training was applied to the stroke patients, brain plasticity was occurred. The mechanism was to increases of regional cerebral blood flow in the brain.[63] According to the result of this study there was significant difference in Fugl Meyer score after task oriented training applied to the chronic stroke patients. Before training the Mean Fugl Meyer score was 30.66 and after the training it was 35.83. So, significant difference were noticed.

The result of this study confirmed the positive effect of task oriented in all component of Fugl Meyer score. Before training and after training Fugl Meyer scale was applied on the patients and with the use of Wilcoxon test, there were significant difference in Fugl Meyer score. In this research Fugl Meyer score was improved in both group, Younger age group as well as older age group. There was not mean difference between age group.

The clinical significance of this research is the task oriented training applicable for chronic stroke patients in a clinical environment compared with many other previous studies that also employed task oriented training and confirmation of the possibility that is an effective treatment.

This study found that there was no significant different between domains and non- domain side involved patients. In this study all stroke patients were included for training. Mainly two types of infracted patients were included, one was having middle cerebral infract and other was having anterior cerebral infracted patients, In case of anterior cerebral artery infract upper limb involvement was less than middle cerebral artery infraction. So improvement was better and earlier in patients with anterior cerebral artery infraction, and less improvement in patients with middle cerebral artery infraction.

Conclusion

Present study defines the effect of task oriented training on arm function in chronic stroke patients with use of Fugl Meyer scale. As results suggests that there is significant effect of task oriented training on upper extremity function in chronic stroke patients. Thus it is concluded that task oriented training is effective for improvement of upper extremity function in chronic stroke patients, so with conventional treatment we can also apply the task oriented training for improving the arm function.

Related limitation of the study were, there was limited age group, There was no untreated control group to rule out spontaneous recovery, There was no differentiation or separation between MCA infarction stroke patients and ACA infarction stroke patients, The long term sustainability of therapy might need future evaluation, which was not done. Further study can be done with large sample size, More activities can be included in training program, In this research, only stroke patients were included, in future one can take other neurological condition patients in which upper limb

function can be affected, So, one can apply task oriented training on other neurological condition patients. In this research only one outcome measure was used, which only measures function of upper limb but not measures ADL. So, one can take other outcome measures which measure the activities of daily living, One can apply task oriented training only on MCA infracted patients in which upper limb involved more than lower limb.

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