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ORIGINAL ARTICLE

A COMPARATIVE STUDY OF COMBINED GRADED REPETITIVE ARM SUPPLEMENTARY PROGRAM (GRASP) AND CONSTRAINT INDUCED MOVEMENT THERAPY (CIMT) VERSUS CONVENTIONAL THERAPY ON HAND AND ARM FUNCTION IN SUB ACUTE STROKE

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ABSTRACT

Background of the study: Stroke (CVA) is a rapidly developing loss of brain function due to disturbance caused by an interruption of the blood flow to the brain. The aim of the study is to compare a combination of Constraint Induced Movement Therapy and Graded Repetitive Arm Supplementary Program versus Conventional Therapy on arm and hand functions on sub acute stroke. **Methods:** This is a Quasi experimental study. Sampling of 30 subjects of age >40years of both sexes are selected from the JKKMMRF College of Physiotherapy. Group A of 15 subjects receives combination of Constraint Induced Movement Therapy and Graded Repetitive Arm Supplementary Program, Group B of 15 subjects receives Conventional Therapy. Pre and post intervention were assessed by Fugl Meyer Assessment scale and Chedoke Arm and Hand Activity Inventory. **Result:** Group A sub acute stroke patients included in the study completed the 15 sessions of combination of Constraint Induced Movement Therapy and Graded Repetitive Arm Supplementary Program they were re-evaluated at the six- month follow-up. The significant P value is less than 0.0001 which is extremely significant. **Conclusion:** we conclude that the combination of Constraint Induced Movement Therapy and Graded Repetitive Arm Supplementary Program has improvement of arm and hand functions on sub acute stroke.

Keywords: Constraint Induced Movement Therapy, Graded Repetitive Arm Supplementary Program, Conventional Therapy, Fugl Meyer Assessment, Chedoke Arm and Hand Activity Inventory

INTRODUCTION

Stroke (CVA) is a rapidly developing loss of brain function due to disturbance caused by an interruption of the blood flow to the brain[1]. It is a common neurological disorder. Here, the techniques to improve the arm and hand functions are (GRASP) Graded Repetitive Arm Supplementary Program and Constraint Induced Movement Therapy (CIMT), CIMT, there is an accumulating body of research on CIMT in patients following stroke that has demonstrated significant improvement in upper extremity. The patient is engaged in intense task –oriented practise of more affected upper extremity for up to 6 hours a day, performed on consecutive weekdays for 10-15 days .The therapist uses shaping techniques to modify and progress performance (Example ; Object is lifted and placed at increasing distances away from the patient)feedback, coaching, modeling, encouragement are provided during practise. It is important to note that the patients were included in the studies if they had potential for recovery and some residual upper arm and hand movements (active wrist and finger extension) but not to use the arm usually. Limited pain/ spasticity and absence of cognitive impairment were also included. Behavioural methods designed to ensure adherence to exercise and developing task oriented behaviour include engaging the patient in self monitoring of target behaviour (Example; mode of activity, duration, frequency, perceived exertion, overall response to activity).Problem-solving to identify obstacles generate potential solutions.[2] Graded Repetitive Supplementary Program (GRASP) is a supplementary program has been shown to improve arm and hand function after stroke. During the first few months after stroke, the brain has enhanced plasticity and it is more sensitive to stimuli and experience, such as fine motor exercise. However, patients can be very tired in this period, lack motivation to do exercise/ find it frustrating to do a lot of challenging exercises. A therapist plays an important factor in adding value of exercise and hand activity early after stroke to patient families and as well as motivating and monitoring patients[3]. The Comparison of the study with another technique is conventional therapy. It is a world- wide technique and standardized, includes stretching, strengthening, task oriented. Here, conventional therapy includes the usual and customary care on improve the upper extremity function. The techniques includes in lying and sitting position with therapist supervision[4].These techniques are compared and calculated and then resulted as the effective technique by using appropriate scales.

METHODS

The study was conducted at JKKMMRF. A sample of 30 sub acute stroke patients with >40 age groups are selected and divided into Group A of 15 participant receiving combined Constraint Induced Movement Therapy and Graded Repetitive

Arm Supplementary Program and Group B of 15 participant receiving Conventional Therapy. The therapy session of 60 min should be performed 5 days/week which is continued for 6 months. The Therapists regularly review the treatment program and the frequency of therapy sessions according to the patients progress. The parameters used for the study was Fugl Meyer Assessment and Chedoke Arm and Hand Activity Inventory, both male and female are encompassed in the study, exclusive basis undergone Shoulder dislocation, Hearing loss, Seizure episodes, Mental instability, uncooperative patient, visual problems

Procedure:

GROUP A (Constraint Induced Movement Therapy and Graded Repetitive Arm Supplementary Program)

Constraint Induced Movement Therapy

It is a form of rehabilitation therapy that improves the functions of upper extremity functions in stroke. A combined restraint of the unaffected limb is more increase in progression. It has also be used in Behavioural Approach to Neuro rehabilitation.[5]

Essential Components: Repetitive & task oriented training, Shaping, Task practise, Behavioural strategies, Daily schedule, Home practise. Problem solving is used to overcome the affected upper extremity. Constraining use of more affected upper extremity. Remind the patient to use more affected limb

Exercises Includes: Opening a lock, turning a door knob, Pouring a drink, Eating food, throwing a ball

Graded Repetitive Arm Supplementary Program: It is program to improve the arm and hand strength and the ability to use the affected arm in daily activities.[6]

Components of GRASP

1) Stretching
2) Arm strengthening
3) Hand strengthening
4) Coordination

Dosage: 45 minutes for 5 days with regular intervals of time

GROUP- B (Conventional Therapy)

It is a usual traditional approach of treatment in physiotherapy.[7]

Exercises include:

Lying: Positioning of the limbs

Elongate the trunk, mobilize the scapula, Elevate and abduct the arm, Self assisted arm movements, Sitting, Arm elevation, Trunk rotation, Self assisted arm movements

Repetition of exercise is for 10 repetitions, 10 sec of rest given in between each exercise done for 45 minutes.

DISCUSSION

The purpose of the study was to determine the effectiveness of combined CIMT and GRASP[8] on improving hand and arm functions in sub acute stroke patients. The

Fugl Meyer Assessment[9] and Chedoke Arm and Hand Activity Inventory[10]was taken as the parameters to assess the hand and arm functions. The study sample comprised of 30 patients grouped as A and B. In each group 15 subjects participated. Group A with Graded Repetitive Arm Supplementary Program and Constraint Induced Movement Therapy whereas Group B with Conventional therapy. The result of the statistical analysis brings out the following for consideration.

Chieh-ling Yang conducted a review to evaluate the dissemination and implementation impacts of a rehabilitation intervention.publications, and surveys was used to describe the dissemination and implementation impact of the graded repetitive arm supplementary program (GRASP). Three categories in the Payback Framework were evaluated and resulted as GRASP has implemented successfully in rehabilitation intervention[11].

Jawaria Shahid conducted a comprehensive review of physical therapy interventions for stroke rehabilitation. There are limited studies that describe the application of physical therapy interventions to prevent disabilities in stroke survivors and promote recovery after the stroke. In this review, they have described a wide range of interventions based on impairments, activity limitations and goals in recovery during different stages of a stroke[12].

The study on priming Constraint Induced Movement Therapy with intermittent theta burst stimulation to enhance upper extremity recovery in patients with stroke were conducted by randomized controlled trial, single blind study were divided into 3 groups.

(a) mCIMT + real iTBS, (b) mCIMT + sham iTBS, and (c) mCIMT alone. 600-pulse iTBS will be delivered to the primary motor cortex on the ipsilesional hemisphere, and then, patients will receive mCIMT for 1 h/session, 3 sessions/week for 5 weeks. Upper extremity recovery will be assessed with Fugl-Meyer Test-Upper Extremity and Wolf Motor Function Test. The study ended up by resulting on effectiveness of iTBS on ipsilesional M1prior to the mCIMT in patients with stroke[13].

The result showed that there was statistical significant difference between Group A and B. The sub acute stroke patients who were treated with combined Graded Repetitive Arm Supplementary Program and Constraint Induced Movement Therapy had shown good improvement in hand and arm functions.

In the analysis and interpretation Of Fugl Meyer Assessment in Group A and Group B for 15 patients in each group: The unpaired t test value of FMA in Group A and B post-test analysis was 13.44 which was greater than the tabulated t value.

In the analysis and interpretation of Chedoke Arm and Hand Activity Inventory in Group A and Group B for 15 patients in each group: The unpaired t test value of CAHAI in Group A and B post- test analysis was 20.32 which was greater than the tabulated t' value.

Based on the statistical analysis and interpretation the result of the study was improving the arm and hand functions.

Ethical clearance: Ethical clearance was obtained from the Institutional ethical

CONCLUSION

The study which was conducted for 6 months period of intervention showed that Group A of those who received Graded Repetitive Arm Supplementary Program and Constraint Induced Movement Therapy resulted in improvement of arm and hand functions than Group B who received conventional therapy.

The study concluded that combination of Graded Repetitive Arm Supplementary Program and Constraint Induced Movement Therapy was effective treatment for improvement of arm and hand functions on sub acute stroke

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