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Comparative Study Of Graded Repetitive Arm Supplementary Program (Grasp) Vs Task Specific Training (Tst) On Upper Limb Function In Subacute Stroke Survivors

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Abstract

Study Design: Comparative study Design Methods**.**
Aim and Objectives: The aim of the study was to find out the comparison between GRASP and TST on Upper Extremity functions of subacute stroke survivors
Participants: 30 subjects were chosen based on inclusion and exclusion criteria by using convenient sampling method. They were divided into 3 groups of 10 each for respective groups.
Methods: Fugl Mayer Assessment (FMA) was administrated to all the subjects to evaluate the pre-test value. Each group received their respective intervention for 8 weeks, 5 sessions per week. After the intervention, the post-test was conducted for all the three groups by the administration of Fugl Mayer Assessment (FMA). Graph pad InStat was used to analyze the data.
Result: Statistical analysis shows that there was a significant difference on Upper Extremity Functions of persons with subacute stroke in both Experimental groups (A) and (B) as well as Control group (C). comparing mean obtained on posttest in the experimental groups (A, B) and control group (C) using, Fugl Mayer Assessment (FMA) 43.1, 42.4 and 37.3 respectively; it is seen that mean obtained in GRASP is higher than the TST and the least are obtained in Conventional OT on Fugl Mayer Assessment (FMA). **Conclusion:** This study concludes that Graded Repetitive Arm Supplementary Program (GRASP) and Task Specific Training (TST) combined with Conventional Occupational Therapy improve Upper Extremity Functions of persons with subacute stroke.

Keywords: Subacute stroke, Graded Repetitive Arm Supplementary Program (GRASP), Task Specific Training (TST), Conventional Occupational Therapy

INTRODUCTION

A stroke is a neurological disorder with a sudden onset caused by an interruption in cerebral blood flow, with symptoms that are consistent with the involvement of specific brain regions. The degree and kind of disability

followed by a stroke depend on the extent of brain damage and the region affected, but both lower and upper extremity impairment and sensory, emotional, and cognitive deficits predominate and manifest as a decreased capacity for physical exercise and loss of mobility.[1]

The field of study on "activity (or experience) dependent brain plasticity" is vast and expanding quickly. Occupational therapists are especially qualified to help the patients achieve their highest level of functional recovery by applying the concepts of activity-dependent brain plasticity. Human studies also support the idea that meaningful use of a limb with repetitive task-oriented training can promote functional plasticity following stroke.[2]

Task Specific Training is based on theories of neuroplasticity and the brain's capacity for reorganization. It offers goal directed repetitive practice of motor tasks to enhance functional abilities. Training causes neuroplasticity changes on a variety of levels, including behavioral (recovery of sensory or motor function), physiological (strengthening of motor evoked potentials), and structural/neuroanatomical (axonal or dendritic sprouting, neurogenesis).[3]

Task Specific Training, which includes the use of instruction, explanation, manual assistance, visual and verbal feedback on performance, reinforcement, and contextual practice, emphasizes the practice of the functional task or action itself as the remedial component promoted by principles of motor learning. Through repetition, feedback, and purposeful engagement, it tries to assist motor relearning. By changing the task specifications, this approach emphasizes neuroplasticity and addresses concerns about the negative effects of compensatory use of the affected side, learned non-use, and use of adaptive aids on motor learning.[4]

Graded Repetitive Arm Supplementary Program was developed by Canadian researchers. It is a self-directed hand and arm exercise program which is demonstrated and monitored by a trained professional but executed by the patient with assistance from their family or carrier when possible. Instead of replacing current therapeutic services, this program is aimed at enhancing them by providing more opportunities for practice [5].

GRASP exercises are designed to improve range of motion, strength, weight-bearing, and both gross and fine motor abilities. This program consisted of bilateral task-oriented tasks that were repeated to help participants practicing the functional skills required for numerous daily activities (e.g. cutting, buttoning, hanging up the clothes, pouring and lifting). The GRASP program begins with a demonstration of each exercise by a therapist to the participants and his family before assigning the appropriate grades of set. For each activity, this program provided both written and visual guidelines, in addition to a kit with low-cost supplies to complete the exercises (e.g. popsicle sticks, ball, paper clips, toothpicks and clothes pegs). Recommended progression of number of repetitions for each exercise were three sets of five repetitions, three sets of eight repetitions, and three sets of ten repetitions.[6]

AIM AND OBJECTIVES OF STUDY

AIM:

To find out the effect of Graded Repetitive Arm Supplementary Program (GRASP) over Task Specific Training on upper extremity functions of persons with subacute stroke.

OBJECTIVES:

To Evaluate and compare the effect of Graded Repetitive Arm Supplementary Program (GRASP) over Task Specific Training on Upper Extremity Functions of persons with subacute stroke.

METHODS

The subjects will divide into 3 groups. Group A, Group B, Group C. Each group consists of 10 subjects each. Fugl meyer will be administrated to all the subjects to evaluate the pre-test value. Group (A) receive Graded Repetitive Arm Supplementary Program (GRASP). Group (B) received Task Specific Training, whereas Group (C) received Conventional Occupational Therapy. Each group received their respective intervention for 8 weeks, 5 sessions per week. After the intervention, the post-test will be conducted for all the 3 three groups by the administration of fugl meyer assessment.

DATA ANALYSIS

The aim of the study was to find out the Effect of Graded Repetitive Arm Supplementary Program (GRASP) and Task Specific Training on Upper Extremity Functions of Persons with Subacute Stroke. Data analysis was

done with Graph pad prism, to compare pre and post characteristics of both experimental and control group. To test the hypothesis, the statistical analysis was done by using paired t-test and the analysis of variation within the groups was performed using an ANOVA. The "p value" <0.0001 was chosen as the significance level.

RESULTS

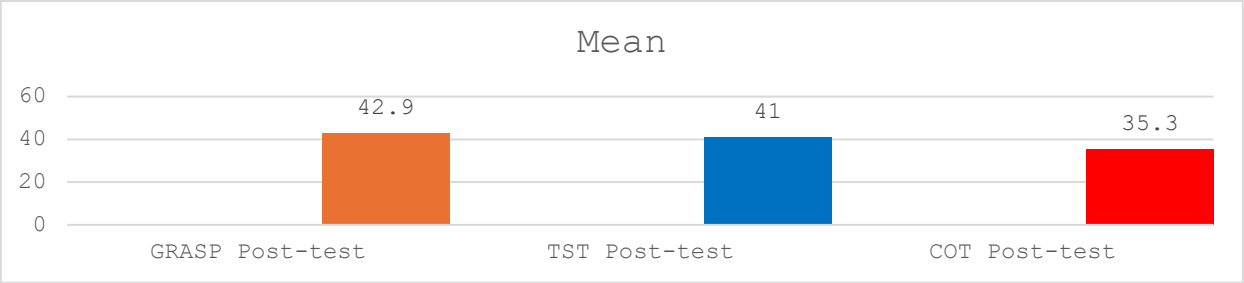
TABLE -1: Comparison of Upper Extremity Functions between Experimental Group (A), (B) & Control Group (C) pretest and post test

GROUP	TEST	MEAN	S.D VALUE	't' value	'p' value
Experimental group (A) (GRASP)	Pretest	31.20	5.45	10.1283	P<0.0001
	Post test	42.90	6.89		
Experimental group (B) (TST)	Pretest	31.90	4.53	13.1806	P<0.0001
	Post test	41	5.85		
Control group (C) (COT)	Pretest	31.90	5.32	7.9649	P<0.0001
	Post test	35.30	4.90		

TABLE -2: ANOVA analysis of variance of group A, B, C of post-test on the Manual Function Test

POST TEST	MEAN	STANDARD DEVIATION	'p' value	Level of significant
GROUP A	42.90	6.89	<0.0001	Considered significant
GROUP B	41	5.85	<0.0001	
GROUP C	35.30	4.90	<0.0001	

GRAPH 1- shows Comparisons of mean differences of upper extremity function from post-test value of the entire group (A), (B), (C)



DISCUSSION

The aim of the study was to find out the Effect of Graded Repetitive Arm Supplementary Program (GRASP) and Task Specific Training on Upper Extremity Functions of Persons with Subacute Stroke. The researcher conducted the study at HAMSA Rehab, Trichy district. The services provided in this rehabilitation Centre includes Occupational Therapy, Physiotherapy, Speech Therapy and General Medical Care for approximately 65 patients.

30 male and female stroke patients who matched the selection criteria were the participants. They were divided into 3 groups: Control group C (conventional occupational therapy), Experimental group A (GRASP), and Experimental group B (task specific training). The researcher obtained informed consent from the patients and care givers for the intervention and to use their data for assessment and to measure the outcome of the intervention.

The mean age of Experimental group A, Experimental group B and control group C was 49, 49.9, and 50.8 respectively. Patients with Upper Extremity Functional Impairments in all three groups were screened using Mini Mental State Examination (MMSE), and Fugl Mayer Assessment (FMA) was used to assess the upper extremity functions to all the group samples. Group (A) received Graded Repetitive Arm Supplementary Program (GRASP). Group (B) received Task Specific Training, whereas Group (C) received Conventional Occupational Therapy. Each group received their respective intervention for 8 weeks, 5 sessions per week, and

1 session per day. After the intervention, the post-test was conducted for all the 3 three groups by the administration of Fugl Mayer Assessment Test (FMA) to evaluate the outcome following the intervention.
Paired 't' test have been used to compare the scores tabulated for pre-test and post-test of control and experimental groups. ANOVA test have been used to compare the scores and tabulated for the mean value of all the groups to find out significant level of the upper extremity functions. GraphPad InStat was used to interpret the data.
The data analysis of the study implies that the entire subjects improved in upper extremity functions by Fugl Mayer Assessment (FMA). Though the statistical mean difference is not much high, Experimental group A (GRASP) improved more than experimental group B (Task Specific Training) than Control group C (Conventional Occupational Therapy). These improvements suggest that the GRASP program effectively targeted upper extremity function in subacute stroke population.
This finding is also supported by H-GRASP: the feasibility of an upper limb home exercise program monitored by phone for individuals post stroke. The goal of this research was to find out whether a stroke recovery program for the upper limb could be monitored by a phone at home. Eight stroke patients were recruited. Stroke patients participated in an 8-week home exercise program that included behavioral tactics to encourage the participants to use more of the affected upper limb. Therapists were contacted every week to check on participants. In the study, the COPM, the MAL, the CAHAI, and grip strength were utilized. The results imply that a phone-monitored upper limb home exercise program with behavioral strategies to integrate exercise gains into everyday upper limb use may be beneficial for community-dwelling stroke survivors. The effects of the treatment lasted for up to six months.
This finding is also supported by Meaningful Task-Specific Training (MTST) for Stroke Rehabilitation: A Randomized Controlled Trial. This was a double-blind, randomized, controlled trial that was carried out in the neurology department of a university hospital and the occupational therapy department of a rehabilitation Centre. Two groups were randomly selected from a convenience sample of 103 individuals 4 to 24 weeks (mean, 12.15 weeks) after the stroke (MTST, 51; standard training group, 52). The study comprised participants whose arm recovery was at the Brunnstrom stage, which ranges from 2 to 5. The 8-week follow-up was completed by 95 individuals. The MTST or a dose-matched standard training program based on the Brunnstrom stage and Bobath neurodevelopmental approach were given to the participants to complete over the course of 4 weeks. The Graded Wolf Motor Function Test (GWMFT), ARAT, the FMA, and the MAL were outcome measures. Compared to the control group, the MTST group's mean scores on the outcome measures at the post- and follow-up assessments improved.
The data analysis of the study implies that the entire subjects improved in upper extremity functions by Fugl Mayer Assessment (FMA). Though the statistical mean difference is not much high, Experimental group A (GRASP) improved more than experimental group B (Task Specific Training) than Control group C 0(Conventional Occupational Therapy).
With these findings and the above discussion, the researcher accepts alternative hypothesis and rejects null hypothesis.

CONCLUSION:

From this study, it is concluded that there is a significant improvement in upper extremity functions in persons with subacute stroke.
The results of the study demonstrated that both Graded Repetitive Arm Supplementary program (GRASP) and Task Specific Training are efficacious for upper extremity functions in comparison to Conventional Occupational Therapy

LIMITATIONS OF THE STUDY

Sample size is limited for each group.
Study was done for confined age group.
Sample are collected from the single centre affect the generalization of treatment.
No follow up was done to see the maintenance effect of GRASP and Task Specific Training.

FUTURE RECOMMENDATION OF THE STUDY

Long term follow-up study can be conducted to understand the sustained effect of GRASP and Task Specific Training.
Large sample size may be used to find the effect of GRASP and Task Specific Training.
Training was given only to subacute patients, future studies on chronic stroke population can be conducted.

REFERENCES

1. Guidelines for prevention and management of stroke; Directorate general health service ministry of health and family welfare, Government of India, 2019
2. G. Nelles, W. Jentzen et.al, Arm Training Induced Brain Plasticity in Stroke Studied with Serial.Positron.Emission Tomography, NeuroImage **13,** 1146–1154 (2001) doi:10.1006/nimg.2001.0757
3. Kamal Narayan Arya et.al, Meaningful Task-Specific Training (MTST) for Stroke Rehabilitation: A Randomized Controlled Trial, Top Stroke Rehabilitation,2012;19(3):193–211 doi: 10.1310/tsr1903-193
4. Judi Edmans, Occupational therapy and stroke; 2nd edition,2010; ISBN 978-1-4051-9266-8
5. Ole Morten Rønning; Bjørn Guldvog, Outcome of Subacute Stroke Rehabilitation: A Randomized Controlled Trial, 1998; 29: 779-784.
6. Kathryn S Hayward and Sandra G Brauer, Dose of arm activity training during acute and sub-acute rehabilitation post stroke: systematic review of the literature, Clinical rehabilitation 2015; vol 29(12): 1234-1243
7. John bamford , peter sandercock et al ,Classification and natural history of clinically identifiable subtypes of cerebral infarction, 1991;337;1521-26. 17.
8. Heart and Stroke Foundation , Canadian Partnership for Stroke Recovery; 2022 stroke engine team.
9. National Stroke Network, upper limb assessment and treatment guides; task specific training; 2017
10. Robert teasel, narhayati Hussein et al, Evidence Based Review of Stroke rehabilitation, clinician handbook, hemiplegic upper extremity rehabilitation; 2020; chapter (4)
11. Evidence Based Review of Stroke rehabilitation, clinician handbook, elements of stroke rehabilitation; 2020: chapter (6)
12. Mary Vining Radomski Catherine A. TromblyLatham, Occupational Therapy for Physical Dysfunction, 7th edition; 2014, ISBN 978-1-4511-2746-1.
13. Aho, K., Harmsen, P., Hatano, S., Marquardsen, J., Smimov, V.E. *et al.* Cerebrovascular disease in the community: Results of a collaborative study, 1980; *Bull. WHO,* 58, 113-30
14. Simon.B.N.Thomsonand Marynanne morgan, Occupational.therapy.for.stroke.rehabilitation; 1990
15. P.Michel et.al, Introduction to.Stroke.and.Its.Management; Cerebrovascular.Diseases, 2003; 15(suppl2):1–10,DOI: 10.1159/000069674
16. Diji Kuriakose and Zhicheng Xiao, Pathophysiologyand Treatment of Stroke: Present Status and Future Perspectives, International Journal Of Molecular Science, 2020
17. Hatem SM, Saussez G, della FailleM, Prist V,ZhangX, Dispa Dand Bleyenheuft Y, Rehabilitation of Motor Function after Stroke: A Multiple Systematic Review Focused on Techniques to Stimulate Upper Extremity Recovery. (2016) Front. Hum. Neurosci. 10:442. doi: 10.3389/fnhum.2016.00442
18. Joel stein, Richard L. Harvey; Demosmedical, Stroke Recovery and Rehabilitation; 2009, ISBN-13:978-1-933864-12-9
19. Janet H Carr, Roberta B Shepherd; Stroke Rehabilitation Guidelines for Exercise and Training to Optimize Motor Skill; 2003; ISBN 0 7506 4712 4