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A Study to Compare Effect of Hold-Relax v/s Static Stretching on Elbow Flexors Muscle Spasticity in Stroke - A Comparative Study

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ABSTRACT

Background: Stroke is a condition in which Spasticity in the body musculature greatly affect the functional independence of the patients. Hold- Relax and Static Stretching is one of the useful treatment to reduce Spasticity.
Aim: To find out the effect of Hold – Relax V/S Static Stretching on Elbow flexors muscle Spasticity in Stroke Patient
Materials and Methods: 20 subjects were randomly allocated into two groups (Group A and Group B). For 10 subjects in Group A Control group was given Static Stretching with conventional rehab and Group B Experimental group was given Hold- Relax with conventional rehab. Treatments were given to 3 weeks 3 sets per sessions. The outcome measure used to assess the Spasticity before and after the intervention was Modified Ashworth Scale (MAS).
Results and Discussion: The Hold-Relax group showed a significant reduction in Spasticity of Elbow flexors muscle, compared to the control group ($p<0.05$).
Conclusions: Hold- Relax is more effective than Static Stretching.

Keywords: Stroke, Spasticity, Hold- Relax, Static Stretching, MAS.

INTRODUCTION

The term Stroke or brain attack is defined as the sudden loss of neurological function caused by an interruption of the blood flow to the brain.[1] Spasticity is a motor disorder characterized by a velocity-dependent increase in muscle tone with increased resistance to stretch; the longer and quicker the stretch, the stronger the resistance of the spastic muscle.[1] Hold-Relax is the technique of Proprioceptive Neuromuscular Facilitation (PNF). In Hold-Relax is the technique of resisted isometric contraction of the antagonistic muscles (Shortened muscles).[2]Arm function place a critical role in the performance of daily life activities. Most everyday activities required the use of both hands, and because of this, performance of bimanual activities receives considerable attention in the rehabilitation settings.[3] Improved arm and hand function (Eating, Drinking, gripping activities etc.) positively contribute to societal participation and quality of life. The Modified Ashworth Scale is clinical tool used to measure the increase of muscle tone. In 1964, Bryan Ashworth published the Ashworth scale as a method of grading spasticity while working with stroke patient.[4] Bohannon and Smith modified the Ashworth scale by adding 0 to 4 grades.

Need for the study

There are few studies, which compare Hold - Relax and Static Stretching

in stroke patient. Hold-Relax has been used to increase strength, maintain flexibility and functional mobility. It is also effective and for improving muscle activation and decreasing muscle fatigue. Hold -Relax effective for increasing range of motion in the extremities, which lead decrease the Spasticity in stroke patient. Static stretching is great way to release the Spasticity and increase the flexibility. It is also effective at increasing range of motion.

Aims of the study

To find out the effect of Hold – Relax V/S Static Stretching on Elbow flexors muscle Spasticity in Stroke Patient.

Objectives:

1) To find out the effect of Hold – Relax on spastic stroke patients 2) To find out the effect of Static Stretching on spastic stroke patients 3) To compare effect of Hold-Relax and Static Stretching on Elbow Flexors muscle Spasticity in Stroke patients.

MATERIALS USED: Plinth, Towel, Chair, Step Stool, Mask, Gloves, Face Shield, Sanitizer, Pillow, Assessment form, Pen and paper, Consent form, Stop watch

CRITERIA FOR SELECTION:

Inclusion Criteria: Age between 35 years to 70 years, Gender: both male and female, Ischemic and hemorrhagic types of stroke, hemodynamically stable, Modified Ashworth Scale (MAS) Grade 1 to 3.

Exclusion Criteria: Fracture of Upper limb less than 3 Weeks. Uncooperative patient. Patient having other form of neurological impairments, Blurred vision, Vestibular system dysfunction.

METHOD

After the approval of the study from the ethical committee, 20 subjects from Out Patient Department (OPD) centers who fulfilled the inclusion and exclusion criteria were taken for the study purpose. Written informed consent was signed by each subject before proceeding for the study procedure. The demographic data including name, age, sex, affected side, post stroke duration, assistive devices for ambulation were recorded using subject evaluation form. Patients were then explained about the test and procedure to be conducted. Before treatment, Modified Ashworth Scale has been taken in all 20 patients. Patients were divided into two groups Control group and Experimental group. Patient were divided randomly Group A (Control group) and Group B (Experimental group). Group A- Control group and Group B – Experimental group. Stretching with Conventional Rehab has been given to Group A and Hold -Relax with Conventional Rehab has been given to Group B. Hold-Relax and Static Stretching techniques have been used to reduce Elbow flexors spasticity. Group B patients were received Hold-Relax technique of PNF.

For Hold- Relax technique supine position has been given to patient. In supine position patient has been asked to keep elbow joint in available range of motion of elbow extension. Place the towel under the elbow joint. Patient elbow joint has been maintained in that position and then patient has been asked to flex elbow for isometric contraction of elbow flexor muscles. Isometric contraction of elbow flexor muscles has been held for 10 sec followed by 5 sec of relaxation. Treatment has been given for 3 weeks. 3 sets per session of Hold – Relax and Static Stretching.

In Stretching, Patient position has been supine lying and therapist position has been sitting on the chair. First grasp the distal forearm with the upper arm at the patient's side supported on the table. Stabilize the scapula and anterior aspect of the proximal humerus. Then gradually extend the elbow just past the point of tissue resistance to lengthen the elbow flexors. Therapist was holded for 30 sec and followed by 10 sec relaxation. The stretching technique repeated for 3 sets per session for 3 weeks. At the end of 3 weeks Modified Ashworth Scale has been taken for Group A and Group B. Then comparison of

Modified Ashworth Scale score before and after treatment has been done.

FIG 4.2 (a) Static Stretching position of patient FIG 4.2 (b) Hold-Relax position of patient

RESULT

In present study 20 subjects with the age group of 35 to 70 were taken and divided into two groups. Group A (Control group) and Group B (Experimental group). 20 individuals completed the study program without any complications. The data obtained in both groups are as follows. Statistical Package for Social Sciences [SPSS] v20 was used for the data analysis.

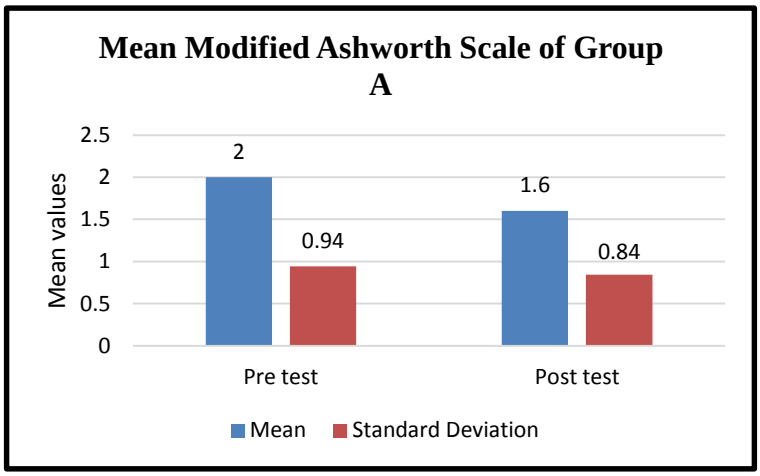
Table 1.1 Paired sample T test for Group A

Paired samples statistic

	N	Mean	Standard deviation	Standard Error Mean
Pre test	10	2.00	0.94	0.30
Post test	10	1.60	0.84	0.27

Paired samples test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence interval of the Differences				
				Lower	Upper			
Pretest-Posttest	0.40	0.70	0.221	-0.10018	0.90018	1.809	9	0.104



Graph 1.1: Showing the pretest and posttest mean difference scores of Group A.

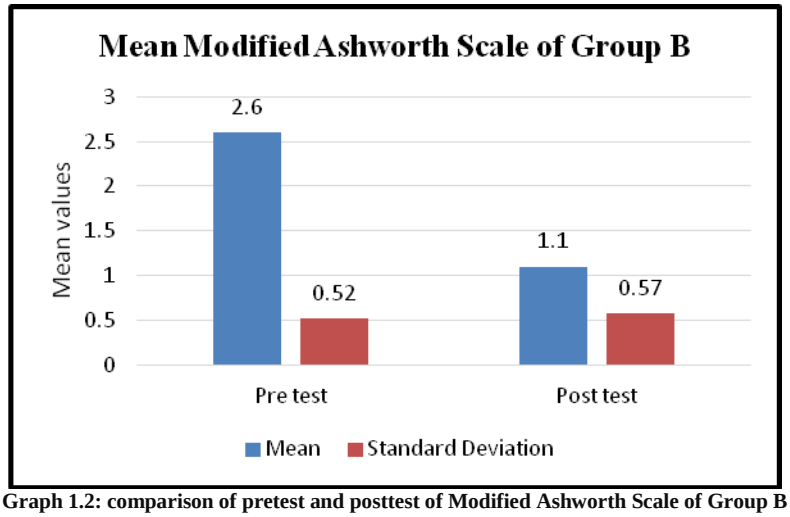
Table 1.2: Paired sample T test for Group B

Paired samples statistic

	N	Mean	Standard deviation	Std. Error Mean
Pre test	10	2.60	0.52	0.16
Post test	10	1.10	0.57	0.18

Paired samples test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence interval of the Differences				
				Lower	Upper			
Pretest-Posttest	1.50	0.71	0.22	0.99417	2.00583	6.708	9	0.000



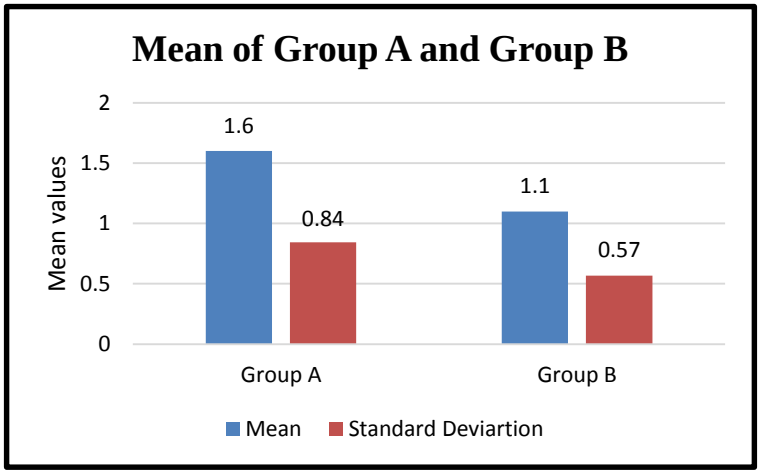
Graph 1.2: comparison of pretest and posttest of Modified Ashworth Scale of Group B

Table 1.3: Between group Comparison of Mean Modified Ashworth Scale for Group A and Group B

Treatment	N	Mean	Std.Deviation	Std. Error Mean
Spasticity Group A	10	1.60	0.84	0.27
Group B	10	1.10	0.57	0.18

Independent samples test

	Levene's Test for Equality of Variances		t- Test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean differences	Std. Error Differences	95% CI of the difference	
								Lower	Upper
Spasticity Equal variances assumed	4.136	0.57	1.555	18	0.00	0.50	0.32	-0.17535	1.17535
Equal variances not assumed			1.555	15.767	0.140	0.50	0.32	-0.18227	1.18227



Graph 1.3: Between group Comparison of Mean Modified Ashworth Scale for Group A and Group B

DISCUSSION

The study was conducted to compare the effects of Hold-Relax and Static Stretching on Elbow flexors muscle spasticity. According to result study indicate that Hold-Relax technique is more effective than Static Stretching.

Stretching the process of elongation, is currently used technique in the physical management of spasticity. During stretching tension is applied to soft tissue structures. Structures that are put under tension can consist of muscle, tendon, connective, vascular, dermal and excitability properties. However, many neural and non-neural responses to stretch, especially in Spasticity. The aims of stretching in spasticity may be normalize muscle tone, to maintain or increase soft tissue extensibility, to reduce pain and to improve function.

Modified Ashworth Scale procedure is quick and easy and is common tool in the measurement of Spasticity. Modified Ashworth Scale is widely used in research, in different patient groups such as stroke. Moderate to good intra-rater reliability and poor to moderate inter-rater reliability of the scale was found. Hold-Relax has been used to increase strength, maintain flexibility and functional mobility. It is also effective and for improving muscle activation and decreasing muscle fatigue. Hold -Relax effective for increasing range of motion in the extremities, which lead decrease the Spasticity in stroke patient. Hold-Relax is more effective then Static stretching because Hold-Relax improve flexibility through relaxation of the contractile component of the muscles, while static stretching causes an increasing in elasticity of the non- contractile viscoelastic component.

Limitation of the study: Patients with cognitive impairment are not included. Duration of stroke was not taken into consideration. Type and site of lesion was not considered. Small sample size.

FURTHER RECOMMENDATION: Larger sample size can be recommended for further study. Future research can be conducted by taking control group. Study can be performed to compare if any difference in recovery among acute, sub-acute and chronic patients.

CONCLUSION

The results of this study show that the Hold-Relax is more effective than Static Stretching. As Hold-Relax improve flexibility through relaxation of the contractile component of the muscles, while static stretching causes an increasing in elasticity of the non- contractile viscoelastic component.

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Conflict of Interest: There was no personal or institutional conflict of interest for this study.

Source of funding: No fund was need.

Ethical Clearance: From B.N. Patel College Of Physiotherapy

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