

To Study the Effects of Forced Used Training and Capsular Stretching To Improve the Movement of the Shoulder Joint in Chronic Stroke Patients

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ABSTRACT

Stroke is a major cause of disablement in many western countries. In the Netherlands, the standardized annual incidence rate for stroke in men and women is 1.74 and 1.96 per thousand, respectively. Approximately 80% of stroke patients survive the acute phase, and although most patients regain their walking ability, 30% to 66% of the survivors are no longer able to use the affected arm. The recovery process of upper extremity function is often slower than the recovery process of lower extremity function.

So many studies have been done on the treatment of chronic stroke to but no such evidence based practice has been done on Comparative study of the effects of Forced Used training & capsular stretching to improve the movement of shoulder in Chronic stroke patients.

So in this study I intended to give Forced Used training & capsular stretching to improve the movement of shoulder in chronic stroke patients.

It is a comparative study design; a sample of 30 patients was included in the study with the pre-test and post test study design. Random sampling is done on the basis of baseline assessment and diagnosis of their condition as per investigation.

Duration of this study is 6 months and data were collected at Day 0 and Day 45 and Day 90 and follow up.

Results: Graphical presentations, which point to over all sense of the study depicts the same. All graph show the significant difference for improvement in functional performance of the upper extremity, in Group A and Group B separately. The level of mean difference in pre test and post test of both the groups presented

functional performance of the upper extremity improvement more in Group A than Group B.

Keywords: Forced used technique, capsular stretching, chronic stroke patients

INTRODUCTION

Stroke

Stroke is a complex and devastating disease. Despite treatment advances, stroke remains a leading cause of morbidity and mortality. 29% of stroke patients die within one year whereas 20% of these will die within 3 months.

Forced-use training (FUT) is a treatment strategy, designed to compel usage of the more-affected limb by intensive practice of task-oriented activities to shape behavior, and was originally developed for upper extremity rehabilitation following stroke. Controlled experiments have shown that constraint-induced movement therapy (CIMT), a version of forced-use training, is effective at overcoming the learned non-use of affected upper limbs and elicits significant improvements in motor function and real-life usage of the affected upper limb after cerebrovascular accidents. [1]

Constraint-induced movement therapy (CIMT), also known as forced use movement therapy, is a therapeutic approach to rehabilitation of movement after stroke. It has purportedly been demonstrated to improve motor function in patients following cerebrovascular accident (CVA). [8]

Recovery from a stroke can feel daunting. Retraining the brain to complete

actions that it used to take for granted means intense rehabilitation in hospital, with a therapist, and at home. While strokes are game changers, they don't have to be a life sentence. The brain is adaptive and resilient, and with a focused stroke recovery plan, there is hope. [6]

Stroke rehab with a physical therapist is a well-supervised process, but rehab doesn't end at discharge. Empowered independent rehab at home is a must to continue to improve mobility, strength and endurance to enhance the ability to perform activities of daily living (ADL). [7]

Capsular stretching the glenohumeral joint capsule has a significant degree of inherent laxity with a surface area that is twice that of the humeral head. This redundancy allows for a wide range of motion.

Medially, the capsule attaches both directly onto (Antero-inferiorly) and beyond the glenoid labrum laterally it reaches to the anatomical neck of the humerus. Superiorly, it is attached at the base of the coracoid, enveloping the long head of the biceps tendon and making it an intra articular structure. [2,3]

The capsule also has a stabilizing role tightening with various arm positions. In adduction, the capsule is taut superiorly and lax inferiorly; with abduction of the upper extremity this relationship is reversed and inferior capsule tightens. As the arm is externally rotated, the anterior capsule tightens while internal rotation induces tightening posteriorly. The posterior capsule in particular has been shown to be crucial in maintaining glenohumeral stability, acting as a secondary restraint to anterior dislocation (particularly in positions of abduction) as well as acting as a primary posterior stabilizing structure. [3]

The treatment should initially be conservative, with the emphasis on passive stretching of the capsular structures. [4]

Stretching for the anterior, inferior and posterior shoulder should be performed by the patient as a part of the motion programme. Stretching a shoulder of a

chronic stroke patient can be painful but stretching slightly past the point of pain is necessary to make forward progression in range of motion.

Aims and Objectives of the study:

1. To find out the effect of Forced Used training to improve the movement of shoulder in Chronic stroke patients.
2. To find out the effect of capsular stretching to improve the movement of shoulder in chronic stroke patients.
3. To find out the correlation difference between these two technique.

Hypothesis

Alternate hypothesis

There is significant difference in the shoulder movement after application of Forced Used training and capsular stretching in chronic stroke patients.

Null hypothesis

Null hypothesis is rejected.

Need of the Study

So many studies have been done on the treatment of chronic stroke to but no such evidence based practice has been done on the comparative study of Forced Used training and capsular stretching. So in this study I intended to give Forced Used training and capsular stretching to find out significant improvement of the shoulder movements in the chronic patients.

Study Design

It is a comparative study design; a sample of 30 patients was included in the study with the pre-test and post-test study design, random sampling is done on the basis of baseline assessment and diagnosis of their condition as per investigation.

Duration of this study is 6 months and data was collected at Day 0 and Day 45 and Day 90 and follow up.

Inclusion Criteria

1. Chronic stroke patients with history of stroke less than 6 months
2. Both the gender were included
3. Having limited movements of shoulder joint.
4. Patients greater than or equal to 40 to 65 year of age.

5. Considerable nonuse of the more affected limb (amount of use < 2.5 on MAL scale).

Exclusion Criteria

1. History of surgery on the particular shoulder
2. Fracture of shoulder complex
3. Rotator cuff rupture
4. Shoulder dislocation
5. Presence of contracture in the upper limb muscles.
6. Tendon calcification
7. Brachial plexus injury

Protocol & Procedure

All the patients were considered after the diagnosis and base line data collection is in process. The patients are diagnosed by Consultant Medical or Neurological specialist, on the evidence of Laboratory findings, CT scan and MRI, the subjects are screened for Inclusion and Exclusion criteria to full fill the sample size.

All the participants who were clinically diagnosed were screened after finding their suitability as per the inclusion and exclusion criteria and will be requested to participate in the study.

Subjects were assigned into Groups A and Group B.

Group A received Forced use technique 5 days per week for 3 months where as Group B received Capsular stretching 5 days a weeks for 3 months.

Both groups were given traditional physiotherapy treatment.

The subjects of Group A received normal control exercise program which includes Passive movement, Stretching exercise and Active Exercises along with Forced used technique. The subjects of group B treated with normal control exercise program which consist of Passive Movements, Stretching

Exercises and Active Exercises with, including Capsular stretching



Fig. 1: Group A patient receiving forced used technique



Fig. 2: Group B patient receiving Capsular stretching

Data analysis:

The data obtained using FIM, MAL scale of this study are ordinal and not interval or ratio. Since this does not adequately fulfill the conditions for parametric tests; non-parametric test is applied here. The Wilcoxon Signed Ranks Test is used to compare the results of two different groups of subjects to see they differ significantly. The result shows a significant improvement in both the group getting both *Forced Used training & capsular stretching*.

Within group analysis

Table 1: Group analysis within Group A and Group B of FIM scale

Outcome measures		Day 0	Day 45	Day 90	Repetitive measures	
		Mean ± SD	Mean ± SD	Mean ± SD	Z	P
FIM	Group A	30.60± 8.34	37.73± 7.76	42.47± 8.14	-2.90	0.000
	Group B	27.67± 7.32	31.07± 7.22	33.20± 6.12	-3.86	0.000

The result of the present study demonstrated that there is a significant improvement in functional performance of the affected upper extremity. When two samples were conducted at the end of 45 days and after 90 days using FIM scale, it was found that there is a

significant improvement in the functional performance of the affected UE in group A compared to group B (p=0.000).

Within group analysis

Table 2: Group analysis within Group A and Group B of MAL scale

Outcome measures		Day 0	Day 45	Day 90	Repetitive measures	
		Mean ± SD	Mean ± SD	Mean ± SD	Z	P
MAL	Group A	1.47±.516	2.40±.541	3.37±.516	-2.90	0.000
	Group B	1.27±.594	1.73±.563	2.40±.471	-3.86	0.000

The result of the present study demonstrated that there is a significant improvement in functional performance activity of the upper extremity of the affected side. When two samples were conducted at the end of 45 days and after 90 days using MAL, it was found that there is a significant improvement in functional activity in group A compared to group B (p=0.000).

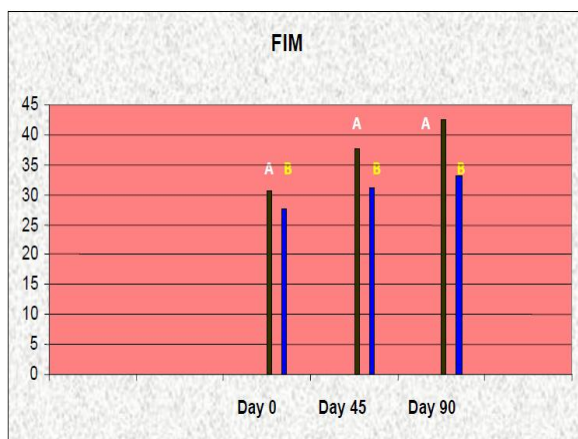


Fig 3: Group analysis within Group A and Group B of FIM scale

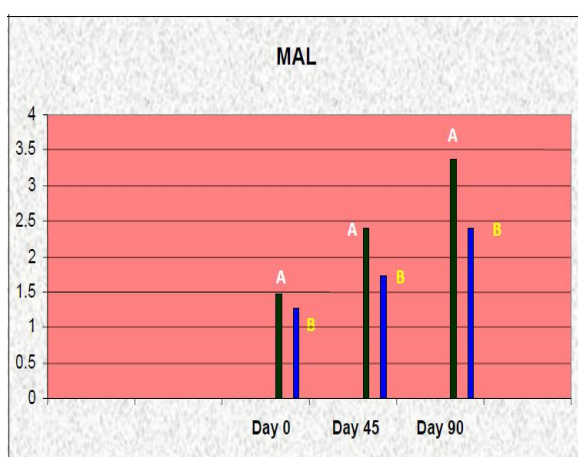


Fig 4: Group analysis within Group A and Group B of MAL scale

RESULTS

Data collected through the study showed more improvement in the hand

function and functional activities in patients with hemiparesis in the group A. Thus, it can be concluded that *Forced Used training* is more beneficial in improving hand function for hemiparetic patients post stroke.

One of the objective of the study was to record the outcome after the application of *Forced Used training* in hemiparetic stroke patients. The patients in Group A are treated with *Forced Used training* with upper limb exercises and the results show a more significant improvement in the functional performance of the shoulder joint when pre test and post test data were compared.

Another objective of the study was to record the outcome after the application of *capsular stretching* in hemiparetic stroke patients. The patients in Group B were treated with *capsular stretching* with hand exercise and the results show a significant improvement but less improvement in functional performance compared to the group A with *Forced Used training* of the upper extremity when pre test and post test data were compared.

Graphical presentations, which point to over all sense of the study depicts the same. All graph show the significant difference for improvement in functional performance of the upper extremity, in Group A and Group B separately. The level of mean difference in pre test and post test of both the groups presented functional performance of the upper extremity improvement more in Group A than Group B.

DISCUSSION

It has been recorded from the study that use of *Forced Used training* and

Capsular stretching produces significant improvement in functional performance of the upper extremity in patients with hemiparesis due to stroke. It can be seen that use of *Forced Used training* and Capsular stretching in patients with hemiparesis due to stroke is beneficial. This can be used to enhance the functional outcome of these patients. Hence alternate hypothesis is accepted at $p = 0.000$ and the null hypothesis is rejected.

Limitations:

The study is done on an immediate basis i.e. the MAL scale was measured immediately on the use of *Forced Used training* and Capsular stretching and no follow up was done. The lack of follow up has the drawback that sustained of this improvement and further progression value is not revealed. The hemiparesis were of both the sides (right and left). It is known that right sided hemiparesis usually have some perceptual disorder also which is not considered in the study, but nevertheless can affect the outcome.

CONCLUSIONS

Subjects in *Forced Used training* group Confirmed that they were largely using their affected limb for ADL following intervention with significant changes in MAL and FIM score suggesting increased use of the affected limb, Whereas subjects in the Capsular stretching group showed nominal MAL and FIM changes and reported the pattern of use similar to those that they reported before intervention.

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