



Effectiveness of Motor Relearning Programme in Improving Mobility of Chronic Stroke Patients

¹Dr. Manisha Yadav (PT), ²Dr. Deepshikha Yadav (PT)

Assistant Professor, MPT (Neurology), MAAN (Mayo) College of Medical Science, Bhopal (M.P.)¹

Assistant Professor Department of Physiotherapy, Mansarovar Global University, Bhopal (M.P.)²

Abstract: Stroke is the world's third most frequent cause of death, with more than half of neurological admission to community clinics, behind heart disease and cancer. The Motor Relearning Program (MRP) involves several elements of the theory of motor training and provides practical instructions to retrain functional skills (for example, balanced sitting, standing, transfer abilities, gait, and more). Task-related or motor-relearning (MRP)/taking particular exercises with particular reinforcement exercises in the parallel muscle have demonstrated improvements in locomotion, a lower limb weight in the seat and a stand up. Assessing the efficacy of a three-week motor relearning program to improve fundamental mobility in patients who have chronic strokes. The research included a total of 32 respondents who met the requirements and were earlier diagnosed as being stroke by the neurologist. They were allowed to terminate their participation at any time during study. After obtaining a written consent form, Demographic data were collected. No significant differences were found between the groups regarding their age and heights. The Motor Relearning Program was conducted in the respective participant's home environment. None of the subjects attended physiotherapy for lower limb anywhere else during the study. The Motor Relearning Program was given for three weeks and the Timed up and go test pre and post intervention scores (time in seconds) were recorded on the first day pre intervention and on the last day post intervention after three weeks. The two pre and post timings to perform TUG test were recorded and the two pre and post scores groups were analyzed using data analysis software. The average mean of TUG test scores for the first day session pre MRP intervention was 55.19 seconds. The average mean of TUG test scores for the last day session post intervention after 3 weeks was 27.06 seconds. Three weeks of Motor relearning program intervened for half an hour, 3 times per week is feasible and effective for improving basic mobility and walking in chronic stroke subjects in their home setting. Therefore, MRP should be recommended for improving basic mobility in chronic stroke subjects in home setting also.

Keywords – Motor Relearning Program, Stroke, timed up and go test

I. INTRODUCTION

Stroke is the world's third most frequent cause of death, with more than half of neurological admission to community clinics, behind heart disease and cancer.¹ The rehabilitation of stroke individuals is time consuming and is costly.² The main impact on the patients and their family is usual long-term disability, activity limits (disabilities) and decreased involvement (disability) because most patients with stroke survive the original injury.³ The WHO defines strokes as Strokes Stroke- “a condition characterized by rapidly developing symptoms and signs of a focal brain lesion, with symptoms lasting for more than 24 hours or leading to death, with no apparent cause other than that of vascular origin”. The annual incidence of stroke in the Western countries is about 180 patients per 100 000 people.⁵ Most people are disabled and handicapped, although rehabilitation aims to decrease disability by optimizing performance of everyday duties.⁶ The stroke patients with more than 6 month duration are considered to be chronic stroke patients. Muscle strength is impaired in people who have stroke and several writers say that people with the stroke show a rise in sitting to stand movement (STS) in relation to elderly people who have no neurological impairment. Postural impairment often happens in relation to muscle weakness after a stroke and may lead to asymmetrical limb charge during functional assignments like STS. Walking velocity is significantly reduced in people with stroke compared against non-disabled checks as the most commonly used (clinical) measure in the quantification of gait impairments. Although the primary goal for many people after stroke is functional ambulation, many never recover this functional ambulation. For those people who have a stroke, their gait is often slow, their strength and equilibrium are poor and their walking pattern is changed in terms of quality and adaptability. Approximately 90 per cent of patients with chronic stroke have ambulatory disorders. As persons who suffer from chronic stroke continue to walk in a Degraded coordination pattern, they are more likely to drop, become fearful and lose independence. In the late stage (which corresponds to a push-off) the cinematic have decreased parietic hip expansion, knee flexion and ankle bending angles. In addition, in this stage of the step cycle EMG activity of calf muscles is significantly reduced.

II. HYPOTHESIS

2.1 Null Hypothesis

- Motor Relearning Program will not be effective for improving basic mobility in chronic stroke patients in home environment.

2.2 Alternate Hypothesis

- Motor Relearning Program will be effective for improving basic mobility in chronic stroke patients in home environment.

III. OPERATIONAL DEFINITION

- Stroke- “An acute onset of neurological dysfunction due to an abnormality in cerebral circulation with resultant sign and symptoms that corresponds the focal area of brain”.
- Hemi paretic- “Person with weakness of one side of the body only due to cerebro-vascular accidents”.

IV. METHODOLOGY

4.1 Sample

Total 32 participants meeting the inclusion criteria and who were previously diagnosed by Neurologist as having Stroke were recruited for the study. Participants were chronic stroke patient residing, in Bhopal city, patients who reported at Mayo hospital (Bhopal).

4.2 Inclusion Criteria

- More than 6 month post stroke
- No serious unstable medical complication
- They could follow directions (written, verbal or demonstration)
- Can ambulate 25 feet/10 meter (with or without assistive device)
- Age between 25-65 years
- Not receiving any other form of physiotherapy for lower limb

4.3 Exclusion Criteria

- History of neurologic disease other than the chronic stroke
- Orthopaedic disorder involving any joint of lower limbs that interfere with study
- Gross visual field deficits
- Unhealed fracture of lower limb
- Peripheral arterial occlusive disease
- Any cardiac problems diagnosed by physician
- Uncontrolled hypertension

V. RESULT AND DISCUSSION

The Motor Relearning Program was given for three weeks and the Timed up and go test pre and post intervention scores (time in seconds) were recorded on the first day pre intervention and on the last day post intervention after three weeks. The two pre and post timings to perform TUG test were recorded and the two pre and post scores groups were analyzed using data analysis software.

The average mean of TUG test scores for the first day session pre MRP intervention was 55.19 seconds. The average mean of TUG test scores for the last day session post intervention after 3 weeks was 27.06 seconds. Data analysis between the 1st day pre intervention TUG test scores and last day post intervention TUG test scores was done using paired test. The results showed significant differences between pre and post reading groups. The average post intervention mean of TUG test scores was significantly less than the first session pre intervention TUG test scores, which shows a significant decrease in pain.

Paired Samples Statistics

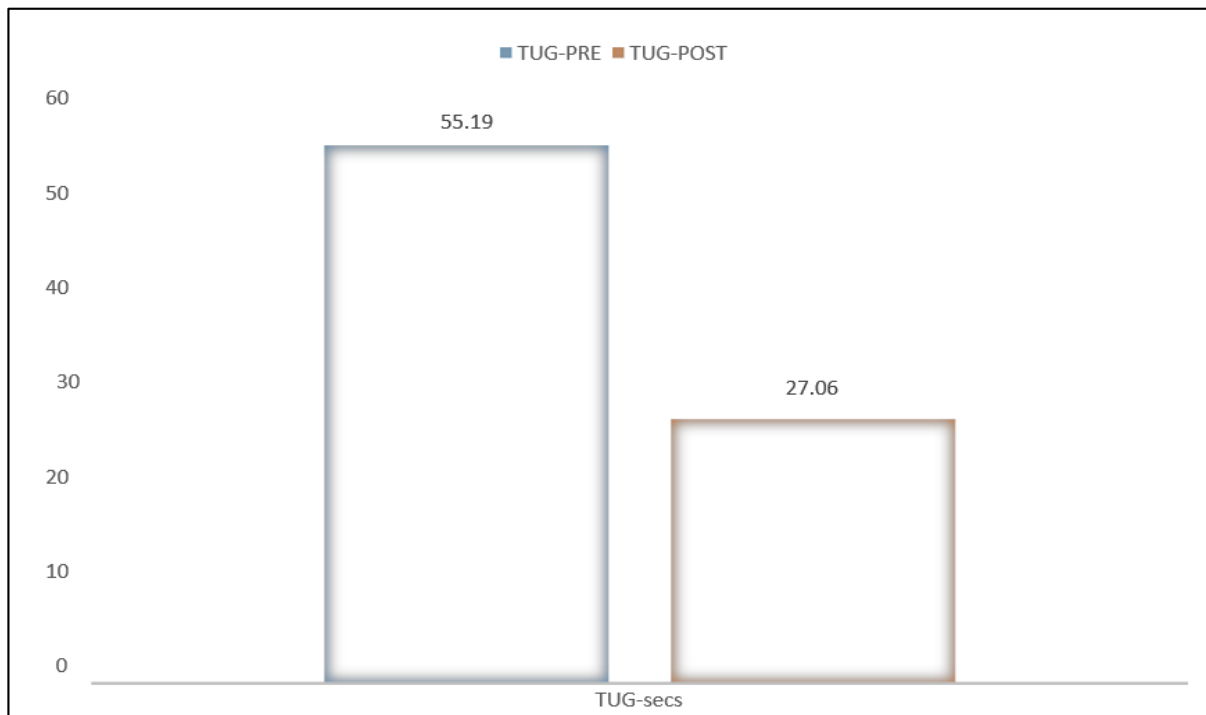
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TUGPRE	55.19	32	2.705	.478
	TUGPOST	27.06	32	1.865	.330

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	TUGPRE & TUGPOST	32	.279	.122

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 TUGPRE - TUGPOST	28.125	2.826	.499	27.106	29.144	56.307	31	.000



Graph – 1 – Bar graph showing significant decline in completion time of TUG test after MRP intervention

Basic mobility such as sitting to standing, standing to sitting and walking are pre requisite for independence for anyone. Just as standing up is essential to independence so also is walking for independence. The capacity to walk independently is a life-enrichment activity and the most effective way to get throughout our daily lives from one location to another. In this experimental study the results showed that there was improvement in their basic mobility after pre and post time periods are compared. Past studies have shown that intervention of MRP is effective for improving gait and thus basic mobility. The MRP for walking was given for 3 weeks came out to be sufficient to produce significant improvement in TUG score. Previous studies have shown that Task Oriented training/MRP is effective in improving basic mobility such as gait. But most studies were usually done for 4 to 6 weeks, whereas present study was conducted for 3 weeks. The systems underpinning the TUG post-intervention score improvements look multifactorial and could be ascribed to a decreased co-contraction of agonists-antagonists, Improving voluntary descending orders to the muscles of the paretic, Reorganization of synapses and cortical representation, as observes in prior research, after repeated practice of functional task.¹⁶ The research was designed to give participant plenty of chance for knowledge of the job. The engine relearning program was organized. We should note that step-ups, as per this research, have been discovered in some past research to be connected with functional enhancement. Nugent and colleagues have recorded a connection between the amount of step-ups made and the enhancement in the MAS walking article. The same step-up practice, Sherrington and Lord recorded a major connection in an experimental group of older

Participants between increasing strength of the quadriceps muscles and increasing velocity of the walk, they all had a fall-related fracture and some had a stroke. This program all practice, The task and contextual significance of most exercises is to practice the activities to be learned in an suitable setting, including exercises that specifically focus on the muscles (and muscles synergies) needed for this action, working through the range, at which they must generate force. Therapist/myself as coach encouraged the performance of most critical biomechanical features and discouraging behavioural adaptations which have limited effectiveness through their interference with cadence or balance. Participants also practice on their own and under supervision by therapist and family members, with a checklist of those components to which they need to direct their attention. Repetition and extensive practice are critical to the motor learning process, and thus to brain reorganization. Thus in short, initially missing components of gait were identified, then the subjects were taught the missing components. This was immediately followed by the performance of the task/GAIT itself. Task/GAIT was practiced in the absence of the therapist also as MRP is based on motor learning theory and practice and repetition are important component of this theory. Also sit to stand was taught in the same way as gait was taught, which was a one component of TUG scale. The improvement in STS score also added to improved TUG score post intervention in the experimental group. There is proof in publication that motor learning training techniques can have a beneficial effect on brain restructuring following a neural lesion. Training for tasks particular (i.e., particular functional actions training, such as walking, reaching, standing up) Stimulates the re-generation of motor control by generating muscles and time force for certain actions and tasks at appropriate length and relationships with each other. This is study these

Principles were incorporated which resulted in better outcomes in basic mobility in experimental group. If cerebral restructuring and functional rehabilitation are dependent on use and activity, Then the patient results are likely to play a significant part in the recovery setting. The physical or built environment (physical setting) is the rehabilitation environment, Methods used (type of intervention, intensity, dosage) and family (knowledge, expertise, attitudes and teach of ability) to provide rehabilitation. Recovering skills in critical tasks requires specific training and intensive practice in appropriate contexts. Motor theory describes how to acquire and modify motor patterns through experiential learning, such as observations and repetitive task or action practices. The relearning method promotes the recovery of normal motor skills with proper feedback and an active participation of the individual through task-orientated practices.¹⁵ In this research, The motor relearning program was structured in a manner that allowed patients to gain ample experience. The training was therefore more anticipated and therefore self-initiated, targeted, and efficient for the patients. The theoretical basis for this research is Carr and Shepherd's motor relearning program.

Home-based rehabilitation programs are one way of providing ongoing low-cost programs, which either help to maintain or even improve the performance of these patients.⁴² Home rehabilitation can be a more efficient and resource-efficient option for people after stroke for hospital rehabilitation. In terms of comfort and familiarity many individuals With disabilities and family prefer home-based therapy to outside therapy. A latest Cochrane study of the home-based rehabilitation stroke literature (HBSR) has come to the conclusion that, although that rehabilitation technique seems to enhance the autonomy of private daily life activities, Accurate nature and content of rehabilitation services based on therapy were unsure. Additional research to define the most efficient intervention programs is suggested, their economic advantage and the most appropriate service level.

Most HBSR experiments use an interdisciplinary approach to community care, but few attempts to characterize the content of such programs. Result of this study is consistent with few other studies which were carried out in home setting of chronic stroke patients and their functional outcomes were better post intervention. Taking into account data published in literature, home-based stroke rehabilitation certainly sounds appealing, because patients are certainly useful in meeting the restrictions placed on them in actual places where they live and work. There has been even concrete proof, although slight. That home stroke rehabilitation leads to an improvement in private and expanded daily living practices and does not impair the function of people affected by stroke. "Home-based" or "residence-based" are pure: services provided in the home environment.

VI. CONCLUSION

Three weeks of Motor relearning program intervened for half an hour, 3 times per week is feasible and effective for improving basic mobility and walking in chronic stroke subjects in their home setting. Therefore, MRP should be recommended for improving basic mobility in chronic stroke subjects in home setting also. Motor relearning program can be given to improve basic mobility and walking in chronic stroke subjects in their home environment. Therapists can refer to this study while planning out their treatment protocol.

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