International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 05, 2020
ISSN: 1475-7192

Effectiveness Of Early Truncal Facilitation Techniques On Balance And Functional Mobility In Post Stroke Patients.

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ABSTRACT

OBJECTIVES: To find effectiveness of early truncal facilitation techniques on balance and functional mobility in post stroke patients.

MATERIAL AND METHODOLOGY: An experimental study was conducted at physiotherapy department of Krishna College of physiotherapy. A total of 30 patients were allotted in a single group using convenient sampling and consecutive sampling method. This Group was given early truncal facilitation techniques on post stroke patients.

STATISTICAL ANALYSIS- data was analysed using Paired 't' test.

RESULTS: Statistical analysis was performed using paired t-test Intra group comparison (within group) was analysed for TIS for balance and FIMS for functional mobility. The mean TIS score on pre intervention was 6.06±3.29 which was increased to a mean of 16.53±4.041 post sessions. The P value by Paired t test was found to be <0.0001 which is extremely significant. Whereas the mean FIMS score on pre intervention was 49.33±3.20.65 which was increased to a mean of 81.96±21.19 post intervention. The P value by Paired t test found to be <0.0001 which is extremely significant.

CONCLUSION: From this study, it can be concluded that there was extremely significant improvement in subjects who underwent early truncal impairment on post stroke patients statistically and clinically. Hence this study accepts the alternate hypothesis (H_1)

KEYWORDS: *Stroke, Trunk Impairment Scale, Functional Independence Measure Scale.*

I. INTRODUCTION:

Stroke is the sudden loss of neurological function caused by an interruption of the blood flow to the brain.[1]According to World Health Organisation stroke is defined as a "rapidly developing clinical sign of local

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(at times global) disturbances of cerebral functions lasting more than 24 hr or leading to death with no apparent cause other than vascular origin". Stroke is said to be the most common cause of disability in activities of daily living (ADL).

Stroke represents third most common cause of death developed in nations.Stroke is said to be one of the leading causes of death and disability in India. The estimated adjusted prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/ 100,000 in urban areas. The incidence rate is 119-145/100,000 based on the recent population based studies[2].

Stroke can be classified into two main types: Ischaemic (i.e. caused by a clot in a blood vessel in the brain) Haemorrhagic (i.e. caused by a bleed in the brain).[5]

Motor deficits are characterized by paralysis (hemiplegia) or weakness (hemiparesis) typically on the side of body opposite to the side of lesion. Complete loss of voluntary movements in the arm and leg on one side is termed as Hemiplegia.

Further, contrary to common belief, the trunk muscles are impaired on both the sides of the body in patients with stroke.[11] Trunk is the central key point of the body with its primary contribution to stabilize spine and trunk. The trunk being the central key point of the body, proximal trunk control is a prerequisite for distal limb movement control, balance and functional mobility.

Trunk performance is considered to be less affected after stroke than the performance of the upper and lower extremities because trunk muscles are innervated by both hemispheres**.**[12] Trunk control is the ability of the trunk muscles to allow the body to remain upright, adjust weight shifts and perform selective movements of the trunk that maintains the base of support during static and dynamic postural adjustments.[12] The lack of proximal stabilization influences the limbs profoundly in that the arm and leg can only be moved in spastic synergy patterns.[3]

Trunk impairments were reflected by the reduced activity level of the lateral trunk muscles, in delayed onset of and in reduced synchronization between activation of pertinent muscular pairs.[10] Trunk control is a fundamental component for performing All Daily Living activities.[13] For balance and use of extremity during every day functional activities and higher-level tasks good trunk stability is essential.[2] Thus, Trunk control is an early predictor of Functional outcome after stroke.[14] More literature are available which are focusing on the hemiplegic upper and lower extremities while the trunk receives little attention. Dickstein et al. (2004) reported that the anticipatory activity of trunk muscles is impaired in stroke patients. Therefore, improving trunk stability is the major goal of rehabilitation in many stroke patients.[15]

Balance is the condition in which all the forces acting on the body are balanced such that the center of mass (COM*)* is within the stability limits, the boundaries of the base of support (BOS).[1]

Functional mobility defined as person's ability to move around in his or her environment. Examples include walking, scooting along a bed, and rising from a chair .[14]Getting up from a chair, walking up the stairs, or making yourself food are just a few examples of how functional mobility could be measured.

Based on the reviews, there are fewer studies which evaluates a physiotherapy intervention for treating trunk performance after stroke. Therefore, it was the aim of this study to investigate the effect of

additional exercises, aimed at improving sitting balance and selective trunk movements, on trunk performance after stroke.

The positive thing of this study is that trunk facilitation is effective in improving balance and functional mobility in patients with stroke as it stimulates proprioceptors within the muscles and tendons, so it helps to improve functions and increasing muscle strength, flexibility, and balance.

II. MATERIALS AND METHODOLOGY:

An experimental study was conducted at physiotherapy department of Krishna College of physiotherapy. A total 30 patients were allotted in a single group using convenient sampling and consecutive sampling method. This Group was given early truncal facilitation techniques on post stroke patients which were selected according to inclusion and exclusion criteria. Written informed consent was taken and whole study was explained to them. Inclusion criteria were as follows: 1) clinically diagnosed stroke patients.2) Subject with Brunnstorm stage 2 and above. 3) Subjects with trunk control impairment 4) both male and female subjects. Exclusion criteria were as follows: 1) Comatose patients 2) Non cooperated Patients 3) Patients who are not willing to participate

Group : A single group was given Early Truncal facilitation techniques was given to the group for five days per week and duration was of 6 week protocol

Outcome measures**:-**1)Trunk Impairment Scale 2)Functional independence Measurement scale

Structured Exercise Protocol:

1-2 weeks (3 sets X 6 reps)	4-5 weeks (3 sets X 10 reps)	5-6 weeks (3 sets X 10 reps)
Bed mobility exercises: From Supine lying to Side lying and from Side lying to Prone lying	Bed Mobility exercise: In Quadripod Position - Cat-Camel Exercises	Bed Mobility exercise: Progression in quadripod Leg-lifting
Initiation of Pelvic Bridging	Pelvic Bridging	Unilateral Pelvic Bridging
Superman exercises in prone lying	Prone on elbows	Pushups
Pertubations in sitting	Pertubations on swiss ball	Reach outs on Swiss ball

Received: 09 Jan 2020 | Revised: 18 Feb 2020 | Accepted: 29 Mar 2020

Pelvic tilts in Supine lying	Leg rotation exercises	Knee to chest Exercises
Wall squats	Mini squats	Mini squats with TheraBand
Initiation of sit to stand	Sit to stand	Standing
Standing with support	Standing without support	Single leg standing
Walking with support	Walking without support	Obstacle walking

Table no. [1]- EXERCISE PROTOCOL

III. RESULT:

Total 30 subjects were included in study. 20 were male and 10 were female. Age Group of all patients showed with the mean age of single group was 56 years.

The TIS score and FIMS score were assessed before the treatment and at the end of treatment period. Intra group comparison were done by using paired‘t’ test. Analysis were performed using instat statistical software.

Age distribution**:** -

Table no. 2-Age distribution

Group	**Mean Age (Yrs.’)**
Single Group	56 years

Table no.3 Comparison of TIS

Group	Pre-interventional mean ± SD	Post-interventional mean ± SD	P value	t value	Interference
Single group	6.06+3.29	16.53+4.041	<0.0001	15.524	Extremely significant

The above table shows the comparison of mean and standard deviation of pre and post values of TIS within group. In that single group, the mean on pre-treatment was 6.06±3.29 and post treatment was 16.53±4.041. The P value by paired 't' test was <0.0001 which is extremely significant.

Table no.4 Comparison of FIMS

Group	Pre-interventional mean ± SD	Post-interventional mean ± SD	P value	t value	Interference
Single group	49.33+20.55	81.96+21.19	<0.0001	10.350	Extremely significant

The above table shows the comparison of mean and standard deviation of pre and post values of FIMS within group. In that single group, the mean on pre-treatment was 49.33±20.55 and post treatment was 81.96±21.19. The P value by paired 't' test was <0.0001 which is extremely significant

IV. DISCUSSION:-

In this study an attempt was made to analyse effectiveness of early truncal facilitation techniques on balance and functional mobility in post stroke patients. This study was done to investigate that by giving early truncal facilitation techniques will it show early and fast improvement and reduce the symptoms after giving treatment in post stroke patients. Also its post treatment evaluation in a standardized manner using TIS and FIMS. The result shows extremely significant improvement by early truncal facilitation techniques which was a tailored protocol given to subjects.

A pre-treatment outcome measure using TIS and FIMS was done. The specific treatment protocol was given to the subjects as followed . The treatment protocol was for five days per week and duration was of 6 weeks. After completion of 6 week the post treatment outcome measure using TIS and FIMS were documented accordingly and a proper ergonomic advice was also given. The outcome measures showed considerable changes. Statistical analysis was done by using instat –graph pad. Intra Group comparison (within Group) was analyzed statistically using paired t test for TIS and FIMS. This shows that there is extremely significant difference for TIS (P- 0.0001) and FIMS (P-<0.0001)

The result of current study shows that early truncal facilitation techniques has extremely significant effect in management of post stroke subjects both statistically and clinically. Also it showed improvement on balance and functional mobility in stroke patients.

V. CONCLUSION:

Various conservative approaches are used in treating stroke but this study concluded that the effectiveness of early truncal facilitation techniques on balance and functional mobility helps in decreasing pain and improving quality of life and making the subject independent in its activities of daily living. It is proved from this study that the effectiveness of early truncal facilitation techniques on balance and functional mobility has significant effect on pain reduction and improvement of functional status in subjects having stroke also early trunk facilitation is effective as it stimulates proprioceptors within the muscles and tendons, thereby improving functions and increasing muscle strength, flexibility, and balance.

Hence, this study accepts the alternate hypothesis (H_1).

CONFLICT OF INTEREST- Nil.

ETHICAL CLEANRANCE- Institutional Ethical Committee Of Krishna Institute Of Medical Sciences Deemed To Be University, Karad.

SOURCE OF FUNDING- Funded by Krishna Institute of Medical Sciences deemed to be university, Karad,

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