



A STUDY ON REVEAL THE RELATIONSHIP BETWEEN TRUNK CONTROL AND FUNCTIONAL INDEPENDENCE IN STROKE PATIENTS

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Introduction

Stroke is one of the leading causes of morbidity and mortality. WHO defined it as an acute onset of neurological dysfunction due to an abnormality in cerebral circulation with resultant signs and symptoms that correspond to involvement of focal areas of the brain. Hemiplegia constitutes the main somatoneurological disorders in about 90% of the patients. (*WHO 1989*)

The goal of stroke rehabilitation is to restore as much independence as possible by improving physical, mental and emotional functions. This must be done in a way that preserves your dignity and motivates you to re-learn basic skills that the stroke may have affected, such as eating, dressing and walking (www.stroke.org)

The ability to control balance in the sitting and standing positions is a fundamental skill of motor behavior for achieving autonomy in everyday activities. The trunk control performance of patients soon after a stroke has been found to be closely correlated with long term functional movements. (*Bohannon RW 1990*)

Trunk stability is often over looked as an essential core component of balance of coordinated extremity use for daily functional activities, the performance of higher level motor tasks and participation in sports activities. Trunk stability requires appropriate muscle strength and neural control as well as adequate position sense to provide a stable foundation for movement.

Good trunk stability is essential for balance and extremity use, during daily functional activities and higher level tasks. Dynamic stability of the trunk requires adequate flexibility and muscle strength which are found to be affected in people post stroke. It is not clear whether they have adequate postural control and proprioception to ensure stable foundations of balance to enable skilled extremity use. The purpose of this study is to reveal the relationship between the trunk control and functional independence in stroke patients.

Aim

To reveal the relationship between trunk control and functional independence in stroke patients.

Objectives

1. To improve the trunk control in stroke patients.
2. To improve the functional independence through conventional occupational therapy along with trunk control activities.

Hypothesis

There is a relationship between trunk control and functional independence in stroke patients.



NULL HYPOTHESIS

There is no relationship between trunk control and functional independence in adult stroke patients.

Using Activities of Daily Living Mobility Tasks:

Clearly the most effective tools that occupational therapists can use to help patients regain trunk control are self-care, instrumental ADL, and mobility tasks. The therapist first must perform a thorough evaluation as described in the previous section. Following the evaluation, therapists and patients should identify the most problematic movement patterns that occur during the activity analysis skills to choose appropriate tasks that incorporate the desired patterns and postures. For example, if the identified problematic patterns are lateral flexion and lateral weight shifts, therapists may choose the following activities for the patient to practice:

- Lower extremity dressing
- Weight shifting for pressure relief
- Scooting
- Assuming a sitting position from side-lying position
- Reaching for objects that are positioned above and to the side of the patient opposite the side where lateral flexion is desired
- Reaching objects on the floor that is on the side of the patient.

Review of Literature

Susan Ryerson, Nancy N, Byl. David A .Brown; Rita A; Wong, Joseph, M. Hidler (2008)

In their study determined whether trunk position sense is impaired in people with post stroke hemiparesis. 20 subjects with chronic stroke and 21 non neurologically impaired subjects participated and the study results showed that subjects with post stroke hemiparesis exhibited greater trunk positioning error than age matched controls.

Greet Verheyden (2006)

Evaluated trunk performance in non acute and chronic stroke patients by means of the trunk control test and TIS and to compare the TCT with the TIS and its subscales in relation to balance, gait and functional ability after stroke .51 stroke patients participated and the results showed measures of trunk performance were significantly related with values of balance, gait and functional ability.

Methodology

Study Design

Correlational study.

Study Sampling

Convenient sampling.

Inclusion Criteria

1. Patients with either right or left Hemiplegia.
2. Adult hemiplegics of both genders.
3. The person should be able to sit without support for more than 10 sec. (TIS score – >2)
4. Minimum score of 21 on the MMSE.
5. Duration of illness more than 3 months.
6. Medically stable to participate in the study.



7. Patients with single unilateral CVA both due to hemorrhage and infarction of either hemisphere.

Exclusion Criteria

1. Double Hemiplegia.
2. Recent history of low back pain or disorders.
3. Hip prosthesis at the non hemiplegic side.
4. Patients with psychiatric disorders, alcoholism, vestibular, orthopedic and cardio respiratory disorders.
5. Subjects suffering from Hemiplegia from causes other than CVA. E.g. Traumatic Brain Injury.

Instruments Used

Screening Tool

1. Mini Mental Status Examination (MMSE).
2. Trunk Impairment Scale (TIS).

Outcome Measure

1. Functional Independence Measure (FIM)
2. Trunk Impairment Scale (TIS).

Procedure

A total of 30 hemiplegic patients fulfilling the inclusion criteria were recruited from Chandra Physiotherapy center and Freedom care for this study. The patients were explained the purpose of the study and were requested to participate followed by the obtainment of consent form.

The selection of subjects were done by convenient sampling and then divided into two groups (experimental & control group). Pre test were done to measure trunk control, ADL performance. The control group was treated according to Conventional Occupational Therapy, where as experimental group by Conventional occupational therapy combined with trunk control activities. Duration of study was WEEKLY 5 DAYS (6 weeks). Then all the patients were reassessed and the post treatment scores was obtained & statistically analyzed.

Statistical Analysis

Table – I, Pre and Post Test Value of Fim Scale

S.No.	Experimental Group	Control Group
1	12	7
2	16	10
3	18	12
4	16	8
5	12	4



6	12	6
7	14	8
8	6	12
9	9	5
10	20	7
11	15	11
12	14	4
13	15	6
14	17	5
15	16	10

Table – II ,Pre and Post Test Value of TIS Scale

S.No.	Experimental Group	Control Group
1	5	4
2	4	2
3	5	5
4	6	3
5	6	4
6	6	4
7	4	4
8	9	4
9	6	3
10	3	3
11	6	3
12	3	3



13	6	3
14	6	3
15	6	3

Result of Independent t test between the groups (FIM)

Group	Mean	Standard Deviation	Mean Difference	“t” value	Sig.(2-tailed)
Experimental	14.13	3.543	6.467	5.570	0.000
Control	7.67	2.769	6.467	5.570	

In the above table, the independent t test result shows that the comparison between the groups in functional status improvement (FIM). P value is 0.00, which is less than acceptable level of significance 0.05. there is a significant value (0.000) when we compare the pre and post test value of the experimental and control group.

Result of MANN-WHITNEY U Test between the Groups (TIS):

Ranks				
	Group	N	Mean Rank	Sum of Ranks
TIS	1	15	21.67	325.00
	2	15	9.33	140.00
	Total	30		
Ranks				
	Group	N	Mean Rank	Sum of Ranks
TIS	1	15	21.67	325.00
	2	15	9.33	140.00
	Total	30		

*significance at P<0.05

The above Table shows through Mann Whitney U test that the comparison between the groups in Trunk control. P value is 0.00, which is less then acceptable level of significance 0.05. Mann Whitney U test shows the significance difference between the groups in Trunk control.



Result of PEARSON TEST rank between two variables (FIM & TIS)

Descriptive Statistics			
	Mean	Std. Deviation	N
TIS	4.50	1.503	30
FIM	10.50	4.659	30

Correlations			
		TIS	FIM
TIS	Pearson Correlation	1	.717**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	65.500	145.500
	Covariance	2.259	5.017
	N	30	30
FIM	Pearson Correlation	.717**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	145.500	629.500
	Covariance	5.017	21.707
	N	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation test results show that there is a positive significant between trunk control and functional independence. The 2-tailed significant value is 0.000.

DISCUSSION

Stroke patients often show trunk performance deficits in clinical practice. It was the aim of the study to reveal the relationship between trunk control and functional independence in adult stroke patients.

The result of this study showed that experimental group improved better than the control group. Both, experimental and control group had shown significant improvement in post therapy assessment. Control group received conventional therapy based on NDT of bobath the subjects of the experimental group received conventional therapy and trunk control activities based on activity based approach.

Changes in the center of mass or support base due to self-initiated or environmental disturbances require the co-ordinated activity of ankle, knee, hip, and trunk muscles to restore force equilibrium and to preserve balance.

Therefore, postural stability is considered as a prognostic clinical tool for functional recovery in stroke patients. Stroke commonly disrupts that contribute to sitting balance and standing balance. Both trunk and limb muscles are involved in the coordination and regulation of automatic postural responses.

Considering the predictive value of balance on functional outcome in stroke patients, it is reasonable to speculate that trunk muscle might be related to functional disability.



Even mild weakening of trunk muscles in uni-hemispheric stroke patients can interfere with balance, stability, and functional disability.

So, in this study it was found that compared to control group, in experimental group maximum numbers of subjects were significantly improved their performance in daily activities.

Recommendations

Further study can be done

- To find out any probable relationship between postural disturbance and side of paresis.
- Large sample size with balanced representations of both the genders and equal no of both right and left hemiplegics.
- BMI level can be included in inclusion criteria.

Conclusion

Rehabilitation professionals now have the benefit of evidence that motor therapy after stroke can improve motor skills. The improvement in motor skills may have some effect on ADL. However, there is a paucity of evidence regarding the relative efficacy of different kinds of therapy. Even for many of the trails comparing experimental protocols to conventional therapy, the greater effects of the experimental protocols could be attributed to the greater therapy intensity of those protocols. From this result of our study it can be concluded that there is a relationship between trunk control and functional performance in stroke patients.

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