

Correlation between Post Stroke Cognitive Impairment and Activities of Daily Living among Patients with Stroke

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Abstract

A correlational study was carried out to assess the correlation between post stroke cognitive impairment (PSCI) and activities of daily living (ADL) among patients with stroke admitted in a selected multi-specialty hospital in Kerala. 30 stroke patients were selected as sample by non probability purposive sampling method. The tools used for the study were structured interview schedule, Mini Mental Status Examination (MMSE), Modified Barthel Index (MBI) and National Institute of Health Stroke Scale (NIHSS). Data were collected from subjects at three different time points: on admission to the hospital (first phase assessment), one week after admission to hospital (second phase assessment) and on first follow up (third phase assessment). The study found that there was a significant negative correlation between PSCI and ADL of patients with stroke at different time points. The study also revealed that there was a significant change (decrease) in PSCI from first vs. second phase assessment and first vs. third phase assessment. The study also found a significant change (increase) in ADL of patients with stroke on repeated assessments.

Keywords: Post stroke cognitive impairment; Activities of Daily Living; Mini Mental Status Examination; Modified Barthel Index; National Institute of Health Stroke Scale.

Background

Stroke is a global health problem. According to World Health Organization, 15 million people suffer stroke worldwide each year. Of these, five million die and another five million are permanently disabled [1]. Every two seconds, someone in the world suffers a stroke. Every six seconds, someone dies of a stroke. Stroke is the second most common cause of cognitive impairment and dementia [2]. WHO estimates suggest that by 2050, 80 percentage stroke cases in the world would occur in low and middle income countries mainly India and China. By 2015, India will report 1.6 million cases of stroke annually, at least one-third of whom will be disabled [3].

Need and significance of the study

Cognitive impairment may lead to decrease in functional capacity; therefore it affects rehabilitation outcomes in stroke. The smallest amount of stroke necessary to cause cognitive impairment is greater than 10 ml and less than 50 ml, which amount to between one percentage and four percentage of the brain's volume [4].

A program of aerobic and resistance training helps patients overcome cognitive deficits occurring as a result of stroke, shows research presented at the 3rd Canadian Stroke Congress in Calgary, Alberta. A program of aerobic and resistance training helps patients overcome cognitive deficits occurring as a result of stroke, shows research presented at the 3rd Canadian Stroke Congress in Calgary, Alberta. A program of aerobic and resistance training helps patients overcome cognitive deficits occurring as a result of stroke, shows research presented at the 3rd Canadian Stroke Congress in Calgary, Alberta. Activities may be affected by stroke, resulting from

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the impact of paralysis, poor coordination, loss of feeling, lack of awareness or neglect of one side of the body, or difficulty initiating a movement or planning a sequence of movements. Activities of daily living (ADLs) are the activities in which people engage on a daily basis including self-care activities. Initially, it's obvious a patient may not be capable of basic self-care due to a combination of cognitive and physical factors and may be totally dependent upon others to care for them [5].

Problem Statement

A study to assess the correlation between post stroke cognitive impairment and activities of daily living among patients with stroke admitted in a selected multispecialty hospital at Kozhikode city.

Objectives

- Assess the correlation between post stroke cognitive impairment and activities of daily living of patients with stroke.
- Determine the change in post stroke cognitive impairment of patients with stroke on repeated assessments.
- Find out the change in activities of daily living of patients with stroke on repeated assessments.

Hypotheses

- H₁ - There will be a significant correlation between post stroke cognitive impairment and ADL of patients with stroke.
- H₂ - There will be a significant change in post stroke cognitive impairment of patients with stroke on repeated assessments.
- H₃ - There will be a significant change in activities of daily living of patients with stroke on repeated assessments.

Methodology

Research approach

Non experimental research approach

Research Design

Correlational Survey Design

Variables

Research variables

Post stroke cognitive impairment

Activities of daily living.

Setting of the study

The study was conducted in the neurology wards and the neuromedical ICU of a selected multi-specialty hospital in Kerala.

Sample

30 patients with stroke admitted in Baby Memorial Hospital, Kerala.

Sampling technique

Non probability purposive sampling.

Tools

The tools used in the study include:

- Tool 1: Structured interview schedule for collecting demographic data and health related data of stroke patients.
- Tool 2: Mini Mental Status Examination to assess the post stroke cognitive impairment of stroke patients.
- Tool 3: Modified Barthel Index to assess the ability of stroke patients to perform their activities of daily living.
- Tool 4: National Institute of Health Stroke Scale to assess the severity of stroke of patients on admission to the hospital.

Data Collection Procedure

The study was conducted in three phases:

- First phase- On admission, the investigator assessed the PSCI, ADL and severity of stroke of patients by using MMSE, Modified Barthel Index and National Institute of Health Stroke Scale. The structured interview schedule was used to collect the socio demographic and health related data of the stroke patients.
- Second phase – One week after admission to the hospital, the investigator assessed PSCI and ADL of stroke patients.
- Third phase - The above said parameters were again reassessed on the first follow up (one month \pm 2 weeks after the second phase assessment).

Result

Table 1: Correlation between post stroke cognitive impairment and activities of daily living of patients with stroke **n = 30**

Variables	Karl Pearson value	'p' value
MMSE 1 vs. MBI 1	0.475	0.008 *
MMSE 2 vs. MBI 2	0.674	0.000 *
MMSE 3 vs. MBI 3	0.896	0.000 *

*Significance at 0.05 level

Mini Mental Status Examination (MMSE) 1, 2 and 3 and Modified Barthel Index (MBI) 1, 2 and 3 indicate assessment of MMSE and MBI on first, second and third phase.

Data in the Table 1 shows a significant positive correlation between MMSE and MBI scores. In this

study, high cognitive scores indicate low cognitive impairment. As PSCI decrease (MMSE scores increase) with increase in MBI scores, it is concluded that there was a significant negative correlation between PSCI and ADL of patients with stroke on first, second and third phase assessments.

Change in post stroke cognitive impairment of patients with stroke on repeated assessments.

Table 2: Mean, standard deviation and mean percentage scores for post stroke cognitive impairment of patients with stroke **n = 30**

Variables	Maximum possible score	Mean	SD	Mean percentage
MMSE 1	30	14.33	6.728	47.767
MMSE 2	30	17.30	6.075	57.667
MMSE 3	30	19.67	8.314	65.567

The data in the above table shows that there was a significant difference (increase) in the mean scores of MMSE on repeated assessments (first, second and

third phase assessments) which reveals that there was a significant change (decrease) in PSCI on repeated assessments.

Table 3: Summary of Repeated measures ANOVA for post stroke cognitive impairment of patients with stroke **n=30**

Source of variation	Sum of squares	Mean squares	df	F	'P' value
Within group	428.467	308.695	1.388	14.603	0.000

*Significance at 0.05 level

Table 3 reflects that the computed F value of Repeated measures ANOVA for PSCI shows that there was a significant difference in the mean scores of MMSE with repeated observations within the group (F = 14.603, 'p' = 0.000).

Table 4 shows that there was a significant decrease in PSCI in stroke patients from first to second phase assessment and also from first to third phase assessment. ('p' values 0.000, 0.000 at 0.05 levels of significance).

Table 4: Bonferoni test results for pair wise comparison of means of post stroke cognitive impairment scores of patients with stroke at different time intervals **n = 30**

Pair wise comparison	Mean difference	Standard error	'p' value
MMSE1 vs. MMSE 2	2.967	0.611	0.000 *
MMSE 1 vs. MMSE 3	5.333	1.219	0.000 *
MMSE 2 vs. MMSE 3	2.367	1.037	0.090

*Significance at 0.05 levels

Change in ADL of patients with stroke on repeated assessments.

Table 5: Mean, standard deviation and mean percentage scores for ADL of patients with stroke **n = 30**

Variables	Maximum possible score	Mean	SD	Mean percentage
MBI 1	100	27.83	23.731	27.83
MBI 2	100	36.97	26.308	36.97
MBI 3	100	55.93	32.748	55.93

The data in the above table shows there was a significant change (increase) in the ADL of patients with stroke on repeated assessments.

Table 6 reflects that the computed F value of

repeated measures ANOVA for ADL of patients with stroke shows a significant difference in the mean scores of ADL with each of the repeated observations within the group ($F = 21.866$, $p' = 0.000$).

Table 6: Summary of repeated measures ANOVA for activities of daily living of patients with stroke n = 30

Source of variation	Sum of squares	Mean squares	DF	F	'p' value
Within group	12327.622	8609.178	1.432	21.866	0.000 *

*Significance at 0.05 level

Table 7: Bonferoni test results for pair wise comparison of means of ADL scores of patients with stroke at different time intervals n = 30

Pair wise comparison	Mean difference	Standard error	'p' value
MBI 1 vs. MBI 2	29.133	2.903	0.011 *
MBI 1 vs. MBI 3	28.100	5.378	0.000 *
MBI 2 vs. MBI 3	18.967	4.362	0.000 *

*Significance at 0.05 level

Table 7 illustrates that there was a significant increase in ADL of stroke patients on repeated assessments.

Conclusion

There was a significant negative correlation between PSCI and ADL of stroke patients that was present on admission to the hospital and persisted during the second and third phase assessments. There was a significant decrease in PSCI of stroke patients on repeated assessments. There was a significant increase in ADL of stroke patients on repeated assessments.

Implications

Nursing Practice

- Study emphasizes the importance of identifying early PSCI to optimize rehabilitation, care planning.
- Highlights the importance of performing MBI tests to identify the extent of dependence or independence in ADL.

Nursing Education

- Must equip student nurses with the most excellent use of MMSE as a measurement of PSCI.
- Helps to keep the students aware of the PSCI and its correlation with ADL.

Recommendations

- A similar study can be repeated on a large sample size using probability sampling technique.
- A comparative study can be done among stroke patients with and without post stroke cognitive impairment to assess the impact of cognitive impairment on functional outcome in stroke.
- An experimental study can be done on a long term basis to assess whether PSCI persists as time progresses.
- A similar study can be conducted on a long term basis.

Reference

1. Internet Stroke Centre, Stroke statistics, 2011. Available from <http://www.strokecenter.org/patients/about-stroke/stroke-statistics/>.
2. National stroke Association. Participate in World Stroke Day 2011. Stroke Advocacy Network Newsletter, 2004 June 4. Available from: <http://www.stroke.org/site>.
3. Kounteya S. 'India will report 1.6 million stroke cases a year by 2015'. The Times of India online edition. 2010 Mar 21. Available from: <http://timesofindia.indiatimes.com/india/India-will-report-1-6-million-stroke-cases-a-year-by-2015/articleshow/57>.
4. Tur BS, Gursel YK, Yavuzer G, Kucukdevci A, Arasil T. Rehabilitation outcome of Turkish stroke patients: in a team approach setting. Int J Rehabil Res. 2003 Dec; 26 (4): 271-7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/14634361>.

5. Paolucci S, Antonucci G, Troisi E, Bragoni M, Coiro P, De Angelis D. Aging and stroke rehabilitation. a case-comparison study. *Cerebrovasc Dis.* [internet] 2003; 15(1-2): 98-105. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12499718>.
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