

[ORIGINAL ARTICLE]

Test-Retest Reliability of Indian Stroke Scale on Functional Activities in Chronic Stroke Patient**Ms. Jayshree Karnahke¹, Dr. Pallavi Jadhav (PT)², Dr. Sakshi Thorat (PT)³**¹ Under Graduate Student, ²Professor & HOD, ³Post Graduate Student, Department of Neuro Physiotherapy, Maharashtra Institute of Physiotherapy, Latur, Maharashtra, India**ABSTRACT :**

Background: Stroke is a neurological deficit which attributes to acute focal injury of CNS caused by loss of blood supply to brain. Indian Stroke Scale, recently invented scale to assess the participation of daily activities in stroke patients. Hence, this study was done to evaluate the reliability of Indian Stroke Scale on functional activities in chronic stroke patients.

Method: 30 chronic stroke patients were selected and screened through study criteria. The procedure was explained and written consent was taken. Scores of Indian Stroke Scale was taken pre and post treatment session.

Result: Statistical analysis reveals the correlation of 0.996. The level of significance of all subscales was 0.000. Since, the correlation value was between the 0.8 - 1, there was a strong positive correlation.

Conclusion: The study concluded that the Indian Stroke Scale is highly reliable.

Keywords: *Indian Stroke Scale, Chronic Stroke, Stroke, Correlation, Disability, Reliability*

Introduction

The World Health Organization (WHO) defined Stroke as rapidly developed clinical signs of focal disturbance of cerebral function, lasting more than 24 hours or leads to death with no apparent cause other than of vascular origin¹. The latest estimate from the Global Burden of Disease injuries and risk factor study (GBD 2015) revealed that stroke is currently the most leading cause of death in worldwide. Ischemic heart disease and stroke together accounted for 15.2 million deaths (15-15.6 M) in 2015. The literature till date revealed that the burden of stroke in people less than 65 years has increased over the last few decades. So, the incidence has increased by 25% among adults aged 20 to 64 years worldwide. Some studies showed that about 12% of strokes occur among the population younger than 40 years⁽²⁾.

Cerebrovascular accident [CVA] can also be defined as the sudden loss of neurological function caused by an interruption of the blood flow to the brain. Strokes can be classified according to etiological categories (thrombosis, embolus and haemorrhage), affected

specific vascular territory (anterior cerebral artery syndrome, middle cerebral artery syndrome and posterior cerebral artery syndrome) and management categories (transient ischemic attack, minor stroke, major stroke, deteriorating stroke and young stroke). But there are particularly two types of strokes, ischemic stroke and haemorrhagic stroke, which are commonly studied. Ischemic stroke usually affects about 80% of individuals. It results when a clot blocks or impairs blood flow and reduces essential oxygen and nutrients to brain. Haemorrhagic stroke happens when blood vessels rupture, causing leakage of blood in or around the brain. It affects the remaining 20% of individuals. Clinically, a variety of focal deficits are possible, like changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual, and language functions. To be classified as stroke, neurological deficits must persist for minimum 24 hours. Motor deficits are characterized by paralysis or weakness, typically on the side of the body opposite to the side of the lesion. The term hemiplegia is often used to refer to variety

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of motor problems that are outcome of stroke. The severity of neurological deficits in an individual depends on the location and the extent of brain injury, the amount of collateral blood flow and early acute care management received. Impairments of stroke may resolve voluntarily within 3 weeks as brain swelling subsides (reversible ischemic neurological deficit). The residual neurological impairments are those that last longer than 3 weeks and can lead to long-term disability⁽³⁾.

Stroke leads to opposite side paralysis or paraparesis, that is, weakness of upper and lower extremity. Other manifestations of stroke include altered consciousness, visual impairments, speech difficulties, bowel and bladder incontinence, intellectual deficits, behavioral problems, balance impairment, gait impairments and many more. Balance and gait impairments are proven to be the major issue after stroke in patients⁽³⁾. All the above impairments lead to difficulty in performing daily activities/tasks like getting up and sitting down, toileting activities, stair climbing up and down, etc., which affect the life style of the patients.

There are many assessment tools which can be used to determine the extent of impairment. For example, Glasgow Coma Scale (GCS), Mini Mental State Examination (MMSE) scales to assess the level of consciousness, Berd Balance Scale (BBS) for balance assessment, Dynamic Gait Index (DGI) to assess the gait impairments and many more. But there are very few assessment tools to assess the functional ability of the stroke patients. And there are further less scales to assess the functional ability of stroke patients in Indian sociocultural contexts^(2,3).

In December 2020, V. Prakash and Mohan Ganeshan invented a scale “Indian Stroke Scale” to assess the functional ability of post stroke patients. The scale consists of 25 tasks. Patients are supposed to rate their ability to do the respective task from 1-5. 1 indicated completely limited, 2 a lot limited, 3 somewhat limited, 4 a little limited and 5 not at all limited. At the end, total score is calculated. Higher the score, higher is the functional independence and vice versa^(4,8).

V. Prakash and Mohan Ganeshan had conducted the study in stroke patients of Gujarat. The reliability of the scale, they found by doing study in Gujarat, was 0.445,⁽⁹⁾. They did not conduct further studies to evaluate the reliability of the scale in other parts of India. So, it is necessary to find the reliability of the

Indian Stroke Scale in other parts of India to Validate the scale all over the country.

Hence, this study evaluated the reliability of the Indian Stroke Scale in post stroke patients in Latur city.

Materials And Methodology

A total of 30 patients from Neurosciences OPD of Maharashtra Institute of Physiotherapy, Latur had participated in this study. Inclusion criteria for this study were 1. Chronic stage stroke patient diagnosed from medicine dept OPD [Haemorrhagic and Non-Haemorrhagic]; 2. Both Genders; 3. First time stroke patient; and 4. Age group between 45 to 60 years. Exclusion criteria were 1. Uncooperative patient; 2. Mentally ill patient; 3. Patient suffered from other serious pathological disease [example –tumor]; and 4. Patient unwilling to participate.

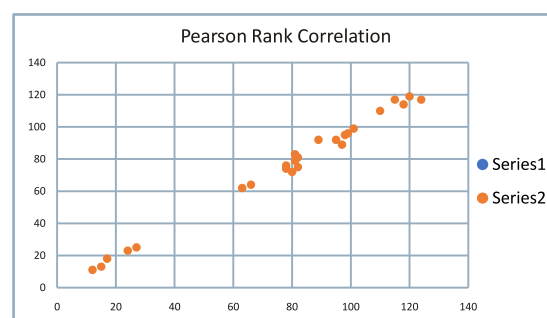
This study was approved by Maharashtra Institute of Physiotherapy, Latur ethical committee. Participants were screened and were selected in accordance to inclusion and exclusion criteria. An informed consent was taken from each participant. An explanation of the study was given to each participant.

The Indian Stroke Scale was used to assess the extent of impairment or the functional ability of the patient. The Indian Stroke Scale Score was taken before and after the treatment of all the participants. It was recorded as observation 1 and observation 2, respectively. The collected data was recorded in excel sheet. Statistical analysis was done using Pearson Correlation.

Data Presentation, Analysis And interpretation

Table 1: Shows correlation of sums of observation 1 and observation 2

Covariance	1145.55
r	0.99
p	< 0.001



Graph 1: Shows correlation of sums of observation 1 and observation 2

Result :

The value of p was 0.001 and of r was 0.996. It indicates that there was a strong positive correlation. There is significant reliability of Indian stroke scale in Indian socio-cultural context.

Discussion :

Stroke is a condition in which there is loss of functional activities. Patients' face difficulty in doing their daily activities⁽³⁾. The present study assess the functional activities of the patient in Indian context with the help of Indian Stroke Scale. Hence, the purpose of the study was to evaluate the inter-rater reliability of Indian Stroke Scale.

The Indian Stroke Scale measures functional status, that is, the extent of a person's participation in daily activities both at home and in the community having stroke within Indian sociocultural context. In this scale, the items are generated from a well-defined conceptual framework of post stroke outcomes relevant to patients living in India. The domains of functioning are mobility, self-care and domestic life^(4,6).

V. Prakash and Mohan Ganeshan in December 2020 invented this scale to assess the functional activities of the patient. They had done this study on stroke patient in Gujarat and concluded that reliability of this scale is 0.44 which is not highly reliable^(8,9).

The present study was aimed to determine the inter-rater reliability of Indian Stroke Scale in stroke patients of Latur city. The data analysis and statistical inference has reinforced the reliability of Indian Stroke Scale.

In the present study, the correlation was calculated to find out the reliability of the Indian Stroke Scale in Stroke patient of Latur city. Statistical analysis reveals that correlation co-efficient, r , was 0.996 and the level of significance, p , was 0.001. Since the value of r is between 0.8-1, it was very strongly correlated.

There are many other scales to measure the functional activities of stroke patient. Some examples of such scales are Barthel Index, Fugl-Meyer Assessment motor scale, Katz scale for Stroke, mobility scale for stroke and many more.

The Barthel index scale is an ordinal scale used to measure performance in activities of daily living having reliability of 0.8493,⁽⁷⁾.

The Fugl-Meyer assessment [FMA] is a stroke specific, performing based impairment index. It was

designed to assess motor functioning, balance, sensation and joint functioning in stroke patients. This scale has the reliability of 0.99 which is highly reliable^(3,5).

The Kartz Activities of Daily Living [ADL] scale is a widely used graded scale that assesses six primary and psychosocial functions that are bathing, dressing, toilet, transferring, feeding and continence. The reliability of this scale is 0.743.

Another new Mobility Scale for Stroke Patient was developed to specifically discriminate between the lower levels of mobility found in acute stroke patients in first two weeks post onsets. The reliability of this is 0.80.

All the above scales are proven to be reliable to assess the functional activities of the stroke patients. But for providing a better management we must evaluate the patient with a good validity and reliability of the scale⁽¹⁰⁾.

The Indian Stroke Scale is having the reliability of 0.99 which is more reliable as compared to the other scales. The features included in this scale for assessing the patient are more reliable and easier for the patient to do.

Hence, this study reveals that The Indian Stroke Scale is highly reliable, in assessing the functional mobility/ activities in stroke patients.

Conclusion

This study concludes that Indian Stroke Scale have significant inter-rater reliability in assessing functional activities of daily living in chronic stroke patients. We recommend this scale for students and researchers as a tool to assess functional activities in stroke patients.

Hence, the Indian Stroke Scale is reliable for assessing the functional activities in stroke patients.

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Conflict of Interest: no conflict

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Indian Stroke Scale

During the past 2 weeks, to what extent do you feel limited in doing following activities?	
1. completely limited	
2. a lot limited	
3. somewhat limited	
4. a little limited	
5. not at all limited	
I. Get out of bed	
II. Stand without support for 5 min	
III. Stand up from an armchair	
IV. Stand up from a low or soft couch	
V. Move around inside your home	
VI. Walk outside of your home	
VII. Walk on slippery ground	
VIII. Walk a long distance such as kilometer or for 10-15 min	
IX. Walk fast for a short distance	
X. Climb stairs or steps	
XI. Toileting	
XII. Taking a bath	
XIII. Getting dressed	

XIV. Eating with preferred hand	
Are following activities important to you, if yes, during the past 4 weeks to what extend 1. completely limited 2. a lot limited 3. somewhat limited 4. a little limited 5. not at all limited	
XV. Pour liquid from a bottle	
XVI. Reach and retrieve object	
XVII. Sit down on floor and get up	
XVIII. Wash dishes and utensils	
XIX. Prepare a meal	
XX. Clean your house	
XXI. Wash clothes by hand	
XXII. Carry a bag of groceries	
XXIII. Travel in a public transport	
XXIV. Attend social ceremonies	
XXV. Visit friends or neighbors	