

FUNCTIONAL DISABILITY IN STROKE SURVIVORS

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ABSTRACT

Introduction: Stroke is an important cause of premature death and disability in the low-income and middle-income countries like India and China requiring partial or complete assistance to carry out activities of daily living. Advances in treatment of stroke have reduced the mortality rates, but functional disabilities still continue to be a burden. **Objective:** To assess functional disabilities among stroke survivors. **Materials and Methods:** A Quantitative descriptive study among 50 stroke survivors attending the stroke OPD of a tertiary care hospital using convenient sampling. The functional disability was assessed using Modified Barthel Index (MBI) in which the scores measure from disability (00) to ability (100). It measures 11 functions that are important for independent living. It includes feeding, bathing, grooming, dressing, bowel and bladder continence, toileting, transfer, mobility and stair use. Data was collected from stroke survivors attending OPD based on the sample selection criteria. **Results:** The study has shown dependency in nearly 50% of the sample (4% were totally dependent, 8% severely dependent and 36% moderately dependent). Among the 11 areas of functional disabilities assessed, bladder control (92.2%) and bowel control (88%) were found to be better while dressing (76%) and stair climbing (77.4%) were poor. **Conclusion:** The study highlights that in spite of the improved health services, the severity of functional disabilities among stroke survivors after a month seems to be relatively high in India than Western countries. It brings attention towards more community centred rehabilitation services and peer group support to attain functional restoration, family and social reintegration.

Key words: Functional disabilities stroke survivors, ADL

INTRODUCTION

Stroke is a chronic neurological disease and the major cause for loss of life, limbs and speech in patients' lives. It is the second leading cause of mortality and disability worldwide (WHO).¹ Of all the neurological conditions, stroke may lead to the longest-term disability.² The World Health Organization (WHO) predicts that disability adjusted life years (DALYs) lost to stroke will rise from 38 million in 1990 to 51 million in 2020.³

Unfortunately, most of the studies on stroke were focused on the mortality rates that were found to be decreasing⁴. But high disability rates found among stroke survivors with devastating physical and social consequences have made it a global public health challenge⁵.

Surviving a stroke can be a long-term process that affects many aspects of a person's life. In fact, stroke is a leading cause of significant disability in the USA, with approximately 700,000 people experiencing a new or recurrent stroke each year.⁶ From the early 1970s to the mid-1990s the estimated number of stroke survivors increased from 1.5 to 2.4 million.⁷

Low- and middle-income countries account for approximately 75% of global stroke deaths and 81 percent of stroke-related disability.⁸ WHO estimates that by 2050, 80% of stroke cases in the world would occur in low and middle income countries mainly India and China.⁹ In India, the hike is largely due to demographic changes and by the increasing prevalence of the key modifiable risk factors like DM, hypertension etc. which are poorly controlled.¹⁰ Stroke in India has important global implications since an estimated 13.3% of global DALYs lost due to stroke occurred in India.¹¹ Stroke is one of India's leading causes of morbidity and mortality, with an estimated adjusted prevalence rate of stroke ranging from 84 to 262 per lac in rural areas to 334 to 424 per lac in urban areas.¹² According to recent population based research, the incidence rate of stroke in India is 119 to 145 per lac.¹³

It is estimated that 25% to 74% of the 50 million stroke survivors in the world have some physical, cognitive or emotional deficiency, and require partial or complete assistance to carry out activities of daily living (ADL).¹⁴

The types and degrees of disability that follow a stroke depend upon the area of the brain being damaged. Generally, stroke can cause five types of disabilities: paralysis or problems controlling movement, sensory disturbances including pain, problems related to using or understanding language, problems with thinking and memory and emotional disturbances. Paralysis is one of the most common disabilities resulting from stroke. Sensory deficits may also hinder the ability to recognize objects that the patients are holding and can be severe enough to cause loss of recognition of one's own limb. One-fourth of all stroke survivors experience language impairment involving the ability to speak, write, and understand. Stroke survivors may have dramatically shortened attention spans or may experience deficits in short term memory. Psychological trauma of stroke may cause fear, anxiety, frustration, anger, sadness and a sense of grief for their physical and mental losses.¹⁵

Cerebral oedema is the most frequent cause of death in acute stroke and the characteristic of large infarcts involving the middle cerebral artery and the internal carotid artery. A stroke can have effect on many body functions including motor activity, bladder and bowel elimination, intellectual function, spatial perceptual alterations, personality, sensation, swallowing and communication. The function affected are directly related to the artery involved and area of the brain it supplies.¹⁶

International research has addressed the functional disabilities after stroke but in India the studies are limited. Stroke is a sudden event and it affects the individual and the family who, in general, are not prepared to deal with its sequelae. The functional disability due to stroke is responsible for a large portion of retirement due to disability.¹⁷

The patients with physical and/or mental sequelae require dynamic continuous, progressive rehabilitation, to attain functional restoration, family community and social reintegration.¹⁸ The study conducted in patients who had experienced a stroke showed major compromise in the domains immediately after stroke, and during the rehabilitation showed improvement in some domains.¹⁷

Health services to the stroke survivors with functional disabilities in the community can be planned only on the basis of a sound knowledge on the extent (severity) and areas of functional disabilities present in these patients. A detailed assessment of stroke survivors using a standardised scale was considered appropriate by the investigators to determine what these patients can do and where they require assistance.

MATERIAL AND METHODS

A Quantitative descriptive study among 50 stroke survivors attending the stroke OPD of a tertiary care hospital using convenient sampling. The functional disability was assessed using Modified Barthel Index (MBI) (Shah version).

Sample Size was estimated using the formula $n = 4pq/d^2$ where n is the sample size, p is prevalence %, q is 100-p and d is allowable error at 10% of prevalence. The minimum sample size was calculated 20. A total sample of 50 was taken for the study for better generalization of the findings.

Sample selection criteria

Inclusion Criteria

Stroke survivors after four weeks after stroke.

Subjects who were able to speak English or Malayalam.

Subjects belonging to the age group of 30-80 years.

Exclusion Criteria

Stroke survivors who were critically ill.

Data Collection Instruments

Tool 1: The demographic and clinical data (self developed questionnaire).

The demographic data included were age, sex, marital status, type of family, education and occupation and the clinical data included type of stroke, co-morbidities and date of stroke occurrence. The clinical data was collected from discharge summary of the patients from medical record.

Tool 2: Modified Barthel Index - Shah version (MBI)

Modified Barthel index is a standardized ordinal scale to measure performance in activities of daily living (ADL) with a reliability- 0.89, internal consistency - 0.96-0.99 and concurrent validity - 0.993. The scoring system in Barthel index is that it measures from disability (00) to ability (100). The MBI measures 11 functions that are important for independent living. It includes feeding, bathing, grooming, dressing, bowel and bladder continence, toileting, transfer, mobility and stair use. Each function has five questions. Items are weighed and scored according to the subjects' perceived importance. Higher scores indicate better performance. The maximum score of 100 indicates full independence. The score ranges from 0-100. The scoring is as follows - Total dependence 00-20, Severe dependence 21-60, Moderate dependence 61-90, Slight dependence 91-99 and Independence 100.

Data was collected from stroke survivors attending OPD based on the sample selection criteria.

Ethical clearance

Ethical clearance was obtained from the Institutional Ethical & Scientific Review Committee. Permission was taken from the Head of the Department, Stroke of the tertiary care hospital. Informed written consent was obtained from each subject before data collection.

Theoretical Framework

Orem's theory of self-care deficit was used as the theoretical framework of the study. The assessment of activities of daily life (ADL) in the study has been done using Modified Barthel Index with a view to get direction to be adopted by the nurses to provide nursing care to the self-care agency.

Pilot Study, Data Collection Procedure and Data Analysis

A pilot study was conducted among ten subjects according to the sample selection criteria to find out the feasibility of the study, after which the data collection for the main study was done. The subjects took around 20-30 minutes to complete the questionnaire. The demographic data was collected from the subjects and their care takers and the clinical data was obtained from their discharge summary. The data analysis was done using SPSS version 20.

RESULT AND DISCUSSION

Table 1: Distribution of the subjects based on demographic variables

n=50

| Demographic Variable | f | % |
|----------------------|----|----|
| Age in years | | |
| 30-44 | 6 | 12 |
| 45-60 | 24 | 48 |
| >60 | 20 | 40 |
| Gender | | |
| Male | 39 | 78 |
| Female | 11 | 22 |
| Marital status | | |
| Single | 1 | 2 |
| Married | 47 | 94 |
| Widow/ widower | 2 | 4 |

| | | |
|----------------------|----|----|
| Living status | | |
| With family | 49 | 98 |
| With friends | 1 | 2 |
| With caregiver | 0 | 0 |
| Institutionalized | 0 | 0 |
| Alone | 0 | 0 |
| Education status | | |
| Primary education | 34 | 68 |
| Secondary education | 6 | 12 |
| Graduate | 6 | 12 |
| Post graduate | 4 | 8 |
| Demographic Variable | f | % |
| Occupational status | | |
| Professional | 5 | 10 |
| Unskilled worker | 8 | 16 |
| Skilled worker | 6 | 12 |
| Unemployed | 20 | 40 |
| Retired | 11 | 22 |

The above table shows that nearly half (48%) of the sample were between 45-60years. Majority were males and were living with their family (78% and 98% respectively). Majority of the subjects (68%) had only primary education.

Table 2: Distribution of subjects based on the clinical data

n = 50

| Clinical Variables | f | % |
|--------------------------|----|----|
| Co morbidities* | | |
| Hypertension | 39 | 78 |
| Diabetes mellitus | 12 | 24 |
| Coronary artery diseases | 3 | 6 |
| Other | 4 | 8 |
| Nil | 4 | 8 |

| Number of co morbidities | | |
|--------------------------|----|----|
| Nil | 7 | 14 |
| One | 29 | 58 |
| Two | 13 | 26 |
| Three | 1 | 2 |

* Multiple responses

Hypertension was the co morbidity found in 78% of the subjects. One or more co morbidities were present in 86% of subjects.

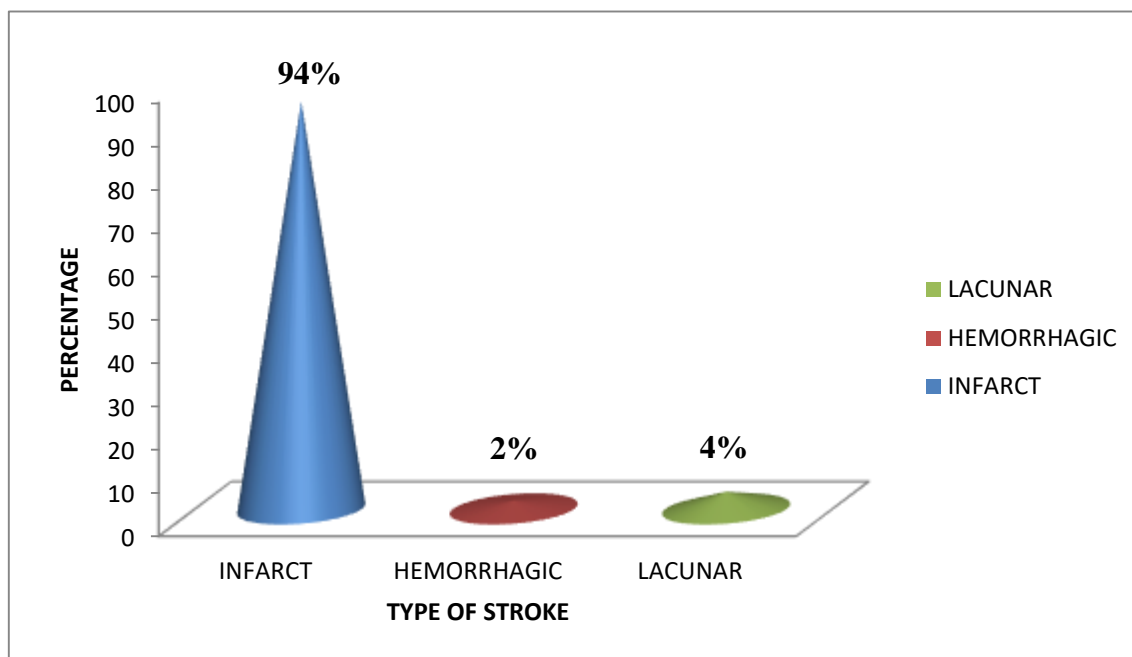


Figure 1: Distribution of subjects based on the type of stroke

The type of stroke as evidenced from the medical record in majority (94%) of subjects was infarcts.

Table 3: Distribution of subjects based on the mean score of function wise disabilities

n =50

| Sl .No | Function wise disabilities | Maximum score | Mean Score | % |
|--------|----------------------------|---------------|------------|-------|
| 1 | Chair/ bed transfer | 15 | 13.12 | 87.98 |
| 2 | Ambulation | 15 | 12.52 | 83.44 |
| 3 | Ambulation/wheel chair | 5 | 0 | 0 |
| 4 | Stair climbing | 10 | 7.74 | 77.4 |
| 5 | Toilet transfer | 10 | 8.24 | 82.4 |
| 6 | Bowel control | 10 | 8.8 | 88 |
| 7 | Bladder control | 10 | 9.22 | 92.2 |
| 8 | Bathing | 5 | 4.32 | 85 |
| 9 | Dressing | 10 | 7.6 | 76 |

| | | | | |
|----|------------------|----|------|------|
| 10 | Personal hygiene | 5 | 4.12 | 82 |
| 11 | Feeding | 10 | 8.64 | 86.4 |

Among the 11 areas of functional disabilities assessed, bladder control (92.2%) and bowel control (88%) were found to be better while dressing (76%) and stair climbing (77.4%) were poor.

Table 4: Distribution of subjects based on the severity of the functional disabilities

n = 50

| Severity of the Functional Disabilities | f | % |
|---|----|----|
| Total dependence (0-20) | 2 | 4 |
| Severe dependence (21-60) | 4 | 8 |
| Moderate dependence (61-90) | 18 | 36 |
| Slight dependence (91-99) | 12 | 24 |
| Independence (100) | 14 | 28 |

The above table depicts the severity of the functional disabilities in terms of dependence versus independence. Only 28% of the subjects were totally independent at the time of the study.

DISCUSSION:

The present study on assessment of functional disabilities among 50 stroke survivors (39 males and 11 females) has shown dependency in nearly 50% of the sample (4% were totally dependent, 8% severely dependent and 36% moderately dependent). This finding on functional disabilities is in contrary to the results of the study conducted on the functional status and disability in patients after acute stroke among 175 patients in Brazil (Fidel Lopez, Juan Diego 2016) where the percentage of totally independent survivors after stroke was quite high (86%). But the percentages of totally dependent subjects in both the studies were the same (4%). However, it is worth noting that the functional disability was assessed in the present study after a month where as it was assessed in the other after six months of stroke.¹⁹

A study conducted in Germany on the Assessment of functioning and disability after ischemic stroke on 4264 patients by Wemier C. and Kurth T. after 100 days of stroke found that 4% had died, 50.7% had regained functional independence, 46.3% had no or mild residual symptoms.²⁰ The above study also has shown better improvement in functional disabilities than the present study. Again the time of data collection after the stroke in the review study is worth noting i.e. 100 days after stroke.²¹

A prospective cohort study on Disability Status and Its Influencing Factors Among Stroke Patients in Northeast China by Yumei Lv et al at inpatient rehabilitation in Northeast China on 522 subjects using the Modified Barthel Index found a disability decrease from 63.8% to 46.7% at 3-year follow-

up.²² Unlike China, in India, majority of stroke survivors are cared for by relatives in the joint family. Usually they receive family support from care givers during their process of recovery. The present trend from joint families to nuclear families in India especially in Kerala has presented a challenge in the care of the elderly stroke survivors. Hence the differences in health resources, economic status, and available rehabilitation services in varying regions could be the reasons for variations in study results.

Among the 11 areas of functional disabilities assessed using Modified Barthel Index, bladder control (92.2%) and bowel control (88%) were found to be better in this study while disabilities related to dressing (76%) and stair climbing (77.4%) were worse. This is in contrast with the Brazilian study conducted by Fidel and Juan in which bladder control was most affected.¹⁹

The cohort study conducted in Dallas, U.S by Glen E, Margaret K. (1998) on the survival and functional status twenty or more years after first stroke has shown entirely different results. Functional levels of 148 stroke survivors and 148 control subjects from the Framingham study cohort were studied. Twenty plus year stroke survivors experienced a greater mortality than age-and sex-matched controls (92.5% and 81% respectively). The slopes of the two survival curves were essentially the same. Functional status (e.g. walking and independence in activities of daily living) of stroke survivors, however, compared very favourably with that of control subjects. This may be because of an improvement in independence over a period of twenty years. The relatively high percentage of functional disabilities found in the present study may be due to limitation that only one-time assessment of the functional disabilities immediately after a month among the stroke survivors.²³

An Indian Study by Raju RS, Sarma PS, Pandian JD (2021), had shown that all domains of quality of life (QoL) had a positive correlation with Functional Independence Measure (FIM) score i.e, patients with impaired QoL were likely to be functionally dependent. The study also observed that the older stroke patients were more likely to be functionally dependent.²⁴

Eight themes were emerged from a qualitative study conducted in India on stroke survivors and caregivers (Tiwari S, Joshi A, Rai N, Satpathy P – 2021). One of the theme was multifunction loss and dependency.²⁵ The findings of the present study is reinforced with the emerged theme of the qualitative study.

It is recommended that all patients with stroke receive a comprehensive multidisciplinary assessment to determine their rehabilitation needs when they return to communities or home. Community health workers play an essential role in promoting rehabilitation and facilitating care transitions for post-stroke patients with disability.²⁶

Under the prevailing circumstances of our country, it would be a most important option to think about the social support groups that are expected to play a very big role in a patient's recovery to routine life. Peer support also empowers stroke survivors emotionally and make them think that they are not alone in their life. A number of research studies have noted benefits for both the person receiving support and the person providing support. Its impact would be far reaching as the scientific community is aware of the psychosomatic relationship which can do miracles in enhancing the functional ability of the stroke survivor.²⁷

CONCLUSION

The study highlights that in spite of the improved health services, the severity of functional disabilities among stroke survivors after a month seems to be relatively high in India than Western

countries. It draws attention towards the need for better community centred rehabilitation services, peer group support to attain functional restoration, family and social reintegration.

Conflict of interest

Authors declare that there are no conflicts of interest.

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