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Correlation between Functional Independence, Depression Anxiety and Community Integration in Subjects with Post Stroke Hemiparesis

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ABSTRACT

Stroke is the rapid loss of brain functions due to disturbance in the blood supply to the brain. It is a major cause of long term disability. Stroke survivors show a variety of physical and psychosocial problems, which can affect their reintegration into the community. This study explored the association of community reintegration with motor function in form of functional independency and Post Stroke Depression (PSD) and anxiety. Sixty post stroke survivors (both acute & chronic stage) with mean age of 58.3 ± 7.8 years participated in this study, in which 36 were male and 24 were female taken from Neuro-rehabilitation OPD of SBB College of Physiotherapy, VS and SVP hospital campus. Functional Independency was assessed by Functional Independence Measure (FIM) Scale, PSD and Anxiety by the Depression, Anxiety, Stress Scale (DASS), and Community Reintegration by the Community Integration Questionnaire (CIQ). Data analysis was done. Results show that there is Strong Positive correlation between FIM and CIQ ($r = 0.861$, $p < 0.05$), Strong Negative correlation between FIM and DASS ($r = - 0.849$, $p < 0.05$) and Strong Negative correlation between DASS and CIQ ($r = - 0.819$, $p< 0.05$) in subjects with post stroke hemiparesis. This study concluded that the higher the Functional Independence, the higher community reintegration, and the lower the PSD and anxiety. Functional independence and depression are factors that influence community reintegration and should be assessed and adequately treated before stroke survivors' return to the community.

Key Words: Community Reintegration, Functional Independence, Depression, Rehabilitation, Stroke.

INTRODUCTION

Stroke is defined by the World Health Organization as a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin[1]. Stroke is classified broadly into three categories; Ischemic Stroke occurs due to blockage of blood vessel which limits the blood supply to the brain whereas Haemorrhagic stroke occurs due to rupture of blood vessel leading spillage of blood in the intracranial cavity, depending on the site of blood spillage the haemorrhagic stroke could be classified as intracerebral haemorrhage or subarachnoid haemorrhage[2]. Stroke is the second most common cause of mortality and third most common cause of disability worldwide[3]. India has the highest burden of acute coronary syndrome (ACS) in the world and the three most common risk factors for ACS are smoking (40%), high blood pressure (38%), and diabetes (30%)[4]. Overall prevalence of stroke ranges from 147–922/100,000 in various studies[5]. Stroke survivor will live with severe motor, sensory, and cognitive limitations so to

depend entirely on their family. Stroke can result in a complex matrix of physical, communication, cognitive, and emotional impairments that limit a person's ability to perform basic activities of daily living or participate in the community[6].

Physical Impairment has immense impact on community reintegration of stroke patients and emotional alterations are very frequent after stroke[7]. In the study by Carter et al two factors that contributed most to impairment of community reintegration were depression and physical disability[8]. Moreover, home rehabilitation intervention has been shown to induce motor and functional gains, which translate into a greater degree of higher-level function and satisfaction with community reintegration[9].

Mood disorder may be a specific complication of stroke, and failure to recognize and treat the disorder may be an important unmet need of survivors of stroke[10]. Depression manifests itself as a combination of feelings of sadness, loneliness, irritability, worthlessness, hopelessness, agitation, and guilt accompanied by an array of physical symptoms. It is the most common mental health condition after stroke[11] and has been linked to worse functional outcome, slower recovery, and lower quality of life. Depression affects 25-40% of patients within the 1st year after a stroke and is most evident within the first 2 years post stroke[12]. Some studies have suggested that stroke and depression often occur together. Depression also has potentially long-lasting impact on functioning among stroke survivors[13].

Community reintegration is one of the most important elements of stroke rehabilitation and likely the most underestimated area[14]. It has been defined as the reorganization of physical, psychological and social characteristics so that the individual can resume well-readjusted living after incapacitating illness. It is also the term used to refer to returning to the mainstream of family and community life, engaging in normal roles and responsibilities, actively contributing to one's social groups and the society as a whole[15]. Self-perceived participation in community activities represents an individual's perception of and satisfaction with his or her involvement in life situations. Many people with stroke have a low level of satisfaction with community reintegration after they are discharged from the hospital and return to the community[16]. The effects of some stroke-related factors (e.g., physical impairments and mental status) on satisfaction with community reintegration have been examined in some studies[17].

Motor impairment is a frequent complication after stroke. The ability of patients to live independently after stroke depends largely on the reduction of motor impairment and the recovery of motor function. Stroke survivors have residual neurological deficits that persistently impair function. Impairment of motor function often involves paralysis or paresis of the muscles on the side of the body contralateral to the side of the lesion. In the stroke survivor population, 50% have some level of hemiparesis, 30% are unable to walk without some assistance and 20% are dependent in activities of daily living. The result of this disability is a significant impact on independence, quality of life, and lost productivity[18]. Stroke rehabilitation is a complex field that covers a wide continuum of care from the acute phase of stroke to community reintegration. However, community reintegration, being an important aspect of stroke rehabilitation, has received relatively less attention from clinicians and researchers. This study therefore aimed to determine the association of community reintegration with motor function and post-stroke depression (PSD).

MATERIAL AND METHODOLOGY

The study was conducted in the Neuro-rehabilitation OPD of SBB College of Physiotherapy, SVP and VS Hospital of Ahmedabad. Informed consent from all Participants was taken. The estimated sample size was 52. The inclusion criteria of this study were: Age of 35 to 75 years of

either gender, Post stroke (both acute and chronic), both ischemic and hemorrhagic stroke, Able to understand simple questions. Subjects with auditory, visual and perceptual deficits were excluded. n=60 Post Stroke Hemi paretic Subjects aged of 35 to 75 (mean, 58.3 ± 7.8), M: F=36:24, acute: chronic =18:42 were selected as per selection criteria. After taking their demographic details and preliminary physical assessment they were examined for independent functional ability using Functional Independence Measurement Scale (FIM), Community Participation using Community Integration Questionnaire (CIQ) and Post Stroke Psychological Disturbances using Depression, Anxiety, Stress Scale (DASS) by asking interview based questions to the Participants.

OUTCOME MEASURES

FUNCTIONAL INDEPENDENCE MEASURMENT SCALE (FIM)

The Functional Independence Measure (FIM) scale was developed as a measure of disability for a variety of populations. Designed to assess areas of dysfunction in activities that commonly occur in subjects with any progressive, reversible or stable neurologic, musculoskeletal, or other disorder like patients with functional mobility impairments. Includes measures of independence for self-care, including sphincter control, transfers, locomotion, communication, and social cognition. Is an 18-item, seven-level, ordinal scale intended to be sensitive to changes over the course of a comprehensive inpatient medical rehabilitation program. Uses the level of assistance an individual needs to grade functional status from total independence to total assistance. Each item is scored on a 7 point ordinal scale, ranging from a score of 1 to a score of 7. The higher the score, the more independent the patient is in performing the task associated with that items.

Inter-Rater Reliability of FIM has been established at an acceptable psychometric performance (Interclass co-relation coefficients ranging from 0.86 to 0.88). The concurrent validity (ICC > 0.83) have shown strong construct validity on the FIM[19].

COMMUNITY INTEGRATION QUESTIONNAIRES (CIQ)

CIQ Contains 15 items assessing community integrations across three domains: Home integration (e.g. meal preparation, Housework, child care), Social integration (e.g., shopping, visiting friends, leisure activities), Productive activity (e.g., full versus part-time work, school, volunteer activities). Total scores can range from 0 to 29 points: Home integration (10 points), Social interaction (12 points), Productive activity (7 points).Most items range from 0 to 2 points. High scores represent greater independence and community integration. Excellent test-retest reliability (ICC = 0.96)[20].

DEPRESSION, ANXIETY AND STRESS SCALE (DASS)

The Depression, Anxiety and Stress Scale - 42 Items (DASS-42) is a set of three self-report scales designed to further the process of defining, understanding, and measuring the ubiquitous and clinically significant emotional states of depression, anxiety and stress[21]. DASS-42 has 14 items in each domain. There are three components of the scale: Depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, and lack of interest /involvement. Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. Stress scale assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. It is a patient-reported questionnaire with scoring from 0-3. The total scoring is 126 for the DASS-42. Excellent test-retest reliability (r=0.71-0.81)[22].

STATISTICAL ANALYSIS

Data analysis for 60 subjects was done by SPSS version 20 and Microsoft excels 2019. Data was screened for Normality using Kolmogorov Smirnov normality test. Data was found to be not normally distributed, so nonparametric Spearman correlation coefficient test was used to found associations between various scales keeping level of significance at 5 %.

RESULTS

n=60 Post Stroke Hemi paretic Subjects aged of 35 to 75 years (mean, 58.3 ± 7.8), M: F=36:24, acute: chronic =18:42 post stroke hemi paretic subjects were obtained. Study Results of all Post Stroke Hemi paretic Subjects showed Strong positive correlation between FIM and CIQ, Strong negative correlation between FIM and DASS and Strong negative correlation between DASS and CIQ.

DEMOGRAPHIC DETAILS OF PARTICIPANTS	
GENDER	n (%)
Male	36 (60%)
Female	24 (40%)
Post Stroke Subjects	
Acute	18 (25%)
Chronic	42 (75%)
Post Stroke Duration	
Acute (Mean)	4.63
Chronic (Mean)	15.23
FIM Score, Mean ± SD	76.9 ± 35.5
CIQ Score, Mean ± SD	64.3 ± 23.4
DASS Score, Mean ± SD	62.8 ± 21.1

FIM= Functional Independence Measures, CIQ= Community Integration Questionnaires, DASS = Depression, Anxiety, Stress Scale.

TABLE 1: POST STROKE HEMIPARETIC SUBJECTS

Sr.no	Outcome measure	r value	interpretation	Statistical significant
1	FIM and CIQ	0.861	STRONG POSITIVE CORRELATION	significant
2	FIM and DASS	- 0.849	STRONG NEGATIVE CORRELATION	Significant
3	DASS and CIQ	- 0.819	STRONG NEGATIVE CORRELATION	significant

TABLE 2: POST STROKE ACUTE (n=18, <6 MONTHS) HEMIPARETIC SUBJECTS

Sr.no	Outcome measure	r value	interpretation	Statistical significant
1	FIM and CIQ	0.826	STRONG POSITIVE CORRELATION	significant
2	FIM and DASS	- 0.851	STRONG NEGATIVE CORRELATION	Significant
3	DASS and CIQ	- 0.806	STRONG NEGATIVE CORRELATION	significant

TABLE 3: POST STROKE CHRONIC (n=42, >6MONTH) HEMIPARETIC SUBJECTS

Sr.no	Outcome measure	r value	interpretation	Statistical significant
1	FIM and CIQ	0.851	STRONG POSITIVE CORRELATION	significant
2	FIM and DASS	- 0.854	STRONG NEGATIVE CORRELATION	Significant
3	DASS and CIQ	- 0.7.80	STRONG NEGATIVE CORRELATION	significant

DISCUSSION

Community reintegration, being the final stage of rehabilitation, is very important. The concept of reintegrating to one's previous roles and relationships with family, co-workers, and the community, if considered at all, has been presumed to be hinged on physical and functional recovery in stroke survivors.

In this study, none of the stroke survivors was fully satisfied with their community reintegration. The mean CIQ score of the stroke survivors in this present study is lower than that of the findings in previous studies[23] [24] [25]. There may be some reasons for the differences in the results. First, the study environment was different. Second, the previous studies involved stroke survivors with onset of 1 year or more, whereas in this study sample consisted of some patients who had an irrespective post-stroke duration.

Age is independently associated with community reintegration. Age was also found to be a significant predictor of the CIQ scores. The association is a negative one, indicating that older participants had lower level of satisfaction with community reintegration. None of the participants in the age category of ≤50 years was restricted in reintegration to normal living, but the age category ≥60 years, despite being able to walk unassisted, had the most number of stroke survivors restricted in their community reintegration. This is in consistent with the findings in the study by Murtezani et al [24], who reported that regardless of the unassisted walking, older chronic stroke patients were not satisfied with their level of social reintegration. The older patients may have less self-perceived reintegration to normal living because most of them have decreased social participation. The reason for the discrepancy in results is uncertain. It was postulated that the younger stroke survivors may be more educated and have higher expectation of their recovery and community reintegration than their older counterparts.

Depression is independently associated with community reintegration. This study results showed that depression is independently associated with CIQ scores. The higher the level of depression, the lower the level of satisfaction with community reintegration[26] as a determinant of satisfaction with community reintegration in stroke survivors. Stroke severity or physical disability and functional impairment have been associated with depression[27]. Post-stroke depression has been reported to slow down the process of rehabilitation, exerting a negative influence on all aspects of the process of recovery[28], and remission has been associated with recovery in activities of daily living[29]. Patients with stronger reintegration to normal living have been found to have better outcomes in anxiety, depression, daily activity and quality of life. These reasons may be used to explain the relationship found between community reintegration and PSD in this study. Taken

together, the results suggest that relieving symptoms of depression may be essential in enhancing community reintegration among stroke survivors but will require further investigations. Since PSD can be treated, it should be assessed for and managed in stroke survivors before they return to the community. Clinicians should work with the patient and caregivers to avoid negative effects, promote problem solving, and facilitate reintegration of the patients into valued family and social roles[30]. Physiotherapists and occupational therapists should work with clinical psychologists to minimise the effects of depression in patients who are diagnosed with the condition during rehabilitation. All professionals in the care of patients with stroke should be aware of the possibilities of depression and trained to look out for it and refer appropriately.

Functional Independence is independently associated with community reintegration. The results of this study showed a positive association between community reintegration and functional ability. The ultimate goal for many stroke survivors is to achieve a level of functional independence that enables them to return to their homes and reintegrate into community life as much as possible[31]. Recovery of function to pre stroke level of motor ability and independence in activities of daily living has long been the gold standard by which success in rehabilitation after stroke is measured[32]. In a study conducted by Belanger et al[33] on social integration in stroke survivors, the determining factors relating to social integration are motor functions and autonomy, personal perception of health conditions, proximity of children and relatives, relatively low age, regular presence of another person in the home, and proximity of friends. The authors found that the presence of motor problems is the main factor in determining the living environment after stroke. The results of this study showed that motor function is an independent predictor of the CIQ scores. These findings are consistent with those of a previous study of stroke survivors, which showed an association between social integration and motor function[30]. These findings highlight the potential importance of improving motor function in enhancing community reintegration.

Research on stroke rehabilitation has focused on physical/functional recovery as the predominant measure of outcome[34]. There is a gap in knowledge of social issues and integration into societal, family, and community roles after stroke, despite that assessment of community reintegration has been emphasised in stroke rehabilitation reviews and guidelines[35]. While a lot of studies have examined the effect of different exercise programs to improve motor function[36], community reintegration is not often used as an outcome. Since improvement in motor function is directly associated with community reintegration, community reintegration should be assessed alongside motor function in community stroke survivors with neuromuscular deficits during rehabilitation.

Limitations of the study was as the stroke survivors in the present study were able to ambulate independently, the findings of this study may not be generalised to stroke survivors who cannot ambulate independently.

CONCLUSION

Better Functional independence represents better community integration. Better functional independence and community integration reduces stress and anxiety in post stroke survivors irrespective of their stage of recovery.

Clinical implications: Measures to improve functional independence using various neuro rehabilitation techniques & modifications in ADL at the earliest, enhances community participation & reduces stress and anxiety.

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