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NEUROREHABILITATION IN STROKE SURVIVORS HAVING POST STROKE DEPRESSION

Neurology

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ABSTRACT

Objective: To observe the role of neurorehabilitation in stroke survivors having post stroke depression **Method:** Design: A retrospective study, Setting: Neurological Rehabilitation unit of a tertiary care university research center. Participants and Study Period: Stroke survivors having depression and admitted inpatient neurorehabilitation during the period from October 2019 to May 2020. Assessment and outcomes: All participants underwent inpatient neurorehabilitation in a same setting. Depression was assessed by depression sub scale of Hospital Anxiety And Depression Scale (HADS-D). The functional outcomes were assessed at admission and discharge by using Barthel Index (BI), Scandinavian Stroke Scale (SSS) and modified Rankin Scale (mRS). **Results:** Out of the participants, there were 65% males with a median (interquartile range) age of 58 (61, 49) years. At the time of discharge, 59% of the participants recovered from depression (HADS-D <8). There was also improvement in the functional outcomes of BI and SSS at the time of discharge as compared to admission which was significant statistically ($p<0.05$). **Conclusion:** After inpatient neurorehabilitation, stroke survivors having post stroke depression showed improvement in depression and functional outcome measures.

KEYWORDS

Neurorehabilitation, Stroke Survivors, Post Stroke Depression

INTRODUCTION:

Stroke is one of the major causes of adult disability in the world and about 60% of the stroke survivors experienced long term permanent functional disabilities[1]. Such individuals have an increased incidence of neuropsychiatric disorders[2]. Depression is the most common among the neuropsychiatric disorders occurring in stroke survivors with incidence of 20%-65% [3,4] with commonest occurrence during first six months following stroke[5]. Post Stroke Depression (PSD) may be defined as depression that did not exist before the stroke but occurred in chronological context to it. PSD causes negative impact on functional outcomes with increase risk of stroke recurrence & mortality[6, 7, 8]. Its significance to stroke outcome is generally & underestimated and neglected[9,10, 11]. The literatures on PSD are mainly on prevalence, risk factors, relation with stroke characteristics, impact on quality of life & care givers etc[12,13,14,15]. The management of PSD includes pharmacological, psychosocial and stroke-focused interventions. The Pharmacological therapy with antidepressants and psychotherapy are considered as first line of treatment for PSD[16]. As per the knowledge; there were very few studies on role of neurorehabilitation stroke survivors having depression. Therefore, this study was aimed to observe the role of neurorehabilitation amongst stroke survivors having post stroke depression.

Materials and Methods

This study was an observational retrospective study conducted in the neurological rehabilitation unit of a tertiary centre hospital. Study population included stroke patients attending for neurorehabilitation during the period from October 2019 to May 2020. Inclusion criteria were : first ever stroke, with less than 1 year post stroke duration, age ≥18 years, having diagnosed with depression and underwent inpatient neurorehabilitation. Exclusion criteria included**:** participant unable to or not willing to give consent, recurrent stroke, not having depression after stroke, severe cognitive impairment, pre existing psychiatric illness, having communication disorder i.e. global aphasia, hearing defects and severe co morbid conditions i.e. recent Myocardial infarction, unstable angina, uncontrolled diabetes, contracture of joints etc. The study was approved by institutional ethic committee.

The stroke survivors fulfilling inclusion criteria were identified from hospital records and the data was then collected from the electronic records (discharge summaries). The demographic details, the clinical complaints & examination findings were recorded. The functional outcomes at the time of admission and at discharge after 3 weeks inpatient neurorehabilitation were also collected. All patients had received daily multidisciplinary neurorehabilitation program in the same unit which included 1 hour each of physiotherapy, occupational therapy, clinical psychotherapy and psycho social counseling. Physiotherapy program included exercises for range of motion, stretching and strengthening of affected limb, along with balance and gait training with assistive device. The occupational therapy program comprised of modification and training to perform activities of daily living, functional abilities training, fine motor activities (etc) which was done by a trained occupational therapist. The psychotherapy was focused mainly on cognitive assessment and retraining of affected domains by the clinical psychologist. The psycho social counseling including awareness and counseling about the illness was also given to all the patients by psychiatric social worker.

Assessment and Outcome measures:

The depression subscale from Hospital Anxiety Depression Scale (HADS-D) was used for screening of depression. The HADS-D[17] consisted of 7-item questionnaire on depression and responses ranged from 0 to 3 with final scores range 0-21. A score 8 or more in HADS-D was considered as depression.

The functional ability of patients was assessed by Barthel Index[18]. It is a 10-item scale, which assesses patients' ability for ADL activities including feeding, bathing, grooming, dressing (both upper and lower half), bladder and bowel care, personal toilet, transfers, stair negotiation abilities and mobility. It is a 100-point scale, with the higher score suggesting more functional independence of the patient.

Impairment after stroke was measured by Scandinavian Stroke Scale (SSS)[19] which consists of nine items generating a minimum score of 2 (worst neurological compromise) and a maximum score of 58 (without neurological compromise), with 9 items based on consciousness, eye movement, arm motor power, hand motor power, leg motor power, orientation, speech, facial palsy and gait.

The degree of disability or dependence was assessed by modified Rankin Scale (mRS)[20] . The score ranges from 0-6, measuring from perfect health without symptoms (score 0) to death (score 6).

Statistical analysis:

The data collected was analyzed and basic descriptive statistics were computed. The continuous variables were described by using mean, median and range while the categorical variables were described by using percentages. Paired t test was used for the comparison in the outcomes measures. The *P* value < 0.05 was considered as significant.

Results:

The more than three hundreds stroke patients were screened from the records. Out of these, 18 patients fulfilled the inclusion criteria. One patient did not have complete data in the records; thereby only 17 patients remained for the study.

The clinical and demographic profiles of participants are displayed in table 1. The median age was 58yrs with majority of the patients were males (65%) and left sided hemiplegia (65%). Median duration of stroke was 90 days. Twelve patients (70%) had dysarthria while remaining had no speech abnormality. The shoulder pain was present in 13 patients (76%) however sensation was normal in only 6 of them (35%).

At the time of discharge, 10(59%) patients did not have depression (HADS-D<8) while remaining 7 (41%) were still having depression (HADS-D ≥ 8) (table 2).

There was improvement in the outcome measures including HADS-D at the time of discharge which were significant except for mRS (table3). The mean of HADS-D was 12.3±3.5 and 7.4±4.6 at admission and discharge respectively (p=.0003). The mean of BI and SSS from admission to discharge were 47.8±12.6 to 62.1±15.1 and 31.7± 7.1 to 37±7.7 respectively which were significant statistically (p<0.05).

Tables :

Table 1: Baseline demographic and clinical characteristics of the patients (n=17) at admission

Sl No.	Variables	(N=17)
1	Age (in years) Median (IQR)	 58 (61,49)
2	Gender Male Female	 11 (65%) 6(35%)
3	Duration of stroke (in days) Median (IQR)	 90 (210,30)
4	Type of stroke Hemorrhagic Infarct	 9 (52%) 8 (48%)
5	Side of hemiplegia Right Left	 6 (35%) 11(65%)
6	Aphasia 1= Motor 2=Normal (No aphasia) 3= Dysarthria	 0 (0%) 5 (30%) 12 (70%)
7	Sensations 1= Absent 2= Impaired 3= Normal	 6 (35%) 5 (30%) 6 (35%)
8	Shoulder pain Present Absent	 13 (76%) 4 (24%)

Table 2: No. of participants showing improvement of depression with change in HADS-D score at discharge

Sl no		No. of patients at admission	No of patients at discharge
	Depression (HADS -D≥ 8)	17	7 (41%)
	No depression (HADS -D<8)	0	10 (59%)

Table 3 : Changes in the outcome measures including HADS-D from admission to discharge

Outcomes	n=17								P value
	Admission				Discharge				
	mean	SD	median	IQR (Q3-Q1)	mean	SD	median	IQR (Q3-Q1)	
HADS-D	12.3	3.5	12	15-10	7.4	4.6	6	10-3	0.0003
BI	47.8	12.6	48	50-45	62.1	15.1	65	75-45	0.0004
SSS	31.7	7.1	33	37-28	37.0	7.7	40	41-30	0.003
mRS	4.0	0.6	4	4-4	3.4	0.9	4	4-3	0.007

HADS= Hospital Anxiety and depression Scale, BI= Barthel Index, SSS=Scandinavian Stroke Scale, mRS=modified Rankin Scale, SD= Standard Deviation, IQR=inter quartile range

DISCUSSION:

The current study was focused on neurorehabilitation outcomes among stroke survivors of duration less than one year and having depression. In this study, majority of participants were elderly male with left hemiplegia having shoulder pain. Berg et al[21] observed in their study that the older males were more depressed following strokes. The reason behind why men had more depression might be, they were more concerned about functional disability and had poor coping ability with the stroke consequence when compared women[22]. Further, Berg et al, also reported a similar finding that post stroke depression was more in left hemiplegic patient. As the anosognosic disturbances are known to occur in right hemisphere lesions, the prevalence of depressive disorders may be higher after a left hemisphere stroke[23].

The shoulder pain after stroke is one of the disabling conditions affecting performance in activities of daily living which may indirectly contribute to the development of depressed mood. This might explained why majority of participants in our study had shoulder pain.

In our study, 59% of the participants showed no depression at discharge with HADS-D <8 while other 41% were still with depression (HADS-D ≥8). Tamara Rabi et al in their study also found 26% of patients initially diagnosed as depression experienced statistically significant recovery[24].

The findings of our study may be due to the good family care and support over and above multidisciplinary neurorehabilitation programs which resulted in improvement of functional status in individuals. Psychosocial counseling was done to all the patients that might have also influenced the observations and findings in the present study.

In the current study, the functional outcomes were significantly improved. This implies that the neuro-rehabilitation program resulted in effective improvement of functional outcomes in participants. Tamara Rabi Zikic et al[24] observed that the functional outcome measured by BartheI Index significantly improved in stroke patients irrespective of depression.

In further analysis, we also observed that participant who recovered from depression had significantly better functional outcomes score as compared to those with persistent depression. This suggests that recovery of depressive symptoms influenced the improvement in functional outcomes measures. However these correlations will require further study in future.

The data screening, assessments of outcome measures & data analysis were done separately by different physiatrists so as to reduce the bias. The limitations of our study were 1) small sample size, retrospective study 2) depression was diagnosed from the self reported questionnaires; 3) exclusion of participants having recurrent stroke, longer stroke duration & global aphasia, therefore finding is not a representative of general stroke patients and 4) shorter period of followed up.

CONCLUSION:

Multidisciplinary neurorehabilitation program resulted in improvement of depression and better functional outcomes amongst stroke survivors of less than one year duration having post stroke depression. However, a better study like a randomized controlled trial with large sample size may be required in the future to observe whether the recovery occurred was due to the natural phenomenon or due to neurorehabilitation or both.

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