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Assessment of Functional Outcome in Post Stroke Patients after Rehabilitation Programme

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Abstract
Background and Purpose: *Assessment of functional outcome in stroke patients after rehabilitation program. Functioning and disability after stroke are clinically meaningful and of major relevance to patients.*
Methods: *Present hospital based prospective study was carried out in PMR department in Sawai Man Singh hospital in Jaipur, Rajasthan state (west part of India) during the year 2016-2017, include two hundred stroke patients for inrehabilitation program. Assessment neurological Severity of stroke on European stroke scale (ESS) and functional disability on Glasgow outcome scale (GOS).*
Results: *Out of 200 included cases, seven were dropped out. Mean age of this study was 56.33 Yrs ± 2 SD (Incidence of stroke in young individual is significantly less than older individual). Hypertension was significant risk factor ($p<0.005$) and obesity was non significant risk factor ($p>0.005$). The correlation between the ESS and on functionally outcome was significant ($p<0.005$). Significant improvement in functional status and motor recovery in higher ESS score (≥64) patients than lower ESS score (<64) patients.*
Keywords: *Stroke, European Stroke Scale (ESS), Glasgow outcome scale (GOS).*

Introduction

Stroke rehabilitation is a combined and coordinated use of medical, social, educational, and vocational measures to retrain a person who has suffered a stroke to his/her maximal physical, psychological, social and vocational potential, consistent with physiologic and environmental limitations. Evidence from clinical trials supports the premise that early initiation of therapy favorably influences recovery from stroke. When the initiation of therapy is delayed, patients may in the interim develop avoidable secondary complications, such as contractures and deconditiong.

In addition, many studies show that stroke rehabilitation can improve functional ability even

in patients who are elderly or medically ill and who have severe neurologic and functional deficits

Method

Present prospective study includes two hundred patients admitted to in department of physical medicine and rehabilitation (PM&R) in Sawai Man Singh hospital between March 2016 and February 2017 for stroke rehabilitation program. PM&R Department is a state spinal injury centre in Rajasthan where stroke patients admitted for rehabilitation program. The diagnosis of stroke was based on clinical assessment supported by CT scanning or MRI. Exclusion criteria included medical instability, unwilling to participate in therapy. Neurorehabilitation program was started as early as possible after admission. The usual daily treatment consists of 1 hour of therapy, based on individual needs and tolerance. Along with neurological examination, patients were also evaluated on European Stroke Scale[1] (ESS) for assessment of severity of stroke in initial stage. The ESS evaluates level of consciousness, speech, visual field, gaze, facial movement, arm in outstretched position, arm raising, wrist extension, fingers, leg maintained in position, leg flexing, foot dorsiflexion and gait on a total score from 0 to 100. Functional outcome of stroke measure by Glasgow Outcome Scale[2] (GOS). Activity of daily living (ADL) was assessed on admission, weekly until death or ends of rehabilitation and again at the 6- month post stroke examination using the GOS. The GOS evaluates 10 different abilities (toilet use, bowels, bladder, grooming, mobility, transfer, feeding, bathing, dressing and stairs) on a score from 0 to 100. According to the GOS functional disabilities was classified in to five categories. Death, GOS-1 (0 points); persistent vegetative state, GOS-2 (1 to 20 points); severe disability, GOS-3 (25 to 50 points); moderate disability, GOS-4 (51 to 70 points); good recovery, GOS-5 (75 to 100 points). In our study persistent vegetative state, severe, moderate disability but dependent patients (0 to 60 points) categories in to total and partial dependent (functional deficit) and moderate disability but independent patients, no disability patients (60 to 100 points) in to independent (functional non deficit) category.

Result

Seven patients dropped out due from study, one hundred ninety three patients were followed for six months. Sociodemographic profiles are shown in table 1. Mean age of patient was 56.33 Yrs ± 2 SD. Ratio of rural to urban background was 1.25: 1. Ratio of male to female was 1.15: 1. Ratio of married to unmarried was 11.5: 1 Our study has 44.5% patients in age group of 51-70 yrs; it showed an increasing frequency of stroke with advancing age.

Stroke risk factors, type, motor impairment is shown in table 2. In our study, hypertension (51.5%) and smoking (40.5%) were major risk factors then diabetes, obesity and alcohol intake. Ratio of infarction: hemorrhage = 1.32: 1. With reference to BMI criteria, twenty patients (10%) had obesity. In our study population obesity was a non significant risk factor for women as well as in men ($p>0.005$).Even though the occurrence of obesity had non significant correlation with overall stroke but had significant correlation to ischemic stroke. Seventeen patients (12.61%) out of one hundred eleven ischemic strokes had obesity indirectly a significant correlation. On European stroke scale, a score of sixty four and more direct a good prognosis had all the recruited patients were found on this scale during the initial stage of admission. Table 3 and 4 show the relation between neurological severity and functionally outcome of stroke patients at initial and six month post stroke stage. One hundred three had a score of less than sixty four (53.38%) and ninety had score of more than sixty four (46.63%). 55 patients out of 193 patients had reached their best possible independent function according to the GOS score. The correlation between the European stroke scale and rehabilitation on functionally was significant

(p<0.005). End of this study fifty five patients were recovered to a functional level (28.50%), ninety nine patients were deficit (51.29%), and thirty nine patients were expired (20.21%) (Chart1). However, it cannot be excluded that further improvement may have occurred in some patients after rehabilitation was ended.

Table 1 Sociodemographic parameter of stroke patients

Parameter	specific examples	no. of patients
Age group	<35 yrs	21(10.5%)
	36-50 yrs	58(29%)
	51-70 yrs	89(44.5%)
	>71 yrs	32(16%)
Occupation	Student	3(1.5%)
	Non working female	61(30.5%)
	Farmer/laborer	68(34%)
	Retired	5(17.5%)
	Service/businessmen	33(16.5%)
Sex	Male	107
	Female	93
Marital status	Married	184
	Unmarried	16 \
Occurrence	First	161
	Recurrent	41
Residence	Rural	111
	Urban	89
Hand dominance	Right	171
	Left	29

Table 2 descriptive characteristics of the stroke rehabilitation patients

	no. of patients	%
Stroke type		
Infarction	111	55.5%
Hemorrhage	86	43%
Other	03	1. 5%
Stroke risk factors		
Hypertension	103	51.5%
Diabetes	22	11%
Smoking	81	40.5%
Obesity	20	10%
Alcohol	10	5%
Stroke motor impairment		
Left body	78	39%
Right body	111	55.5%
Both side	11	5.5%
Associated symptom at admission		
Dysphasia	171	85.5%

Table 3 show the number of stroke patients have neurological severity (ESS score) and functional disability (GOS score) at the time of admission

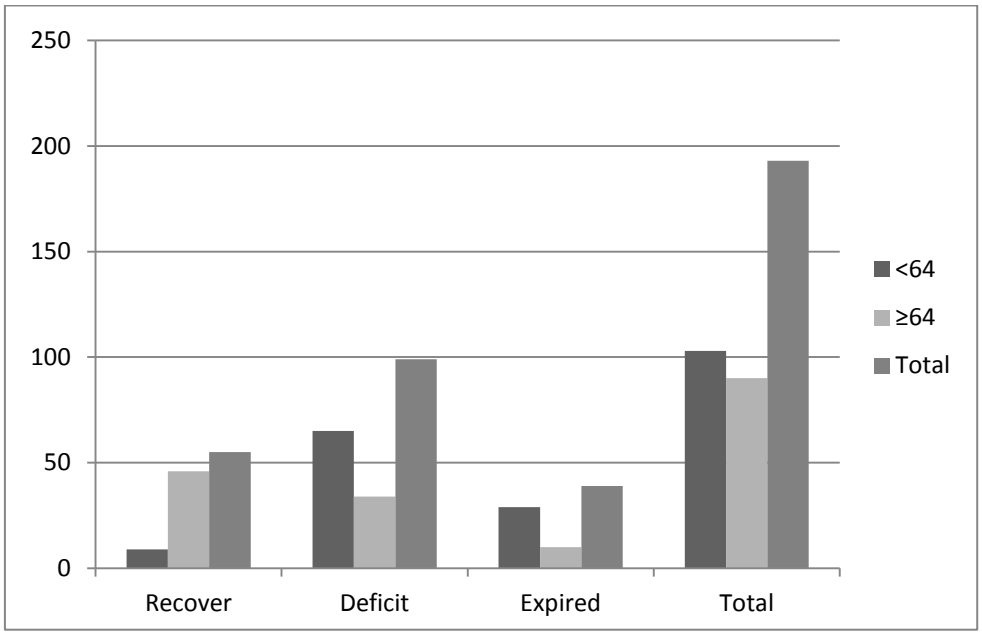
ESS score (0 to 100 points)	GOS – I, II, III, IV(Dependent) (0 to 60 points)	GOS–IV(independent), V (60 to 100 points)	Total
<64	103	0	103
≥64	75	15	90

Seven patients drop out from study

Table 4 Functional outcome of stroke patient's correlation with European Stroke Scale Score in stroke patients at six-month follow up

ESS Score	Functionally Deficit, GOS – I, II, III, IV(Dependent) (0 to 60 points)	Functionally non deficit, GOS–IV(independent), V (60 to 100 points)	Expired	Total
<64	65 (63.11%)	9 (8.73%)	29 (28.16%)	103
≥64	34 (37.78%)	46 (51.11%)	10 (11.11%)	90

Chart 1 At six month post stroke outcome of stroke patient's correlation with European Stroke Scale Score



CHI-SQUARE- 48.945with two degree of freedom p=0.000 (p<.005)

Discussion

The vast majority of strokes cases in this study were present in age group of 56-70 years (41.5%) compared to similar survey carried out in Sunder Rao PSS[3], Saha and et all[4] and Bharucha and et all[5].these studies shows that prevalence of stroke increase with age. The most common risk factor among the elderly in our study was hypertension and smoking in compare to young stroke patients. Razdan & et all[6] and most of the epidemiological studies of strokes[4,6,7,8,9] have confirmed the blood pressure is among most important risk factors in stroke patients. Along with that 11% patients had diabetes[4,8]. Interestingly, previous studies identified that obesity was an important risk factor for strokes[10,11,12] but in our study, we found obesity to be a non significant risk factor either for men or for women. In further analysis, when we stratified BMI into <22.9, 23.0-24 and ≥25.0 kg/m^2 (the proposed cut-offs for normal weight, overweight and obesity for Indian populations), the association between obesity and stroke risk remained non-significant. Our rural and urban background finding were similar to observed by Gourie et al[13] study stroke where was higher in rural area compared with urban area. Secondary/ repetitive stroke was present in 20.5% patients, which is near to the figure observed by S. rajdan et al[6]. As regard to the job-working group 50.5%, house hold 30.5% and retired 17.5%. Shi-chlo li[14] in china saw the distribution as working group 60.7%, household 25.45% and other 3.7%. We cannot be conclusive regarding the relationship between occupation and stroke as the sample size to small but it does indicate that most of the patients are from working group and that makes rehabilitation to be the most important component of in stroke management. Ischemia was the most pattern of stroke in our study when is using in the various western study[5,7.] European stroke scale

score which is valid to regarding prediction of recovery in relation to severity of stroke [15,18]. Initial severity of disability and extent of improvement observed within the first weeks post stroke are important indicators of the outcome at six months[16,17]. Best ADL function was reached in patients with initial higher ESS Score (mild stroke) and poor ADL functional in initial low ESS Score (severe stroke) [15,16,17]. At six-month post stroke, the risk of death and dependency was higher in patients with ESS Score less than sixty four. In present study there were significant difference in change score of ADL activity from admittance to 6 months follow up (CHI-SQUARE 48.954 with two degree of freedom p=0.000) ($p<0.005$). Several studies have shown that functional status at admission, stroke severity, motor function and trunk movement are the most important functional outcome in stroke patients[19]. Early initiations of rehabilitation program in stroke patients can avoidable secondary complication such as, spasticity, contracture and disability. Rehabilitation after stroke is starting within days of stroke onset and ending only when it no longer produces any positive effect.

Conclusion

The study indicates that the organization of rehabilitation services after stroke has a major impact on improvement of functional outcome. European stroke scale and Glasgow outcome scale predicts severity and outcome in stroke patients. Higher scorer patients had better functional outcome of stroke at the end of study. Hypertension and obesity poses a challenging due to increase in incidence of stroke and their survival too. Stroke rehabilitation should be taken up with a precise formulated program, which should be short and intensive.

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