Full length research paper

To compare the effects of early and late mobilization in post stroke patients

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To determine the effects of early versus late mobilization on stroke patients. A cross-sectional survey was completed on 100 participants (age > 18 years) suffering from stroke at different tertiary care hospitals in Karachi. Patients were selected through purposive sampling technique and were classified as early and late mobilized. Data was collected through personal interviews with questionnaire based on the Barthel index (to measure level of independence) for comparison. Association between the Barthel index variables and early and late mobilization was assessed through Chi-square test. The difference in mean ranks of the Barthel index scores was determined through application of Mann Whitney U test. P value less than 0.05 was taken as significant. A significant association was found in early and late mobilization between barthel index groups (p<0.001). Comparison of early and late mobilization in barthel index categories was also significant in all components (p<0.05). Based on the results it was concluded that patients who were mobilized early after stroke were found to have better recovery then patients who were mobilized late. Although no death and disability was found in late mobilization patients but these patients experienced longer duration for recovery with disabilities.

Keywords: Stroke patients; Early mobilization; Late mobilization; Barthel Index score; Physiotherapy

Introduction

Cerebrovascular accident (Stroke) is the leading cause of death and disability in the world. According to World Stroke Organization (WSO, 2012), every six seconds, 1 in 6 people suffer from stroke across the globe. Govan et.al, (2008) stated that different 'Stroke' units work for the rehabilitation of patients and increase their physical independency level through early mobilization during their hospital stay. According to O' Sullivan (2006) the most important factors associated with long term disability are immobilization and being bed-ridden for a longer time. Early mobilization may reduce the post stroke complications such as pneumonia, deep venous thrombosis, pressure ulcers, and de-conditioning with bed rest. While on the other hand, long term inactivity may disturb the social, emotional, behavioral, physical and psychological pattern. It is well-known that stroke survivors have low muscular strength and low levels of physical fitness by which their ability to perform everyday activities, independence and community participation compromises. The word early mobilization encompasses mobilization as early as possible after stroke with intact functional capacity and the duration should be at least 30 minutes to one hour "Early" can be described as, within 24 hours, within three days, or within first week (Bernhardt. 2008). Mercer et.al, (2009) suggested that, some stroke patients recover completely and maintain their physical functions, while approximately one half have motor deficits and 25 to 50% need assistance with activities of daily living. Based on the literature conducted by Diserens (2006) and Langhorne (2000) have reported that early mobilization helps to reduce immobility related stroke complications and promote positive psychological effects. However there are some researchers which are

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of the opinion that lying straight for first 24-72 hours is critically important for cerebral blood flow (ischemic tissue), which is still viable if cerebral blood flow is restored. Another study conducted on early mobilization suggest that 85% complications that patients had to face are during their hospital stay and 62% deaths within the first week is due to immobility related complications (Langhorne , 2000). Indredavik et.al, (1999) stated 72 hours were given for early mobilization while others recommend mobilization within 24 hours for positive outcomes in recovery. In a survey conducted among nurses, physicians and physiotherapists in Scotland by Arias et. al, (2007) majority of nurses (62%) and physicians (67%) were of the opinion that early mobilization starts within 12-24 hours whereas it was popular among the physiotherapists that early mobilization should be after first 24 hours.

Timing of mobilization remains an area of debate where conclusive evidence is still awaited to identify a cutoff point unanimously adopted by all concerned organizations. This topic however has not been investigated in our part of the world specifically Pakistan, therefore this study is being conducted by comparing the effects of early and late mobilization in stroke patients and to assess the effects of post stroke rehabilitation after stroke.

Methodology

A cross-sectional survey on stroke patients above 18 years of age was conducted in stroke units of Liaquat National Hospital, Ziauddin Hospital and Dow Institute of Health sciences in Karachi. The actual sample size was 71 based on the sample taken in a previous study 'An Early Mobilization Protocol Successfully Delivers More and Earlier Therapy to Acute Stroke Patients' conducted by Wijk *et.al*, (2012). The sample size was inflated to 100 covering non- response and poorly filled data. Sample was selected through purposive sampling technique. Both male and female stroke patients were included while patients with history of Transient Ischemic Attack (TIA), with disabilities, progressive neurological disorders, heart failure and patients with fractures were excluded from the study. Cutoff for early mobilization in our study was taken at 72 hours. The patients who were mobilized within 72 hours were considered as early mobilized patients and patients who were mobilized after 72 hours were considered as late mobilized patients. First, patients were grouped into early and late mobilization and then were further categorized into Inpatients, Outpatients and Home based patients. A close ended questionnaire was used for data collection along with an assessment tool 'Barthel Index' to measure level of independence or activities of daily living. The questions included information such as age, gender, diagnosis of stroke, type of mobilization, timings of mobilization,

involvement of health professionals, stroke related symptoms regarding mobilization, frequency of mobilization, uses of supportive devices and physical activity levels. Physical activity levels were further classified as high, moderate and low. Where high physical activity meant standing and walking without support, moderate physical activity referred to the sitting on bed unsupported and moving from bed to chair independently and low physical activity was sitting in bed with support, doing self care activity and moving from bed to chair with support.

The effects of mobilization types were assessed with the help of Barthel Index (Mahoney , Loewen, Gresham, Collin 1990).(An international scale used in stroke patients for activity/recovery) comprising of scoring scale ranging between 1-100. We categorized the participants as follows: patients who scored between 0 – 30 were considered as mildly recovered patients, 31 -60 as moderate recovery and patients who scored from 61 – 100 were regarded as fully recovered. A written informed consent was taken from concerned hospitals authorities and the patients or their attendants who agreed to participate in this study. The duration of the study was 18 months and data was collected in 2012.Data entry and analysis was performed using computer software SPSS (version 17). Frequencies and percentages were calculated for categorical variables. For numerical variables mean and standard deviation was taken. Chi-square test was used to determine association between recovery groups and mobilization type and Mann Whitney U test was used to find difference in mean ranks of Barthel Index between early and late mobilized groups. The Mann Whitney U test was applied as the barthel score was not normally distributed as per Shapiro Wilk test (value 0.02). P-value <0.05 was considered significant.

Results

A total of 100 participants above 18 years of age filled the questionnaires with a male to female ratio of 1.5:1, (males 61% and female 39%). Majority of the participants i.e. 51% suffered from hemorrhage of right middle cerebral artery however its association with early and late mobilization was found to be non significant (p= 0.115). Patients categorized as Inpatients were 65%, Outpatients 25% and Home based 10%.

In this study, more than half of the patients (69%) were early mobilized and remaining were late mobilized (31%). Dizziness was found to be the most common symptom as 69% patients suffered from dizziness after first movement out of bed. 53% participants showed full recovery after feeling lightheaded at the first movement (p=0.003).Mann Whitney U test was applied to find difference in mean ranks of the early mobilization and late mobilization groups. Significant difference was observed (P-value < 0.000).

Table1: Association of recovery with Mobilization

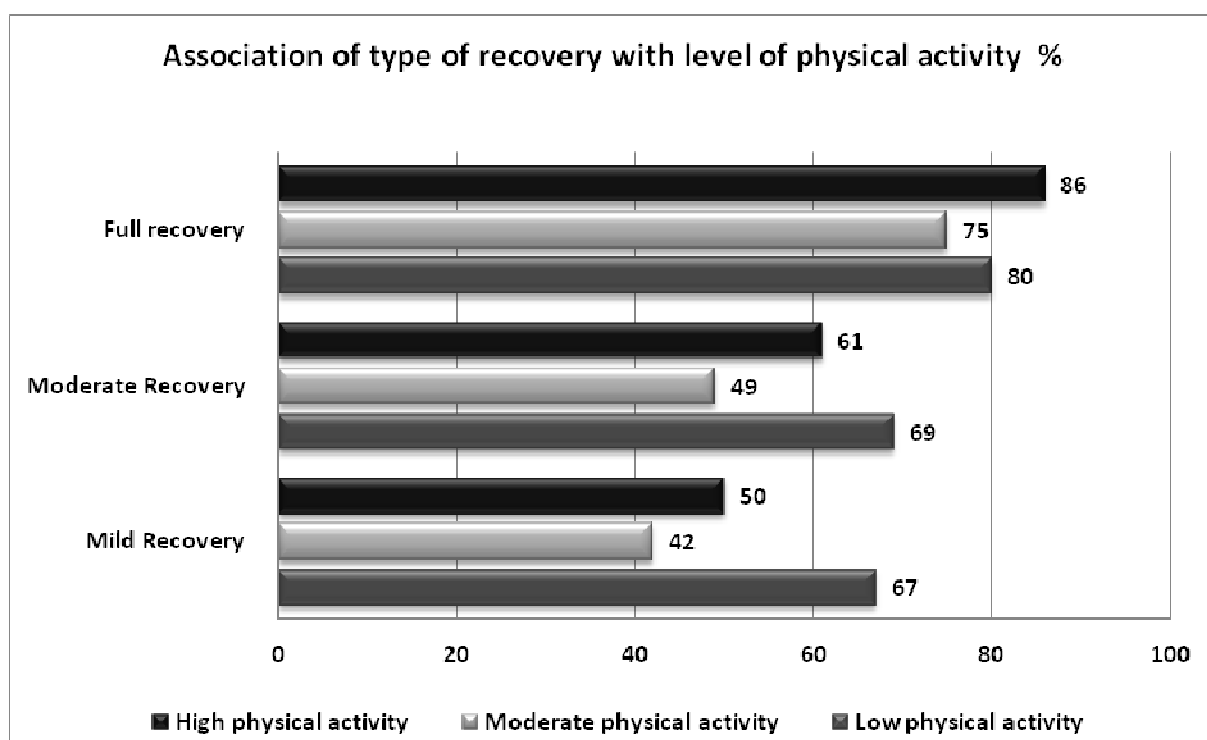|	Consequences of mobilization and recovery groups						
	Mild Recovery		**Moderate Recovery**		**Full recovery**		**P-value**
	n	**%**	**n**	**%**	**n**	**%**	
Early Mobilization	3	4.3	23	33.3	43	62.4	0.000
Late Mobilization	9	29	16	51.6	6	19.4	

Figure 1: Different levels of physical activity associated with recovery

Chi square test was used to determine the association between early and late mobilization and Barthel index. 62.4% (n=43) were fully recovered in early mobilization while 19.4% (n=6) were fully recovered in late mobilization (p - value < 0.000) as elaborated in Table: 1. Association between different categories of Barthel Index and types of mobilization are shown in Table: 2. The role of physical activity in aiding recovery (See figure 1) was highlighted when 86% cases fully recovered in high physical activity group (p value 0.005) as compared to 75% in moderate physical activity group (p value 0.05)Regarding the support required when they were first mobilized, out of the fully recovered patients, 55% walked only with the physiotherapists without any other support, 22.4% walked with the help of safety belts and 12.2% walked independently with cane (p<0.001). When asked about the current status of support required,100% of the mildly recovered patients required support as compared to only 20% from the fully recovered group (p<0.001).

Discussion

The aim of this study was to assess the timing of the first mobilization after the onset of stroke (using questionnaire) and effects of early mobilization compared to late mobilization (using Barthel index). A total of 100 participants were recruited in the study, out of them majority were early mobilized. Our data revealed that those who were mobilized early had good recovery as compared to those who were late mobilized. The reasons for late mobilization were lack of proper knowledge about

Table 2: Association of Barthel Index categories with Mobilization

Categories of Barthel Index					
Barthel Index		**Mobilization Type**			**P-value**
		Early Mobilization		**Late Mobilization**	
		n	**%**	**n**	**%**	
Feeding	Unable to feed	3	4.34	10	32.2	0.001
	Independent	33	47.8	10	32.2	
	Needs help cutting	33	47.8	11	35.4	
Bathing	Dependent	37	53.6	23	74.1	0.052
	Independent	32	46.3	8	25.8	
Grooming	Needs help with personal care	17	24.6	19	61.2	0.000
	Independent face/hair/teeth	52	75.3	12	38.7	
Dressing	Dependent	13	18.8	8	25.8	0.008
	Independent	28	40.5	3	9.67	
	Needs help but can do half unaided	28	40.5	20	64.5	
Bowels	Incontinent	2	2.89	6	19.3	0.002
	Continent	49	71.0	12	38.7	
	Occasional accident	18	26.0	13	41.9	
Bladder	Incontinent or catheterized	5	7.24	8	25.8	0.013
	Continent	37	53.6		29.0	
	Occasional accident	27	39.1	14	45.1	
Toilet use	Dependent	7	10.1	10	32.2	0.008
	Independent	27	39.1	5	16.1	
	Need some help	35	50.7	16	51.6	
Transfer (Bed to chair and back)	Unable, no sitting balance	1	1.44	1	3.22	0.000
	Minor help	40	57.9	14	45.1	
	Independent	19	27.5	1	3.22	
	Major help (one or two people) can sit	9	13.0	15	48.3	
Mobility (on level surfaces)	Immobile or <50 yards	2	2.89	3	9.67	0.001
	Walk with help of 1 person>50 yards	47	68.1	14	45.1	
	Independent (use any aid, stick)>50	15	21.7	3	9.67	
	Wheel chair independent>50yard	5 7.24		11	35.4	
Stairs	Unable	10	14.4	15	48.3	0.001
	Independent	6	8.69	0	0	
	Needs help (verbal, physical, carrying aid)	53	76.8	16	51.6	

post stroke rehabilitation, prolonged bed rest, severity of stroke, poor functional status, and poor dizziness profile and late referral to physiotherapy. A study conducted by Hill (2008) in International Journal of Stroke has shown that patients who had severe stroke should also be mobilized early.

In other study conducted by Bernhardt and Dewey (2004) in Melbourne, Australia regarding early rehabilitation after stroke , almost 28% were able to sit out of bed, and 13% were able to perform motor activities like transferring, walking, or climbing stairs. Our study also revealed similar findings where 27.5% early mobilized participants were able to perform transferring activities independently. Regarding mobility 21.7% early mobilized spent time independently on walking. Moreover 8.7% early mobilized participants were climbing the stairs independently while 76.8% (n=83) needed help in stair climbing either verbally or physically. Internationally, majority of the work has been done on interventional studies, in a Cochrane survey conducted by Bernhardt and Matthew (2009) on early versus delayed mobilization after stroke, the greater part of the patients in both groups were mobilized within 48 hours of stroke onset, however no significant difference was found in death and disability. These results were contrary to the results of our study in which majority patients fully recovered after early mobilization. Another study report by Indredavik et.al, (2007) found that 14% patients were unable to complete mobilization due to dizziness while 86% of patients tolerated dizziness and completed the mobilization. Our study revealed that 69% patients felt dizzy after first mobilization. The effects of assisted walking on mobility showed that 95% of patients walk with the help of aids (Tyson 2009). In our study 94% patients utilized aids to initiate activity after stroke which was similar to previous studies. Our study had a few limitations. Sample size was small though it was calculated on the basis of prevalence. We were able to include patients coming to tertiary care hospitals only, while those seeking treatment from private consultants could not be included. More over patients who were taking home rehabilitation services were not part of the study.

Our study results provide evidence regarding the effects of early mobilization on patients with stroke. This information can be utilized to encourage the patients about post stroke rehabilitation, counseling patients about the advantages of early mobilization, to guide physiotherapists, trainees and assistants on how to mobilize post stroke patients as soon as possible depending on the severity of stroke.

Conclusion

We concluded that patients who were mobilized early after stroke were found to have better recovery then patients who were mobilized late. Although no death and disability was found in late mobilization patients but it was found that late mobilized patients experience longer duration for recovery with disabilities.

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