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Original Article

Functional independence measure scores of patients with hemiplegia followed up at home and in university hospitals

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Abstract. [Purpose] Our purpose was to create awareness among of social rehabilitation at the university and in local governments, to identify gaps in social rehabilitation, and to increase the effectiveness of social rehabilitation. [Subjects and Methods] This study included stroke patients undergoing physical rehabilitation from the stroke outpatient clinic (43 patients) and the Istanbul Metropolitan Municipality Home Care Service (101 patients); face-to-face interviews were conducted to collect patient information regarding nutritional status. In addition, baseline functional independence measure (FIM) scores at baseline and during three months of follow-up were also compared. [Results] The average FIM motor scores at three months did not differ significantly between the home and hospital treatment groups. However, there were significant differences in baseline FIM motor and cognitive scores and three-month follow-up scores as well as average FIM total baseline scores between groups. In addition, month-to-month analysis of changes in FIM values between the two groups also revealed significant differences. [Conclusion] The results of our study were concordant with those of previous studies of stroke patients receiving rehabilitation, in demonstrating improved patient functional and cognitive capacity.

Key words: Hemiplegia, Functional Independence Measure (FIM), Rehabilitation

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INTRODUCTION

Stroke is one of the three most common causes of death, along with malignant tumors and cardiovascular diseases. Advances in medical technologies have increased stroke survivorship, resulting in an increasing number of disabled persons who experience strokes[1)].

Early stroke case fatality has decreased in high-, low-, and middle-income countries. Despite increased stroke incidence, reduced mortality rates have led to an increase in people living with disabilities. Therefore, stroke constitutes the leading cause of serious, complex, and long-term adult disability. According to the World Health Organization, 15 million people suffer stroke worldwide annually. Of these, five million die and another five million are permanently disabled[2–4)].

Patients with chronic stroke are hospitalized during the acute or sub-acute phase, and then receive rehabilitation treatment. However, after their discharge, they often do not receive continuous rehabilitation treatment in their community. The number of stroke survivors using community-based public health rehabilitation services is also low[5, 6)].

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The functional independence measure FIM was developed in 1983 in a collaboration between the American Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation headed by Carl Granger and Byron Hamilton[7].

This study followed up hemiplegia patients from Istanbul Metropolitan Municipality who received care from the Home Care Service program. Hemiplegia patients were enrolled in the rehabilitation program in Bezm-i Alem Foundation University. Rehabilitation of chronic stroke cases was reviewed patients residing in Istanbul. Our purpose was to create awareness regarding social rehabilitation at the university and local governments, to identify gaps in social rehabilitation, and to increase the effectiveness of social rehabilitation. At the same time, Scientific & Technological Research Council of Turkey (TUBITAK) and European Union (EU) projects were developed to produce and implement programs.

SUBJECTS AND METHODS

This randomized, prospective, controlled, single-blind study was conducted in the physical medicine and rehabilitation stroke outpatient clinic and Istanbul Metropolitan Municipality's Home Care Service. A total of 43 stroke patients undergoing treatment at the Physical Medicine and Rehabilitation department and 101 stroke patients treated by the Istanbul Metropolitan Municipality's Home Care Service participated in face-to-face interviews to complete nutritional status-related forms. These forms collected data on patient demographics, FIM scores, concomitant diseases, tobacco and alcohol use, disease duration, and stroke etiology. In addition to their demographic characteristics (age, gender, weight, height, and body mass index [BMI]), the patients were also questioned regarding their occupations, main symptoms, and time to diagnosis. The patients included in this study were between 20 and 75 years of age. In addition, FIM scores were compared during three months of follow-up.

The FIM was designed to quantity physical and cognitive disability and focuses on care take reliability[7]. The main objective for its incident was to create a generic measure that could be administered by clinicians and non-clinicians to assess patients in all age groups with a wide variety of diagnoses[7]. The FIM contains a total of 18 items. The motor and cognitive subscales comprise 13 and five items, respectively[8]. The motor subscale collects knowledge regarding self-care, sphincter control, transfer, and locomotion, while the cognitive subscale focuses on communication and social cognition. All items are scored using a seven-point ordinal scale based on the number of assistance required for the patient to perform each activity[8]. Higher FIM scores indicate patients that have a higher level of independence and require a small amount of assistance[8]. The total of all 18 items constitutes the total score, which ranges from 18–126[8].

The team performing follow-up for the home-based rehabilitation group consisted of a specialist doctor of physical medicine and rehabilitation, a medical doctor, and 12 physical therapists. The team responsible for follow-up of the hospital-based rehabilitation group consisted of a specialist doctor of physical medicine and rehabilitation, one medical doctor, and six physical therapists. In this rehabilitation program, patients met with a physiotherapist two days a week for three months. The neurological rehabilitation included balance-coordination training, hand rehabilitation, stretching and relaxation exercises, walking exercises, and posture exercises. All recruited subjects signed informed consent forms before participating in the study after approval was obtained from the local ethics committee. All subjects gave their consent to the random assignment to the groups.

All calculations were performed using the SPSS for Windows, version 16.0 (SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to confirm that the data were within the ranges of normal distribution in both groups. A non-parametric test was employed for variables outside the normal distribution. Independent-samples t tests were used to compare data between groups. $P < 0.05$ with a 95% confidence interval were considered statistically significant.

RESULTS

A total of 144 stroke patients were included in this study (Table 1) (Fig. 1). The majority were men (90 patients, 62.5%). Their mean age was 65.10 ±11.56 years. The mean disease duration was 2.16 ± 1.59 years. The mean BMI was 28.52± 4.32 kg/m^2. Eighty-five (59%) and 59 (41%) patients had hemiparesis on the right and left sides, respectively. The stroke types included ischemic (131 patients, 91%) and hemorrhagic (13 patients, 9%). Tobacco and alcohol use were reported by 60 (41%) and 38 (26%) patients, respectively. Patient demographic information by group is presented in Table 2. Tables 2 and 3 show patient FIM values according to groups.

DISCUSSION

The results of our study show that the monthly average FIM motor scores did not differ significantly between the home and hospital treatment group ($p>0.05$). However, there were significant differences between groups in baseline motor and cognitive FIM scores and three-month average FIM total baseline scores ($p<0.05$). Analysis of the changes in FIM scores between group by month revealed statistically significant differences ($p<0.05$, Table 3). These results confirm previous reports that the level of disability at admission is the strongest prognostic factor associated with both cognitive and motor outcomes[9, 10].

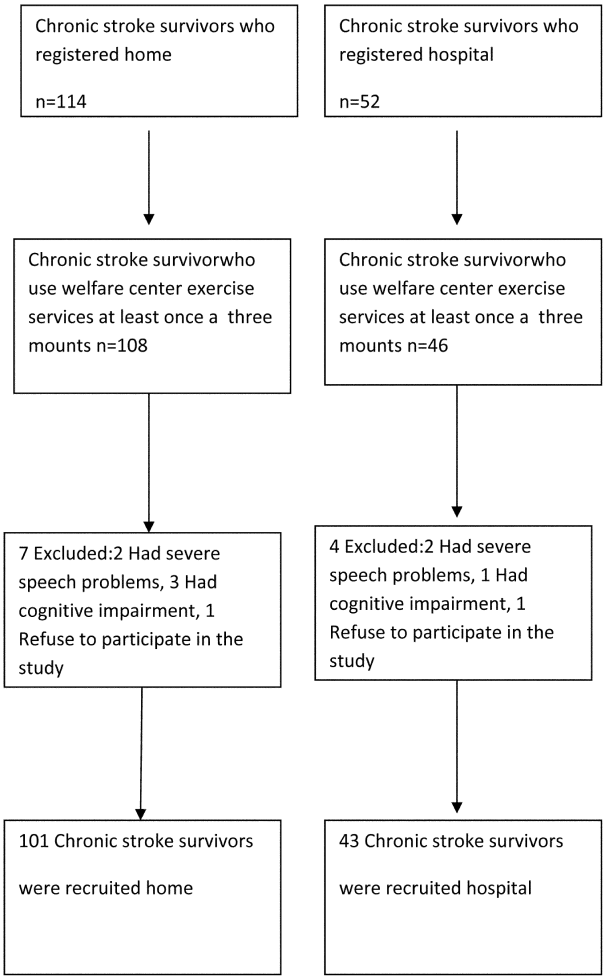

Fig. 1. Study flowchart

Admission motor FIM scores also strongly influence final motor outcome[9, 10].

Age is another important prognostic factor, with younger patients having generally better outcomes[11].

The average age of the patients in the current study was 65.10 ±11.56 years (range, 25−80 years). The incidence of cerebrovascular disorders increases with age, and only 28% of hemiplegic patients are under 65 years of age[7]. As of 1997, the estimated average age in Turkey was 72.37 years[12].

Many studies have reported strokes to occur more frequently in women than in men[13]. In our study, 36.5% of our patients were female and 62.5% were male, with a ratio of female to male patients of approximately 1:3, consistent with previous reports.

Inouye et al. also used FIM scores to evaluate factors that affected functional results of acute stroke patients after inpatient treatment. Spearman's rank correlation method revealed that total FIM scores at discharge correlated strongly with total FIM scores at the time of admission and were negatively correlated with age and onset-to-admission interval (OAI) using the. Total FIM scores at the time of hospital admission were the best predictor of FIM total scores at the time of discharge. However, the nature of the stroke, gender, length of hospital stay, and OAI were not correlated with total FIM scores at the time of discharge. Because the total scores at admittance and discharge were highly correlated, the scores at admittance can be used to found a rehabilitation program, inform the patient and family about the possibility of improvement, and assess the amount and quality of care given in the home or discharge placement[14].

Heruti et al. evaluated changes in FIM scores of 315 stroke patients. They reported significant differences in patient motor and cognitive FIM scores. Likewise, a positive association was observed between the increase of functional and cognitive FIM scores.

Better rehabilitation outcomes were observed in patients with higher admission cognitive status after adjusting for the effects of age, gender, OAI, length of stay, and severity of stroke[15].

Table 1. Patient demographic data

	Home (n=101)	Hospital (n=43)
Gender	62 men (61%)	28 men (65%)
Age (years) [β]	64.43 ± 11.11	66.70 ± 12.54
Disease duration (years) [β]	1.56 ± 0.85	2.20 ±1.45
BMI (kg/m^2) [β]	30.42 ± 4.52	27.33 ± 3.24
Tobacco	42 (41%)	18 (41%)
Alcohol	28 (27%)	10 (23%)
Ischemic stroke	91 (90%)	40 (93%)
Hemorrhagic stroke	10 (10%)	3 (7%)
Right side	51 (60%)	35 (59%)
Left side	34 (40%)	24 (41%)

BMI: Body Mass Index. [α]$p < 0.05$ indicates statistical significance, [β]mean (±SD)

Table 2. FIM values at baseline and three months

		Home	Hospital
FIM Motor	Baseline[α, β]	28.66 ± 14.53	43.30 ± 22.23
	3 months [β]	44.65 ± 19.73	49.43 ± 23.17
FIM Cognitive	Baseline[α, β]	16.93 ± 7.60	26.97 ± 8.43
	3 months[α, β]	20.73 ± 7.87	31.00 ± 6.00
FIM Total	Baseline[α, β]	45.42 ± 19.60	70.41 ± 29.60
	3 months[α, β]	65.41 ± 24.83	83.80 ± 31.05

[α]$p < 0.05$ indicates statistical significance, [β]mean (±SD)

Table 3. Change in FIM values at baseline and three months according to group

		Baseline	3 months
FIM Motor	Home[α, β]	28.66 ± 14.53	44.65 ± 19.73
	Hospital[α, β]	43.30 ± 22.23	49.43 ± 23.17
FIM Cognitive	Home[α, β]	16.93 ± 7.60	20.73 ± 7.87
	Hospital[α, β]	26.97 ± 8.43	31.00 ± 6.00
FIM Total	Home[α, β]	45.42 ± 19.60	65.41 ± 24.83
	Hospital[α, β]	70.41 ± 29.60	83.80 ± 31.05

[α]$p < 0.05$ indicates statistical significance, [β]mean (±SD)

Lanzillo et al. retrospectively examined changes in onset and terminal FIM scores to identify factors associated with these changes in a study of 224 stroke patients assessed over five years. Statically significant changes in FIM values were observed. The degree of disability at admittance was confirmed as the strongest prognostic factor associated with both cognitive and motor outcomes. There is forceful evidence to support the advantages of measuring functional recovery by means of normalized changes in FIM score. Following a rehabilitation program, functional recovery should be evaluated separately for motor and cognitive domains. Rehabilitation programs should begin as soon as possible. Progressed assessment of rehabilitation outcome leads to advanced achievement and favourable treatment outcomes[16].

Our study and similar studies have shown that stroke patients participating in rehabilitation programs have improved functional and cognitive capacity. Istanbul Metropolitan Municipality in his study at home under the care reveals the name of the stroke patients can be monitored without the need for a hospital. This positive concept should be made more widely

He received physical therapy and rehabilitation at the hospital after being left to their fate of stroke patients new hope to break this vicious cycle. In this context, this project can be extended by making it.

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