Effects of Day Hospital Rehabilitation After Stroke

Barbro Grenthe Olsson, RN, MSc, and Katharina Stibrant Sunnerhagen, MD, PhD

Objective: We sought to evaluate with 3 relevant, reliable, and valid measurement instruments the effect of 6 to 8 weeks of day hospital rehabilitation (DHR) after stroke on physical and cognitive functions and self-rated health and health-related quality of life, possible relationships among these variables, and direct costs of the rehabilitation period. *Design:* We conducted a prospective follow-up study of DHR in a university hospital with pretreatment and posttreatment assessments. *Patients:* In all, 52 consecutive patients aged 18 to 60 years with first-ever stroke occurring in the mean 6 months before study start comprised the study group. *Methods:* We conducted assessments using Functional Independence Measure, Medical Outcomes Study 36-item Short Form, and EuroQol. *Results:* Significant improvements occurred in physical and cognitive functions ($P < .0001$) and self-rated health and health-related quality of life ($P < .0001$ for both physical and mental component summaries and $P < .0001$ for the EuroQol). Improvements correlated inversely with baseline scores ($P = .026$-$P < .0001$ for different variables). Improvements in self-rated health and health-related quality of life were not related to improvements in physical and cognitive functions. Direct costs were estimated at about 12,000 euros or $14,500 per patient for the treatment period. *Conclusion:* During the 6 to 8 weeks of DHR, there is significant improvement in physical and cognitive functions and self-rated health and health-related quality of life, which are not related significantly to each other. Improvements are greater in patients with more severe impairment of physical and cognitive functions and self-rated health and health-related quality of life at baseline. **Key Words:** Day hospital rehabilitation—stroke—Functional Independence Measure—Medical Outcomes Study 36-item Short Form—EuroQol—costs.

The annual incidence of stroke in Sweden is estimated at about 27,000 to 35,000 individuals.[1] About 70% of these, or 213 per 100,000 individuals, are first-ever strokes.[2] A commonly applied type of rehabilitation after stroke is day hospital rehabilitation (DHR). Several studies of the effect of DHR have been published. In a recent review of studies on the effectiveness of DHR in all ages, Dekker et al[3] state that none of the studies has applied DHR as a dedicated program by a multidisciplinary approach (physiotherapy, psychology, speech therapy, social work, rehabilitation engineering, occupational therapy, and rehabilitation medicine).

Five of the studies included in the above-mentioned review have studied the effect of DHR on quality of life.[4-8] However, according to Dekker et al,[3] there is no proof of validity or reliability for the instruments used in these studies (i.e., Life Satisfaction Index [Nottingham version] and Geriatric Quality of Life Questionnaire).

This noncontrolled study aimed to study, in a nongeriatric population and with a multidisciplinary approach: (1) whether a 6- to 8-week DHR period after the acute inpatient treatment for a stroke is accompanied by improved self-rated health and health-related quality of life, using methods (Medical Outcomes Study 36-item Short

From the Institute of Clinical Neuroscience–Rehabilitation Medicine, Sahlgrenska Academy, Göteborg University, Göteborg, Sweden.

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Address correspondence to Barbro Grenthe Olsson, Institute of Clinical Neuroscience–Rehabilitation Medicine, Sahlgrenska Academy, Göteborg University, SE-413 45 Göteborg, Sweden. E-mail: barbro.m.olsson@vgregion.se.

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Form [SF-36] and EuroQol) that have been validated for use in patients with stroke; (2) whether possible changes in health and health-related quality of life are related to a reduced demand for physical and cognitive support, as measured by the Functional Independence Measure (FIM) instrument, which has also been validated in patients with stroke undergoing rehabilitation; and (3) direct costs for such a treatment period.

Methods

This is a prospective study performed from January 2003 to August 2004 on 52 consecutive patients. The diagnosis of stroke was based on patient history at admission and examination by a stroke physician, followed by computed tomography for all patients and, for many, magnetic resonance imaging for stroke typing and lesion location according to hospital guidelines. Inpatients with acute stroke had been admitted to the hospital for examination, care, and rehabilitation. This study is focused on the patients who were referred as outpatients to the university hospital day rehabilitation department for continuing rehabilitation after stroke. The inclusion criteria in this study were: first-ever stroke, age 18 to 65 years, patient willingness to participate, assessment that the patient should be able to actively participate in the study, and a need of at least two of the members of the team mentioned below, coordinated by a physician. In all, 59 patients fulfilling the criteria were admitted during the study period. One patient declined to participate. Six patients discontinued rehabilitation for different reasons after just 2 to 4 weeks and were, therefore, excluded from the study. A total of 52 patients (age 18-60 years), thus, participated in the study and the average time since stroke onset was 180 days (22-473 days). Of these patients, 49 were living at home and 3 were in intermediate housing (while waiting for appropriate changes in their living quarters) during the DHR period.

Each patient with ischemic stroke was classified according to Trial of Organization 10172 in Acute Stroke Treatment criteria into the etiologic categories of large vessel disease, small vessel disease, cardioembolic stroke, other determined cause, and undetermined origin. The distribution of ischemic stroke subtypes was: large vessel disease n = 27, small vessel disease n = 3, cardioembolic n = 6, other determined stroke n = 1, and undetermined stroke n = 0.

There were no sex-related age differences. Furthermore, there were no differences among the groups for cerebral infarction, hemorrhage, or subarachnoidal bleeding related to the number of days from first admission to the hospital for the stroke until the start of DHR. There was also no difference among the diagnosis groups in the level of consciousness at admittance as assessed by the Reaction Level Scale 85[9] (Table 1) or in the length of hospital stay in association with acute stroke.

Table 1. *Gender distribution, diagnoses, ages, days from first hospitalization for the stroke, Reaction Level Scale (RLS), and length of hospital stay (LOHS) in association with the acute stroke in the study group*

	Diagnoses			Side location		
	Cerebral Infarction (CI)	Intracerebral bleeding (IB)	Subarachnoidal bleeding (SB)	Right-sided (R)	Left-sided (L)	No defined side (0)
Total number	37	6	9	18 (35%)	23 (44%)	11 (21%)
Females/males	12/25	5/1	7/2	6/13	13/10	5/13
Age, mean	52.0	44.4	43.3	51.8	48.9	47.4
(SD)	(7.4)	(17.8)	(13.8)	(11.3)	(9.5)	(12.1)
Days from first admission to start of DHR						
Median	122	116	121	120	116	122
(Range)	(29-449)	(22-189)	(67-360)	(22-391)	(29-449)	(67-360)
RLS, stage 1-7	22/13/1/1/0/0/0	3/1/0/1/0/0/1	2/5/1/0/0/0/1	12/3/0/2/0/0/1	10/12/1/0/0/0	5/4/1/0/0/0/1
LOHS, days						
Median	63	98	71	67	66	47
(Range)	(1-164)	(22-148)	(8-146)	(1-164)	(7-134)	(8-146)