Post-Stroke Follow-Up in a Rehabilitation Center Outpatient Clinic

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Abstract

Background: Follow-up examinations in a rehabilitation center clinic after stroke are essential for coordinating post-acute services and monitoring patient progress. Of first-stroke patients discharged from our rehabilitation ward to the community 92% are invited for ambulatory check-up once every 6 months.

Objectives: To review patient complaints at follow-up and the recommendations issued by the attending physical medicine and rehabilitation specialist at the outpatient clinic.

Methods: We extracted relevant data from the records and assessed the relationship between functional status on admission and discharge (measured by FIM), length of stay, and number of complaints. Patients were divided according to the side of neurologic damage, etiology, whether the stroke was a first or recurrent event, and main clinical syndrome (neglect or aphasia).

Results: Patients' complaints included: decreased hand function (in 40%), general functional deterioration (20%), difficulty walking (11%), speech dysfunction (10%), various pains (especially in plegic shoulder) (8%), urine control (2%), sexual dysfunction (3%), swallowing difficulties (2%), and cognitive disturbances (2%). Patients received the following recommendations: physiotherapy (for 52.5%), occupational therapy (37.5%), speech therapy (12.5%), different bracing techniques (22.5%), pain clinic treatment (12.5%), changing medication prescriptions (7.5%), psychological treatment (10%), sexual rehabilitation (5%), vocational counseling (2.5%), counseling by social workers (2.5%), and repeat neuropsychological diagnosis (2.5%). A reverse correlation was found between the number of complaints and FIM at admission ($P = 0.0001$) and discharge ($P = 0.0003$), and between LOS and FIM at admission ($P = 0.0001$) and discharge ($P = 0.004$). A direct correlation was found between the number of complaints and LOS ($P = 0.029$). No relation was found between age, type of stroke, first and recurrent event, and clinical syndromes and patient complaints in the outpatient rehabilitation. Community rehabilitation services met 58% of all recommendations in 62% of patients, mainly physiotherapy and occupational therapy, with 34% of patients waiting for implementation of the recommendations and 4% not available for follow-up.

Conclusions: Follow-up examinations should be an integral part of post-stroke rehabilitation. Rehabilitation treatment in the community must be strengthened.

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Stroke has a profound effect on the national healthcare system. It is the most prevalent chronic condition and the main reason for hospitalization in individuals 65 years of age and older. A survey performed in Israel [1] in a predominantly geriatric population found that in the year following the stroke one-third of patients died, two-thirds returned directly to the community, and the remainder moved to geriatric rehabilitation hospitals or long-term care institutions before returning to the community. Most of them returned to the community within 3 months of the stroke. About half of those who survived 1 year after the stroke suffered from impairment in motor functioning, in the ability to communicate, in cognition, or some disability that affected their quality of life. The current study was designed to: a) review patients' complaints and the recommendations of the rehabilitation center's outpatient clinic during follow-up care; b) review outpatients' rehabilitation treatment after discharge from rehabilitation; and c) examine the factors that may influence patients' complaints during the outpatient rehabilitation (age, functional assessment scores, length of stay, type of stroke, whether it was a first or recurrent event, and clinical syndromes).

FIM = Functional Independence Measure
LOS = length of stay

Patients and Methods

Subjects' demographics and characteristics were obtained from a database containing information about patients discharged from our rehabilitation department over the 2 year period 2001–2002 and seen in our ambulatory rehabilitation clinic at the Loewenstein Rehabilitation Hospital. The rehabilitation department's policy is to invite patients for a follow-up examination 3 months after discharge and every 6 months thereafter.

The study analyzed the following variables: Functional Independence Measure at admission and discharge, length of stay in the neurologic department, age, etiology, clinical syndromes, number of complaints, and recommendations by the stroke outpatient clinic at follow-up examinations. Relevant clinical, demographic and FIM information was obtained.

The study group comprised patients with first and recurrent stroke who were discharged from our rehabilitation department and admitted to our ambulatory rehabilitation clinic. Functional status was measured by the patients' scores on the motor and cognitive components of FIM, which was prospectively obtained at the time of admission and discharge for all patients. FIM is an 18-item scale that measures independence in tasks involved in feeding, grooming, dressing, toileting, mobility, and cognition. FIM has proven content and construct validity, is responsive to small increments in functional status after stroke, and correlates highly with measures of neurologic impairment after stroke, such as the National Institutes of Health Stroke Scale. FIM was introduced to Israel and the study hospital by one of the authors (H.R.) in 1990, and has gained widespread popularity around the world [2].

Results

Patients' characteristics

The study group included 120 stroke patients (88 first and 32 recurrent), representing about 25% of the total number of patients discharged from our department in 2001–2002. The patients, 78 men (65%) and 42 women (35%), had a mean age of 63.4 ± 8.2 years. The relevant average check-up time for the study was 14.6 months after the stroke. Average LOS was 65.92 days. Length of stay in the 2001–2002 period did not change significantly. Average time after discharge was 9.34 months.

The average total FIM score, determined at admission and discharge, was 71.3 and 91.8 points respectively, and the calculated average functional gain during inpatient rehabilitation was delta FIM 20.5. Patients were divided according to the side of hemiparesis, the main clinical syndrome (presence or absence of neglect or aphasic syndromes, type of lesion, first or recurrent stroke).

Sixty-six percent of patients had right hemiparesis, 17% with and 39% without aphasia; in 38% the lesions were left hemiparesis, 10% with and 28% without neglect; and in 6% the lesions were other (ataxia, dysphagia). In 85% of patients the stroke was ischemic and in 15% it was hemorrhagic. In 26% the stroke was recurrent and in 74% it was the first stroke.

The patients' subjective complaints were: decrease of hand function (40%), general functional deterioration (20%), walking difficulties (11%), speech dysfunction (10%), different pains, especially in plegic shoulder (8%), urine control (2%), sexual dysfunction (3%), swallowing difficulties (2%), and cognitive disturbances (memory and orientation) (2%).

Physician recommendations during the check-up visit to the rehabilitation clinic for follow-up examination were as follows: physiotherapy (52.5%), occupational therapy (37.5%), speech therapy (12.5%), different bracing techniques (22.5%), pain clinic treatment (12.5%), changing medication prescriptions (7.5%), psychological treatment (10%), sexual rehabilitation (5%), vocational counseling (2.5%), counseling by social workers (2.5%), and repeat neuropsychological diagnosis (2.5%).

All patients were contacted by telephone to evaluate the implementation of recommendations by the community. Average telephone contact time was 6 months (SD ± 2.7 months) after the relevant follow-up examination. Community rehabilitation services met 58% of all recommendations in 62% of patients, mainly physiotherapy, occupational therapy and speech therapy. Thirty-four percent of patients were waiting for implementation of recommendations, and 4% were not available because of disconnected telephone, severe ill health or hospitalization. All patients were distributed according to regions of the Clalit Health Services, the major health management organization in Israel [Figure 1]. The recommendations met by community rehabilitation services in the

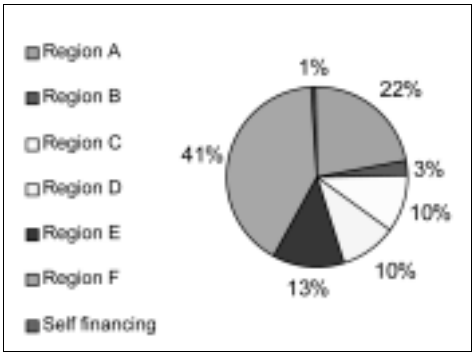

Figure 1. Patient distribution according to regions of the Clalit Health Services

Table 1. Implementation of recommendations according to regions of the Clalit Health Services

	Physiotherapy (%)	Occupational therapy (%)	Speech therapy (%)
Region A	78	64	49
Region B	65	60	50
Region C	82	69	58
Region D	79	60	59
Region E	72	59	20
Region F	77	65	43

Table 2. Influence of LOS and of FIM at admission and discharge on the number of complaints, and the relationship between LOS and FIM at admission an discharge

	No. of complaints	LOS
FIM at discharge	–0.5468	–0.4477
P value	0.0003	0.0043
FIM at admission	–0.5981	–0.6829
P value	0.0001	0.0001
LOS	0.3502	–
P value	0.029	–

Table 3. Influence of age, type of stroke, and clinical syndromes on the number of complaints

	No. of complaints
Age	0.0229
P value	NS
Infarction	0.1916
P value	NS
Hemorrhage	0.2101
P value	NS
Neglect syndrome	–
Present	0.3788
Absent	0.2480
P value	NS
Aphasia	–
Present	0.3442
Absent	0.2332
P value	NS
First stroke	0.1322
Recurrent stroke	0.3212
P value	NS

NS = statistically not significant

62% of patients are presented in Table 1 according to regions of the Clalit Health Services.

Statistical analysis

A reverse correlation was found between the number of complaints and FIM at admission ($P = 0.0001$) and discharge ($P = 0.0003$), and a direct correlation was found between the number of complaints and LOS ($P = 0.029$). A reverse correlation was found between LOS and FIM at admission ($P = 0.0001$) and discharge ($P = 0.004$) [Table 2].

No relationship was found between age, type of stroke, first or recurrent event, clinical syndromes (neglect and aphasia), and the number of complaints [Table 3]. The number of patients with special clinical syndromes and recurrent stroke who complained was high, although not statistically significant.

Discussion

Ambulatory follow-up examination in stroke patients after discharge is an important part of outpatient rehabilitation. High quality outpatient rehabilitation may be crucial to the future improvement of functional outcomes in stroke patients; without it, patients may achieve less and live with greater dependency.

The study was designed to review patient complaints at follow-up, the recommendations issued by the attending PM&R specialist at the outpatient clinic, the implementation of recommendations by the community, and the influence of age, type of stroke, clinical syndromes, and first or recurrent stroke on the number of complaints. The results revealed a large number of complaints and recommendations issued for patients after discharge from rehabilitation.

Rehabilitation after stroke is a time-dependent process, and the most significant predictors of functional gain in post-acute stroke rehabilitation were FIM score and LOS. More impaired patients needed longer periods of hospitalization for improvement [2].

The number of patient complaints in the study was related to functional status on admission and discharge, and length of stay in the hospital. A reverse correlation was found between the number of complaints and FIM at admission and discharge, and between LOS and FIM at admission and discharge, demonstrating that higher functional status on admission and discharge correlated with a low number of complaints after discharge from rehabilitation and a shorter period of hospitalization. Patients with a low total FIM at admission needed a longer period in hospital, more therapy, and a greater amount of care in an outpatient rehabilitation setting for functional improvement. A direct correlation was found between the number of complaints after discharge and LOS. Shorter LOS correlated with a high total FIM at admission and discharge and fewer complaints after discharge from rehabilitation, demonstrating that these patients needed fewer services after discharge from inpatient rehabilitation and are a lesser burden for the community.

We did not find a correlation between age and the number of complaints after discharge. Numerous studies have reported that age-associated factors may influence inpatient stroke rehabilitation referral, treatment and outcome, particularly for patients above the age of 75 [3]. In addition, younger stroke patients benefited more from rehabilitation in a stroke unit than older ones, not only because of their age but also because of differences in the multidisciplinary input available for elderly patients outside the stroke units [4].

The type of stroke (ischemic infarct or intracerebral hemorrhage) did not affect the number of complaints. ICH is a major cause of stroke-related morbidity and mortality; the pathophysiologic mechanisms and acute complications are well understood. Our study supports the finding that there is no difference between ICH and cerebral infarction patients in functional disability after rehabilitation therapy. ICH is associated with greater functional disability than cerebral infarction at the onset of rehabilitation therapy and with greater increments in functional recovery during rehabilitation therapy. There is no difference between ICH and cerebral infarction patients in functional disability after rehabilitation therapy [5].

Statistical analysis did not find a significant influence of the main clinical syndromes, or of first or recurrent stroke on the number of complaints in the study. Recurrent stroke tended to leave patients with greater disability than a first stroke. From the public health perspective one would expect patients with recurrent strokes to have poorer health and economic outcomes (on average) than those with first strokes.

Specific syndromes such as neglect and aphasia, resulting from right and left hemispheral damage, have profound effects on the patients' general activities and activities of daily living. Numerous studies have reported that neglect is associated with lower performance on measures of impairment (sensory-motor and cognitive), as well as on measures of disability in ADL and IADL. The recovery pattern of neglect patients is slower and more attenuated [6]. Antonucci et al. [7], in a random group study, found that rehabilitation programs cause a significant improvement in neglect, which generalizes to situations simulating everyday life. They found that motor and functional recovery of stroke patients with neglect were significantly improved by the simultaneous presence of a treatment specifically focused on neglect. It is important to identify the influence of time on the functional outcome of neglect patients and to develop appropriate therapeutic modalities for this complex, multifactorial syndrome.

Aphasia is a disturbance of one or more channels of language – namely, expression, comprehension, reading and writing. It appears generally in patients with damage to the left hemisphere, and is dominant for speech in about 85% of the population. These symptoms have an adverse effect on everyday life, self-care, and social performance. Widen-Holmquist et al. [8] studied a population-based sample of 20 patients living at home 1 to 3 years after stroke and found that the aphasic patients were significantly more dependent in ADL measures and spent less time in leisure activities. Aftonomos et al. [9] studied the outcomes of individuals

PM&R = physical medicine and rehabilitation
ICH = intracerebral hemorrhage

ADL = activities of daily living
IADL= instrumental activities of daily living

with aphasia enrolled in two community-based, comparably managed and equipped therapy programs and found significant improvements in individuals with chronic as well as acute aphasia, independent of the diagnostic type of aphasia, impairment severity at start of care, or geographic location.

Our study demonstrated that the FIM total score can be used for stroke patients as an indicator of functional disability and the amount of care required in an outpatient rehabilitation setting. This study revealed: a) a high number of complaints of patients and recommendations issued after discharge from rehabilitation; b) that outpatient care may be crucial for improving functional outcomes in stroke patients after discharge; c) the importance of ambulatory follow-up examinations after discharge; d) the need for rehabilitation services in the community as complementary to the inpatient ones; and e) the need to significantly expand the extent and type of rehabilitation services.

The study's findings emphasize the need to examine the reasons for barriers to these services. In light of the aging of the population and the expected increase in the number of disabled stroke patients, it is important to find efficient and effective ways of caring for them. A comprehensive and thorough planning policy is needed to promote the quality of care and improve the quality of life of chronically disabled stroke patients in Israel.

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That rainbow song's no good. Take it out

Internal memo at MGM studios after the first screening of The Wizard of Oz. The Wizard of Oz became MGM's second smash hit of the 1940s (after Gone With the Wind) and is still considered one of the most watched movies in the history of cinema. It won the Oscar for the best musical of the year, and another Oscar for the best song – "Somewhere Over the Rainbow."

Capsule

Combination antimicrobial therapy for Gram-negative bacteremia

The use of combination antimicrobial therapy for bacteremia caused by Gram-negative bacilli is controversial. Safdar et al. conducted a meta-analysis of published studies to determine whether a combination of two or more antimicrobials reduces mortality in patients with Gram-negative bacteremia. Criteria for inclusion were analytic studies of patients with documented Gram-negative bacteremia that included patients receiving a single antibiotic (monotherapy) and patients receiving two or more antibiotics (combination therapy). Data on mortality (outcome) had to be provided. Most studies used beta-lactams or aminoglycosides alone and in combination. The summary odds ratio was 0.96 (95% confidence interval 0.70–1.32), indicating no mortality benefit with combination therapy. Subgroup analyses adjusting for year of publication, study design and severity of illness did not change the results. Considerable heterogeneity was present in the main analyses. Analysis of only *Pseudomonas aeruginosa* bacteremias showed a significant mortality benefit (OR 0.50, 95% CI 0.30–0.79). This analysis did not support the routine use of combination antimicrobial therapy for Gram-negative bacteremia, beyond settings where infection by *P aeruginosa* is strongly suspected or more than one drug would be desirable to assure *in vitro* efficacy.

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