BRIEF REPORT

Patient and Caregiver Outcomes 12 Months After Home-Based Therapy for Hip Fracture: A Randomized Controlled Trial

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ABSTRACT. Crotty M, Whitehead C, Miller M, Gray S. Patient and caregiver outcomes 12 months after home-based therapy for hip fracture: a randomized controlled trial. Arch Phys Med Rehabil 2003;84:1237-9.

Objective: To compare the effect of early discharge and home-based therapy with conventional hospital rehabilitation on patient and caregiver outcomes at 12 months after hip fracture.

Design: Randomized controlled trial.

Setting: Acute and subacute care with follow-up in a community setting in Australia.

Participants: Sixty-six older adults admitted to acute care after hip fracture who were assessed as needing rehabilitation.

Interventions: Eligible patients were randomized to either home-based (n=34) or hospital (n=32) rehabilitation. Patients assigned to the home-based group were discharged home within 48 hours of randomization. Patients assigned to hospital rehabilitation received usual care.

Main Outcome Measures: Modified Barthel Index (MBI), timed up and go (TUG) test, Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), and Caregiver Strain Index.

Results: At 12 months, 56 of 66 (85%) participants were available for follow-up assessment. Both groups achieved significant improvements in MBI and TUG test scores. Patients in both groups had a significant decline in the physical score of the SF-36 and there were no differences between groups. Caregivers of patients allocated to receive home-based therapy reported a reduction in burden after 12 months. Over that period, there was a significant reduction in the burden for caregivers of those patients who received home rehabilitation (P=.020).

Conclusion: For patients who were previously functionally independent and living in the community, early return home with increased involvement of caregivers after hip fracture resulted in similar patient outcomes (home vs hospital) and less caregiver burden at 12 months.

Key Words: Caregivers; Hip fractures; Home-care services; Rehabilitation.

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WITH THE AGEING of the population and an anticipated increase in hip fractures, providing health care on an outpatient basis has become more attractive. Programs that emphasize early discharge after hip fracture have been supported by recent evidence based on a review of orthogeriatric services.[1] After hip fracture, many of the issues faced by patients are functional rather than medical, and home programs reduce the risk of hospital injury, allow patient choice, and encourage rehabilitation goals of relevance to the patient. However, the primary motivation for establishing these programs has been to reduce costs by transferring some care responsibilities onto the community and the patient's families. While there is limited evidence from randomized controlled trials that suggests home programs produce patient outcomes that are at least as good as hospital programs,[2,3] it is still unclear whether these programs increase the emotional, physical, and financial burdens of caregivers.[4] The purpose of this study was to compare the effects of home versus hospital rehabilitation on the outcomes of hip fracture patients and their caregivers at 12 months postfracture.

METHODS

Participants

In 1998, patients admitted to 2 Australian teaching hospitals in Adelaide (Flinders Medical Centre, Repatriation General Hospital) for surgical treatment of a fall-related hip fracture were invited to participate in the study. Patients were eligible for the trial if they were age 65 years or over, medically stable, needed a formal rehabilitation program, had adequate physical and mental capacity to participate in rehabilitation, were expected to return home after discharge from the hospital, and had a home environment suitable for rehabilitation. Patients were not eligible if they had inadequate social support in the community, no telephone at home, or did not live in Adelaide's southern metropolitan region. Written informed consent was obtained from all participants. Randomization was undertaken by the hospital pharmacy department, which maintained a computer-generated allocation sequence in sealed opaque envelopes. Further information on recruitment and study protocol can be found elsewhere.[5] The ethics committees of the participating hospitals approved the study protocol.

Treatment Groups

Patients who consented to participate were randomized to either early discharge and home-based therapy (n=34) or conventional care (n=32). Participants were discharged from acute care within 48 hours of randomization and were visited by physiotherapists, occupational therapists, speech pathologists, social workers, and therapy aides, who negotiated a set of realistic, short-term, and measurable treatment goals with both participants and their caregivers. Standard therapy services, such as podiatry, nursing care, and assistance with light domestic tasks, were provided as required. The participants who were allocated to conventional care received routine hospital interdisciplinary rehabilitation.

Table 1: Outcome Assessments for Patients and Caregivers at Baseline and 12 Months by Treatment Group

	Hospital Rehabilitation		Accelerated Discharge and Home Rehabilitation		Differences at 12mo Between the 2 Groups	
	Baseline (n=32)	12mo (n=28)	Baseline (n=34)	12mo (n=28)	Mean or Median Difference	95% CI for Difference
Outcomes for patients						
Median MBI (25th, 75th)	85.0 (77.0, 89.0)	97.0 (85.3,100.0)*	85.0 (79.0, 89.0)	97.0 (92.3,100.0)*	1.0	−1.0 to 6.0
Median TUG test (25th, 75th)	41.5 (27.5, 53.0)	24.5 (15.5, 32.8)*	37.0 (24.0, 49.5)	19.0 (14.0, 28.0)*	−3.0	−11.0 to 3.0
Mean SF-36 PCS (95% CI)	30.0 (23.1–36.9)	33.3 (27.6–39.1)*	41.7 (31.0–52.3)	38.0 (34.0–41.9)*	−2.3	−7.6 to 3.0
Mean SF-36 MCS (95% CI)	54.5 (50.8–58.1)	52.3 (47.3–57.3)	46.4 (35.9–56.9)	53.8 (49.2–58.3)	0.7	−3.8 to 5.3
Outcomes for caregivers						
Mean SF-36 PCS (95% CI)	40.7 (27.0–54.5)	34.9 (30.5–39.3)	47.5 (39.4–55.5)	43.2 (37.7–48.8)	−8.3	−15.0 to −1.6
Mean SF-36 MCS (95% CI)	51.8 (46.9–56.8)	50.3 (46.6–54.1)	51.1 (45.1–57.2)	50.2 (46.5–53.9)	0.1	−4.9 to 5.2
Median CSI (25th, 75th)	1.0 (1.0, 3.5)	4.0 (0.5, 8.0)	2.0 (0.3, 4.8)	1.0 (0.0, 3.0)*	−1.0	−5.0 to 0.0

NOTE: Significance testing for change between baseline and 12mo for each group was by using paired samples *t* tests for normally distributed data and the Wilcoxon signed-rank test for nonparametric data. Higher scores indicate a better score or a greater improvement; lower scores indicate a better score or a greater improvement.
Abbreviations: CI, confidence interval; 25th, 75th, 25th, 75th percentile.
*$P<.05$ for change from baseline to 12mo.

Baseline Assessments

Data collected at baseline included demographic information (age, gender, marital status, accommodation), level of independence before admission, and details of the fracture and treatment when admitted to acute care. Patients were also administered standard questionnaires that included measures of ability to perform day-to-day activities (Modified Barthel Index[6] [MBI]) and health-related quality of life (QOL; Medical Outcomes Study 36-Item Short-Form Health Survey [SF-36][7]). Caregivers completed the Caregiver Strain Index[8] (CSI) when the patient was discharged from the rehabilitation program.

Outcome Assessments

Follow-up data were collected at 4 and 12 months after randomization by an assessor who was blinded to treatment allocation. Details and results of the 4-month outcomes have been reported elsewhere.[9]

Participants assessed at 12 months were asked to complete a measure of mobility (timed up and go[10] [TUG] test) and to respond to a survey that assessed their ability to perform day-to-day activities[6] (MBI) and QOL[7] (SF-36). The SF-36 questionnaire[7] and the CSI[8] were administered to caregivers where applicable. Data collected at 12 months also included changes in residence and mortality.

Statistical Analysis

Data were analyzed on an intention-to-treat basis using the SPSS, version 9.0.[a] Differences over time within a group were tested using paired samples *t* tests for normally distributed data and the Wilcoxon signed-rank test for nonparametric data. Differences between groups on continuous variables that were not normally distributed were analyzed with the Mann-Whitney *U* test; otherwise, independent sample *t* tests were used. Change from baseline to 12 months was calculated and differences between groups were tested as above. The Fisher exact test was used to compare proportions. All comparisons were 2-tailed and significance was set at *P* less than .05.

RESULTS

Sample Characteristics at 1-Year Follow-Up

Of the 66 patients who were recruited to the trial, 56 were available for 12-month follow-up (3 were lost to follow-up, 7 died). Of the survivors, the mean age was 81.8±7.2 years, 41 (73%) were women, and 32 (57%) had caregivers. Three had moved into higher-level care, 2 to hostels, and 1 to a nursing home. At 12 months, 95% of participants were walking independently or were requiring only minimal assistance, and 4% were unable to walk. At baseline, there were no differences between those who survived to 1 year and those who died or were lost to follow-up for age ($P=.738$), use of mobility aids ($P=.792$), MBI score ($P=.414$), or treatment group allocated ($P=.560$). More women than men survived to the 1-year follow-up ($P=.038$).

Changes in Outcomes Over 12 Months

Table 1 includes data that describe the outcomes for both groups at baseline and at 12 months. At 12 months, patients who received conventional hospital care had significantly improved scores on the MBI ($P=.036$), the TUG test ($P=.001$), and the physical component summary (PCS) scores ($P=.012$) of the SF-36. There was no difference in QOL mental component summary (MCS) score of the SF-36 ($P=.689$). For caregivers (n=32), there was no significant change in scores on the CSI ($P=.140$) or on either the PCS ($P=.125$) or MCS ($P=.789$) scores of the SF-36 from baseline to 12-month follow-up.

At 12 months, patients who received early discharge and home-based rehabilitation had also significantly improved scores on the MBI ($P\leq.001$), TUG test ($P=.003$), and PCS ($P=.023$) compared with baseline. There was no difference in QOL MCS score ($P=.109$). For caregivers, there was a significant improvement in CSI score ($P=.042$), but not for either the SF-36 PCS ($P=.266$) or MCS ($P=.400$) scores from discharge to 12-month follow-up.

Comparison of Outcomes

At 12-month follow-up, there were no differences between the groups for scores on the MBI ($P=.250$), TUG test ($P=.314$), or either the PCS ($P=.386$) or the MCS ($P=.733$) scores. For caregivers, there was a significant difference in the PCS score ($P=.017$), but no differences in CSI score ($P=.151$) or MCS score ($P=.958$). When change between baseline or discharge and 12 months for variables were tested, there was a significant reduction in burden for caregivers of patients who received home-based therapy ($P=.020$).

DISCUSSION

In keeping with other studies that have examined hospital-based therapy versus an early discharge and home program, we found that the latter did not adversely affect patient outcomes at 12 months.[2,3] The caregivers of patients who received home rehabilitation reported a significantly greater reduction in burden between baseline and 12 months. When comparing conventional care with home-based rehabilitation, the change in burden of caregivers was significantly greater and in the positive direction for those caring for patients allocated to receive home-based rehabilitation. These caregivers also scored significantly higher on the PCS score.

The effect of early discharge and hospital-at-home therapy programs on older patient's caregivers has been debated.[4] An evaluation[11] of one of the oldest schemes in the United Kingdom, which studied patients who were discharged after stroke, malignant disease, and postoperations (including hip fracture), found that caregivers felt increased levels of burden with patients who were discharged early. In that study, 31% of the caregivers reported it had caused them some burden.[11] There are several possible reasons for the results reported in our study. Caregivers who took patients home earlier may have been given more information and a larger role in the decision-making process. Patients were only accepted into the trial if the caregiver consented, and the early discharge program involved establishing goals for therapy in consultation with both the caregiver and patient.

CONCLUSION

Successful early discharge programs depend on a careful selection of patients and their caregivers. We believe consultation with families is important to explain the nature of the program and to relieve their suspicions of the motives for early discharge. We also believe that our eligibility criteria are useful (medically stable, assessed as needing, and having adequate physical and mental capacity to participate in a formal rehabilitation program, expecting to return home after discharge from hospital, a home environment suitable for rehabilitation, and adequate social support in the community). With this approach, our trial suggests that generally good outcomes for both patients and caregivers can be achieved in 12 months.

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Supplier

a. SPSS Inc, 233 S Wacker Dr, 11th Floor, Chicago, IL 60606.