

Health-related quality of life and self-reported ability concerning ADL and IADL after hip fracture

A randomized trial

Birgit Hagsten¹, Olle Svensson² and Ann Gardulf³

Departments of ¹Nursing, Karolinska Institutet, and the Department of Occupational Therapy, Karolinska University Hospital, Huddinge, Stockholm, ²Surgery and Perioperative Science, Division of Orthopedics, Umeå University Hospital, Umeå, ³Laboratory Medicine, Section of Clinical Immunology, Karolinska Institutet at Karolinska University Hospital, Huddinge, Stockholm, Sweden.

Correspondence 16 BH: birgit.hagsten@karolinska.se

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Background It is not known whether postoperative occupational therapy is of value for hip fracture patients. In this randomized trial we evaluated the effects of an individualized, postoperative, occupational training (OT) program on the patient's self-reported health-related quality of life (HRQL) and self-reported abilities to perform activities of daily living (ADL) and instrumental activities of daily living (IADL).

Patients and methods 100 eligible patients (aged ≥ 65 years) were randomized 50:50 to an OT or control group (termed the C group: conventional care). The OT group received individualized OT from day 3 or 4 after surgery and until discharge, and also a home visit. The patients answered the Swedish Health-Related Quality of Life questionnaire (SWED-QUAL) and the modified Disability Rating Index (DRI) three times: 3–4 days after surgery, at discharge, and at follow-up after 2 months.

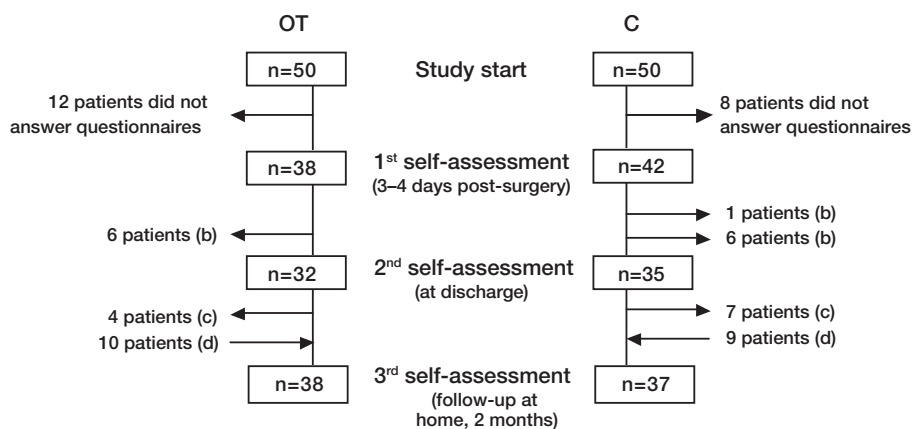
Results We found no statistically significant differences between the groups at discharge and at follow-up regarding mean SWED-QUAL scores. However, on comparing each group over time, 2 months after the fracture the OT group had regained their self-reported pre-fracture HRQL status in 10 of 12 SWED-QUAL subscales, and the C group in 6 subscales. Statistically significant differences ($p < 0.05$) were found between the groups after 2 months regarding self-reported IADL (moving around indoors, performance of light housework, and getting in and out of a car).

Interpretation Our findings indicate that the individualized occupational training improved the ability to

perform IADL and appeared to speed up the recovery in some HRQL areas. ■

Despite the fact that a large number of individuals suffer from hip fracture after falls, relatively few studies have asked for the patient's own views regarding their postoperative health-related quality of life (HRQL). Studies have shown the self-reported HRQL to be impaired 3 and up to 12 months postoperatively (Borgqvist et al. 1992, Johansson et al. 1998, Hall et al. 2000, Randell et al. 2000, van Balen et al. 2001, Tidermark et al. 2002, van Balen et al. 2003, Suriyawongpaisal et al. 2003). However, in a relatively recent study in the US, Peterson et al. (2002) reported that the patient's physical function, bodily pain, social function, vitality, emotional role, mental health and general health seemed to have recovered 6 months after the fracture.

To date, we have not found any published trial including an intervention with the aim of evaluating the possible effects of occupational training (OT) on HRQL and self-reported ADL and IADL after hip fracture surgery. We therefore performed a randomized trial to investigate this.



Profile of trial, including drop-outs.

Patients and methods

Patients

During 2 years starting in 1996 and ending in 1998, patients aged ≥ 65 years with hip fractures resulting from falls and treated at the Orthopedics Department at Huddinge University Hospital were considered for the study. These patients had to be living independently and did not normally use technical aids or mobility aids. Patients with cognitive impairment or those not proficient in Swedish were excluded.

Questionnaires

The SWED-QUAL questionnaire includes 68 items that form 13 multi-item, Lickert-type subscales with 4 answering alternatives (Brorsson et al. 1993). The higher the score, the better the patient's self-rated HRQL.

The Disability Rating Index (DRI) (Salén et al. 1994) requires the patient's own assessment of his/her ability to perform ADL and IADL activities. 7 of the 12 original DRI items were used: dressing, standing bent over a sink, sitting for 30 min, making a bed, climbing stairs, outdoor walks and light work. 5 items were not considered relevant to elderly hip-fracture patients and were replaced with the following: washing hair, moving around indoors, cooking, buying food and walking with sticks. 2 other items were added: getting in and out of a car and travelling by bus. The answers are given on visual analogue scales (1 = no problem in performing the task, 100 = unable to perform the task).

Time points for self-assessments

The patients answered the questionnaires three times: the first and second times at the orthopedic ward (3–4 days after surgery and on discharge), and the third time at home 2 months after surgery. At the first assessment, the patients rated their perceived HRQL and ability to perform ADL and IADL prior to the fracture.

Randomization

All patients fulfilling the inclusion criteria were considered for the study in a consecutive manner. Our aim was to recruit 100 patients; since 5 declined participation, 105 patients in total were asked to participate.

The randomization process has been described in detail elsewhere (Hagsten et al. 2004). Briefly, it involved preparing 50 + 50 opaque envelopes with a card stating either OT or C and then random selection (Figure).

At the first self-assessment, 38 OT patients and 42 controls answered the questionnaires (Figure). At the second assessment, 6 OT patients and 7 controls had been discharged before they had the possibility of answering the questionnaires. Before the third assessment, 4 OT patients and 7 controls had dropped out for different reasons. 10 more OT patients and 9 controls answered the questionnaires at 2 months, as compared with discharge (Figure). 85 patients answered the questionnaires at least once (Table 1). Internal drop-outs were especially pronounced for the subscale "sexual functioning", in which none of the 85 patients found the ques-

Table 1. Demographic and medical data regarding the hip fracture patients

	OT group (n = 41) ^a	C group (n = 44) ^a
Age, mean (range) years	81 (68–93)	78 (65–93)
Hospital stay, median (range) days	14 (3–33)	13 (4–23)
Women/men	34/7	32/12
Marital status, living alone	28	26
Type of fracture:		
cervical/trochanteric	23/18	31/13
Need for adaptation of the home ^b	22	

^a 15 patients did not answer the questionnaires on all three occasions: OT group, 9 patients (age range 70–91 years, 8 women); C-group, 6 patients (age range 67–95 years, all women).
^b Home visits only done with patients in the OT group.

tions relevant and did not answer them. As a result, this subscale is not included in the analysis.

Intervention

All patients received the same postoperative care at the ward during the first 3–4 days after surgery. After the first self-assessment, the OT group then received individualized training by an occupational therapist not otherwise included in the study who visited every OT patient for 45–60 min each weekday morning. The training/instructions were individually planned together with the patients to focus on those activities that would be of the greatest importance for the patient's self-care and independence once he/she returned home. The patient's need for technical aids was investigated and he/she was trained with the aids considered necessary. The occupational therapist gave each patient individual instruction on how to get up from the bed, how to stand up and how to walk to the bathroom for morning toilet by using crutches or walking frames in the correct way. Once in the bathroom, the patients were given instructions on how to proceed to sit down on a shower bench or on a raised toilet seat in the correct manner to avoid pain from the surgical wound. After performing their morning toilet, the patients received instructions on how to dress with the help of individually tried technical aids such as stocking aid and reacher.

During the hospital stay, the study occupational therapist and the patient visited the patient's home

to decide together how to prepare and adapt the home environment for the maximum degree of independence when the patient returned home.

The patients in the C group received postoperative rehabilitation from the staff at the ward. The nurse's responsibility in rehabilitation has traditionally been meeting the needs of patients regarding, for example, hygiene, dressing, changing position, movement and feeding (Kirkevold 1997). This meant that the C group usually got help when they performed ADL activities such as getting up from the bed and dressing, and they did not receive the same training for independence as the OT group. All patients received instruction from a physiotherapist about how to walk with crutches or walking frames.

Statistics

Statistical significance was set at $p < 0.05$. Student's t-test was used for comparison between groups regarding the SWED-QUAL and the DRI, and for comparisons of SWED-QUAL data within each group over time. The background variables age, sex, cohabitation or single living, type of fracture, length of stay in hospital and self-rating of pre-fracture status were used as covariates in analyses of covariance (ANCOVA). Relations between variables were expressed by the product-moment correlation.

Ethics

The patients were given oral and written information, and informed consent to participate was obtained. The study was approved by the Ethical Committee of Huddinge University Hospital.

Results

We found no significant differences between the OT and the C groups in mean SWED-QUAL scores at discharge, or at follow-up after 2 months (Table 2) not even when initial scores and background variables were used as covariates in ANCOVA. On comparing each group over time, however, the OT patients were found to have regained their pre-fracture HRQL status in 10 of 12 SWED-QUAL subscales after 2 months. Thus, they had generally regained satisfaction with their

Table 2. Self-reported health-related quality of life after hip fracture. SWED-QUAL scores for patients receiving OT training (OT group) and controls (C group)

SWED-QUAL subscales	Assessment I ^a			Assessment II ^b			Assessment III ^c		
	mean	SD	range	mean	SD	range	mean	SD	range
Physical function									
OT group	69	21	6–85	23	11	9–57	48	16	14–90
C group	70	22	28–90	24	15	0–57	44	18	9–83
Satisfaction with physical functioning									
OT group	60	34	0–100	42	32	10–100	51	33	0–100
C group	72	33	0–100	49	34	0–100	47	34	0–100
Pain									
OT group	73	28	11–100	53	30	20–100	70	25	20–100
C group	84	27	20–100	59	33	0–84	69	30	0–100
Limitations due to physical health problems									
OT group	54	38	0–100	23	33	0–100	35	31	0–100
C group	74	37	0–100	24	28	0–100	42	35	0–100
Limitations due to emotional health problems									
OT group	67	73	0–100	53	42	0–100	57	38	0–100
C group	87	78	0–100	67	42	0–100	64	41	0–100
Positive affect									
OT group	73	23	22–100	67	27	16–100	70	29	11–100
C group	78	25	11–100	71	29	11–100	67	32	0–100
Negative affect									
OT group	78	21	33–100	73	35	22–100	70	30	0–100
C group	79	21	22–100	74	26	16–100	75	24	16–100
Degree of vitality									
OT group	74	22	5–100	81	18	33–100	78	19	25–100
C group	82	17	33–100	81	18	38–100	82	19	22–100
Sleep functioning									
OT group	63	25	16–100	55	27	5–100	66	27	11–100
C group	68	27	11–100	64	26	5–100	65	30	0–100
General health perception									
OT group	77	22	19–100	75	24	14–100	71	25	9–100
C group	80	27	7–100	79	24	29–100	78	26	17–100
Satisfaction with family life									
OT group	92	15	33–100	94	11	50–100	94	14	41–100
C group	92	14	41–100	91	14	50–100	95	11	58–100
Satisfaction with relationship									
OT group	92	15	41–100	94	12	55–100	93	17	20–100
C group	94	11	61–100	93	12	58–100	95	11	61–100

^a 2–4 days after surgery
^b at discharge, 9–11 days after surgery
^c follow-up 2 months after surgery

physical function, they had no more limitations in their daily lives due to emotional/health problems than before the injury, they had regained their previous vitality, emotional well-being, sleeping pattern, general health, satisfaction with family life and relationship to their partner, and they had no more pain than before the injury. At this time, members of the C group had generally regained their self-reported pre-fracture HRQL status in the following 6 of the 12 subscales: physical function, satisfaction with physical functioning, pain, limitations due to physical health problems,

limitations due to emotional health problems, and emotional well-being.

Differences were found between the groups after 2 months in self-reported IADL: moving around indoors ($p = 0.03$), performance of light housework ($p = 0.05$), and getting in and out of a car ($p = 0.05$).

Correlations

We found weak negative correlations between length of stay in hospital and physical functioning (at discharge: -0.29 , $p < 0.05$; at 2 months: -0.28 ,

$p < 0.05$). Thus, the longer the stay in hospital, the worse was the physical functioning. After 2 months, a weak negative correlation was also found between length of stay in hospital and vitality (-0.26 , $p < 0.05$). Thus, the longer the stay in hospital, the less was the degree of perceived vitality. Positive correlations were found between age and satisfaction with relationship to partner (at discharge: 0.38 , $p < 0.01$; at 2 months: 0.24 , $p < 0.05$), and between age and family life (at discharge: 0.46 , $p < 0.001$; at 2 months 0.28 , $p < 0.05$). Thus, the older the patient, the more satisfied they were with their partner and their family life.

Discussion

Our findings indicate that the OT training improved the ability to perform IADL, and it seemed to have speeded up the recovery of the HRQL in some areas.

Physical functioning and physical independence are two important dimensions of a person's HRQL recognized by the WHO (1995). To our knowledge, this is the first time that a randomized trial has been set up with OT training as the single intervention. In relation to the often unfavorable long-term effects of a hip fracture demonstrated in previous studies (Hall et al. 2000), the relatively simple and restricted contribution by the occupational therapist in our trial thus seems to have paid off in terms of benefit to the patients and their families. Intervention trials concentrating on the effects of the occupational therapist's role in patient care and rehabilitation, if not completely lacking, are certainly difficult to find in the literature. We have found only one previous study showing that occupational therapy can significantly reduce disability and handicap in stroke patients (Walker et al. 1999).

The lack of significant differences between the OT group and the controls in HRQL in our study may have been influenced by the choice of instruments and/or the sample size. In this study, we used the SWED-QUAL questionnaire which focuses most on general health and psychological and behavioral aspects of HRQL. It may be that a generic instrument focusing more on physical functions as part of the HRQL would have been

more suitable to capture any effects of OT training after hip fracture. In a study by van Balen et al. (2003), the authors tested 2 instruments focusing on functional status and 2 instruments that additionally included psychological and social-health considerations in patients with hip fractures. For the evaluation of functional recovery, they recommended the use of the Rehabilitation Activities Profile (RAP) and for the evaluation of psychological health in elderly hip fracture patients, the Nottingham Health Profile (NHP).

The findings of this trial indicate that OT training is beneficial for elderly hip fracture patients (mean age 81 and 78 years in this study, for treatment and control groups, respectively) (Table 1). An OT program including a home visit for planning of home adaptation is a rather simple and inexpensive measure, and may also be of help in preventing new falls at home (Close et al. 1999, Hagsten et al. 2004). We thus recommend that elderly hip fracture patients should be offered OT training and a home visit, to get an individualized training and psychological support, as this seems to improve the ability to perform ADL and IADL and to speed up both mental and social recovery postoperatively.

Author contributions

BH performed the study and wrote the paper under supervision. OS had medical responsibility for the patients. AG was the main supervisor of the project. All investigators were involved in the study design.

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