

A randomized controlled trial of enhanced Social Service occupational therapy for stroke patients

PA Logan, J Ahern Stroke Research Unit, Nottingham, JRF Gladman Department of Geriatric Medicine, University Hospital, Nottingham and NB Lincoln Department of Psychology, Nottingham University, Nottingham

Objective: To determine whether stroke patients referred to the Social Service occupational therapy service would benefit from an enhanced service compared to the usual service.

Design: Randomized controlled study allocating patients to the enhanced service or the usual service.

Subjects: Stroke patients discharged home from hospital and referred to Social Service occupational therapy department.

Outcome measures: The sections and total score from the Nottingham Extended Activities of Daily Living Scale (EADL), the Barthel Index, the General Health Questionnaire (GHQ) and the number of pieces of equipment provided were analysed.

Results: One hundred and eleven stroke patients were recruited to this study. Fifty-three were randomly allocated to the enhanced service and 58 to the usual service. Patients receiving the enhanced service were seen more quickly after referral, for longer, and received significantly more visits ($p < 0.01$) than those receiving the usual service. Three months after entry to the study the enhanced service group had better EADL ($p < 0.01$) than the usual service group. This benefit remained significant in only the mobility section of the EADL at six months. Carers of the stroke patients in the enhanced group had lower GHQ scores ($p < 0.05$) than those in the usual group at six months.

Conclusions: This trial supports the use of domiciliary occupational therapy for stroke patients after discharge from hospital in terms of improvements in functional outcomes in the short term, but the long-term benefits remain unclear.

Introduction

Occupational therapists are employed by the Local Authority Social Service departments to assess and treat permanently and substantially disabled people. A study¹ of occupational thera-

pists employed by Social Services in Scotland found that 77% of their time was concerned with delivering equipment and adaptations. A specific investigation² of the Social Service occupational therapy (SSOT) service received by stroke patients in Nottingham found that half of stroke patients discharged from hospital were referred to the SSOT. The patients were treated on average twice and then discharged, with the therapy mostly limited to the provision of equipment.

Address for correspondence: PA Logan, Department of Health Care of the Elderly, Medical School, B-Floor, University Hospital, Nottingham NG7 2UH, UK.

Occupational therapists in this study commented that they would like to be able to provide follow-up therapy after the initial visit.

Studies of domiciliary therapy provide evidence that therapy at home may be effective for stroke patients. The Bradford Community Stroke³ and the DOMINO⁴ trial of domiciliary therapy (physiotherapy and occupational therapy) showed an advantage of home therapy for some patients. Although a considerable amount of the therapy provided in these trials was physiotherapy, recent small trials have begun to give evidence for the benefit of occupational therapy alone for stroke patients.⁵⁻⁷ Thus, there is some reason to propose that domiciliary occupational therapy might be effective for stroke patients, but more trials are required.

We considered that occupational therapy provided by the Social Services would be a feasible way to provide a potentially effective community occupational therapy service if the therapists were able to provide a reasonable number of sessions. We therefore undertook a randomized controlled trial comparing the routine Social Services occupational therapy provision with an enhanced experimental service.

Method

The sample of patients who were identified as eligible for inclusion into this study were first time stroke patients discharged from hospital and referred to the City of Nottingham, and Boroughs of Gedling and Beeston Social Service occupational therapy departments. These three departments cover an inner city, suburban and rural population of 506 350. The patient diagnosis was checked with the Nottingham Stroke Register. Patients were recruited over an eight month period. It was calculated by using previously published information² that over this time approximately 100 eligible stroke patients would be referred to these three departments and that 100 patients would be adequate to detect, with confidence, a three point difference on the Extended Activities of Daily Living Scale.

Once the referral was received by the Social Service occupational therapy department they were randomly allocated by the administration

clerk (using prepared sealed envelopes) to either the enhanced service or to the usual service. The referral date and the discharge from hospital date was collected to ascertain whether patients were referred before discharge. Written consent was obtained by post after randomization but before the first visit by the treating occupational therapist.

The enhanced service group were seen and treated by a single research occupational therapist (PAL). It was expected that the case load would be such that she could see patients sooner than possible by the routine service. She had equal access to aids and budgets for adaptations and she was able to check that equipment provided was appropriate. In the routine service all patients were prioritized by the senior occupational therapist and only the urgent cases were seen immediately whereas others were placed on a waiting list. On the basis of earlier work it was expected that few patients would receive further rehabilitation beyond the assessment for and provision of aids and appliances. For patients in both groups the first date they were seen after referral, the number and time of treatment sessions provided, the equipment and adaptations provided and the date of discharge from therapy were recorded. Patient-related activity was also monitored; this included telephone calls, letters written, forms completed.

Functional and psychological outcomes of the patients were assessed three and six months after entry to the study. Three months after entry to the study the Extended Activities of Daily Living (EADL) Scale⁸ was sent by post. Six months after entry to the study the patients were assessed at home by an independent assessor, who had not been informed which treatment the patients had received. The EADL Scale was sent prior to the visit, to be completed by the patient and picked up at the interview. The independent assessor administered the Barthel Index,^{9,10} and the General Health Questionnaire (GHQ).¹¹ Details of equipment or adaptations the patient had received or awaited were recorded. At the same interview the independent assessor asked the carer, if available, to complete the GHQ.¹¹

Data were analysed with the SPSS-X¹² package using nonparametric and parametric statistics as appropriate.

Results

One hundred and eleven patients were referred to the SSOT department following an admission to hospital due to a stroke, and all were identified as eligible for inclusion into the study. They were randomly allocated to the two groups. Fifty-three patients were randomly allocated to receive the enhanced service and 58 to receive the usual service group. All the patients gave initial consent to be included in the study. Table 1 shows that the baseline characteristics of the patients in the study were similar in the two groups.

Details about the amount of therapy received by the patients were obtained from the notes of 78 (70%) of the sample, 42 (79%) from the experimental group and 36 (62%) from the control group. Unfortunately a fire in the SSOT department destroyed the remaining notes. Table 2 shows the results. As anticipated, patients in the experimental service were seen quicker, more frequently, and received more therapy than those receiving the routine service.

Three months after entry to the study 10 patients had died and one had been admitted to a nursing home. The remaining 100 patients were assessed by post. The reasons for incomplete assessments can be seen in Table 3. There was no significant difference in drop-out rate between the groups at three months. There were 88 EADL forms returned, of these, 34 (38.6%) had

been completed by the patient, 51 (57.9%) by a relative and three (3.5%) by a friend. There was no significant difference between groups in the number of forms completed by the patient themselves. Two of the forms were completed incorrectly and could not be analysed. Three months after entry to the study patients receiving the enhanced service had statistically significantly higher Extended Activities of Daily Living scores than those patients receiving the usual service. The results are shown in Table 4.

All 86 patients who completed the EADL at three months, plus the two who had completed the form incorrectly and the eight who did not respond, were contacted six months after entry to the study and asked if they would complete a short assessment by an independent assessor. The patients who did not complete the assessment are shown in Table 3. There was a statistically significant difference ($p < 0.05$) between the drop-out rate in the two groups with a nonsignificant trend towards more patients in the group receiving the usual service moving into a nursing home.

Eighty-three EADL forms were suitable for analysis six months after entry to the study. Of these, 75 (90%) of the forms had been completed by the patient and eight (10%) by a relative. There was no significant difference between the EADL scores of the two groups except in the mobility subscale which was still higher (better) in the group receiving the enhanced service. The

Table 1 Characteristics of patients

	Usual service ($n = 58$)	Enhanced service ($n = 53$)	Comparison
Age			t-test
Mean (SD)	74 (11.5)	71 (10.2)	NS
Sex			chi-squared
% Men	33 (57%)	23 (43%)	NS
Residence before stroke			chi-squared
% Living alone	29 (50%)	19 (36%)	NS
Dysphasia			chi-squared
% Present	9 (15%)	14 (26%)	NS
% Left hemisphere affected	26 (45%)	24 (45%)	chi-squared NS
Days in hospital			M-W
Median (range)	45 (4-238)	39 (6-252)	NS

NS = $p > 0.05$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

M-W, Mann-Whitney *U*-test.

Table 2 Comparison of therapy given to the two groups

	Usual service (n = 36)	Enhanced service (n = 42)	Comparison
Days from referral to discharge from hospital			t-test
Mean	12	9	*
Days from referral to first visit			t-test
Mean	22.5	9	**
Number of visits			t-test
Mean	2.5	6	**
Minutes of therapy			t-test
Median (mean; range: SD)	85 (55; 0-400: 83)	240 (222; 60-600: 136)	**
Minutes of patient-related activity			t-test
Median (mean; range: SD)	33 (30; 0-160: 31)	66 (65; 10-210: 32)	NS
Days case open to therapist			t-test
Median (mean; range: SD)	48 (9; 0-330: 85)	120 (118.5; 1-360: 63)	NS

NS = $p > 0.05$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3 Overall outcome at three and six months

	Three months		Six months	
	Usual service (n = 58)	Enhanced service (n = 53)	Usual service (n = 58)	Enhanced service (n = 53)
Dead	6	4	7	5
Nursing home	0	1	6	1
Alive at home but no consent	3	1	6	2
Did not return questionnaire	5	3	NA	NA
In hospital	0	0	1	0
Completed questionnaire	44	44	38	45

Wilcoxon test showed no significant change over time (enhanced service $p = 0.97$, usual service $p = 0.96$) of EADL scores using the three and six month assessments for the two services.

The nonsignificant excess of patients from the group receiving the usual service having moved into a nursing home or being in hospital by the six month assessment may indicate that the most disabled patients were excluded from the six month analysis. An intention to treat analysis was undertaken in an attempt to investigate the effect of the drop-out rate on the results. All patients who had died were given an EADL score of 0, all those who did not complete the six month assessment but were alive were given a score of 7 (the median of those who did respond) and

those who had entered a nursing home or hospital were given a score of 2 (as had been found with previous use of the EADL).¹³ Despite this manoeuvre there was no statistically significant difference between the groups ($p = 0.07$).

The Barthel and GHQ scores were available for all 83 patients. The results are shown in Table 4. The Barthel and GHQ showed no significant differences between the groups. Patients in both groups scored low on the GHQ, providing some evidence that the sample as a whole was not suffering from psychological stress. There were 55 carers assessed at six months and all completed the GHQ. When the scores for the carers of the two groups were compared, the results showed a significant difference, with those carers of

Table 4 Disability and mental health at three and six months

	Usual service Median (range)	Enhanced service Median (range)	Comparison
Three month assessment			
<i>n</i>	43	43	
EADL total score	3 (0-18)	8 (0-19)	**
Mobility	0 (0-6)	2 (0-6)	**
Household	2 (0-9)	4 (4-10)	**
Leisure	1 (0-5)	2 (0-5)	**
Six month assessment			
<i>n</i>	38	45	
EADL total score	6 (0-18)	8 (0-21)	NS
Mobility	1 (0-6)	2 (0-6)	**
Household	3.5 (0-10)	4 (0-4)	NS
Leisure	2 (0-6)	2 (0-5)	NS
Barthel Index	16 (2-20)	16 (1-20)	NS
General Health Questionnaire			
Patient <i>n</i>	38	45	
Total score	3.5 (0-18)	2 (0-17)	NS
General Health Questionnaire			
Carer <i>n</i>	26	29	
Total score	4.5 (0-27)	1 (0-13)	**

NS = $p > 0.05$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

patients in the experimental group scoring lower than those in the control group ($p < 0.01$).

The equipment and adaptations provided by the occupational therapists are shown in Table 5. The results were collected by the independent assessor and verified by checking with the patient notes. The details are of equipment actually received, not what was promised or on order. The patients receiving the enhanced service had significantly more items per patient than those receiving the usual service, although the only individual item for which the difference reached significance level was the stair rail.

Discussion

In this study, we have shown that a dedicated stroke occupational therapist, providing an enhanced service, working with the Social Services department enabled stroke patients referred to it to be seen more quickly and more often than the routine service. In addition to receiving a more prompt and intensive service, patients were more likely to receive equipment

and appliances such as stair rails, grab handles, kitchen aids and ramps. In the short term, patients receiving the enhanced service had greater functional independence in terms of mobility, household ability and leisure activity than those receiving the routine service. By six months a benefit over the routine service in terms of mobility still remained, but benefits in terms of household ability and leisure activity were not seen. Carers of patients receiving the enhanced service (but not the patients themselves) were less distressed than carers of those receiving the routine service. This adds to the body of literature indicating the efficacy of rehabilitation intervention in the post-discharge phase and in the role of occupational therapy.

The results of this study suggest that the benefit seen at three months was due to the increased number of therapy sessions and duration of each session received by the patients in the enhanced group. It was unfortunate that some of the records were destroyed by fire, however the notes of patients in both groups were available and we have no reason to believe that it was not a representative sample. The patients in the usual ser-

Table 5 Comparison of equipment and adaptations provided

	Usual service (n = 38)	Enhanced (n = 45)	Comparison
Pieces of equipment per patient			
Median (range)	2 (0-6)	3 (0-10)	**
Eating aid	10	6	NS
Kitchen aid	3	11	NS
Trolley	5	5	NS
Chair raise	7	4	NS
Bed raise	2	2	NS
Wheelchair	24	30	NS
Walking aid	26	31	NS
Hoist	0	1	NS
Vertical lift	1	0	NS
Shower	1	4	NS
Special arm chair	3	5	NS
Grab handle	10	21	NS
Toilet seat	12	16	NS
Bath seat	15	16	NS
Bath board	20	20	NS
Dressing aid	3	0	NS
Stair rail	7	20	**
Ramp	1	6	NS

NS = $p > 0.05$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

vice received on average two or three visits from the occupational therapist, which is similar to previously published work.² The patients were seen slightly sooner than when studied in 1995 (a mean of 22 days compared to 25 days). This may have been due to the threat of being monitored. Working policy had not changed over this time, however the routine occupational therapists had their workload slightly reduced by the research occupational therapist. The patients in the enhanced group received on average six visits. If this number of therapy sessions was confirmed by further research it would not be an unrealistic package to provide for each patient and less than recommended by Gladman *et al.*¹³ who suggested 15-20 visits. This is of relevance to the SSOT departments who are endeavouring to improve their services and provide rehabilitation as opposed to only the provision of equipment.

Stair rails were provided to nearly half of the patients receiving the enhanced service, which is interesting since the only significant difference between the groups at six months was in the mobility score of the EADL. Since stair rails are relatively inexpensive we suggest that these should be provided as soon as the need for them has been identified.

The benefit seen at three months of the enhanced service was not sustained by the six month assessment. It is difficult to understand this loss of effect. It is possible that the apparent loss of effect may be in part artefactual since the drop-out rate from the study was higher in the group receiving the usual service than in the enhanced group, although no statistically significant difference between the services was observed when an intention-to-treat analysis was performed in an attempt to correct for the drop-out rate.

Another explanation for the loss of effect at six months is that the usual services managed to help the patients on their nonurgent waiting list between the three and six month assessment and that the enhanced service was of no further benefit after the first three months. A limitation of this study was that no baseline measure of disability was taken before the patients were randomly allocated to the two groups. By randomly allocating the patients it was hoped that equal numbers of severely disabled people would be in each group, however we are unable to check this fact. A future study of this type would need to incorporate a baseline measure of disability. The long-term benefits of community occupational

therapy remain uncertain and more trials with greater numbers are required.

The results from this small study of Social Service occupational therapy provide support to the idea that domiciliary occupational therapy is effective in improving early outcome and may have a positive effect on carers. The results from the GHQ at six months provide some evidence that the intervention of an occupational therapist may have reduced stress levels in the carers. However the groups were small, 26 in the usual group and 29 in the enhanced group and the difference between groups small. In hindsight it would have been advantageous to have completed a baseline GHQ before the patients were randomly allocated. Even with the small number this is a unique finding and requires replication in larger studies. The findings should encourage occupational therapists to strive for early intervention so that patients do not have to wait to receive some alleviation from their disabilities. One area that we did not investigate in this study, was the amount of discharge planning that had taken place before the referral to the SSOT and whether a home visit had been undertaken. These factors are important when patients are transferred from hospital to community care.

The findings of this study need replication in other settings and with greater numbers. Not only will this confirm whether occupational therapy is of value in community stroke patients, but a larger sample will allow estimates of whether any benefits persist after three months.

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