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A randomized controlled trial of leisure rehabilitation after stroke

AER Drummond and **MF Walker** Stroke Research Unit, City Hospital, Nottingham

A three-group pre-test–post-test design was used to evaluate the effectiveness of a leisure rehabilitation programme. Subjects were randomly allocated to the leisure rehabilitation group, the conventional occupational therapy group, or the control group. Baseline assessments of leisure were carried out on admission to the study and at three months and six months after discharge from hospital. The results showed an increase in the leisure scores for the leisure rehabilitation group only. There was an age imbalance in the study but, after analysis of covariance, the results were upheld.

Introduction

Many studies have shown that involvement in leisure pursuits decreases after stroke.[1–6] Factors such as loss of social status,[1] physical disability,[2,5] loss of confidence,[2] depression,[3] stigma,[7] inability to use public transport[3] or ignorance of the facilities available[8] have been highlighted as possible reasons for this reduction. However, Sjogren and Fugl-Meyer[4] suggest that such a decrease reflects unsuccessful coping with stroke. Viitanen *et al.*[5] report that hemiplegic patients are unable to 'maintain or reorientate their interests and activities themselves' and are 'inadequately supported by others'. Greveson and James[9] present similar findings and concluded that 'Little help or advice had been given to patients to participate in leisure interests such as gardening, painting or sewing, and patients thought that this could have appreciably improved their quality of life'. Thus there appears to be a growing opinion that not enough is done to enable patients who have had a stroke to resume former interests or to acquire new ones. It seems that patients do not generalize rehabilitation principles into other areas of their lives.

Only one study of leisure rehabilitation with stroke patients has been conducted. Jongbloed and Morgan[10] randomized 40 subjects into two groups; one received 'Occupational therapy intervention related to leisure activities' and the other (the control group) were visited by an occupational therapist who discussed leisure but who offered no intervention. No significant differences were found between the two groups for activity involvement. Unfortunately, the control group was neither an appropriate control group

Address for correspondence: AER Drummond, Department of Health Care of the Elderly, Medical School, Queen's Medical Centre, Nottingham NG7 2UH, UK.

nor an appropriate comparison treatment group. These subjects were exposed to discussion about leisure, and this alone might have stimulated them to resume leisure activities.

Jongbloed and Morgan also stressed the effect of environmental variables, such as availability of transport and access to pursuits, on their results. However, it could be argued that their intervention should have identified and resolved such difficulties in their treatment group. This again could have influenced the results.

Another study of leisure rehabilitation has been carried out but with another diagnostic group. Bar *et al.*[11] conducted a large follow-up study of 366 patients who had had a myocardial infarction (MI). As part of this study the authors investigated the effect of a cardiac rehabilitation programme on subjects' leisure and social activities. Fifty-one control subjects who did not attend the cardiac programme were compared with a group of 153 who had. Bar *et al.* found that at one year after MI the subjects who had attended the programme had significantly higher participation in leisure and social activities. Their results suggest that the cardiac rehabilitation programme was an effective way of rehabilitating leisure.

Unfortunately there are some flaws in the design of this study. The subjects in the control group were those individuals who refused to attend cardiac rehabilitation. The reasons given for this refusal included travelling distance and lack of interest in the programme. However, such reasons may have been the important factors in resuming leisure and social activities – not the content of the programme. Transportation is known to be an important factor in leisure involvement[12] and, additionally, if these subjects lived away from the main towns they would have had access to fewer facilities. Thus there is a reasonable case for suggesting that the control sample was biased. Another difficulty with the study by Bar *et al.* is that little detail is given on the content of the cardiac rehabilitation programme. Five centres were involved in the study, but all had different staff and the length of the programmes differed. It is not even known whether specific leisure advice or intervention was offered on the programmes. Thus it is difficult to conclude that the increase in leisure and social activities in the cardiac rehabilitation group was a result of attending the cardiac rehabilitation programme.

It is not known whether introducing leisure programmes into treatment would encourage stroke patients to participate in leisure activities. Therefore the aim of the present study was to evaluate a leisure rehabilitation programme with stroke patients.

Method

Subjects

All patients admitted to the Stroke Unit, City Hospital, Nottingham, between October 1990 and July 1992 were considered for inclusion in the study. The patients had been randomly allocated to the stroke unit as part of another study evaluating its effectiveness.[13] Additional exclusion criteria specific to the present study on leisure intervention were:

1) Severe comprehension difficulties (defined as having a Speech Therapy rating of 3 or less on the Boston Diagnostic Aphasic Examination).[14]
2) A previous history of dementia documented in the medical notes.
3) A home address outside Nottingham District Health Authority.
4) An address in a nursing home or rest home (such institutions often provide leisure pursuits for their clients).
5) Transfer to another hospital or ward for medical reasons.
6) Inability to speak English.
7) Refusal of consent to participate in the study.

Baseline assessments were carried out on admission to the stroke unit. The Nottingham Leisure Questionnaire[15] was used to record the number of activities and amount of time spent by subjects in leisure activities prior to admission. An overall leisure score (TOTL) was calculated by summing the frequencies of all the activities carried out and a total leisure activity score (TLA) was calculated by adding up the number of activities an individual undertook, regardless of the frequency. The gross function section of the Rivermead Motor Function Scale[16] was used to assess motor performance and the Rivermead Activities of Daily Living Scale, self-care section[17] to assess functional performance. These two scales were also used to assess the sub-

jects' performance prior to their discharge from the unit.

After baseline assessment, subjects were not seen again until a discharge date had been set by the ward staff. Those who did not meet the study criteria on discharge were also excluded; for example, those who were to be discharged to a nursing home.

Random allocation to groups

To avoid bias, on the day of discharge subjects were randomly allocated to one of the three study groups using restricted randomization.[18] Sealed envelopes were opened by administrative staff who then indicated to which group a subject was to be assigned. The three study groups are described as follows.

G1. Leisure rehabilitation group This group was seen by a therapist for a minimum of 30 minutes a week for the first three months following discharge from hospital. Thereafter they were seen for a minimum of 30 minutes a fortnight for the next three months.

The hobbies and interests of the subjects were discussed in detail and the importance of maintaining a leisure programme was stressed. The treatment programme for each subject was different, reflecting personal preferences and abilities. However, the advice and help offered fell into the following broad categories: treatment (e.g. practice of transfers needed for leisure pursuits); positioning; provision of equipment; adaptations; advice on obtaining financial assistance and transport; liaison with specialist organizations, and providing physical assistance (e.g. referral to voluntary agencies).

Table 1 Reasons for initial exclusion from the leisure study

Reason	Number
Comprehension problems/aphasic	31
Medical transfer	8
Outside geographical area	4
No consent	1
Deceased	1
Address in nursing home	1
Incorrect diagnosis	1
Speaks no English	1
Total	48

G2. Conventional occupational therapy treatment group This group was seen by the same therapist for the same amount of time. Consequently these subjects had the same amount of therapy time as the subjects in G1. Subjects in G2 were seen for occupational therapy activities such as transfers, washing and dressing practice, and, where appropriate, perceptual treatments. In situations where subjects were virtually independent, the visits were check-up visits, and subjects were questioned about their progress and any existing problems. The treatment programme for each individual in G2 was therefore different, to reflect their differing abilities and problems. No reference was made to the importance of continuing previous interests, and no help or advice was offered to encourage participation in leisure pursuits.

G3. Control group This group had no additional input over that which they were receiving from hospital and social services.

Assessment

At three and six months from the date of discharge, all subjects were visited by an independent assessor who did not know to which group they had been allocated. They were assessed on a number of measures, including the Nottingham Leisure Questionnaire.[15]

Results

Sample studied

One hundred and twenty-eight patients were admitted to the stroke unit between 30 October 1990 and 31 July 1992. Sixty-three patients (49% of the population available) were excluded; 48 did not meet the initial criteria for admission to the study (Table 1) and a further 15 were excluded prior to discharge randomization (Table 2). Sixty-five patients were therefore entered into the study; 21 were randomly allocated to the leisure treatment group, 21 to the conventional treatment group and 23 to the control group. The characteristics of the sample are shown in Table 3.

No statistically significant differences were found between the three groups in marital status (chi square = 9.61, d.f. 6, $p = 0.14$), side of hemiplegia (chi square = 2.34, d.f. 4, $p = 0.67$) or time

Table 2 Reasons for exclusion before randomization

Reasons	Number
Discharge to nursing home	9
Deceased	1
Medical transfer	4
Refused	1
Total	15

before stroke and initial assessment ($H = 1.74$, $p = 0.42$). There was no difference in gender between the groups (chi square = 1.56, $p = 0.46$). A Mann–Whitney *U*-test revealed no significant difference between the number of visits made to the leisure group (G1) and the conventional treatment group (G2) ($U = 177.5, p = 0.27$).

A significant difference in age was found between the groups ($H = 10.58, p \leq 0.01$) (Table 3). The Mann–Whitney *U*-test revealed significant differences between G1 and G2 ($U = 99.5$, $p < 0.01$) and between G1 and G3 ($U = 134.5$, $p < 0.01$), but not between G2 and G3 ($U = 218$, $p = 0.58$). This meant that the subjects in the leisure treatment group were significantly younger than subjects in the other groups.

The occupations of subjects were recorded in order to ascertain social class and educational attainment. However, the majority of women (93%) gave their job as 'housewife' and, as no information was collected on their husbands' occupations, deductions regarding social class could not be made. Similarly, deductions on education could not be made.

Withdrawals and exclusions

Of the 65 subjects entered into the study, three could not be assessed at three months. Two of these withdrew from the study because of de-

Table 3 Characteristics of sample

	Groups		
	G1 ($n = 21$)	G2 ($n = 21$)	G3 ($n = 23$)
Sex			
Men	14	10	13
Women	7	11	10
Marital status			
Married	17	15	13
Widowed	1	4	7
Single	2	0	3
Divorced	1	2	0
Side of hemiplegia			
Left	12	14	15
Right	8	7	8
Bilateral	1	0	0
Age (years)			
Mean	58.95	70.10	68.65
SD	13.11	6.69	9.95
Range	29–77	62-84	46–87
Time since stroke to baseline assessments (days)			
Mean	29.52	28.38	25.44
SD	21.75	10.43	17.80
Range	5–90	15–53	4–85
No. of home visits			
Mean	14.95	15.29	N/A
SD	2.52	3.57	N/A
Range	9–19	3–19	N/A

N/A, not applicable.

teriorating health, and one was excluded as she had moved permanently into a nursing home and therefore no longer met the study criteria.

A further two subjects completed three-month but not six-month assessments. One subject died and the other had another stroke. Of these five subjects, one was from G1, one from G2 and three from G3.

Comparison of treatment groups

Baseline assessments

No statistically significant differences were found between the groups for leisure on admission. Table 4 illustrates the mean, standard deviation and range for the total leisure score (TOTL) and the total activity score (TLA) of each group. The Kruskal–Wallis scores are also shown.

No statistically significant differences were found between the groups on motor performance on admission ($H = 1.38$, $p = 0.50$) or discharge ($H = 2.93$, $p = 0.23$) from the unit. Similarly no statistically significant differences were found between the groups on functional performance on admission ($H = 1.66$, $p = 0.44$)

Table 4 Leisure scores on admission to study

	G1 ($n = 21$)	G2 ($n = 21$)	G3 ($n = 23$)	*H*	*p*
TOTL					
Mean	42.14	35.14	39.13	3.13	0.21
SD	12.40	12.27	12.68		
Range	25–68	19–58	12–62		
TLA					
Mean	16.19	13.19	14.00	4.22	0.12
SD	4.20	4.14	5.30		
Range	9–24	7–23	4–25		

TOTL, total leisure score; TLA, total leisure activity score; *H*, Kruskal–Wallis value; *p*, significance.

Table 5 Leisure scores at outcome assessments

Three months	G1 ($n = 21$)	G2 ($n = 20$)	G3 ($n = 21$)	*H*	*p*
TOTL					
Mean	43.91	31.05	31.29	11.88	<0.01*
SD	13.54	9.91	9.63		
Range	21–68	12–47	16–50		
TLA					
Mean	15.62	10.85	10.48	18.42	<0.001*
SD	3.99	3.50	3.16		
Range	7–23	4–17	6–17		
Six months	G1 ($n = 20$)	G2 ($n = 20$)	G3 ($n = 20$)	*H*	*p*
TOTL					
Mean	48.50	32.20	33.15	19.95	<0.001*
SD	11.12	11.23	10.66		
Range	34–72	16–58	12–49		
TLA					
Mean	17.60	11.20	10.95	27.07	<0.001*
SD	3.15	3.45	3.76		
Range	13–26	6–19	4–17		

TOTL, total leisure score; TLA, total leisure activity score; *H*, Kruskal–Wallis value; *, significant at 1% level of significance.

Table 6 Comparison of leisure scores between groups

	G1 and G2		G1 and G3		G2 and G3	
	U	*p*	*U*	*p*	*U*	*p*
Three months						
TOTL	100.5	<0.01*	98.5	<0.01*	210.0	1.00
TLA	75.5	<0.001*	69.0	<0.001*	191.5	0.63
Six months						
TOTL	53.0	<0.001*	63.5	<0.001*	184.0	0.67
TLA	35.5	<0.001*	34.0	<0.001*	191.5	0.82

TOTL, total leisure score; TLA, total leisure activity score; *U*, Mann–Whitney *U*-test values; *, significant at 1% level of significance.

or discharge ($H = 3.63, p = 0.16$).

Outcome assessments

Table 5 illustrates the means, standard deviations and ranges for total leisure scores for each group at three months and six months after discharge. Significant differences were found between the groups using a Kruskal–Wallis test. The total leisure scores and total leisure activity scores were both significantly different between the groups at three and six months.

Mann–Whitney *U*-tests demonstrated that the significant differences were between groups G1 and G2 and between G1 and G3 (Table 6). This indicates that the leisure scores were significantly higher in the leisure rehabilitation group at three-month and six-month assessments.

Group comparisons correcting for initial differences

The pattern of results suggests that there was a significant difference between the leisure scores of the leisure rehabilitation group and the other groups. However, because subjects in G1 (the treatment group) were younger this may be a confounding variable; younger patients may engage in more leisure activities than older patients. Consequently, the effect of age needs to be controlled.

In order to do this an analysis of variance with a covariate (ANCOVA) was used. This test is strictly designed for use with parametric data but there is no other comparable test available for nonparametric data. Analysis of variance (ANOVA) was conducted on the significant results and, for those values which remained significant, the effect of the covariate (age) was examined; the effect of the removal of age on the results was then studied (ANCOVA).

The results of ANCOVA show that at three months the TOTL (total leisure scores) and TLA (total leisure activity scores) remained significantly different between the groups (TOTL: ANCOVA $F2,58 = 4.85$, $p = 0.01$); TLA: ANCOVA $F2,58 = 7.89$, $p = 0.001$). The TOTL and TLA also remained significantly different between the groups at six months (TOTL: ANCOVA $F2,56 = 9.16$, $p < 0.001$; TLA: ANCOVA $F2,56 = 16.68$, $p < 0.001$).

The ANOVA and ANCOVA tests illustrate whether there is a significant difference between the three groups but do not show where the difference lies. In order to establish this the Duncan procedure, and a posteriori test, was used. The results confirmed that the differences were between G1 and G2 and between G1 and G3 at the 1% level of significance. Thus the results suggest that the leisure scores remained higher in the leisure rehabilitation group even when the effect of the confounding variable, age, was removed.

Discussion

There was a preponderance of men, married subjects and individuals with a left hemiplegia in the sample studied. However, these subjects were distributed evenly in each of the groups. With the notable exception of age, all other subject demographic characteristics were distributed evenly among the three groups. The age difference was an unfortunate result from randomization as it was a possible confounding variable in leisure

participation. However, statistical measures were used to control its influence on the results.

Information was collected on the occupation of subjects as a possible indicator of social class and educational background. However, no deductions could be made from the information recorded. It is recognized that these variables may influence participation in leisure.

There were no significant differences between the groups on baseline assessments, suggesting that the leisure and functional performance of the groups was similar prior to intervention. After three and six months, subjects in the leisure rehabilitation programme had higher leisure scores than those subjects in the other groups, suggesting that leisure rehabilitation is an effective way of maintaining and increasing leisure participation after stroke.

These results appear to contradict the results of Jongbloed and Morgan[10] who found no statistically significant difference between their two groups for activity involvement after intervention. It may be that the different results reflect the amount of input offered in the two studies; subjects in the Jongbloed and Morgan study only received five one-hour visits. It is, however, more likely that the control group were contaminated by their exposure to discussions of leisure which might have stimulated these subjects to resume leisure activities. This idea is supported by the fact that leisure activity increased in both groups during the study period. In contrast the results of the present study illustrate that only the leisure activity of the leisure rehabilitation group (G1) increased over the study period. The mean scores for the other groups decreased or remained unchanged.

The results from Jongbloed and Morgan's study raises the question as to whether talking about leisure is as effective as intervention. It may be that providing adequate counselling to individuals may be of the same value as involving them in a leisure rehabilitation programme. This possibility remains, and would need to be addressed in future research. As Fain[19] commented, leisure counselling is a 'relatively unexplored universe'.

Although there are obvious limitations to this study because the sample size was small, the results highlight the need for further research in this area. There is a possibility that providing a counselling service on leisure could be as valuable as providing an actual treatment package. It may be that the same effects could have been obtained with fewer treatment sessions or that, instead of using an occupational therapist, occupational therapy assistants, other staff, or specially trained volunteers could have the same effect. Many studies have reported that patients have long periods when they have little to do as inpatients in rehabilitation centres and stroke units,[20,21] and provision of leisure rehabilitation may be an important step forward.

Conclusion

The results of this study suggest that providing a leisure rehabilitation programme for stroke patients does increase involvement in leisure activities.

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