PAPERS AND ORIGINALS

Untrained community help in the rehabilitation of stroke sufferers with language disorder

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Summary and conclusions

The Newcastle Speech-After-Stroke Project is one of many schemes in Britain that have used untrained helpers to set up community clubs and home visiting for dysphasic stroke sufferers. To examine the contribution to rehabilitation made by such activities, patients' language abilities and social confidence were assessed when they entered the project and after about six months. Formal tests of language showed no significant improvement after six months, but social confidence increased.

Such projects can make a valuable contribution in helping dysphasic people to regain a role in the community. Nevertheless, too much should not be expected of them in the way of direct help in the patients' recovery of language.

Introduction

Up to a third of survivors of stroke in the UK may suffer from dysphasia.¹ As their condition may improve only slowly, these language-disordered patients place a continuing burden on their relatives and on the rehabilitation services. The relevant services—neuropsychology and speech and occupational therapy—are, however, seriously understaffed.

Under the pressure of public need and the inadequacy of professional provision, volunteers have rallied to fill the gap.²⁻⁴ In early 1978 the Chest, Heart, and Stroke Association listed 153 club schemes for stroke sufferers run by volunteers: some, but not all, of these cater exclusively for the dysphasic. Some 30

speech clubs, in which speech therapists supervise volunteers have been fostered by Diana Law, herself dysphasic from stroke. There have been no scientific evaluations of the benefits produced by these clubs, though Griffith, in a pilot study of two schemes, claimed that 21 out of 31 patients had improved in speech and understanding after about nine months.⁴ She did, however, state that spontaneous recovery could not be excluded; some of the patients were also receiving formal speech therapy, and improvised rather than standard aphasia assessments were used to compare performance before and after attendance.

The setting up of the Newcastle speech-after-stroke project in May 1977 offered the opportunity for a more rigorous examination of the usefulness of such schemes and of the value of untrained workers.

Aims of the Newcastle project

The project, which was initiated by speech therapists and organised by the city's Council for the Disabled, was designed only for people with a language disorder after completed stroke in carotid artery territory. Four paid workers were employed for six to 12 months to launch the scheme and to recruit enough volunteers to help to run the clubs and arrange home visiting and continue the scheme. None were speech therapists, but all had some experience of voluntary work with the elderly, the disabled, or the subnormal, and three received a two-week introductory course of visits and discussions with rehabilitation specialists. The clubs were advised for much of the first three months by an experienced, retired speech therapist, but she did not give any direct speech therapy to the patients. The scheme never claimed to offer such therapy: its objectives were quite different.

The general briefing given to the workers was to: (a) provide natural circumstances for encouraging communication and the using of language; (b) give social confidence and reassurance—for example, in helping with shopping and using buses; (c) provide enjoyment for the members of the club and some relief for their relatives. Club members met one day a week from about 11 00 am to 3 00 pm with extra home visits, where these were welcomed. The pattern of club activities which emerged, at the choice of the members, was of language games, discussion of news, crosswords, etc, in the mornings, followed by a snack lunch, and a demonstration, game, slide show, outing, etc, in the afternoons.

The clubs were kept small with only 10 to 14 members, none of whom was receiving speech therapy. At least 11 months—exceeding the period of significant spontaneous recovery—had elapsed since their

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stroke. Other criteria for inclusion were that (a) they were likely to benefit from a boost to their social confidence, (b) they had already had a substantial period of speech therapy, (c) their verbal comprehension was good enough for them to participate in group conversation and activities, (d) they were continent and physically fairly robust, and (e) they were living in a convenient place for transport and wanted to join. Fewer than half the dysphasic outpatients at the speech therapy departments of two general hospitals met these criteria.

Assessments

The assessments included measures of functional communication, social interaction, and attitudes to social situations as well as a formal test of language. Patients were assessed on the social measures by an independent research worker soon after their first attendance at a club and reassessed from four to six months after joining the scheme. The clinical assessments were conducted by speech therapists who played no part in running the clubs; in most cases the first such assessment was made just before the clubs had begun, and the second was made after at least 22 weeks (range 22-35, median 30).

Assessments of language—The Boston diagnostic aphasia examination (BDAE)⁵ was undertaken by speech therapists in the clinic, while the researcher compiled a functional communication profile (FCP)⁶ with assessments made by the patient or relative, or both. The researcher also interviewed patients in their homes and filled in a questionnaire developed from a pilot study before the project. In addition a speech therapist who did not know the patients made a blind comparison of conversations tape-recorded during the first and second home interviews.

Social assessments—The social situations questionnaire,⁷ which measured the frequency of social contacts and any difficulties, was answered by the patient or a relative at home. The patient's score on a social interaction scale⁷ was rated by the researcher after home interviews and, in the case of four patients, by two clinical psychologists after interviews at the club. This scale assessed verbal and non-verbal behaviour in a conversational setting. The project questionnaire also included questions on how often the patient went out and what visitors called.

At the end of the study patients and relatives were asked directly about the usefulness of the clubs and any changes they themselves had observed.

Results

All assessments were completed for 16 patients (11 men and 5 women; see table I). Two other members decided not to continue with the club after one or two visits, one died, two became too ill to continue during the study, and one withdrew from the investigation.

TABLE I—Biographical data on research subjects

Case No:	Men											Women				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Age (years)	47	54	54	55	56	56	59	61	64	66	69	52	58	59	60	64
Social class (former occupation)	1	3	3	2	3	3	2	3	3	2	3	4	4	4	5	3
Months after stroke	67	16	21	18	16	14	115	11	25	12	29	24	13	12	18	185
Severity of aphasia (Boston Diagnostic Aphasia Examination rating scale)*	2	2	5	2	1	2	1	3	1	5	2	3	5	4	3	4

*0 = No usable speech or auditory comprehension, 5 = Minimal discernible speech handicap.

TABLE II—Comparison of first and second examinations with Boston Diagnostic Aphasia Examination (25 subtests with objective scoring)

Case No:	1	2	3	4	5	6	7	8	9	10*	11	12	13	14	15	16	Total
No of subtests with same score on both examinations	8	6	19	11	6	10	4	5	11	11	11	11	10	15	12	9	159
No with higher scores on second examination	10	12	4	11	14	9	14	11	1	7	3	7	7	7	6	6	129
No with lower scores on second examination	7	7	2	3	5	6	7	9	13	1	11	7	8	3	7	10	106
																Total	394

*This patient was examined on only 19 subtests on the first assessment due to poor eyesight. Friedman's test $\chi^2 = 3.1$; $P > 0.05$.

LANGUAGE

There was no significant evidence of improvement in language on the 25 subtests of the BDAE that used objective scoring (table II). There was a slight but non-significant trend for more subtests to be scored higher on the second assessment than were scored lower (129:106); but 159 of the 394 subtests received the same score, despite a possible range of scores from 8 to 105 (some of this stability was due to a consistent complete success or complete failure on some tasks). Auditory verbal comprehension showed the least deterioration (table III), with 84% of the scores being at least as good on the second assessment as on the first. Reading comprehension gave the most stable results overall, with 55% of the scores being the same on the first and second assessments. Speech and writing subtests showed about equal degrees of improvement, deterioration, and stability.

TABLE III—Comparison of language use on first and second examinations with Boston Diagnostic Aphasia Examination

	No of subtests	No of subtests with same score on both examinations	No of subtests with higher score on second examination	No of subtests with lower score on second examination	Total scores
Speech	10	55	58	46	159
Auditory comprehension	4	27	26	10	63
Writing	6	35	29	31	95
Reading comprehension	5	42	16	19	77
Total	25	159	129	106	394

One patient (case 9) showed a significant overall deterioration ($\chi^2 = 9.9$; $DF = 2$; $P < 0.01$). Although there was no evidence to suggest that he had had a further major cerebral accident, he had experienced an epileptiform episode.

The picture for functional communication was more optimistic. Comparisons of the relatives' and patients' own ratings on the first and second profiles showed no deterioration. Five out of the 16 patients were rated as definitely better on at least one aspect of communication, and in only two patients was there no improvement. The relatives' personal involvement in the scheme, however, made their judgments partial, so we checked their ratings by asking more probing questions about changes observed in language use through the project questionnaire.

Comparison of FCP and questionnaire—For use of speech in general, the questionnaire corroborated the FCP ratings for 11 of the 16 patients. Three patients had unchanged FCP ratings on the second

assessment but showed improvement on the questionnaire, particularly in their ability to tell someone their own name. For the remaining two patients, the FCP ratings suggested a bigger improvement than was corroborated by the questionnaire. Furthermore, the FCP acknowledged no negative changes in any patients, but questionnaire answers showed that four people were now considered to be less able to say their doctor's name or address, seven less able to remember names, and four less able to find words in conversation. For use of auditory comprehension, 12 FCP ratings tallied with questionnaire answers, and, in the remaining four, the relatives commented on the patient's improved ability to follow the thread of a conversation, although the FCP ratings had not reflected this change. Eight people were reported on the questionnaire to have improved in writing, although six had shown no change on the FCP ratings; in one case FCP ratings suggested an improvement which was not endorsed by the questionnaire's more precise answers. Answers to questions about reading comprehension showed a similar greater degree of sensitivity of the questionnaire: nine patients were reported to have improved in ability to read or in enjoyment of reading, but FCP ratings reflected improvement in only four.

Overall, the three language assessments agreed in confirming a picture of greater improvement in auditory comprehension, with relative stability of reading and writing. Concerning speech, the answers to the questionnaire reflected, on probing, a mixed pattern, including some of the decrement which the BDAE had detected in some individuals but which was denied on the FCP. These results could illustrate either the limitations of formal, objective, clinical tests in examining functional communication or the subjectiveness of relatives' assessments based on functional ratings. Since the study included only those who considered that the clubs were likely to help them, and since relatives often feel obliged to present an optimistic face about the patient's progress,⁸ the BDAE results in this case may represent the more accurate assessment, despite their limitations.

The "blind" judge's evaluation of tape-recorded conversations from the first and second interviews did nothing to resolve this issue. In six patients she rated speech at the second interview as better on at least one of six criteria (fluency, grammatical range, word-finding, articulation, rhythm, initiation of conversational exchanges) and in two patients as worse (on fluency and initiation). Except in one case, however, the changes she reported were slight. Her comments on individuals, moreover, did not tally with the objective subtests of speech for the BDAE, the FCP ratings on speech, or the questionnaire answers. The patient rated by the judge as most improved had lower scores on the second BDAE in five out of 10 subtests requiring speech; the two patients rated by the judge as having deteriorated scored worse on only one subtest of speech each. To assess functional use of speech in natural circumstances, the recordings were of conversations with relative, patient, and interviewer at home. The results suggest that the expected day-to-day variability of the brain-damaged and the dependency on topic and conversational mood of the relative and patient made such single samples unreliable as assessments of individual change. Nevertheless, the judge's blind ratings over the whole group gave more support for improvement in speech than deterioration.

SOCIAL

All the assessments confirmed the expectation of an increase in social confidence. In all but two patients the researcher noted an improvement in social interaction between the patient and herself on the second visit on at least one criterion, though she was, of course, no longer a complete stranger. On the first assessment of four patients at the club the clinical psychologists noted no major inappropriateness of social interaction but some awkwardness on four of the 10 criteria used in the scale (voice quality, length of utterance, interest in others, interest in self). This awkwardness had resolved in all four patients by the second interview. The psychologists concluded that inappropriateness in social interaction had not been a significant problem in the patients they had seen at the club, despite their limitations in speech and comprehension.

The social situations questionnaire showed that all the patients had experienced, with the onset of dysphasia, an increase in the subjective difficulties they had in social situations, as well as a decrease in the frequency of social interaction. While they attended the clubs at least some of these difficulties diminished, and frequency of interaction increased (in addition to the direct contacts at the club). The project questionnaire confirmed the increase in social activity, despite the

fact that the second questionnaire was given in the winter. Reported weekday activities included an occasional trip to town, visits to a son's shop, and playing chess. Evening activities were still dominated by television, but the relatives commented, in two cases, on greater participation in family discussions about programmes. Increase in weekend activity for three people included buying surprise presents and going to church. The number of visitors calling at the house increased; some of this was due to new contacts with welfare workers and church groups and some to club members visiting each other. Five patients had had a holiday or a day outing, other than with the club, for the first time since the stroke. Two patients thought that they were more outgoing and sociable than they had been before the stroke.

The relatives were enthusiastic about the clubs; two patients had mild reservations. One said that the club activities were not such as he would have chosen for himself in health. The other patient decided to leave the club after 17 weeks of irregular attendance because he wanted a cure or nothing. The most frequent comments were that the club improved motivation for talking by giving something to talk about, that being with fellow-sufferers meant there was no embarrassment in talking, and that the club contributed to the patients' insight into their disability and to their independence.

All the members had been admitted to the club when the speech therapists thought that therapy needed to be followed by stimulation and conversation in a social setting. Six members and their relatives thought that speech therapy had helped them more with improvement in language than the club. Seven agreed that the club was more appropriate for them at this stage. Three made no distinction between club and speech therapy. For improving social confidence, only two replied that speech therapy would have helped more, with 10 preferring the club, two having no preference, and two denying any reduction in social confidence with the stroke (even though answers to the social situations questionnaire did not corroborate this).

Discussion

The enthusiastic comments of relatives and patients show that speech-after-stroke schemes at least partially meet a need for which the health and social services make little provision. Such schemes do impose an extra charge on public (or charity) funds, particularly for transport and for the salary of the volunteers' supervisor; nevertheless, they can offer a major improvement in the quality of life of many dysphasic patients and their relatives.

Such schemes are not, however, suitable for all dysphasic patients. The speech therapists thought that most patients would not benefit from places in the clubs because of the nature of their language disorder, social difficulties, or health. For the benefit of patients and for the satisfaction of the volunteers candidates need careful assessment by speech therapists. Therapists will also have to develop a new awareness of the relationships between professional and volunteer in the Health Service, such as have been outlined by Darvill.⁹⁻¹¹

The benefits that speech-after-stroke clubs offer are different from those of formal speech therapy, being social rather than linguistic. No clear distinction can be made between language potential and actual language use in social circumstances, but the evidence of the BDAE suggests that the language disorder did not significantly improve in these patients while they were studied in the clubs, although their sociability and motivation to communicate did improve. In contrast, recent evidence suggests that, except in severely affected patients, formal speech therapy can improve language ability, as measured on standard tests, after the period of spontaneous recovery is assumed to be virtually complete¹² or when treated patients are compared with untreated controls.^{13 14}

For some dysphasic patients, such volunteer-run schemes can form a valuable part of the overall rehabilitation programme. The timing of transfer of patients from speech therapy to club activities and their possible return for periods of more formal help needs further investigation. Such schemes should be encouraged to develop in harness with the NHS speech therapy service, despite the extra demands they make on the time and skills of speech therapists. Clearly they are neither an alternative

to speech therapy nor a panacea for a deficiency in NHS provision.

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References

- ¹ Geriatrics Committee Working Group on Strokes, *Report*. Royal College of Physicians, London, 1974.
- ² *Chest, Heart and Stroke Journal*, 1976, 1, 25.
- ³ Griffith, V E, *A Stroke in the Family*. London, Wildwood House, 1975.

- ⁴ Griffith, V E, *British Medical Journal*, 1975, 3, 633.
- ⁵ Goodglass, H, and Kaplan, E, *Assessment of Aphasia and Related Disorders*. Philadelphia, Lea and Febiger, 1972.
- ⁶ Taylor, M, *Archives of Physical Medicine and Rehabilitation*, 1965, 45, 101.
- ⁷ Trower, P, Bryant, B, and Argyle, M, *Social Skills and Mental Health*, pp 139, 146. London, Methuen, 1978.
- ⁸ Reinvang, I, *Scandinavian Journal of Rehabilitation Medicine*, 1969, 1, 112.
- ⁹ Darvill, G, *Bargain or Barricade?* Berkhamsted, Volunteer Centre, 1975.
- ¹⁰ *Volunteer Involvement in the National Health Service*. Berkhamsted, Volunteer Centre, 1976.
- ¹¹ Darvill, G, *Age Concern Today*, 1977, 15 November, p 7.
- ¹² Broda, H, *Archives of Physical Medicine and Rehabilitation*, 1977, 58, 248.
- ¹³ Hagen, C, *Archives of Physical Medicine and Rehabilitation*, 1973, 54, 454.
- ¹⁴ Basso, A, Faglioni, P, and Vignolo, L A, *Revue Neurologique*, 1975, 131, 607.

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Decreased first-pass metabolism of labetalol in chronic liver disease

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Summary and conclusions

The effect of chronic liver disease on the rate of elimination and extent of "first-pass" metabolism of labetalol was studied. Pharmacokinetic measurements were made after both oral and intravenous administration to seven healthy subjects and to 10 patients with chronic liver disease. Plasma half life was similar in the two groups. Plasma concentrations were considerably higher in the patients than in the healthy subjects after oral administration but similar after intravenous injection. Thus the bioavailability of labetalol was increased in liver disease due to reduced first-pass metabolism. Bioavailability in the group of patients correlated negatively with serum albumin concentration.

There were falls in supine heart rate and blood pressure which tended to be greater after oral administration in the patients with liver disease, suggesting an exaggerated response related to the increased bioavailability. Oral dosage requirements of labetalol and possibly other drugs susceptible to first-pass metabolism are reduced in the presence of liver disease.

Introduction

Labetalol is a new antihypertensive agent with both α - and β -adrenoreceptor blocking properties.¹ In common with many beta-blockers it is extensively metabolised in the liver, less than 5% being excreted unchanged in the urine.²

Reduced bioavailability after oral administration due to hepatic "first-pass" metabolism has been found for propranolol,³ oxprenolol,⁴ alprenolol,⁵ and metoprolol⁶ as well as for many other drugs for which hepatic extraction is high. Variability in the extent of first-pass metabolism between individuals is wide⁷

and accounts for some of the variation in dose requirements of propranolol.⁸ Metabolic studies of labetalol in animals and man⁹ and a study in a single individual when plasma concentrations after oral and intravenous administration were measured⁹ suggested that first-pass metabolism of labetalol was considerable and its systemic bioavailability 40% or less.

In chronic liver disease drug metabolising capacity is decreased. The elimination half lives of antipyrine,¹⁰⁻¹² propranolol,¹³ and phenylbutazone,¹⁴ among others, are prolonged in chronic liver disease. The effect of chronic liver disease on first-pass metabolism has hitherto been studied only for propranolol,¹⁵ when increased bioavailability was found.

This study was set up to compare the rates of elimination and extent of first-pass metabolism of labetalol in patients with chronic liver disease with those of healthy individuals.

Patients and methods

Ten patients with histologically proved chronic liver disease (table I) and seven normal controls were studied in Bristol Royal Infirmary. The controls were aged 22 to 42 years and two of them were women.

No one was taking drugs that interfered with the assay of labetalol or influenced drug metabolism, and none of the patients had had surgical portacaval anastomoses.

TABLE I—Patient characteristics

Case No	Age and sex	Serum albumin (g/l)	Bilirubin (μ mol/l)	Aspartate amino-transferase (IU/l)	Alkaline phosphatase (KA units)	Diagnosis	Oedema and ascites
1	50 M	46	14	28	7	Alcoholic cirrhosis	No
2	65 M	34	24	32	51	Cirrhosis	No
3	53 F	40	70	55	104	Primary biliary cirrhosis	No
4	68 M	41	12	14	14	Alcoholic cirrhosis	No
5	67 M	43	33	12	10	Alcoholic cirrhosis	No
6	57 M	40	14	16	12	Cirrhosis	Yes
7	31 F	27	48	149	20	Chronic active hepatitis	No
8	65 F	26	8	16	12	Alcoholic cirrhosis	Yes
9	70 M	39	9	8	9	Alcoholic cirrhosis	No
10	51 M	29	60	34	18	Cirrhosis	No

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