Screening elderly people in primary care: a randomized controlled trial

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SUMMARY. A randomized controlled trial was carried out to test the effectiveness of a screening programme carried out by nurses for elderly people aged 75 years and over in a general practice. A total of 151 people were randomly allocated to the test group and 145 to the control group. The test group received a home visit from a nurse at which an assessment lasting 45 minutes was made of: activities of daily living, social functioning, sensory functions, mental and emotional problems, current medical problems, blood pressure, urinalysis, haemoglobin level and compliance with medication. Both groups completed a selection of items from four health indices before and 20 months after the intervention. At follow up, the test group scored significantly better than the control group on a morale scale. However, this trial provided no evidence for better resolution of physical problems or finding activities of daily living easier in the test group compared with the control group. It is suggested that the main benefit of such a screening process is that the special attention and education provided improves adaptation to old age and awareness of the support systems available. The government has proposed an annual review of elderly people in their own home and this study suggests that the objectives of this scheme should be clarified.

Introduction

THE care plan for the elderly was a nursing initiative implemented in 1985 by Newcastle health authority. The care plan team was led by a group of health visitors and district nurses who, with the agreement of individual general practices, screened elderly people aged 75 years and over on the practice list. The programme was offered sequentially to practices throughout the city. The objectives of the care plan were to promote health and to identify each individual's functional problems and, where appropriate, to intervene in order to ameliorate or prevent the exacerbation of problems through relevant advice, education or referral. Following the initial screening and action by the care plan team, continued care was then undertaken by the primary care team. The initiative was introduced for three reasons: first, because elderly people might be utilizing general practitioner services less than they needed to;[1,2] secondly, because continuing demographic changes have led to higher proportions of elderly in the population;[3] and thirdly, because there appeared to be no systematic approaches to screening elderly people in many practices. Annual reviews of people aged 75 years and over in their own homes have, of course, now been suggested by the UK government in the proposed new contract for general practice.[4]

The purpose of the present study was to evaluate the effectiveness of a primary care linked screening programme to resolve health and related problems and to improve the quality of life of elderly people.

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Method

In 1986, one of the practices in Newcastle in which elderly people were about to be screened by the care plan agreed that a randomized controlled trial could be carried out in the practice. No specialized system of care for the elderly was organized in the practice and the practice population encompassed a wide diversity of social classes and urban residential areas. The total practice of about 8000 patients was cared for by the primary care team of four general practitioners, two health visitors and two district nurses from a main and a branch surgery.

Sample

Potential entrants to the trial were the 366 people aged 75 years and over who were registered with the practice in 1986; 31 of these had either moved away, died or were resident outside the Newcastle city boundary (the care plan was restricted to Newcastle residents). The eligible sample of 335 elderly persons was approached to take part in the study. Thirty nine patients were excluded; 11 were either too ill or in hospital and 28 refused to take part after explanation of the trial.

Initial evaluation

The final sample of 296 was initially evaluated by an independent interviewer (a community nurse trained in interviewing techniques and who had no previous connection with the care plan team) using a selection of items from the following schedules: a functional and problem evaluation interview;[5] the McMaster health index — an interview questionnaire which measures physical, social and emotional function;[6] the Philadelphia geriatric center morale scale — a self completion scale measuring life satisfaction and morale;[7] the Nottingham health profile — a self-completion questionnaire which enquires about sleep, physical mobility, energy, pain, emotional reactions and social isolation.[8] Patient contact with health and social services was also established.

Care plan

These elderly people were stratified into the age–sex groups 75–84 years and 85 years and over, then randomly allocated to the test (151 patients) and control groups (145 patients). The elderly people in the test group received a home visit from one of the care plan nurses. At this contact, an assessment lasting about 45 minutes was carried out which included the following: activities of daily living, social functioning, sensory functions, mental and emotional assessment, current medical problems, measurement of blood pressure, urinalysis and

haemoglobin level and apparent compliance with medication. The requirements for care were decided on the basis of the findings at this consultation and appropriate referrals were made. The threshold referral levels for blood pressure (110 mmHg diastolic), haemoglobin (11 gm dl^{-1}) and urinalysis (any reaction above a trace on reagent strips for protein, ketones and blood or positive for nitrite) were set by the general practitioners. In addition, the care team nurse gave advice to the elderly person about the problems identified and about heating the home. A booklet which described the health, social and voluntary services available locally for elderly people was left with each test group participant. In summary, the test group intervention consisted of a special screening assessment and referrals and/or advice based on the results. The elderly people in the control group received the usual pattern of care from the primary care team.

Interim and final evaluation

An interim evaluation interview of test and control groups was carried out seven months after the care team intervention and a final evaluation interview 20 months after the intervention. The same schedules were used as in the initial evaluation interview.[5-8] All interviewers were trained in the use of the evaluation schedules in order to reduce inter-observer variation. Pilot studies showed good inter-observer repeatability.

Analysis

A trial of this size has an 80% chance of detecting a 6% improvement caused by the care plan intervention at the 5% level of significance, on the assumption that the control group will undergo no change.[9] Non-parametric statistical tests were used to compare rates of functional problems in the test and control groups, and to compare scores on health and morale indices.

Results

This paper reports the results of the final evaluation at 20 months after the screening intervention in the test group. The final sample entering the trial was 296 elderly persons, that is 88.4% of the eligible sample. The 28 refusers were compared with the 296 accepters of the trial and were found to be not significantly different with respect to age and enumeration district.

Baseline comparison

A baseline comparison was carried out between the test and control groups for variables (apart from the stratification variables of age and sex) which might influence outcome. This showed that there was no significant difference in mental test scores, in the proportion living alone, in sheltered housing or residential care and the proportion consulting a general practitioner in the last six months. Tables 1–4 show baseline comparisons for problems, activities of daily living, morale and health profile categories. The control group found it significantly more difficult to walk up or downstairs than the test group ($P<0.01$) at the baseline evaluation (Table 2). In addition, isolation was just significantly greater in the control group at the baseline ($P<0.05$) (Table 4).

Table 1. Proportion of elderly people with problems, comparing test and control groups at baseline and 20 month follow up.

	Baseline			20 month follow up		
Problem with:	Test group ($n=151$) (%)	Control group ($n=145$) (%)		Test group ($n=118$) (%)	Control group ($n=111$) (%)	
Teeth	*13.2*	*14.6*	NS[a]	*5.9*	*11.7*	NS[a]
Feet	*18.5*	*18.6*	NS[a]	*10.2*	*11.7*	NS[a]
Diet	*10.6*	*13.1*	NS[a]	*2.5*	*4.5*	NS[b]
Bowels	*2.0*	*2.0*	NS[b]	*0.0*	*1.8*	NS[b]
Bladder	*4.0*	*6.9*	NS[a]	*1.7*	*5.4*	NS[b]
Bathing	*19.2*	*18.6*	NS[a]	*11.9*	*11.7*	NS[a]
Vision	*21.2*	*24.8*	NS[a]	*17.8*	*17.1*	NS[a]
Hearing	*21.2*	*19.3*	NS[a]	*17.8*	*19.8*	NS[a]

NS = not significant comparing test and control groups. [a] Chi-squared test (df = 1). [b] Fisher's exact test.

Follow-up comparison

During the 20 month follow-up period, 16 patients in the test group and 23 in the control group died. The death rate in the test group (10.6%) was not significantly different from that in the control group (15.9%) (chi square = 1.8, df = 1).

In addition to those patients who died, 17 patients were lost to follow up in the test group (seven refused the care plan intervention, six moved away from the area, one refused the

Table 2. Proportion of elderly people with difficulties with 10 activities of daily living, comparing test and control groups at baseline and 20 month follow up (the remaining patients had no difficulty with these activities).

	Baseline					20 month follow up				
	Test group ($n=151$)		Control group ($n=145$)			Test group ($n=118$)		Control group ($n=111$)		
Difficulty with:	Quite difficult (%)	Very difficult (%)	Quite difficult (%)	Very difficult (%)		Quite difficult (%)	Very difficult (%)	Quite difficult (%)	Very difficult (%)	
Walking a mile	17.9	36.4	20.7	43.4	NS[a]	17.8	32.2	23.4	36.0	NS[a]
Going up/down stairs	25.8	17.9	38.6	24.1	$P<0.01$	21.2	18.6	36.0	19.8	$P<0.05$
Getting up/into chair	15.9	0.7	22.8	0.7	NS[b]	16.1	0.8	18.0	0.0	NS[b]
Feeding yourself	2.0	0.6	1.4	0.0	NS[c]	1.7	0.0	0.9	0.0	NS[c]
Dressing	2.6	2.0	2.1	1.4	NS[b]	2.5	1.7	0.9	0.9	NS[c]
Washing face and hands	3.3	0.7	2.8	1.4	NS[b]	1.7	0.8	2.7	0.9	NS[c]
Shopping	11.9	27.2	16.6	30.0	NS[a]	12.7	22.9	13.5	23.4	NS[a]
Cooking	9.9	7.9	13.1	9.0	NS[a]	5.1	6.8	9.9	6.3	NS[a]
Doing light housework	25.8	6.0	29.0	5.5	NS[a]	22.9	3.4	24.3	4.5	NS[a]
Doing heavy housework	31.1	35.8	35.2	44.8	NS[a]	34.7	31.4	36.0	38.7	NS[a]

NS = not significant comparing test and control groups. [a] Chi-square test (df = 2), [b] Chi-square test (df = 1) amalgamating columns 'quite difficult' and 'very difficult'. [c] Fisher's exact test.

Table 3. Mean scores on the morale scale for elderly people, comparing test and control groups at baseline and 20 month follow up.

	Mean morale scale scores					
	Baseline			20 month follow up		
Category	Test group (n=133)	Control group (n=129)		Test group (n=101)	Control group (n=93)	
Attitude to own ageing	1.26	1.52	NS	1.85	2.19	$P<0.01$
Agitation	0.68	0.66	NS	1.33	1.60	NS
Loneliness	0.68	0.81	NS	1.02	1.42	$P<0.05$

NB: Higher scores indicate lower morale. NS = not significant comparing test and control groups. Mann Whitney U test.

Table 4. Mean scores on the Nottingham health profile.

	Mean Nottingham health profile scores					
	Baseline			20 month follow up		
Category	Test group (n=132)	Control group (n=130)		Test group (n=101)	Control group (n=92)	
Energy	19.9	23.7	NS	20.5	25.3	NS
Pain	7.1	10.0	NS	8.2	15.6	NS
Emotional reaction	7.3	7.2	NS	14.3	19.0	$P<0.05$
Sleep	13.5	12.3	NS	20.0	25.2	NS
Isolation	13.0	17.0	$P<0.05$	15.5	22.9	$P<0.01$
Mobility	17.5	21.8	NS	18.9	22.0	NS

NB: Conventional scoring of the Nottingham health profile has been used: higher scores reflect greater difficulty. Mann Whitney U test.

follow-up evaluation interview and three were either in hospital or too ill to be interviewed). In the control group, 11 patients were lost to follow up (one moved away from the area, six refused follow-up evaluation and four were either too ill to be interviewed or were in hospital). Thus 118 test group patients and 111 in the control group were evaluated at the 20 month follow up. In the test group 19 patients had died or were too ill to participate or were in hospital by the time of the follow up, whereas the comparable number in the control group was 27. This difference was not significant ($\chi^2 = 2.08$, df = 1).

Table 1 shows the problems elicited at the baseline and 20 month follow-up interviews. No significant differences were found between the groups. Table 2 illustrates that the test group showed no significant differences from the control group at follow-up for nine of the 10 individual activities of daily living; only going up/down stairs continued to show a significant difference.

There was a reduced response rate by participants to the Philadelphia morale scale and the Nottingham health profile in both test and control groups, possibly because of the more sensitive content of these schedules. Table 3 shows that morale was significantly better in the test group with respect to attitude to own ageing ($P<0.01$) and loneliness ($P<0.05$) at the time of follow up. All the morale scores appeared to worsen with the passage of time, although less so in the test group. It should be noted, however, that the baseline and 20 month follow-up groups are not directly comparable over time within the test group or within the control group. Table 4 illustrates that emotional reaction ($P<0.05$) and isolation ($P<0.01$) were perceived to be significantly worse in the control group compared with the test group at follow up, although isolation was also significantly different at the baseline.

No significant differences were found between the test and control groups with respect to use of health and social services.

Discussion

Hendriksen, Lund and Stromgard found that three-monthly visits aimed at medical and social intervention in those aged 75 years and over significantly reduced the death rate and hospital and nursing home admission rates in the test group compared with a control group over a three year period.[10] Tulloch and Moore examined the effects of social and medical screening in patients aged 70 years or over. After a two year study the authors concluded that the screening programme had no significant impact on the prevalence of socioeconomic, functional and medical problems affecting health.[11] Vetter, Jones and Victor evaluated the effects of an annual unsolicited visit from a health visitor to those aged over 70 years. Over a two year period, there was a significant reduction in the mortality rate and non-significant improvements in the quality of life in an urban practice whereas in a rural practice the health visitor had no similar effects.[12]

In keeping with the results of these earlier randomized controlled trials, the findings from the present study suggest that the benefits of screening are certainly not universal for all the aspects of quality of life measured. However, the loneliness and attitude to ageing components of the morale scale were significantly better at follow up in the screened group compared with the control group. This is a more objective confirmation of the subjective impression from earlier studies[10,11] that confidence and morale were greater in the screened group. It is possible that the care plan intervention enhances adaptation in old age and improves awareness of the support systems available, thus giving rise to better but not more frequent use of services.

Why then are there not greater advantages in terms of medical and functional improvements to those who have undergone screening in this age group? The intervention assessment by the care plan in this study occurred only once and it could be argued that referrals need to be based on more intensive and frequent preventive interventions. The intervention by the care plan team in Newcastle was a 'task force' approach, that is, it was a team external to the practice. Although the care plan team was able to make some direct referrals, for example for chiropody services or for a nursing auxiliary to help with bathing, for the most part the team reported back to the primary care team who undertook further action and referral on the specific needs identified. It could be argued that this liaison mechanism may be less effective than when the primary care team itself undertakes the screening. Nevertheless, another controlled study of screening carried out within a practice failed to show significant benefits in outcome.[11] A further possibility is that underconsultation by the elderly is less than at first thought.[13] Certainly, Hooper has argued that a primary care team already knows most of the important information about the elderly in a practice as long as this is collated in a systematic manner.[14] Effective problem related care of the elderly can therefore take place through the usual practice channels. Nevertheless, it may be that the potential for adaptation in old age is enhanced by the special attention and education in the screening process, and that this is as important as problem resolution.

The government has proposed a higher capitation fee for screening of elderly patients[4] in which a practice team member will be required to visit an elderly person at home annually and carry out an assessment broadly along the lines of the care plan intervention reported in this paper. What implications then do the present results have for these proposals? The experience of the care plan team suggests that annual visiting may create a high workload for practice team members with little effect on elderly peoples' medical and functional problems. Screening pro-

grammes based on the collation of practice information on the elderly[14] or questionnaire screening by post[15] may fall short of the government's specifications. We suggest that the government should clarify what the objectives of these visits should be in terms of outcome. On the evidence of this study, the main benefit may be only the improved morale of the elderly.

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