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Randomised controlled trial of home based care of patients with chronic obstructive pulmonary disease

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Abstract

Objectives To evaluate usefulness of limited community based care for patients with chronic obstructive pulmonary disease after discharge from hospital.

Design Randomised controlled trial.

Setting Liverpool Health Service and Macarthur Health Service in outer metropolitan Sydney between September 1999 and July 2000.

Participants 177 patients randomised into an intervention group (84 patients) and a control group (93 patients) which received current usual care.

Interventions Home visits by community nurse at one and four weeks after discharge and preventive general practitioner care.

Main outcome measures Frequency of patients' presentation and admission to hospital; changes in patients' disease-specific quality of life, measured with St George's respiratory questionnaire, over three months after discharge; patients' knowledge of illness, self management, and satisfaction with care at discharge and three months later; frequency of general practitioner and nurse visits and their satisfaction with care.

Results Intervention and control groups showed no differences in presentation or admission to hospital or in overall functional status. However, the intervention group improved their activity scores and the control group worsened their symptom scores. While intervention group patients received more visits from community nurses and were more satisfied with their care, involvement of general practitioners was much less (with only 31% (22) remembering receiving a care plan). Patients in the intervention group had higher knowledge scores and were more satisfied. There were no differences in general practitioner visits or management.

Conclusions This brief intervention after acute care improved patients' knowledge and some aspects of quality of life. However, it failed to prevent presentation and readmission to hospital.

Introduction

For patients with chronic obstructive pulmonary disease, impaired quality of life is often the main reason for hospital presentation and admission.¹ Home based programmes offering nursing care² or pulmonary rehabilitation³ provide viable alternatives to hospital admission for some patients. Supported discharge involving nurse visits is safe and achieved at lower cost than hospital admission.⁴ Telephone and home visit support after hospital discharge has reduced subsequent hospital admissions.⁵

The aim of the present study was to examine the impact of limited home visiting by a community nurse on patients recently discharged from hospital.

Method

We conducted the study at Liverpool Health Service, a tertiary teaching institution of 565 beds, and Macarthur Health Service, a district hospital of 254 beds. All patients aged 30-80 years who attended the hospital emergency department or were admitted to the hospitals with chronic obstructive pulmonary disease between September 1999 and July 2000 were identified from their records and invited to participate in the study. The recruited patients were randomised to receive the intervention or usual care.

Intervention

The intervention comprised two home visits by a community nurse. The first, within a week of a patient's discharge from hospital, included a detailed assessment of the patient's health status and respiratory function. The nurses provided verbal and written education on the disease and advised on stopping smoking (if applicable), management of activities of daily living and energy conservation, exercise, understanding and use of drugs, health maintenance, and early recognition of signs that require medical intervention. The nurses also identified problem areas and, if indicated, referred patients to other services, such as home care. After the visit a care plan documenting problem areas, education provided, and referral to other services was posted to each patient's general practitioner, and, if appropriate, the general practitioner was contacted by telephone. At the second home visit, one month later, the nurses reviewed patients' progress and need for further follow up. Patients were encouraged to continue to refer to the education booklet for guidance and to keep in contact with their general practitioner.

Usual care comprised discharge to general practitioner care with or without specialist follow up. Discharge did not include routine nurse or other community follow up.

Evaluation

Evaluation comprised patient interviews at recruitment (baseline) and at three month follow up, conducted either face to face or by telephone. We also administered the St George's respiratory questionnaire for measuring disease specific quality of life over the previous four weeks,⁶ at baseline and follow up; higher scores represent worse impairment of quality life.

Sample size

We calculated that 120 patients in each group were required to provide a power of 80% to detect a difference of this size at a significance of 5%. As we were unable to recruit sufficient patients, we revised the power of the study and estimated the power to detect a reduction by half was 48%. We also estimated that the revised power to detect a 10% change in the total score for the St George's respiratory questionnaire was 50%.

Results

Of the 177 patients we recruited, 84 were assigned to the intervention group and 93 to the control group. Follow up was completed with 67 patients in the intervention group and 80 control patients.

Baseline data

The intervention and control groups were similar in terms of sex ratio, age, and ethnicity. They also had similar scores on the St George's respiratory questionnaire and length of hospital stay. A substantial proportion of both groups reported needing others to care for them (30/67 (45%) and 31/80 (39%) respectively). There were no differences between the two groups regarding patients' satisfaction with hospital care, rating of own health, level of education, and main source of income.

Outcome data

Nurse follow up—Most of the patients receiving the intervention (57/67 (85%)) recalled the nurse visits after hospital discharge, compared with only 8/80 (10%) of the controls ($P=0.001$). The general practitioners of the intervention patients were significantly more likely to have been contacted by the nurses (8/67 *v* 1/80, $P=0.008$) and to report receiving the care plan, and most of those who had received the care plan rated them as useful.

Patients' knowledge—At follow up, patients in the intervention group displayed greater knowledge of chronic obstructive pulmonary disease than those in the control group. This included greater awareness of the name of the condition, of the role of vaccination, and of factors that prevent worsening of the condition (see bmj.com). There was no significant difference between the two groups on knowing when to seek help.

General practitioner contact—Information on patients' contact with their general practitioner was obtained from both general practitioners and patients at follow up (table 1). Most patients had visited their general practitioner during the follow up period and had visited regularly. There were no significant differences between the intervention and control patients in the average number of visits reported by general practitioners or patients. However, patients reported making more visits than the general practitioners reported.

Table 1 Contact with general practitioners by patients with chronic obstructive pulmonary disease who received home visits by nurse or standard care, and details of care provided by general practitioners. Values are numbers (percentages) unless stated otherwise

	Intervention (n=67)	Control (n=80)	χ^2 , test of difference (P value)
Patient visited GP	60 (90)	75 (94)	0.8 (0.4)
Mean No of visits to GP:			
Patients' report	6.06 (n=60)	5.54 (n=74)	1.0 (0.3)
GPs' report	5.21 (n=57)	5.11 (n=64)	0.2 (0.9)
GP prescribed drugs	42/57 (74)	53/64 (83)	1.5 (0.2)
GP arranged follow up	37/57 (65)	41/64 (64)	3.6 (0.4)
GP provided patient with education	39/57 (68)	44/64 (69)	0.01 (0.9)
GP provided carer with education	14/57 (25)	11/64 (17)	1.1 (0.3)

GP=general practitioner.

General practitioner action—Most patients in the intervention and control groups were satisfied with the care provided by their general practitioner (56/60 (93%) and 72/75 (96%) respectively) and reported that their general practitioner explained their treatment well (55 (92%) and 70 (93%)). General practitioners reported similar treatment for patients in both groups (table 1). Of those who responded, most general practitioners prescribed drugs for their patients (74% in intervention group, 83% in control group). These usually consisted of inhaled salbutamol or ipratropium bromide, inhaled and oral corticosteroids, and antibiotics. The general practitioners provided education to patients in both intervention and control groups (68% and 69% respectively) and to carers (25% and 17% respectively). Follow up arrangements did not differ between the two groups.

Patients' behaviour—There were no significant differences between the intervention and control groups in the proportions of patients who smoked (15/67 (22%) *v* 26/80 (33%), $P=0.17$), who received an influenza vaccination (48 (72%) *v* 60 (75%), $P=0.65$), and who reported having pneumococcal vaccination (42 (63%) *v* 42 (53%), $P=0.28$).

Function—There were no significant differences between the two groups in the St George's scores at follow up (table 2). For the intervention group, there were significant improvements in activity and impact scores but not the symptom score. For the control group, there was no change in the activity score, improvement in the impact score, and worsening of the symptom score.

Table 2 Change in St George's respiratory questionnaire score among patients with chronic obstructive pulmonary disease who received home visits by nurse or standard care (after excluding patients not completing the study (n=147))

Questionnaire subscale	Questionnaire score		Difference in change from baseline to follow up (95% CI)
	Baseline	Follow up	
Activity subscale:			
Intervention (n=67)	79.29	74.83	2.97 (−2.72 to 8.66)
Control (n=80)	75.54	74.05	
Impact subscale:			
Intervention (n=67)	54.57	48.48	−0.21 (−5.57 to 5.16)
Control (n=80)	51.52	45.22	
Symptoms subscale:			
Intervention (n=67)	64.50	66.05	3.18 (−1.83 to 8.18)
Control (n=80)	62.97	67.65	
Total score:			
Intervention (n=67)	63.71	59.39	1.32 (−2.97 to 5.62)
Control (n=80)	60.69	57.68	

Hospitalisation—There were no significant differences between the two groups in hospitalisation of patients during the three month follow up: 16 (24%) of intervention patients and 14 (18%) of controls presented to hospital and were admitted on one or more occasions. Of the 25 readmissions in the intervention group, 12 were for acute respiratory conditions, while 14 of 19 readmissions in the control group were for acute respiratory conditions. Two intervention patients and eight controls presented to the emergency department for respiratory conditions but were not admitted.

Discussion

This study shows that home follow up by a community nurse of patients discharged from hospital after an acute exacerbation of chronic obstructive pulmonary disease improved the patients' knowledge of the disease and some aspects of functional status. However, we found no difference in patients' subsequent hospital admission or presentation to an emergency department or in total functional status.

Study limitations

While few eligible patients refused to participate, the recruitment rate into the study was lower than expected. Also the rate of patients' reattendance at hospital was lower than anticipated in our sample size calculation. Hence, the recruitment was stopped when 83 intervention patients and 94 controls had been recruited. With a reattendance rate of 18% in the control group, we would have had 80% power to detect an absolute reduction of 13% in the reattendance rate to 5%.

Study implications

This study should be a caution for new initiatives for chronic and complex care in Australia. The introduction of general practice remuneration under the Enhanced Primary Care (EPC) for care planning and case conferencing in south west Sydney provides incentives for general practitioners to engage in such activity in the future.⁷ General practitioner remuneration depends on the involvement of at least two other health professionals such as nurses or other health workers. It will be interesting to see if the extension of care planning and case conferencing by EPC can affect the quality of care received by patients with severe chronic obstructive pulmonary disease and prevent hospitalisation.

Chronic obstructive pulmonary disease is an important problem in general practice.⁸ However, there is evidence that general practitioners may treat severe exacerbations less intensively than do hospital staff, especially with respect to use of antibiotics and corticosteroids.⁹ Effective management strategies for general practitioners include immunisation and early treatment of exacerbations. These were already at a fairly high level in both groups, suggesting that additional systems, including care planning and prompts, may be required to further increase the proportion of patients receiving optimal care.

Conclusion

This brief intervention after acute care was associated with some changes in patients' knowledge and some

What is already known on this topic

Patients with chronic obstructive pulmonary disease often require hospital care and have impaired quality of life

Home based care programmes provide viable alternatives to hospital admission for some patients at lower cost

What this study adds

A brief, home based nurse intervention after acute care improved patients' knowledge but failed to reduce subsequent presentations or admissions to hospital

Additional interventions or interventions earlier in the disease process may be required to reduce hospitalisations

aspects of function, but the intervention failed to engage general practitioners adequately or to prevent patients' readmission to hospital. Further studies are needed to evaluate the role of general practitioners as well as specific management interventions. Strategies that work for diseases such as heart failure or diabetes may not be transferable to patients with severe irreversible airflow reduction. We need to re-examine the part that general practitioners and specialist physicians can most effectively play in managing such patients.

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