Improving general practice consultations for older people with asthma: a cluster randomised control trial

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ABSTRACT

Objective: To evaluate the effectiveness of a multifaceted educational intervention for general practitioners to improve the outcomes of older people with asthma.

Design: Cluster randomised controlled trial.

Participants and setting: 42 GPs recruited from metropolitan Melbourne between 1 August 2006 and 31 July 2007, randomly assigned to an intervention or control group, and 107 patients with asthma, aged 55 years or older (consecutive patients recruited by the GPs).

Main outcome measures: Evaluation by means of a videorecorded consultation with a simulated patient for GPs; and for patients, asthma control and quality of life, lung function and action plan ownership at baseline and at 4 months.

Results: GPs in the intervention group scored significantly higher than those in the control group for the content and style of their consultation with simulated patients. At 4 months' follow-up, there was no significant difference between patient groups in the asthma control scores, asthma-related quality of life or lung function.

Conclusion: This trial showed an improvement in GPs' performance in delivering asthma care to older people. Despite this, there was no significant improvement in patient outcomes.

Trial registration: Australian New Zealand Clinical Trials Registry ACTRN12607000634471.

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In the United States, the United Kingdom and Australia, people over the age of 50 years now constitute the majority of those who die from asthma.[1-3] Links between asthma and an increased risk of mortality among older people have now been established,[4] prompting calls for the application of appropriate prevention and education strategies for older patients with asthma.[5]

Deficits in physicians' provision of care and their understanding of asthma guidelines have been previously identified.[6,7] Furthermore, recent research has revealed differences in the health beliefs and behaviours of older people with asthma that may render currently promoted asthma education strategies less effective in older age groups.[8] In response to this, we designed a multifaceted educational intervention to improve the content and style of general practice consultations for older people with asthma, using previously validated best-practice models to change physician behaviour.[9-11] The intervention was also based on a needs analysis of the priorities of older people with asthma.[8]

We hypothesised that a multifaceted educational intervention for general practitioners targeting the specific needs of older people with asthma would improve patient outcomes.

METHODS

We conducted a cluster randomised controlled trial of an educational intervention designed to improve the outcomes of older people with asthma. Videorecorded consultations with specially recruited simulated patients were used to measure the outcome of our educational intervention on GP behaviour. We measured the outcomes of actual patients with asthma using standard measures of asthma control at baseline and at 4 months. GPs in both the control and intervention groups were provided with their patients' lung function test results at baseline and at 4 months.

Recruitment of GPs and patients with asthma

Between 1 August 2006 and 31 July 2007, we advertised in the newsletters of metropolitan Melbourne Divisions of General Practice and the Royal Australian College of General Practitioners (RACGP) for GPs who would be interested in participating in our study. All who volunteered were accepted into the study.

All participating GPs were asked to provide the names of at least three consecutive patients who had asthma and were aged over 55 years who would be willing to be contacted by the study research assistant to invite participation. Visits at the homes of consenting patients were arranged by the research assistant at the commencement of the intervention and at 4 months after the intervention to measure patient outcomes.

The study was approved by the Alfred Hospital Ethics Committee and written informed consent was obtained from all GPs and their patients.

Random allocation to intervention and control groups

GPs were randomly allocated to the intervention and control groups (allocation was by individual and not by practice, so different GPs from the same clinic could be randomly allocated to intervention and control groups). The randomisation was concealed from the simulated patients and the research assistant who undertook patient outcome data collection.

The GP intervention comprised (in the following order):

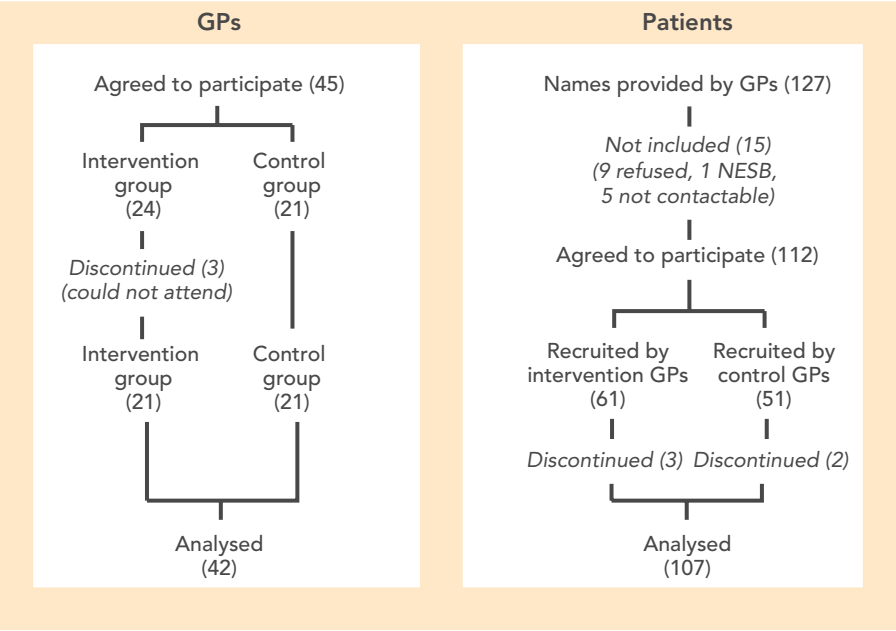
- a 2-hour group educational session involving theoretical and practical knowledge of asthma;
- participation in a videorecorded simulated patient consultation; and
- a 1-hour academic detailing visit at the GP's usual practice location 1–4 weeks after the educational session. This session was used to provide feedback to GPs and was individually tailored to individual GP needs.

GPs in the control group (in the following order):

- were provided with information packs containing details of the study, contact details of the research team, and basic patient resources;
- undertook a simulated patient consultation; and
- were waitlisted to receive the full intervention at the completion of the study.

GPs in the intervention group also received the information packs given to those in the control group, but additionally received a large-font simplified version of an action plan. GPs were not blinded to their randomisation status.

1 Enrolment of general practitioners and their patients



NESB = non-English-speaking background. ◆

Measures

GP outcomes were assessed by the use of eight simulated patients recruited from the Monash Centre for Medical and Health Sciences Education, who were provided with asthma medication devices and information on asthma, and who rehearsed a script based on patients' experience. Simulated patients were all non-physicians who had prior experience of portraying a specific patient case in a consistent, standardised fashion and in evaluating health professional encounters.[12] All were blinded to the intervention status of the GPs. Simulated patients used a previously validated evaluation tool[13] to evaluate their satisfaction with the consultation and its style according to rapport, how organised the GP was, and whether the GP had addressed all of their concerns.

All consultations with simulated patients were videorecorded on an unattended camera, and the research officer and an academic detailer assessed the content of consultations according to a checklist developed from National Asthma Council Australia guidelines[14] and the content of the intervention.

Measures for GP outcomes included the content and style of practice of their videorecorded consultation with a simulated patient, their patients' ownership of a written asthma action plan, and GPs' satisfaction with the intervention at completion of the study. GPs were also asked to evaluate the value of the intervention and their level of confidence after completion of the study, changes to their practice and barriers preventing a change in practice.

Primary endpoints for patient outcomes were patients' lung function[15] and scores on the Asthma Control Questionnaire,[16] an asthma knowledge questionnaire,[17] an asthma-related quality-of-life questionnaire,[18] a questionnaire assessing adherence to asthma preventer medication,[19] and the European Community Respiratory Health Survey.[20]

Statistical analyses

As this study was cluster randomised (with GPs treated as clusters), sample size calculations were based on the number of GPs required. With a minimum of 20 GPs per group, this study had an 80% power to detect difference in continuously normally distributed outcomes equivalent to 90% of one standard deviation with a two-sided P value of 0.05.

Statistical analysis was performed with SPSS, version 11 (SPSS Inc, Chicago, Ill, USA) and SAS, version 9.1 (SAS Institute Inc, Cary, NC, USA). Groups were compared with Student's t test and the χ^2 test for equal proportion. To account for the cluster randomisation, primary outcomes were assessed as changes from baseline using the PROC MIXED procedure in SAS (F test), with clusters (GPs) treated as a random rather than fixed effect. To account for baseline imbalances and other potential confounders, the multivariate models were further adjusted for age, sex, smoking history and practice size. A two-sided P value of 0.05 was considered to be statistically significant.

An independent samples t test was conducted to compare scores of GPs in the intervention and control groups on the content of their simulated consultation and a χ^2 analysis was used to compare the consultation style.

Coding of the data was undertaken by D P G, and an inter-rater reliability check was performed by the research assistant, who was blinded to the status of GPs and patients.

RESULTS

Box 1 shows that, of 45 GPs who enrolled in the educational program, 42 completed all components of the intervention and evaluation (21 in the intervention group and 21 in the control group). Participating GPs provided the names of 127 patients, 107 of whom completed participation in the study.

GP outcomes

There was no significant difference between the demographic variables of GPs in the control and intervention groups (Box 2).

The simulated patients reported the intervention GPs as significantly more likely to address all of their concerns than control GPs (18/21 [86%] v 12/21 [57%]; χ^2 $P = 0.04$. There was no significant difference in the simulated patients' evaluation of GPs in the intervention and control groups in regard to their rapport or how organised they were in the consultation.

There was a significant difference in the content of consultations with simulated patients between the two groups. GPs in the intervention group scored a mean of 15.4 (±2.3), compared with 13.9 (±2.2) for GPs in the control group ($P = 0.04$). GPs in the intervention group were more likely to confirm the diagnosis of asthma by spirometry, down-titrate medication doses, provide written action plans, check medication device use, ensure that patients know what to do in an emergency, check health beliefs, determine access barriers to treatment, and address all of the patient's concerns including medication side effects.

All GPs in the intervention group reported the intervention as being beneficial, and 19 reported increased confidence

in their delivery of asthma care to older patients and improvements in a range of clinical areas. Several GPs also reported barriers to change in their practice. Detailed data on benefits of participation, changes in practice, barriers to change in practice, value of program and level of confidence after intervention are available from the authors.

Patient outcomes

There was little difference between patients recruited by GPs in the intervention and control groups at baseline (Box 3). The only significant difference was that those recruited by GPs in the control group had a higher proportion of current smokers who had smoked for more than 10 years (16% v 2%; $P = 0.02$). Both groups of patients showed adequate asthma control and asthma-related quality of life (Box 4).

Action plan ownership measured at 4 months was low overall, but higher in the intervention group (16; 29%) than the control group (seven; 15%), although this difference was not statistically significant ($P = 0.09$).

There was no significant change in the outcome measures of patients between the baseline and 4-month follow-up visits, including in patients' scores on asthma symptom control, asthma knowledge, asthma-related quality of life, lung function and adherence to taking asthma preventer medication. In spite of there being no significant change in patient outcome measures, 16 of the 58 patients in the intervention group (28%) and 12 of the 49 patients in the control group (24%) reported an improvement in their breathing, and 11 of the 56 patients in the intervention group (20%) and 10 of the 49 in the control group (20%) reported fewer exacerbations of their asthma. During this same period, 15/58 intervention group patients and 11/49 control group patients had their asthma preventer medication down-titrated or increased, or were prescribed preventer medication.

Although 48/58 intervention group patients and 39/49 control group patients had seen a GP between their baseline and 4-month visits, only seven of the intervention and nine of the control group patients had seen the GP in relation to their asthma. Several patients in the study also mentioned that because of difficulties getting appointments with one doctor, they often see several GPs at their particular clinic. Four control group patients also reported that

2 Demographic characteristics of participating general practitioners

Characteristic	Intervention group	Control group	*P*
Sex			0.12
Female	14 (67%)	8 (38%)	
Male	7 (33%)	13 (62%)	
Mean age ± SD (range, 32–69 years)	48 ± 9 years	51 ± 10 years	0.31
Mean duration of practice ± SD (range, 4–42 years)	21 ± 11 years	23 ± 11 years	0.56
Previously attended asthma course	5 (24%)	7 (33%)	0.73
Practice			
Solo	1 (5%)	6 (29%)	0.1
Four or fewer full-time GPs	13 (62%)	13 (62%)	0.3
Five or more full-time GPs	5 (24%)	2 (10%)	0.41
Not currently in a practice	2 (10%)		0.6
Total GPs	21	21	

3 Demographic characteristics of the patients, comparing those recruited by general practitioners in the intervention group and control group

Characteristic	Intervention group	Control group	*P*
Sex			0.62
Female	39 (67%)	36 (73%)	
Male	19 (33%)	13 (27%)	
Mean age ± SD (range, 55–90 years)	70 ± 10 years	71 ± 9 years	0.68
Weekly income			
⩽ $250	22 (38%)	16 (33%)	0.71
$251–$499	19 (33%)	18 (37%)	0.82
$500 +	15 (26%)	12 (24%)	0.95
Missing data*	2 (3%)	3 (6%)	0.85
Asthma onset			0.25
Adult	42 (72%)	41 (84%)	0.45
Childhood	14 (24%)	8 (16%)	
Missing data*	2 (3%)		
Mean period with asthma	29 ± 27 years	25 ± 24 years	0.52
No other medical conditions	2 (3%)	1 (2%)	0.88
Other medications			
Cardiovascular medications	37 (64%)	31 (63%)	0.88
Anti-inflammatory medications	8 (14%)	13 (27%)	0.16
Endocrine medications	11 (19%)	5 (10%)	0.32
No other medications	5 (9%)	7 (14%)	0.54
Smoking history			
⩾ 10 pack-years, current smoker	1 (2%)	8 (16%)	0.02
⩾ 10 pack-years, former smoker	23 (40%)	14 (29%)	0.32
< 10 pack-years, current smoker	2 (3%)	0	0.55
< 10 pack-years, former smoker	9 (16%)	8 (16%)	0.88
Non-smoker	23 (40%)	19 (39%)	0.92
Total patients	58	49	

10 pack-years = one pack per day for 10 years (or equivalent).
* Not all questions were answered by all patients. ◆

4 Mean values for patient outcome measures at baseline and at 4 months*

Outcomes	Intervention		Control		Difference† (95% CI)	*P*
	Baseline	4 months	Baseline	4 months		
Lung function (% of predicted FEV_1 value) (mean ± SD)‡	84% ± 27%	85% ± 25%	77% ± 29%	78% ± 29%	1.6% (–3.3% to 6.4%)	0.53
Asthma knowledge questionnaire score§ (mean ± SD)	19 ± 5	19 ± 5	19 ± 5	19 ± 6	0.3 (–1.7 to 2.2)	0.80
Asthma Control Questionnaire¶						
Well controlled (no. [%] of patients)	23 (40%)	18 (31%)	17 (35%)	19 (39%)	0.1 (–0.2 to 0.5)	0.19
Controlled (no. [%] of patients)	17 (29%)	26 (45%)	13 (27%)	11 (22%)		
Not controlled (no. [%] of patients)	18 (31%)	14 (24%)	19 (39%)	18 (37%)		
Overall mean score (± SD)	1 ± 0.8	1 ± 0.8	1 ± 1	1 ± 1		0.41
Asthma-related quality-of-life questionnaire score** (mean ± SD)	0.7 ± 0.6	0.6 ± 0.5	0.7 ± 0.6	0.7 ± 0.6	0.2 (–0.1 to 0.4)	0.14
Adherence questionnaire score†† (mean ± SD)	1 ± 1.7	1 ± 1.6	0.6 ± 1	0.5 ± 1	–0.2 (–1.1 to 0.7)	0.65
Owned an action plan on completion of intervention (no. [%] of patients)		16 (28%)		7 (15%)		0.09
Total patients*	58	58	49	48		

FEV_1 = forced expiratory volume in 1 second.
* Patients unable to complete lung function tests or questionnaires at either visit were excluded from this analysis. † Difference between the control and intervention groups for the change from baseline. ‡ European Community for Coal and Steel (ECCS) reference values. § Average score of the general population with asthma is 21 out of a possible 31.[8] ¶ Lower scores are more favourable (scores range from 0 to 7, with those < 0.75 indicating well controlled and those > 1.5 indicating inadequately controlled asthma). ** Lower scores are more favourable (scores range from 0 to 4, with those < 1 indicating good quality of life). †† Lower scores indicate greater adherence to preventer medications (scores range from 0 to 6). ◆

their visit to the GP between baseline and 4-month follow-up measurements was with a different GP than the one who participated in the intervention.

DISCUSSION

Our study of the effects of an educational intervention showed an improvement in the content and style of the asthma consultations of GPs in the intervention group, measured through a videorecorded consultation with a simulated patient. GPs in the intervention group also showed higher rates of prescription of asthma action plans, which are a major component of guideline-based care. However, despite being able to change GP behaviour, we were unable to measure a difference in patient outcomes in this study.

Several features of our intervention differed from previously published interventions aimed at developing best practice in asthma care. Specifically, our intervention targeted older people with asthma; was robust in design, evaluating both patient and GP outcomes; and was based on qualitative needs analyses performed on data obtained from both patients[8] and health care providers.[7] Critically, our intervention was based on best-practice models of implementing change in health professional behaviour,[9-11] which it proved to do.

Previously published interventions to improve the delivery of asthma care have focused on the development of patient-centred care and the provision of asthma action plans.[21,22] These have been shown to increase GPs' confidence, reduce emergency department attendances and improve asthma-related quality of life. Yet, these previous trials have predominantly been performed in children.[21,23] Older people with asthma have generally been excluded from studies such as these.[24] Our study was based on our previous research, which identified unique issues in the delivery of care to older people with asthma.[8]

There are several possible reasons for the failure of our intervention to significantly influence patient outcomes. Although GPs who enrolled into our study reflected the demographic trends of GPs in the general population,[25] most were either Fellows of the RACGP or had undertaken postgraduate training. Enrolment into the educational program itself suggests an existing interest in providing quality asthma care. Their patients' lung function, asthma control, asthma-related quality of life and adherence to taking asthma medication at baseline were mostly adequate,[26] with little room for improvement in these measures.

As GPs were randomly allocated to the intervention or control groups at an individual rather than practice level, on one occasion, two GPs from the same practice were randomised to different study groups. Although a comparison of these two GPs' results did not indicate bias, this creates the potential for contamination, and is a limitation of this study.

Other reasons for the lack of observable difference between the study groups include: a Hawthorne effect whereby GPs' specifically focused on providing optimal asthma care in their older patient groups; the short follow-up period of the study; and the patients being selected by GPs, which may have led to mostly adequately controlled asthma in both patient groups.

Future interventions in this area should consider the possibility of selection bias by GPs in our study, and develop a recruitment strategy that ensures the inclusion of more patients with poorly controlled asthma.

Interestingly, most GPs in our study were not confident to perform or interpret spirometry (data not shown). Given that this group of GPs were interested in asthma care, and keen to improve the delivery of care, this finding re-emphasises the importance of the availability of spirometry to GPs, and suggests that more support is necessary to make spirometry available and help with its interpretation in primary practice.

Our techniques in this study are probably transferable to different settings for continuing professional education. Academic detailing is widely used by the pharmaceutical industry as an effective tool to improve the knowledge and influence the behaviour of

practising doctors. Moreover, academic detailing is able to recruit those practitioners who are reluctant to attend educational sessions, and provides opportunities for dissemination of treatment guidelines to groups of practitioners who are traditionally hard to reach.

To our knowledge, our study is the first randomised controlled trial of an educational intervention that specifically targets older people with asthma. Our intervention showed improved management of asthma in older people by GPs, verified by consultations with simulated patients and the delivery of asthma action plans. Our study therefore shows that appropriate educational strategies can improve GPs' knowledge and alter the style of asthma consultations with older people.

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COMPETING INTERESTS

None identified.

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