

Addressing barriers to change: an RCT of practice-based education to improve the management of hypertension in the elderly

MIKE CRANNEY

STUART BARTON

TOM WALLEY

SUMMARY

Background. In the future, primary care groups (PCGs) will have to consider how best to apply audit and education to fulfil their commitment to clinical governance and to facilitate the implementation of research findings.

Aim. To establish whether an exploration of 'barriers to change' can enhance the effectiveness of an educational intervention designed to improve the management of hypertension in the elderly.

Method. A parallel-arm, randomized, single-blind, controlled trial of practice-based educational visits in 18 practices. These practices had previously taken part in a multipractice audit of the management of hypertension in the elderly. Both groups received outreach visits in their own practice, during which they received the results of the previous audit. The nine 'intervention' practices were encouraged to explore barriers that would prevent them from implementing pertinent research findings. The control group was not encouraged to do this. The main outcome measure of the trial was determined in advance as 'the stated management of systolic hypertension in patients aged 70 to 79'. A secondary endpoint was the stated management of a specific patient scenario. The endpoints were tested by questionnaire before and after the educational intervention.

Results. For the primary endpoint, there was a statistically significant difference in the stated threshold for treating systolic hypertension between intervention and control groups after the visits (161.8 mmHg versus 167.2 mmHg; $P = 0.007$). For the secondary endpoint, there was also a statistically significant difference between the two groups, after the visits, in their willingness to treat a 70-year-old male with mild hypertension (89% of doctors would treat in the intervention group versus 57% in the control group; $P = 0.047$).

Conclusion. The effectiveness of an educational intervention is significantly improved by addressing the barriers preventing practitioners from implementing the findings of research.

Keywords: research; elderly; hypertension; educational intervention; randomized controlled trial.

Introduction

TO improve the delivery of health care and to get research results into everyday practice, it is important to use effective

educational strategies.¹⁻⁴ In a recent, major systematic review of the effectiveness of medical education interventions,¹ the use of outreach visits and local opinion leaders were both identified as particularly effective. The term 'outreach visit' describes a personal visit by an educator to health providers in their own setting; in the USA, such visits have been shown to have the potential to change the behaviour of doctors, particularly their prescribing practice.^{5,6} The use of a local opinion leader⁷ to support educational packages has also been shown to have the potential to change health care professional practice in a wide range of contexts.^{5,8-10}

The combination of two or more effective single interventions generally enhances the positive educational benefits to recipients.¹ Thompson *et al*¹¹ reported that the feedback of audit results was also a potentially worthwhile method of improving the practice of health care professionals. However, they cautioned against relying solely on this approach, concluding that the effectiveness of combining audit and feedback with other interventions required further investigation. Few trials have investigated the effect of varying different characteristics of the audit and feedback process.¹¹

On occasions, educational strategies of proven effectiveness fail to produce the desired effects. Recently it has been suggested that identifying barriers to change is an important step in promoting the uptake of research findings.¹² The barriers, which inhibit practitioners from implementing research findings in everyday decision-making, comprise a complex area and have been little studied.¹³ Examples of such barriers include organizational difficulties such as time management, pressure of work, and support of partners.¹³

Addressing these barriers during an educational intervention could improve the impact of audit and feedback in changing the practice of health care professionals; conversely, ignoring such barriers may render education ineffective. Previous studies of audit and feedback have not adequately explored this area.¹⁴

This study examines the additional effect of incorporating an exploration of barriers to changing practice into a multifaceted educational strategy. It was designed to improve general practitioners' (GPs') management of hypertension in the elderly, using a combination of audit feedback by a local opinion leader during an outreach visit.

Method

The study was designed as a parallel-arm, randomized, single-blind, controlled trial (Figure 1). The resources available could only support the provision of practice-based education for 18 practices; therefore, a formal power calculation was not used.

Selection of practices

Seventy-six practices participated in a standardized practice audit of the management of hypertension in the elderly.¹⁵ Their performance in controlling hypertension in the elderly was greatly variable (median = 17%; controlled and interquartile range = 11-27%) as defined by 'overall control' of blood pressure (the product of the proportion of elderly with measured blood pres-

M Cranney, MRCP, general practitioner and honorary research fellow; S Barton, DPhil, MRCP, MRCP, general practitioner and senior lecturer; and T Walley, MD, FRCP, professor of pharmacology, Department of Pharmacology and Therapeutics, The Infirmary, Liverpool. Submitted: 26 October 1998; final acceptance: 24 February 1999.

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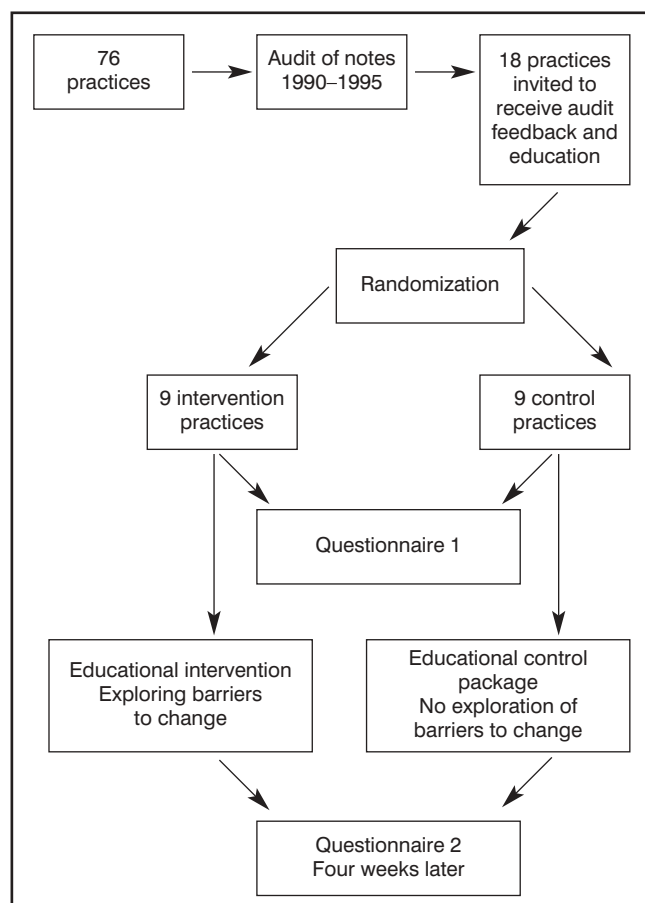


Figure 1. The research design.

sure, the proportion of hypertensives on treatment, and the proportion of those on treatment who have controlled blood pressure).

Nine pairs of practices were then matched from the initial 76 according to numbers of partners and the ranking of overall blood pressure control. Practices were chosen so as to achieve a spread of management of hypertension. Matched practices were randomized either to an 'intervention' or 'control' group using a random number generator.

Questionnaire and outcome measures

The primary endpoint of the trial was predefined as a lowering in the stated threshold for treating systolic hypertension in patients aged 70 to 79 years. This was chosen because systolic hypertension is clinically important,¹⁶ is more closely related to cardiovascular risks than diastolic hypertension,¹⁷ and is much more common in elderly than in middle-aged persons.¹⁷ Also, it is currently poorly managed.^{15,18}

A secondary endpoint was willingness to treat a patient in a clinical scenario (a male patient aged 70 years with a sustained mean blood pressure of 170/94, but no evidence of end organ damage). All of the major guidelines¹⁹⁻²³ recommended treatment for such a patient, but we had previously found that less than half of GPs would prescribe an antihypertensive medication in this situation.²⁴

A questionnaire to measure these endpoints and other endpoints was designed using a compilation of published questions from three sources.²⁴⁻²⁶ The questionnaire was piloted in two practices outside the study. After minor modification, the final questionnaire (Appendix 1) was issued by post and collected

immediately before, and four weeks after, the educational intervention. GPs were also asked whether they had a practice protocol for the management of hypertension.

Intervention and control

The educational intervention was multifaceted, consisting of a semi-structured visit, lasting approximately one hour, in small groups within each practice led by one of the authors: a trained educational facilitator (MC). A trained research assistant observed and recorded each visit and ensured the visit structure was adhered to. The visit included seven components:

1. Feedback of audit results, including a comparison of the practice performance with the other 75 practices involved
2. An exploration of participants' views on the significance of the results
3. Discussion of the evidence-base for the treatment of hypertension in the elderly
4. Exploration of current practice concerning hypertension management
5. Identification of practice priorities, with an exploration and recording of potential barriers to change
6. Creation of a practice action plan to address these issues
7. For practices that had not spontaneously decided to repeat the audit, discussion of how such an audit might be performed.

Thomson *et al*²⁷ recommended that the evidence for any desired change should be clearly presented. An 'evidence pack' was therefore produced to present the relevant evidence and was left in each practice.^{16,19,28-38}

Control practices received the same visit as the intervention group, but barriers to change (component 5 above) were not explored. All visits were tape-recorded and postgraduate education allowance approval was obtained.

Analysis

Responses were coded and analysed on SPSS for Windows. The null hypothesis was that the intervention would not affect the proportion of responders providing appropriate answers in the questionnaires. Differences within the control (or intervention) group before and after the educational visit were assessed using the Wilcoxon signed ranks test for paired data. A Mann-Whitney test was used to establish significant differences between the intervention and control groups.

The impact of cluster bias on our primary endpoint was assessed by comparing analysis based on practices as the unit, with analysis based on individual doctors as the unit. Since both approaches yielded the same significant results for the primary and secondary endpoints, our main results are reported using practices as the unit of analysis, as this was the level at which randomization and matching was carried out. Mean scores for each practice were calculated by amalgamating responses from responding individual doctors within practices.

Results

All 18 practices that were approached participated in the study. The baseline characteristics of the two groups after randomization are shown in table 1.

The educational programme was successfully delivered to all practices. The duration of intervention visits was approximately one hour and the control visits approximately half an hour. All practices completed the first and second questionnaires. Sixty-seven of the 69 possible doctors who could have been involved

Appendix 1. Thirty questions were asked (a full copy is available on request from MC). Included here is a selection of crucial questions that yielded our main results. Primary and secondary endpoints are marked with the symbol ✱. This annotation was not on the original questionnaire seen by the participating GPs.

1) Does your practice have a protocol for the management and treatment of elderly hypertensive patients? (Please tick ONE response only): Yes No

2) What is your threshold for the treatment of hypertension in the following age bands?
Please enter below:
i) The Systolic level above which you would normally commence treatment for each age group;
ii) The Diastolic level above which you would normally commence treatment for each age group;
Make a cross if you do not normally treat a patient in a certain age group.

| | i) Systolic | ii) Diastolic | |
|---------|-------------|---------------|----------------------|
| <65 | _____ | _____ | |
| 65-69 | _____ | _____ | |
| 70-79 ✱ | _____ | _____ | ✱ PRIMARY ENDPOINT ✱ |
| 80-89 | _____ | _____ | |
| >90 | _____ | _____ | |

3) Considering a male patient aged 70 with a sustained mean blood pressure of 170/94 and no evidence of end organ damage: would you prescribe antihypertensive medication for him to lower his BP? (Please tick ONE response only) ✱ SECONDARY ENDPOINT ✱

| | | |
|-----|----|--------|
| Yes | No | Unsure |
|-----|----|--------|

Table 1. Comparison of characteristics of nine intervention and nine control practices (no significant differences between groups).

| | Intervention | Control |
|---------------------------------------|--------------|-------------|
| Number of practices | 9 | 9 |
| Number of eligible doctors | 34 | 35 |
| Mean list size (SD) | 7425 (3422) | 6273 (2580) |
| Mean number partners (SD) | 3.7(1.7) | 3.9(1.2) |
| Number of single-handed practices | 2 | 0 |
| Number of training practices (%) | 3 (33%) | 3 (33%) |
| Number of female partners (%) | 9 (27%) | 12 (34%) |
| Percentage of overall BP control (SD) | 22%(16) | 19%(10) |

in the study responded to at least one questionnaire. Thirty-four doctors belonged to the intervention practices and 35 to the control practices. In the intervention group, 30 completed the first questionnaire and 31 completed the second. In the control group, 34 completed the first questionnaire and 31 completed the second. Fifty-eight doctors completed both questionnaires — 28 in the intervention group (82%) and 30 in the control group (86%) — and these are the basis of the analysis. Missing questionnaires were a result of doctors who missed the first or second practice visit, and this was owing to inevitable reasons such as holidays, illnesses, and other engagements; however, 84% did complete both questionnaires.

Primary endpoint

For the primary endpoint, (reported threshold for treating systolic blood pressure), the intervention and control groups initially reported thresholds of 172.7 and 166.6 mmHg respectively; these thresholds were not significantly different. After the visits, the thresholds for the intervention and control groups were significantly different: 161.8 versus 167.2 mmHg respectively (Mann–Whitney, $P = 0.007$). The control group showed no significant change in the threshold for treating systolic hypertension, but the intervention group showed a significant improvement (Wilcoxon, $P = 0.012$).

Secondary endpoint

There was no significant difference between the intervention and control groups in their initial answers to the scenario of the management of a 70-year-old male with mild hypertension (willingness to treat 61% versus 60% respectively). The intervention group changed their responses significantly after the intervention: 89% expressing a willingness to treat (Wilcoxon, $P = 0.027$). In contrast, the control group did not significantly change: 57% expressing a willingness to treat. The difference between the intervention and control groups after the educational visit was significant (Mann–Whitney, $P = 0.047$).

Other findings

All of the intervention practices produced an action plan for improving performance as compared with none of the controls. Three intervention practices planned in detail a modified repeat of the audit as compared with none of the controls. Several barriers to change were identified by the participating GPs and they are presented in Box 1.

Doctors within the same practice showed surprising discordance when initially asked about the existence of a practice protocol (no significance between intervention and control). The intervention increased the concordance among doctors, with an increased proportion reporting the existence of a protocol ($P = 0.003$, intervention versus control).

Costs

The fixed cost of preparing the educational package was £120, and the variable costs per visit for travel (£5), staff time (£60), secretarial support (£8), and sundries totalled £83. Thus, the mean cost per visit was £90 (at 1997 prices).

Discussion

Our results indicate that addressing barriers to change and incorporating this strategy into an educational outreach visit significantly enhances the effectiveness of medical education. This supports the work of Soumerai and Avorn⁶ who described the effectiveness of an outreach visit using an eight-step social marketing approach to behaviour change. The first step in this approach is a key component and is found in other models of behaviour

- Time pressure
- Workload
- Clinical and administrative burdens
- Absence of peer support
- Being a single-handed practitioner
- Poor teamwork in practice
- Inadequate computer system
- Absence of a personal 'mentor'

Box 1. Some of the barriers to change identified by participating GPs. These 'barriers' are presented randomly and are not categorized according to their importance.

change; it consists of interviews to assess the motivation for current practice and barriers to change. In our study, the intervention group explored their motivation and possible barriers to change in the management of hypertension in the elderly. This led to a significant improvement in the primary and secondary endpoints, and additional improvement in attitudes in other areas.

The effects are not only statistically significant, but would amount to a clinically important change in the practical management of hypertension in the elderly if translated into behavioural change, but it is important to stress that we have not reported here any subsequent change in doctors' performance. This essential step of 'closing the loop' is an important future objective.

Our original audit¹⁵ was conducted in August 1995 and examined a five-year period in the patients' notes; we propose to repeat this audit in August 2000. If GPs' stated intentions were applied and sustained in practice, our previous study¹⁵ suggests that this would avoid approximately 5% of hypertension-related strokes, equivalent to 0.15 avoided strokes per year for each GP with a list size of 2000 patients. Any benefits need to be weighed against the costs of providing the educational intervention and audit. Based upon the assumptions and costs shown above, the cost per additional stroke saved was approximately £180 (not including drug costs and follow-up costs); justifying the extra time required to explore barriers to change.

A weakness of this study is its small size, limited by resources, but we believe the practices studied to be representative. It is evident from Table 1 that the intervention group initially had better overall blood pressure control in their practices (22% versus 19%), but this difference was not statistically significant and is not likely to explain our results. The response rate of 84% of doctors completing both questionnaires compares favourably with other studies of educational interventions. The small study size may explain why no effect of the educational intervention was seen in the control arm. If this study were to be repeated, a larger number of participating practices could enhance the generalizability of the results.

Our study was not blinded to the educators and this is a potential source of bias. The main argument against bias is that the educational programmes followed a semi-structured plan and were observed, recorded, and regulated to ensure that the intended content was delivered.

The move towards clinical governance requires that education and audit should be harnessed to meet nationally defined standards, addressing the needs of patients and aiming to produce healthier outcomes.³⁹ Primary care groups (PCGs) are charged with the supervision of clinical governance. To do this they can audit current performance to identify educational needs. It is already known that outreach visits are an effective method of delivering an educational intervention,⁴⁰ particularly if delivered by an opinion leader.²⁷

Unfortunately, such outreach visits can be costly, and Thompson *et al*⁴⁰ suggested that it would be useful to know which components contributed to the effectiveness of such visits.

Our study demonstrates that consideration of barriers to change can be a particularly valuable component of what is thought to be an educationally optimal programme.¹²

Hypertension in the elderly is one of the most fruitful areas to produce a reduction in the incidence of heart disease and stroke, which is a key objective in public health policy today.⁴¹ PCGs may well choose this subject as a quality marker when monitoring the performance of participating practices in their group.

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Address for correspondence

Dr Mike Cranney, 17 Villiers Crescent, St Helens, Merseyside WA10 5HP.