Original Research

Physicians' participation in establishing criteria for hypertension management in the office: Will patient outcomes be improved?

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We designed this study to determine whether an intensive 1-day educational workshop involving family physicians in establishing essential criteria for hypertension management would significantly affect the short-term outcomes of hypertensive patients in their practices. Forty randomly selected physicians were separated into three groups: those who would be involved in establishing the criteria (15), those who would receive the criteria by mail (15) and those who would act as controls and not be aware of the criteria (10). We found no significant difference between the three groups in the number of hypertensive patients whose condition remained uncontrolled after the intervention. We conclude that physicians' participation in the establishment of standards of care for conditions such as hypertension or their awareness of such standards does not independently result in significantly better patient outcomes. Consequently, we recommend that physicians and health care planners concerned with improving outcomes not rely on any single intervention strategy when planning change.

Nous avons voulu savoir s'il est possible, au cours d'un atelier pédagogique intensif d'une journée, d'établir avec la participation de médecins de famille les critères essentiels du traitement de l'hypertension artérielle, de telle sorte que le devenir à brève échéance de leurs malades hypertendus en soit affecté de façon significative. On choisit au hasard 40 médecins et les répartit comme suit: 15 d'entre eux collaborent à l'établissement des critères, 15 autres en prendront connaissance par la poste, et les 10 restants, faisant office de témoins, ne les connaîtront pas. Il n'y a aucune différence significative parmi ces groupes quant au nombre de malades dont l'hypertension n'est pas jugulée après traitement. Nous en tirons la conclusion que ni la participation des médecins à l'établissement de normes pour le traitement de troubles tels que l'hypertension artérielle, ni leur connaissance de telles normes, n'a comme effet, chacune pour son compte, d'améliorer significativement l'issue du traitement de leurs malades. Aussi recommandons-nous que lorsqu'ils veulent améliorer celle-ci, médecins et planificateurs sanitaires ne se fient pas à un mode unique d'intervention.

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Hypertension remains one of the most significant health problems in North America. Its prevalence, the seriousness of sequelae if left untreated and the efficacy of treatment combine to make it one of the most frequently seen important problems in a primary care practice.

Since most of the care of patients with hypertension in the Maritime region is given by family physicians we set out to determine whether an intensive 1-day educational workshop for family physicians on setting criteria for hypertension management would significantly improve short-term patient outcomes.

Quality assurance and medical audits have been part of the health care delivery system in the United States and Canada for many years, but with mixed results. In 1985 we reported the results of our 3-year study of physicians' participation in selecting conditions and generating criteria for audits done in their practices and found a significant improvement in physician behaviour.[1] We felt the next step was to relate involvement in the process to patient outcomes. We chose hypertension because the effects of management are clear-cut, measurable and immediate. Consequently our hypotheses were that (a) there will be greater improvements in patient outcomes if physicians whose work is to be audited participate in generating the audit criteria than if externally generated criteria are used and (b) the physician's awareness of the criteria will have positive effects on patient outcomes, regardless of the origin of the audit criteria (self-generated or imposed).

Although the potential of quality assurance to change physician behaviour or patient outcomes has long been suggested[2-4] most continuing medical education (CME) departments in US and Canadian schools have neither incorporated relevant parts of the process into their programs nor fully researched the educational value of quality assurance. One exception is the Professional Competence Assurance Program (PROCAP),[5] developed at the University of California in San Francisco: reviews of medical records in ambulatory practices are used to identify deficiencies in the performance of physicians so that personalized educational interventions can be developed; these interventions have included feedback on one's performance as compared with that of peers, targeted readings, conference calls and group seminars with experts. The results have generally been positive,[5-7] but a recent randomized controlled trial of PROCAP failed to show improvements in performance beyond those observed in the control group.[8]

Perhaps the reluctance of CME researchers to deal with quality assurance reflects the generally discouraging results. Reviews have suggested that the study methods are often flawed and that even well-done studies frequently yield equivocal results.[9-11] We intended to involve physicians in an innovative educational experience to overcome some of the problems encountered in previous efforts to achieve behaviour change.

Although an exhaustive survey of CME research is not appropriate here, there have been several studies relevant to our efforts to change the outcome of patients with hypertension in the ambulatory setting. Those studies have resulted in improved physician knowledge or behaviour[12-14] but have had no impact on patient outcomes that could be attributed to the educational intervention.[12,15]

Methods

Recruitment of physicians

Forty family physicians in full-time practice with 5 to 25 years of experience were randomly selected from the mailing list of all practising physicians in Nova Scotia, New Brunswick and Prince Edward Island that the Dalhousie University Division of Continuing Medical Education maintains. The 16 physicians who participated in our previous patient care appraisal study[1] were excluded. The number selected from each province was weighted in proportion to the available pool of family physicians in that province. Physicians were also stratified by experience.

The physicians were separated into three groups according to the level of involvement in setting criteria for hypertension therapy. Group I (15 physicians) participated fully in creating the essential treatment criteria. Group II (15 physicians) was informed of this list of criteria but could not offer input. (One physician in this group moved and was the only loss from the study.) Group III (10 physicians) was unaware of the criteria and acted as the control group.

The participating physicians were visited by one of the principal investigators, who checked the accuracy of all sphygmomanometers used in the practice (and required replacement of defective equipment) and using a stethoscope verified blood pressure measurements taken by the physician and all support staff who normally did this. Pressures that differed by less than 6 mm Hg from the principal investigator's standard were deemed acceptable for the study.

Case finding

An initial baseline list of hypertensive patients from all the practices revealed a cohort with blood pressure levels uncontrolled for periods thought to be unacceptable by the group I physicians. These patients were designated as "uncontrolled hypertensives". We were interested in the number of patients whose condition remained uncontrolled after the CME intervention.

Patients who were identified as having uncontrolled hypertension during the first 9 months of our study (case-finding period) were expected to have one of three types of outcome during the study: (a) satisfactory (blood pressure would return to acceptable levels), (b) unsatisfactory (blood pressure would remain unacceptably high; for patients who died or were admitted to hospital because of hypertension or related causes the last available office reading was used for analysis) and (c)

omitted from analysis (any patient who broke contact with the study physician or died of causes not related to hypertension was excluded).

A sheet was inserted in the file of all patients over the age of 16 years seen in the office during the case-finding period as a reminder to the physician or nurse to measure their blood pressure. If the physician considered the pressure to be normal, measurements were not taken on subsequent visits. Our case-finding period was 9 months; we expected that most of the hypertensive patients would be found during that period.

The sheets were collected regularly from each practice by the project manager, who used code numbers for patients and physicians to maintain confidentiality, and were sorted according to the recorded blood pressure (controlled or uncontrolled, according to the standards set by the group I physicians). Patients with uncontrolled hypertension were those with three blood pressure readings at or above the set levels; one of the three had to have been the last recording in the 9-month period.

To avoid biased entry errors data were entered into a computer by staff who had no knowledge of the project or of the meaning of the data.

Establishment of essential criteria

The 15 physicians in group I were asked to generate a set of essential criteria, with an emphasis on therapy. We believe that criteria generation is an intensive educational process during which physicians learn from peers and the literature. A 1-day workshop with multiple small groups was organized, the research team staff acting as group leaders. As discussion in these groups progressed, appropriate literature previously identified by a consultant group of expert specialists was provided on request. Questions were answered by the hypertension consultants on the research team, who attended the entire workshop session.

The process was designed to reach a consensus among all group 1 physicians on a set of essential criteria for hypertension management. Although other criteria for diagnosis and investigation of hypertension undoubtedly represent appropriate and necessary behaviour, adherence or nonadherence to those broader criteria would correlate poorly, if at all, with short-term blood pressure control. Therefore, physicians setting their own criteria were asked to focus on treatment issues. Adherence to these criteria was not used as an outcome measure; audit data on adherence were given to each physician as feedback on his or her practice behaviour.

The list of criteria generated by group I was mailed to the physicians in group II, who received no supporting documentation and did not have the opportunity to discuss modification of these criteria with either the research team or other physicians in the project.

Follow-up

We believed that the educational effect would occur immediately after the criteria were generated or, in the case of group II physicians, the criteria were received in the mail. Consequently, follow-up started right away and lasted 18 months. Only patients identified as having uncontrolled hypertension during the case-finding period were followed up. The qualification for uncontrolled hypertension in the follow-up period was the same as that in the case-finding period. Patients who made fewer than three visits were excluded.

Audit of physician behaviour

An audit was conducted in the physicians' offices by a team of two health-record analysts, who retrieved the charts of the patients with uncontrolled hypertension identified in the case-finding period and abstracted records of physician care for all visits during the follow-up period. The blood pressure levels in the charts were checked against the readings submitted to the study, and a search was conducted for any readings that had not been reported. No significant discrepancies were found. In addition, the charts were abstracted for the care management criteria to provide feedback to each physician.

Results

There was no significant difference between the group I and group II physicians in the number of patients who still had uncontrolled hypertension after the intervention. However, there were many individual differences between the physicians in each group ($\chi^2 = 23.69$, 1 degree of freedom [df], $p < 0.001$).

There was also no significant difference in patient outcome between the physicians who were aware of the criteria (those in groups I and II) and the control physicians. However, there were significant individual differences between the physicians in each group ($\chi^2 = 19.43$, 1 df, $p < 0.001$).

Because these results were unexpected after the intensity of the intervention, a *t*-test analysis was performed to detect possible differences between the three groups in the proportion of patients with uncontrolled hypertension in each practice. The findings confirmed the previous ones.

We were concerned that our original standards for measuring improvement were too demanding; i.e., the blood pressure had to return to normal, whereas significant lowering of either the systolic or the diastolic pressure would have led to improved health. We also considered that perhaps the case-finding was biased, because all patients with uncontrolled hypertension were considered as being similar; however, some were actually long-standing patients resistant to treatment or noncom-

pliant, and some were new patients with reasonable odds of achieving levels of control.

To even these odds and find general improvements in blood pressure we calculated the average systolic and diastolic pressures for each patient in each of the two study phases and then the average figures by physician group. There were no clinically or statistically significant differences in the pressures between the groups. We repeated the analysis on the patient data and found that the mean decrease in the systolic and diastolic pressures was greater among the new patients than among the total patient population; however, there was still no significant difference between the physician groups.

Discussion

We found no evidence that participation in the patient care appraisal process had a positive effect on the short-term control or reduction of blood pressure. Furthermore, patient outcomes were apparently not affected by physicians' participation in the generation of audit criteria.

Since this project was conceived, funded and initiated we have become increasingly sceptical of the value of single-intervention CME strategies for change. We had incorporated many accepted principles of adult education, but perhaps this was not sufficient to effect sustained behaviour change in the physicians and their patients. For example, although there was peer involvement in generation of the criteria, the physicians returned to their communities where no one else had been involved; consequently, true peer support for change may not have been present. If any of the suggested criteria were not part of the local pattern of practice, there may not have been support from local consultants or colleagues. Similarly, although the access to literature and experts had been more than adequate on the day of the workshop, no follow-up had been planned or implemented, and reminders might have been helpful.

The data obtained in this study indicate clearly that physicians' participation in establishing standards of care for a condition such as hypertension does not automatically result in significantly improved patient outcomes. Consequently, we recommend that physicians or health care planners concerned with improving patient outcomes not rely on any single-intervention strategy for planning changes in care.

We caution against further efforts to assess the impact of any single-intervention CME strategy on the behaviour of physicians or on patient outcome. We do not question the usefulness of the classic randomized controlled trial in basic or clinical research for investigating drugs or other interventions. However, in CME research broader strategies must be developed. Until then investigators should be wary of attempting to establish that one program or activity can be responsible for sustained, meaningful alteration in the way physicians manage a clinical problem.

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References

1. Putnam RW, Curry L: Impact of patient care appraisal on physician behaviour in the office setting. *Can Med Assoc J* 1985; 132: 1025-1029
2. Mushlin AI, Appel FA: Testing an outcome-based quality assurance strategy in primary care. *Med Care* 1980; 18 (suppl): 1-100
3. Sanazaro PJ, Worth RM: Concurrent quality assurance in hospital care. Report of a study by private initiative in PSRO. *N Engl J Med* 1978; 289: 1171-1177
4. Winickoff RN, Coltin KL, Morgan MM et al: Improving physician performance through peer comparison feedback. *Med Care* 1984; 22: 527-534
5. Gullion DS, Adamson TE, Watts SM: Professional Competence Assurance Program (PROCAP). *Proceedings of the 20th Annual Conference on Research in Medical Education*, Association of American Medical Colleges, Washington, 1981: 121-126
6. Idem: The effect of an individualized practice-based CME program on physician performance and patient outcomes. *West J Med* 1983; 138: 582-587
7. Gullion DS, Adamson TE: A practice-based CME program in hypertension using a medication and behavioral treatment approach. *Proceedings of the 24th Annual Conference on Research in Medical Education*, Association of American Medical Colleges, Washington, 1985: 207-212
8. Gullion DS, Tschann JM, Adamson TE: Physicians' management of hypertension: a randomized controlled CME trial. *Proceedings of the 26th Annual Conference on Research in Medical Education*, Association of American Medical Colleges, Washington, 1987: 115-118
9. Bertram DA, Brooks-Bertram PA: The evaluation of continuing medical education: a literature review. *Health Educ Monogr* 1977; 5: 330-362
10. Haynes RB, Davis DA, McKibbon A et al: A critical appraisal of the efficacy of continuing medical education. *JAMA* 1984; 251: 61-64
11. Lloyd JS, Abrahamson S: Effectiveness of CME: a review of the evidence. *Eval Health Prof* 1979; 2: 251-280
12. Dickinson JC, Gregg AW, Gehlback SH et al: Improving hypertension control: impact of computer feedback and physician education. *Med Care* 1981; 19: 842-853
13. Jennett PA, Laxdal O, Hayton R et al: The effects of continuing medical education upon family physician performance in the office management of hypertension — a randomized controlled study. *Proceedings of the 25th Annual Conference on Research in Medical Education*, Association of American Medical Colleges, Washington, 1986: 145-149
14. Evans CE, Haynes RB, Gilbert JR et al: Educational package on hypertension for primary care physicians. *Can Med Assoc J* 1984; 130: 719-722
15. Evans CE, Haynes RB, Nicholas JB et al: Does a mailed continuing education program improve physician performance? Results of a randomized trial in antihypertensive care. *JAMA* 1986; 255: 501-504