Same information, different decisions: the influence of evidence on the management of hypertension in the elderly

M CRANNEY

T WALLEY

SUMMARY

Background. *Evidence-based medicine requires general practitioners (GPs) to act upon the results of clinical trials. Clinical trial evidence may be difficult to understand and apply in practice.*

Aim. *To investigate whether GPs were unduly influenced in managing hypertension in the elderly by the ways in which benefits of trial results were presented, and to establish whether their current treatment of an elderly hypertensive patient was broadly in line with recent clinical trial evidence.*

Method. *Seventy-three GPs attending a refresher course were given a written questionnaire containing data from one clinical trial of treatment of hypertension in the elderly presented in four different ways (absolute risk reduction, relative risk reduction, difference in event-free patients, and number of patients who had to be treated in order to prevent one clinical event), as if from four different trials. The effect of each presentation on treatment preferences was assessed using Likert scales. The results were analysed to determine whether the method of presentation of results influenced decision making. A clinical scenario was presented to investigate their current treatment preferences in an elderly hypertensive.*

Results. *All GPs returned completed questionnaires. Relative risk reduction was the only presentation which was significantly different from the others, and was the most likely to influence prescribing. In free-text comments, 75% of GPs admitted having problems understanding statistics commonly found in medical journals. More than 90% conformed with recent clinical trial evidence for the management of hypertension.*

Conclusion. *GPs were most influenced by relative risk reduction, and were unaware of how the presentation of research results could affect treatment decisions. Most GPs freely admitted to difficulty in comprehending medical statistics. Almost all of the GPs expressed treatment decisions which were broadly in line with clinical evidence.*

Keywords: clinical trials in general practice; hypertension; management of disease.

Introduction

EVIDENCE-BASED medicine requires that clinical decisions should be based on the best available scientific evidence.[1,2] Randomized controlled trials are regarded as the most objective method for establishing best medical practice and clinical effectiveness.[3,4] This places pressure on GPs to act upon the results of clinical trials. In order to interpret clinical trials, GPs must be able to understand how the results are presented.[5,6] Presentation is crucial, since the method of reporting trial results has been shown to alter perception of therapeutic effectiveness and affect treatment decisions of general physicians in other countries.[7,8,9,10]

There have recently been a number of major trials concerning the management of hypertension in the elderly.[11] These have been incorporated into guidelines.[12,13,14,15] Although 'guidelines' are considered to be the weakest form in the hierarchy of evidence,[16] nevertheless they may be more accessible and more easily assimilated by GPs than clinical trials, and hence more influential on clinical practice.

We investigated whether UK GPs were unduly influenced by the method of presentation of trial results, particularly in relation to hypertension in the elderly. We also investigated whether, in their management of hypertension in the elderly, GPs would adhere to the evidence of recent clinical trials or to guidelines based on this evidence.

Methods

To assess the impact of various methods of data presentation, 73 GPs attending a continuing education 'refresher' course were given recent evidence concerning the management of hypertension in the elderly. This was presented as if it came from four separate trials using different drugs, but was actually the same data from part of one trial (MRC trial of hypertension,[11] comparison of diuretic with placebo) 'packaged' in four different ways to show relative risk reduction, absolute risk reduction, difference in event-free patients, and number of patients who would have to be treated to avoid one clinical event (Box 1). A brief description of the four methods of data presentation used in our study is contained in Box 2. A more thorough exposition of this subject can be found elsewhere.[5,6] To reduce sequence influence, the four statements were randomly ordered in different versions of the questionnaire.

For each method of data presentation, the GPs were asked to mark on a Likert scale, running from 0 (would not prescribe) to 100 (would definitely prescribe), their likelihood of prescribing a given drug for a given patient, based upon the evidence given. The effects of the method of presentation of results on decision making was determined by analysis of variance followed by *t*-tests with a Bonferoni correction using Epi-Info 6.

The GPs were also given a clinical scenario (Box 3) and asked if they would treat the patient's blood pressure, and (if so) what treatment they would advise. The extent of adherence to clinical trial evidence and guidelines was then determined.

Results

Seventy-three questionnaires were returned (100% response). Relative risk reduction was the only presentation which was significantly different from the others, and was the most likely to influence prescribing (Table 1). This result was consistent, regardless of sex of GP, years since qualification, number of

M Cranney, MRCGP, general practitioner research fellow; T Walley, MD, FRCP, professor of clinical pharmacology, University of Liverpool.

Submitted: 9 January 1996; accepted 6 June 1996.

Table 1. Influence of data presentation on prescribing: mean Likert score with 95% confidence intervals.

	Mean Likert Score	95% CI
RRR*	69	66-72
ARR	54	51-66
NNT	44	40-47
DEFP	48	45-52

RRR = relative risk reduction; ARR = absolute risk reduction; NNT = number needed to treat; DEFP = difference in event-free patients, *$P<0.001$, analysis of variance followed by *t*-test with Bonferroni correction.

Please consider your treatment option for Mr Brown, taking into account the following information on four different drugs. The summaries below are taken from four large randomized controlled clinical trials recently published in leading British medical journals. Each trial considered the difference in event rates (that is, strokes and coronaries) per 100 patients, over a 5-year period, comparing the treatment group with a placebo control group. Each of the drugs has been on the market for some time and their safety profiles have been well estab-lished. For the sake of this exercise, please consider that the side effect profiles and dosage regimes are the same for each drug.

DRUG A: Patients receiving drug A had 3.65 strokes per 100 patients over 5 years. The placebo group had 5.4 strokes ($P=0.03$) This means drug A produced a 1.75% absolute reduction in the number of strokes over a 5-year period. Also patients receiving drug A had 3.85 coronaries per 100 patients over 5 years, whereas the placebo group had 6.35 coronaries ($P=0.003$).

DRUG B: Patients on drug B had 32.4% fewer strokes over the trial period of five years compared with the placebo group ($P=0.03$). Also the treatment group had 39.4% fewer coronaries than the control group ($P=0.003$).

DRUG C: Over 5 years, the rate of 'stroke-free' patients increased from 94.6% to 96.35% by virtue of taking drug C ($P=0.03$). In the same period, the rate of coronary-free patients increased from 93.65% to 96.15% ($P=0.003$).

DRUG D: It is calculated that, compared with the placebo, you would need to treat 57 patients with drug D for 5 years to avoid one stroke. Similarly you would need to treat 40 patients with drug D to avoid one coronary.

Box 1. Presentation of data as if from four different drug trials.

partners, postgraduate qualifications, or training status. In free-text comments, two GPs recognized that all four 'drugs' and data were in fact the same. Seventy-five per cent of the GPs admitted having problems understanding statistics that are commonly found in medical journals.

Ninety-three percent of GPs (68/73) would treat the patient described in the clinical scenario; 93% of those (63/68) recommended various non-pharmacological treatments. The most appropriate first-choice drug was considered by 55% (40/73) to be a diuretic, by 19% (14/73) to be a beta blocker, by 32% (23/73) to be an ACE inhibitor, and by 15% (11/73) to be a calcium channel-blocker (many expressed joint preferences for appropriate first-choice drug).

Discussion

Our study suggests that UK GPs are unduly influenced by the method of presentation of trial data, and are more influenced by relative risk reduction than by other presentations of the same data — like their hospital colleagues elsewhere. Not surprisingly, relative risk reduction (RRR) is the form of data presentation most favoured by the pharmaceutical industry. In general, the differences in response to RRR, compared with other forms of data presentation, were less marked in our study than in previous work; perhaps this was because, in the past, GPs were more ready to treat hypertension than were general physicians to treat hyperlipidaemia. GPs in our study seemed unaware of these recent studies (another example of a delay in uptake of research findings). As our GPs clearly have difficulty comprehending clinical trial data, it is difficult to see how they could incorporate evidence from trials directly into their practice. Journal editors could help by developing specific uniform approaches to data presentation, which should be incorporated in their instructions to authors.

One way to put research into practice[17,18] is for GPs to make use of systematic reviews and evidence-based guidelines from reliable sources.[19,20] Nearly all of the GPs in our study would treat an elderly hypertensive patient broadly in accordance with the clinical trial evidence and the largely evidence-based guidelines of the British Hypertension Society — except in the choice of drug, where conformity was less. This result contrasts with an earlier study.[21] This conformity in medical practice may be due to background knowledge of the general principles of the management of hypertension, rather than to an actual knowledge of these trials or guidelines.

ABSOLUTE RISK REDUCTION: The difference in event rates between control and treatment groups.

Absolute risk reduction(%) = (Event rate in the control group - Event rate in the treatment group) x 100

RELATIVE RISK REDUCTION: The difference in event rates between the control group and treatment group, divided by the event rate in the control group, and expressed as a percentage.

Relative risk reduction(%) = (Event rate in control group - Event rate in treatment group) / (Event rate in control group) x 100

DIFFERENCE IN EVENT-FREE PATIENTS: The percentage of patients free of the event when receiving either treatment or placebo, presented as a direct comparison between treatments.

Difference in event-free patients = (100 - Event rate in treatment group) compared with (100 - Event rate in placebo group)

NUMBER NEEDED TO TREAT: The number of patients that must be treated in order to prevent one clinical event. This is calculated as the reciprocal of the percentage absolute risk reduction.

Number needed to treat = 100 / Absolute risk reduction (%)

Box 2. Brief description of the four methods of data presentation.

Mr Brown, a fit 68-year-old, visits your surgery with a minor complaint. You routinely check his blood pressure and find it is elevated. Over the next few weeks you find his blood pressure remains consistently elevated, with a mean reading of 172/102. He has no other illnesses or cardiovascular risk factors. What treatment would you consider? What would you do next if there were no respsonse to the initial treatment over some months?

Box 3. Clinical scenario.

Our understanding of guidelines is growing. Successful guideline implementation is dependent upon appropriate development, dissemination, and implementation; it is more likely to succeed when personal involvement at the development stage occurs.[22] There is a danger, however, that doctors may uncritically accept guidelines,[23,24] and not distinguish between those which are evidence-based and those which are not. It is therefore essential that guidelines should include explicit links to the evidence on which they are based, to allow a doctor to check their validity and how current they are. Indeed, guidelines could themselves become a subject for the development of critical appraisal skills. This is not to suggest that guidelines which are consensus-based rather than evidence-based have no validity. The British Thoracic Society guidelines on the management of asthma are widely publicized and clearly influence practice,[25] but the lack of hard evidence behind them is freely admitted. Where there is no hard evidence, an expert consensus may be the best available to us, but such guidelines will alter as evidence develops.

If we are to achieve the implementation of evidence-based medicine, the ability of doctors to assess evidence and guidelines must be developed. This requires changes in medical education,[26] such as those currently under way in the development of new curricula;[27] it will also be encouraged by the introduction of critical reading papers into postgraduate examinations. Resources already exist: both for critical appraisal, in the form of critical appraisal skills programme (CASP) workshops; and for information, such as the Cochrane database (write to The UK Cochrane Centre, NHS R&D Programme, Summertown Pavilion, Middle Way, Oxford OX2 7LG) and the NHS Centre for Reviews and Dissemination (at the University of York, YO1 5DD). These need to be further expanded and exploited.

Medical educators must keep in sight the aim of medical practice, which is not primarily to enhance knowledge but to change practice and improve patient outcomes. Our study suggests that passive diffusion of good practice can occur, and can lead to compliance with clinical trial evidence or guidelines, without a full understanding of those underlying clinical trials. Although it is ideal to be familiar with trial evidence, or with a guideline and the evidence underlying it, doctors who (for lack of time or other resources) are unable to achieve this ideal should not be made to feel left out of the move to evidence-based medicine.

References

1. Rosenberg W, Donald A. Evidence based medicine: an approach to clinical problem-solving. *BMJ* 1995; **310:** 1122-1126.
2. Davidoff F, Haynes B, Sackett D, Smith R. Evidence based medicine. *BMJ* 1995; **310:** 1085-1086.
3. Sackett DL, Haynes RB, Guyatt GH, Tugwell P. *Clinical epidemiology.* 2nd edn. Boston, MA: Little, Brown and Company, 1991.
4. Cochrane AL. *Effectiveness and efficiency.* London: Nuffield Provincial Hospitals Trust, 1972.
5. Sackett DL, Cook RJ. Understanding clinical trials. *BMJ* 1994; **309:** 755-756.
6. Fahey T, Newton J. Conveying the benefits and risks of treatment. *Br J Gen Pract* 1995; **45:** 339-341.
7. Naylor CD, Chen MB, Strauss B. Does the method of reporting trial results alter perception of therapeutic effectiveness? *Ann Int Med* 1992; **117:** 916-921.
8. Forrow L, Taylor WC, Arnold RM. Absolutely relative: how research results are summarised can affect treatment decisions. *Am J Med* 1992; **92:** 121-124.
9. Bobbio M, Demichelis B, Giustetto G. Completeness of reporting trial results: effect on physicians' willingness to prescribe. *Lancet* 1994; **343:** 1209-1211.
10. Bucher HC, Weinbacher M, Gyr K. Influence of method of reporting study results on decision of physicians to prescribe drugs to lower cholesterol concentration. *BMJ* 1994; **309:** 761-764.
11. MRC Working Party. MRC trial of treatment of hypertension in older adults: principal results. *BMJ* 1992; **304:** 405-411.
12. Subcommittee of WHO/ISH Mild Hypertension Liaison Committee. Summary of 1993 World Health Organisation - International Society of Hypertension guidelines for the management of mild hypertension. *BMJ* 1993; **307:** 1541-1546.
13. Jackson R, *et al.* Management of raised blood pressure in New Zealand: a discussion document. *BMJ* 1993; **307:** 107-110.
14. Sever P, *et al.* Management guidelines in essential hypertension: report of the second working party of the British Hypertension Society. *BMJ* 1993; **306:** 983-987.
15. Beard K, Bulpitt C, Mascie Taylor H, O'Malley K, Sever P, Webb S. Management of elderly patients with sustained hypertenson. *BMJ* 1992; **304:** 412-416.
16. Anon. Evidence-based everything. *Bandolier* 1995; **2:** 1.
17. Haines A, Jones R. Implementing findings of research. *BMJ* 1994; **308:** 1488-1492.
18. Smith R. Filling the lacuna between research and practice: an interview with Michael Peckham. *BMJ* 1993; **307:** 1403-1407.
19. Haynes A, Hurwitz B. (eds). *Clinical Guidelines* [Occasional Paper 58]. London: RCGP, 1992.
20. Clinical Guidelines Working Group. *The development and implementation of clinical guidelines.* [Report from General Practice 26]. RCGP, 1995.
21. Dickerson J, Brown M. Influence of age on general practitioners' definition and treatment of hypertension. *BMJ* 1995; **310:** 574.
22. Grimshaw J. Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluations. *Lancet.* 1993; **342:** 1317-1322.
23. McCormick J. The place of judgement in medicine. *Br J Gen Pract* 1994; **44:** 50-51.
24. Charlton BG. Management of science. *Lancet* 1993; **342:** 99-101.
25. Martin R, Hilton S, Kerry S. More recent data suggest guidelines are being adhered to. *BMJ* 1995; **311:** 1645.
26. Smith R. Towards a knowledge based health service. *BMJ* 1994; **309:** 217-218.
27. Towle A. Medical education for the 21st century. *Update* 1995; **51:** 528-530.

Acknowledgements

We thank Dr Chris West, Department of Public Health, Liverpool University, for his help with statistical analysis, and the North West Regional Health Authority for funding this project. We would also like to thank two anonymous referees for their valuable comments.

Address for correspondence

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