Detection, adherence and control of hypertension for the prevention of stroke: a systematic review
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Authors' objectives
To find out the most effective methods of: detecting hypertension, improving patient adherence with treatment, improving control of blood-pressure, and improving professional compliance with standards of good practice.

Searching
MEDLINE (1966 to July 1996) was searched using a standard OVID filter for randomised controlled trials followed by the search terms 'hypertension' and 'high blood pressure' and the secondary terms 'detection', 'compliance' and 'control'. A comprehensive searching of the reference lists in the articles found was performed. A further, but more limited search of the Cochrane Library was conducted using the terms 'hypertension' (all fields) and 'detection', 'compliance' and 'control' (title fields).

Study selection
Study designs of evaluations included in the review
Randomised trials were included that would permit unbiased assessments of the effectiveness of different strategies of improving detection, blood-pressure control and compliance. Some quasi-experimental trials were also included.

No duration for study requirements was set.

Specific interventions included in the review
Screening interventions to detect high blood-pressure (e.g. nurse screening, housewife screening, door to door volunteer screening, computer doctor prompt); interventions to improve adherence to treatment (e.g. educational material, nurse phone calls, self-recording of blood-pressure, social support, periodic home visits, reminder packaging, and calendar pill packs); methods to improve blood-pressure control (e.g. self-monitoring, patient education and professional education interventions).

Reference standard test against which the new test was compared
The review did not include any diagnostic accuracy studies that compared the performance of the index test with a reference standard of diagnosis.

Participants included in the review
The participants included in the review came from a variety of backgrounds. For example, those involved in screening interventions were recruited from a number of sources including primary care, door to door, tenants, and hospital care, whereas studies that involved improving adherence to treatment included hypertensive patients recruited from clinics, hospitals, and health care clinics.

Outcomes assessed in the review
Outcome measures included: the percentage of hypertensive patients detected, adherence to treatment (e.g. self-reported, urinary assay and pill counts, drop-outs), net change in blood-pressure, and reduction in mortality.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
The quality of trials was assessed using a comprehensive assessment schedule, which was presented in an appendix. It included an assessment of randomisation procedures, comparability of groups, design and sample size. Studies received
a score out of a maximum of 34, and scores were reported for each study. All articles abstracted were assessed by two reviewers independently, and any inconsistencies were resolved by discussion.

**Data extraction**
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

In studies where blood-pressures were used as outcomes, net blood-pressure changes were calculated (i.e. intervention group blood-pressure change minus control group blood-pressure change).

**Methods of synthesis**
How were the studies combined?
Tests for heterogeneity were not presented.

When pooling blood-pressures, account was taken of trial sample size and variances of blood-pressure measurements and a standardised normal deviate approach used as recommended by Fleiss (See Other Publications of Related Interest).

How were differences between studies investigated?
Where appropriate, findings were compared among trials of differing quality.

**Results of the review**
A total of 62 studies were included. Eleven studies (4 randomised control trials (RCTs) and 7 quasi-experimental trials) were screening interventions to detect high blood-pressure, 5 trials were interventions to improve adherence to treatment with only adherence outcomes, 19 RCTs examined different methods of improving patient adherence in hypertension, 5 RCTs measured home monitoring of blood-pressure, 13 RCTs examined patient education interventions aimed at improving blood-pressure control, 4 RCTs examined professional education interventions aimed at improving blood-pressure control and 5 trials examined miscellaneous methods used to improve blood-pressure control.

The total number of participants was not stated.

Detection: population screening when compared with usual care or case finding does not appear to increase coverage of the population assessed for hypertension or detection of people with hypertension. Screening programmes in shopping centres or housing blocks do not reach the disadvantaged groups often intended. Case finding appears to be particularly effective when linked with professional training, protocols and reminders to record blood-pressure given to both patients and doctors. Ambulatory monitoring does not have any role in the detection of hypertension in the population.

Patient adherence: no single approach to improving adherence can be recommended based on the evidence reviewed. Complex interventions involving education, easier access to care, and use of protocols may improve adherence and control in some patients. Educational interventions are unlikely to be effective on their own. While simpler drug regimens are likely to improve adherence, simple reminder packaging does not improve adherence or control.

Blood-pressure control: a comprehensive 'stepped care' approach (i.e. education, free care, specialist clinics, and protocols) achieves the greatest improvements in control. Self-monitoring of blood-pressure at home appears to have a small but significant effect on blood-pressure control and may be cost-saving. Patient education alone is unlikely to improve blood-pressure control. Professional education may make a small contribution to blood-pressure control, but it is probably due to increased use of drug therapy.

Professional standards of care: the issuing of guidelines does not result in improvements in care. Locally, rather than expert, produced guidelines that are integrated into clinical practice improve both practice and clinical outcomes. The evidence to support nurse-led clinics is surprisingly sparse, and the only British trial found worse control in the nurse-led clinic.
Cost information
Yes. The author presents an economic appraisal of detection thresholds for high blood-pressure. It is reported that, in Sweden, a review of cost-effectiveness of using different thresholds for treatment of high blood-pressure demonstrated that cost-savings result at a DBP threshold of 100 mmHg at ages above 45 years. Among people aged less than 45 years, thresholds from 90 to 105+ were associated with costs in the region of £28-£180 per life-year gained. The review also included one study that examined the costs of self-monitoring of blood-pressure, in which the effects of self-monitoring were cost-saving.

Authors' conclusions
The author concludes with implications for policy and practice and suggestions for future research

CRD commentary
Inclusion and exclusion criteria are appropriate. The validity of included studies was adequately assessed. Some details of individual studies were provided in the text, and further details were presented in the appendix. The primary studies were combined appropriately in a narrative format.

Reasonable objectives are provided, but the author does not state what the target population is. The literature search could have been extended to include a search of other databases, such as EMBASE, handsearching, and an attempt to identify unpublished literature. A publication bias cannot be ruled out.

This is a fairly thorough review, which provides detailed implications for policy and practice, and suggestions for future research.

Implications of the review for practice and research
The author suggests that more attention should be given to hypertension detection, adherence and control among the poor and ethnic minorities.

The following recommendations are made for future research:

1. A multicentre primary care RCT comparing nurse-led management with general practitioner-led management in hypertension, including economic evaluation.

2. Large-scale RCTs including economic appraisal of interventions that aim to improve patient adherence to treatment. Possible interventions that should be compared in factorial designs with usual care include educational/motivational approaches, follow-up, feedback, simplification of medication regimens.

3. RCTs to test the value of risk factor scores (or profiles) in giving general practitioners and nurses the information they need to reduce cardiovascular disease risk. Comparisons could include computer-aided prompts, and visual and interactive methods involving patients.

4. Controlled comparisons of the effects of organisational and managerial initiatives on improving professional adherence to the best practice in the management of high blood-pressure compared with professional education and clinical guidelines.

The author makes the following suggestions for policy and practice: Detection: Standardisation of methods of blood-pressure measurement is essential. Use of Korotov V (disappearance of sounds) should be widely promoted in primary health care. facilities for the routine maintenance of sphygmomanometers should be available in all health districts.

The British Hypertension Society guidelines on thresholds for starting treatment require review.

Evidence to support detection and treatment of high blood-pressure in older people is very strong. This evidence should be widely disseminated, and professional barriers to treating older people recognised as unacceptable and not consistent with best practice.
Ambulatory monitoring methods increase the cost and complexity of blood-pressure detection without providing any tangible benefits, and should not be promoted in primary health care.

Adherence: improving professional adherence to best practice in the management of high blood-pressure through a range of mechanisms is required. More direct methods such as financial incentives and penalties require investigation as they may prove more effective than educational or clinical guideline approaches.

Standardisation of methods of measuring and reporting on patient adherence is required. Further research on patient adherence should be linked with the associated question of improving blood-pressure control.

Control: the British Hypertension Society's recommended target blood-pressures which should be achieved on drug treatment need to be reviewed. Criteria should take into account co-morbidity, age and level of hypertension.

A stepped-care approach to management is supported by American RCT evidence, but this is not directly applicable to British practice.

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