Lifestyle interventions or drugs for patients with essential hypertension: a systematic review

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CRD summary
This review compared the effectiveness of lifestyle and drug interventions for treating patients with essential hypertension. Based on a small number of diverse primary studies of limited quality, the authors concluded that evidence comparing the antihypertensive efficacy of lifestyle and drug interventions is limited and inconclusive. Whilst these conclusions appear justified, it is possible that not all relevant trials were identified.

Authors’ objectives
To compare the effectiveness of lifestyle and drug interventions for treating patients with essential hypertension.

Searching
MEDLINE, EMBASE and the Cochrane CENTRAL Register were searched from January 1998 to May 2003. Earlier studies were identified from guidelines, systematic reviews and meta-analyses. Other, unspecified, electronic databases targeted at comparisons of lifestyle interventions with drug treatments were searched from their inception to March 2004.

Study selection
Study designs of evaluations included in the review
Only randomised controlled trials (RCTs) or quasi-RCTs of at least 8 weeks duration were eligible. Crossover RCTs were included provided they were of no more than two treatment arms and two periods. None of the trials had a reported duration of more than one year.

Specific interventions included in the review
Studies that directly compared a lifestyle intervention with a drug intervention were eligible for inclusion. Studies where the lifestyle intervention group also received varying antihypertensive medication were excluded. The included studies were of a low calorie diet versus a diuretic; low calorie, low sodium, high potassium diet versus a beta-blocker; a multiple intervention (weight reduction, low calorie, low sodium, exercise, and relaxation) versus a beta-blocker; biofeedback and relaxation response versus a beta-blocker, a diuretic or a centrally acting antihypertensive; weight reduction diet, low sodium and alcohol restriction diet versus a beta-blocker; and yoga versus an unspecified drug intervention.

Participants included in the review
Studies of adults with raised blood-pressure (BP at least 140/85 mmHg) were eligible for inclusion. Studies in which more than 50% of the patients had diabetes were excluded, as were studies of pregnant women. The included studies were of adults (mean age: 42 to 68 years, including one trial of elderly patients (age 60 to 80 years). Where reported, 75 to 100% of patients in the included studies were male.

Outcomes assessed in the review
The primary outcome measure used was clinical BP (systolic and diastolic). Cholesterol levels were also reported in some trials. Only studies from which intention-to-treat outcomes data were available were included. None of the available trials reported long-term cardiovascular outcomes.

How were decisions on the relevance of primary studies made?
One reviewer selected studies for inclusion and a second reviewer checked the decisions. Any disagreements were resolved by discussion.

Assessment of study quality
Study quality was assessed on the basis of blinding of the outcome assessors, adequacy of randomisation, adequacy of concealment of allocation, and loss to follow-up. Two reviewers independently abstracted the data on study design. Any differences were resolved by discussion.

**Data extraction**

Two reviewers independently abstracted the data on study design and end points. Any differences were resolved by discussion. For each study, the mean difference and standard deviation (SD) between final BP measurements in each treatment (lifestyle or drug) arm were calculated for both systolic and diastolic BP. If the SD for final BP was not available, then the mean difference between change in BP from randomisation to the end of treatment was used instead (providing this SD was available).

**Methods of synthesis**

How were the studies combined?
The data were presented as forest plots and combined narratively.

How were differences between studies investigated?
Differences between the trials were discussed in the text.

**Results of the review**

Six trials (n at least 237) were included: five RCTs and one quasi-RCT.

Overall, the trials were of a poor quality and their results were inconsistent. Across trials there was considerable variation in terms of the included interventions and patient populations.

Of the six trials, only one trial in young adults (mean age 42 years) comparing a low calorie, low sodium, high potassium diet with a beta-blocker drug found that the lifestyle intervention reduced BP (diastolic and systolic) more than the drug treatment.

Where reported, a greater reduction in cholesterol levels was shown for dietary interventions in comparison with antihypertensive drugs.

**Authors' conclusions**

The evidence comparing the antihypertensive efficacy of lifestyle and drug interventions was limited and inconclusive.

**CRD commentary**

The review addressed a clear question. The inclusion criteria were clearly defined, with the exception of outcomes; the inclusion of cholesterol levels was inappropriate since antihypertensive drugs are not designed to or likely to reduce cholesterol, and longer term cardiovascular outcome data were not available. The literature search appeared adequate although, as details of the search strategy were not reported and it was unclear how studies of lifestyle interventions were identified, it is possible that trials were missed. The quality of the included trials was assessed and appropriate review methodology was employed to minimise reviewer bias. Details of the primary studies and results were presented in tables and forest plots. The narrative synthesis was appropriate given the high degree of clinical diversity between the available trials. Given the limitations of the primary studies identified for the review, the authors' conclusions appear justified.

**Implications of the review for practice and research**

Practice: The authors stated that the results of the review suggested that, whilst it has not been established that lifestyle interventions can achieve the reductions in BP comparable with those achieved with antihypertensive drugs, lifestyle interventions may be adequate in some individuals with only moderately raised BP.
Research: The authors stated that further trials comparing lifestyle interventions with antihypertensive drugs are required. Such trials should be of good quality, of longer duration and with adequate sample sizes. In addition, future trials should aim to identify which types of patients would benefit from lifestyle interventions.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.