New meta-analysis of treatment trials of hypertension: improving the estimate of therapeutic benefit

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Authors' objectives
To improve the estimate of therapeutic benefit from hypertension treatment.

Searching
MEDLINE was searched (search dates unclear), and existing meta-analyses were examined.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials comparing drug treatment with placebo or no treatment; morbidity and mortality as the main outcome; and sufficient results for an intention to treat analysis.

Specific interventions included in the review

Participants included in the review
Hypertensive patients: hypertension in older patients (mean age greater than 65 years); mild or moderate hypertension in younger patients (average diastolic blood-pressure less than 105 mmHg); non-moderate hypertension (average diastolic blood-pressure greater than 105 mmHg); and poststroke hypertension.

Outcomes assessed in the review
Total mortality; cardiovascular mortality; stroke, except transient ischaemic attack; major coronary event (myocardial infarction, death from coronary heart disease, or sudden death); and congestive heart failure.

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

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The data were extracted by two independent reviewers, and any disagreements were resolved by consensus.

Methods of synthesis
How were the studies combined?
The method of Yusuf et al. (see Other Publications of Related Interest no.1) was used to test the heterogeneity between trial results and combine the odds ratios (ORs). The method of DerSimonian and Laird (see Other Publications of Related Interest no.2) was used to estimate the absolute risk reduction (ARR). The number of patients treated (NTT) to avoid one event was also calculated.

How were differences between studies investigated?
The trials were classified into 4 groups and analysed separately, according to their main inclusion criteria.
Results of the review
Seventeen trials in total: hypertension in older patients, 7 trials (13,154 patients); mild-to-moderate hypertension in young patients, 5 trials (22,967 patients); non-moderate hypertension, 3 trials (334 patients); poststroke hypertension, 2 trials (551 patients).

1. Mortality.

Hypertension in older people: OR 0.90 (95% confidence interval, CI: 0.81, 1.00); ARR -3 (95% CI: -6, 0); NTT 382; p<0.05.

Mild-to-moderate hypertension in younger people: OR 0.98 (95% CI: 0.82, 1.11, p=0.79).

Non-moderate hypertension: OR 0.62 (95% CI: 0.22, 1.78, p=0.37).

Poststroke hypertension: OR 0.77 (95% CI 0.48, 1.24, p=0.28).

2. Cardiovascular death.

Hypertension in older people: OR 0.77 (95% CI: 0.67, 0.89); ARR -4 (95% CI: -8, -1); NTT 225; p<0.001.

Mild-to-moderate hypertension in younger people: OR 0.96 (95% CI: 0.78, 1.21, p=0.76).

Non-moderate hypertension: OR 0.66 (95% CI: 0.20, 2.15, p=0.49).

Poststroke hypertension: OR 0.64 (95% CI: 0.37, 1.11, p=0.11).


Hypertension in older people: OR 0.66 (95% CI: 0.56, 0.77); ARR -5 (95% CI: -8, -2); NTT 197; p<0.001.

Mild-to-moderate hypertension in younger people: OR 0.51 (95% CI: 0.39, 0.69); NTT 833; p<0.001.

Non-moderate hypertension: OR 0.62 (95% CI: 0.17, 2.24, p=0.46).

Poststroke hypertension: OR 0.65 (95% CI: 0.43, 0.99); NTT 31; p<0.05.

4. Major coronary event

Hypertension in older people: OR 0.79 (95% CI: 0.68, 0.92); ARR -3 (95% CI: -4, -1); NTT 362; p<0.01.

Mild-to-moderate hypertension in younger people: OR 0.96 (95% CI: 0.81, 1.14, p=0.66).

Non-moderate hypertension: OR 0.63 (95% CI: 0.17, 2.27, p=0.48).

Poststroke hypertension: OR 0.94 (95% CI: 0.30, 2.95, p=0.92).

5. Congestive heart failure

Hypertension in older people: OR 0.54 (95% CI: 0.43, 0.68); ARR -5 (95% CI: -7, -3); NTT 190; p<0.001.

Mild-to-moderate hypertension in younger people: OR 0.22 (95% CI: 0.03, 1.56, p=0.13).

Non-moderate hypertension: OR 0.14 (95% CI: 0.05, 0.41); NTT 24; p<0.001.

Poststroke hypertension: OR 0.31 (95% CI: 0.10, 2.95); NTT 88; p<0.05.
Authors' conclusions
The most constant treatment benefit concerned stroke, although the absolute reduction was very modest in younger patients with mild-to-moderate hypertension. Only the results from trials in older patients showed a significant reduction of major coronary events. These results need further analyses, ideally based on individual patient data.

CRD commentary
The VA (Veterans' Affairs) study was excluded because 15% of the patients were lost to follow-up for mortality analysis.

Bibliographic details

PubMedID
8642184

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
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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.