Treatment of arterial hypertension in the very elderly: a meta-analysis of clinical trials

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CRD summary
This review concluded that antihypertensive drug therapies reduced non-fatal strokes and the incidence of heart failure but did not change overall mortality in patients over 75 years old with moderate-to-severe hypertension. The conclusions appear to be reliable, but reasons for variation in effectiveness remain unknown.

Authors' objectives
To assess the effectiveness of treatments aimed at reducing arterial hypertension in the very elderly.

Searching
MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), the WHO-ISH Collaboration register, ClinicalTrials.gov, controlled-trials.com and Google Scholar were searched from inception to October 2009 using specified search terms. References from included trials and relevant systematic reviews and meta-analyses were also screened for additional studies.

Study selection
Eligible randomised controlled trials enrolled hypertensive patients aged 75 years or older, compared antihypertensive drug therapies with placebo or no treatment and assessed cardiovascular morbidity and mortality outcomes. Follow-up had to be at least 12 months.

Included drug therapies were: angiotensin converting enzyme inhibitors or angiotensin receptor antagonists; alpha and beta adrenergic blockers alone or in combination; calcium channel blockers; diuretics; central sympatholytics; direct vasodilators; and peripheral adrenergic antagonists. Sixty percent of trial participants were female. The prevalence of smoking ranged from three to 10%; of myocardial infarction from three to 10% and of diabetes, from seven to 24%. Median age was 83 years and most patients had moderate-to-severe hypertension.

The number of reviewers who assessed study eligibility was not stated

Assessment of study quality
Methods of randomisation, blinding, allocation concealment and losses to follow-up were all assessed by a single reviewer

Data extraction
The number of non-fatal strokes, heart failure, deaths and other related outcomes were tabulated to allow calculation of risk ratios (RR) and associated 95% confidence intervals (CI). Mean and standard deviations of blood pressure reduction were also extracted.

Methods of synthesis
Effects were pooled using Mantel-Haenszel fixed-effect meta-analysis. Heterogeneity was quantified using $I^2$. Regression analyses were used to compare reductions in blood pressure associated with each trial.

Results of the review
Ten trials (8,667 patients) were eligible. Trial quality appeared variable with less than 10% loss to follow-up in all trials but failure to describe the method of allocation concealment in six trials. Eight trials provided mortality data with pooled effect indicating no effect (RR 0.97, 95% CI 0.87 to 1.08), but there was moderate to substantial heterogeneity ($I^2=48\%$). However, antihypertensive treatment did reduce the risk of heart failure (RR 0.49, 95% CI 0.37 to 0.67, seven RCTs, $I^2=33\%$) and non-fatal stroke (RR 0.78, 95% CI 0.63 to 0.97, nine RCTs, $I^2=44\%$). Every drug class had a statistically significant effect on reduction of systolic blood pressure but not diastolic blood pressure.

Authors' conclusions
Antihypertensive drug therapies reduced non-fatal strokes and the incidence of heart failure but did not change overall mortality in patients over 75 years old with moderate-to-severe hypertension.

**CRD commentary**
This review utilised appropriate methods to minimise bias in searching for studies and assessing their eligibility and quality, but the latter were not duplicated independently. The methods of synthesis were appropriate. Heterogeneity was moderate to substantial and the number of trials was limited especially as multiple drug therapies were included in the analysis. The generalisability of the results was therefore difficult to assess. Trial quality was not sufficiently high to eliminate potential bias and this resulted in some uncertainty. The conclusions reflect the evidence and appear to be reliable.

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

**Practice:** The authors did not state any implications for practice.

**Research:** The authors did not state any implications for research beyond stating that future trials were required to identify optimal treatment.

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