

THERAPEUTICS

Review: Isolated systolic hypertension increases mortality and morbidity in elderly persons and should be treated

Staessen JA, Gasowski J, Wang JG, et al. Risks of untreated and treated isolated systolic hypertension in the elderly: meta-analysis of outcome trials. *Lancet*. 2000 Mar 11;355:865-72.

QUESTIONS

In elderly persons, what are the risks associated with isolated systolic hypertension (≥ 160 mm Hg with diastolic blood pressure [BP] < 95 mm Hg), and what is the magnitude of the benefit associated with treatment?

DATA SOURCES

Studies were identified from 10 published overviews and 2 reports from trialist collaborations.

STUDY SELECTION

Controlled trials were selected if elderly persons with isolated systolic hypertension were enrolled. Trials were excluded if all the study participants had comorbid conditions, such as stroke; if specialized care was compared with routine antihypertensive agents; and if the study was a preliminary evaluation for a larger study.

DATA EXTRACTION

Data were extracted on study quality, patient characteristics, antihypertensive treatment, duration and length of follow-up, and outcomes (all-cause and cardiovascular mortality, cardiovascular complications, all strokes, and all coronary events). Strokes did not include transient ischemic attacks. Cardiovascular complications included coronary artery disease (myocardial infarction and sudden death), stroke, and vascular disorders.

MAIN RESULTS

8 trials (15 693 patients) were included. Mean age range was 62 to 76 years, median follow-up was 3.8 years, prevalence of smoking at baseline was 16%, and 31% of participants had ≥ 1 cardiovascular complication at baseline. All-cause mortality was positively associated with systolic BP ($P < 0.001$) and negatively associated with diastolic BP ($P = 0.05$): With any given increase in systolic BP, a lower diastolic BP increased the risk for death. For each 10-mm increase in systolic BP, an increase was shown in all-cause mortality (hazard ratio [HR] 1.26, 95% CI 1.13 to 1.40), cardiovascular death (HR 1.22, CI 1.06 to 1.40), cardiovascular events (HR 1.15, CI 1.04 to 1.28), and stroke (HR 1.22, CI 1.04 to 1.40) but not coronary events (HR 1.07, CI 0.91 to 1.26). For each 5-mm Hg increase in diastolic BP, a decrease in all-cause mortality was found (HR 0.95, CI 0.89 to 1.00).

With treatment, the mean reduction was 10.4 (range 6.9 to 18.2) in systolic BP and 4.1 (range 2.3 to 8.3) mm Hg in diastolic BP. An improvement in all outcomes was found when results for all trials were pooled (Table). Summary analysis showed that all outcomes improved with treatment even across subgroups based on sex, age, systolic BP, pulse pressure, previous cardiovascular complications, and smoking status.

CONCLUSIONS

Isolated systolic hypertension and wide pulse pressure in elderly persons increase the risk for mortality and morbidity. Treatment reduces this risk.

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Treatment of isolated systolic hypertension in elderly persons*

Outcomes at mean 3.8 y	Odds ratio reduction (95% CI)	NNT (CI)
All-cause mortality	13% (2 to 22)	59 (55 to 64)
Cardiovascular mortality	18% (4 to 29)	79 (72 to 89)
All cardiovascular events	26% (17 to 34)	26 (25 to 27)
All stroke events	30% (18 to 41)	48 (45 to 51)
All coronary events	23% (10 to 34)	64 (59 to 70)

*Abbreviations defined in Glossary. 1 trial was not a randomized controlled trial; reanalysis without this trial did not alter outcomes significantly.

COMMENTARY

Clinicians, be comforted! This sophisticated meta-analysis by Staessen and colleagues confirms what we already know: Systolic BP better predicts cardiovascular events than does diastolic BP, and absolute 5-year benefits of antihypertensive drug therapy are greater among persons with higher baseline risks, such as men, older adults, and persons with known cardiovascular disease. It also confirms several observational studies that show that wider pulse pressure—a measure dependent on ventricular ejection, timing of blood pressure waves, and arterial stiffness—is associated with higher baseline risks.

Should we now routinely use pulse pressure rather than systolic and diastolic BP measurements alone? Not yet. First, for those who rely on risk assessment to determine when benefits of treatment are likely to outweigh harms, we need changes in current risk-assessment

tools to incorporate pulse pressure. Second, antihypertensive agents have multiple and heterogeneous effects, and the pathophysiology of hypertension is complex; all agents are not equivalent despite equivalent BP reduction (1). We do not yet know whether differences in drug benefits are caused by differences in reducing pulse pressure.

Active research to improve evidence-based care of patients with hypertension is alive and well. The results of these studies are still subject to change. What will the bottom line be? Clinicians, stand by!

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Reference

1. ALLHAT Collaborative Research Group. *JAMA*. 2000;283:1967-75.