



EDITORIALS

Managing blood pressure in older adults

Age alone is no barrier to treatment

Stephen Makin *clinical lecturer in geriatric medicine*, David J Stott *David Cargill professor of geriatric medicine*

Academic Section of Geriatric Medicine, Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK

In a recent paper in *The BMJ*, Liv and colleagues reported the results of a large cohort study investigating the link between blood pressure and mortality in community dwelling Chinese people with a mean age of 92 years.¹ Studies of very elderly people are challenging and rarely performed so these data are of particular interest. Both high and low systolic blood pressure were linked to an increase in mortality (a “U shaped curve” relation). Systolic blood pressure >154 mm Hg was associated with increased cardiovascular mortality, and <107 mm Hg with non-cardiovascular death.

The finding that low systolic blood pressure predicts increased risk of death is consistent with many other epidemiological studies in older people. Although low blood pressure may in itself cause harm, it is also likely to be a marker of ill health, with systolic blood pressure falling for up to two years before death.² Any link between high systolic pressure and mortality has been much less consistent in later life. In very elderly people (≥85 years) an inverse linear relation has been reported, with lowest mortality at the highest pressures,^{3,4} but health status may play a major part in driving these associations.⁴ This is in contrast to epidemiological data for younger or middle aged people, in whom high pressure is clearly and consistently associated with increased risk of fatal and non-fatal cardiovascular events.⁵

How should these data influence decisions on use of antihypertensive drugs in very elderly people? Here we must be mindful of the fact that observational data have serious limitations. Even the most rigorously adjusted analyses cannot rule out residual confounding and reverse causality. Randomised controlled trials remain the gold standard for informing treatment decisions, and a substantial body of such evidence exists to guide treatment of hypertension in older adults.

Evidence says aim low

In a Cochrane review and meta-analysis of randomised trials of treatment of hypertension in people aged over 60, antihypertensive drugs reduced cardiovascular morbidity and both total and cardiovascular mortality.⁶ People aged over 80 have also been shown to benefit from drug treatment of high blood pressure, although there are fewer data in this age group.

In the hypertension in the very elderly trial (HYVET), people with sustained systolic blood pressure >160 mm Hg were randomised to antihypertensive drugs or placebo. Treatment reduced systolic blood pressure from a baseline 173 mm Hg to 143 mm Hg (compared with 158 mm Hg on placebo), leading to a decrease in stroke, heart failure, and total mortality.⁷ However, for selected patients, we should probably be aiming lower.

The Systolic Blood Pressure Intervention Trial (SPRINT) found benefits from targeting a systolic blood pressure <120 mm Hg in participants with mean age of 68 years and systolic >130 mm Hg⁸; in a prespecified subgroup of people aged over 75 intensive antihypertensive treatment achieved a mean systolic of 123 mm Hg and led to a substantial reduction in cardiovascular events and total mortality compared with standard care with mean systolic pressure of 135 mm Hg.⁹ In common with most randomised trials, SPRINT participants were generally fitter with less multimorbidity and polypharmacy than patients in a clinical setting. There was a penalty associated with intensive treatment—an increase in adverse events including hypotension, syncope, acute kidney injury, and electrolyte disturbance, seen across all trial participants.⁸

Consider overall health

For selected older people, reduction of blood pressure aiming to prevent cardiovascular disease and prolong life will be a high priority—and there is potential for further gain from setting a low treatment target. The most recent 2017 American College of Cardiology/American Heart Association Task Force guidelines (including the evidence from SPRINT)¹⁰ recommend a target systolic blood pressure of <130 mm Hg for ambulatory community dwelling people older than 65.

However for some, such as people who are very frail or have complex comorbidity or limited life expectancy, antihypertensive drugs are likely to be irrelevant or harmful. The above guidelines recommend a more guarded approach for people with a high burden of comorbidity and limited life expectancy; clinical judgment, patient preference, and a team based approach to assess risks and benefits should be used in

decisions regarding intensity of treatment and choice of antihypertensive drugs.

What should be done for older people with low systolic blood pressure? Evidence is limited, but it seems reasonable to avoid prescribing medicines likely to further reduce blood pressure. For those taking antihypertensive drugs, the risks and benefits associated with reducing or stopping treatment are also unclear.¹¹ However, it is sensible to reduce or stop antihypertensives in patients with adverse effects such as syncope or acute kidney injury associated with low pressure.

Shared decision making is particularly important when considering preventive treatments for very elderly people. The priorities for older people with hypertension (and their carers) can vary greatly. For some, the option of taking antihypertensive drugs for longer term gain will be attractive. Others look for faster and more noticeable benefit from any medicine taken, with clear improvement of symptoms and enhanced quality of life. The clinician's role is to support patients navigating this decision, in line with their individual preferences.

Competing interests: We have read and understood BMJ policy on declaration of interests and have no relevant interests to declare.

Provenance and peer review: Commissioned; not externally peer reviewed.

1 Lv YB, Gao X, Yin ZX, et al . Revisiting the association of blood pressure with mortality in oldest old people in China: community based, longitudinal prospective study. *BMJ* 2018;361:k2158. 10.1136/bmj.k2158 29871897

- 2 Ravindrarajah R, Hazra NC, Hamada S, et al . Systolic blood pressure trajectory, frailty, and all-cause mortality >80 years of age: cohort study using electronic health records. *Circulation* 2017;135:2357-68. 10.1161/CIRCULATIONAHA.116.026687 28432148
- 3 Mattila K, Haavisto M, Rajala S, Heikkinen R. Blood pressure and five year survival in the very old. *BMJ* 1988;296:887-9. 10.1136/bmj.296.6626.887 3129061
- 4 Boshuizen HC, Izaks GJ, van Buuren S, Ligthart GJ. Blood pressure and mortality in elderly people aged 85 and older: community based study. *BMJ* 1998;316:1780-4. 10.1136/bmj.316.7147.1780 9624064
- 5 Cheng S, Xanthakis V, Sullivan LM, Vasan RS. Blood pressure tracking over the adult life course: patterns and correlates in the Framingham heart study. *Hypertension* 2012;60:1393-9. 10.1161/HYPERTENSIONAHA.112.201780 23108660
- 6 Musini VM, Tejani AM, Bassett K, Wright JM. Pharmacotherapy for hypertension in the elderly. *Cochrane Database Syst Rev* 2009;(4):CD000028. 10.1002/14651858.CD000028.pub2. 19821263
- 7 Beckett NS, Peters R, Fletcher AE, et al. HYVET Study Group. Treatment of hypertension in patients 80 years of age or older. *N Engl J Med* 2008;358:1887-98. 10.1056/NEJMoa0801369 18378519
- 8 A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med* 2017;377:2506. 10.1056/NEJMx170008 29262284
- 9 Williamson JD, Supiano MA, Applegate WB, et al. SPRINT Research Group. Intensive vs standard blood pressure control and cardiovascular disease outcomes in adults aged ≥75 years: a randomized clinical trial. *JAMA* 2016;315:2673-82. 10.1001/jama.2016.7050 27195814
- 10 Whelton PK, Carey RM, Aronow WS, et al . 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive summary: a report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines. *Hypertension* 2018;71:1269-324. 10.1161/HYP.000000000000066 29133354
- 11 van der Wardt V, Harrison JK, Welsh T, Conroy S, Gladman J. Withdrawal of antihypertensive medication: a systematic review. *J Hypertens* 2017;35:1742-9. 10.1097/HJH.0000000000001405. 28486271

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>