

Screening and treatment of hypertension in older adults: less is more?

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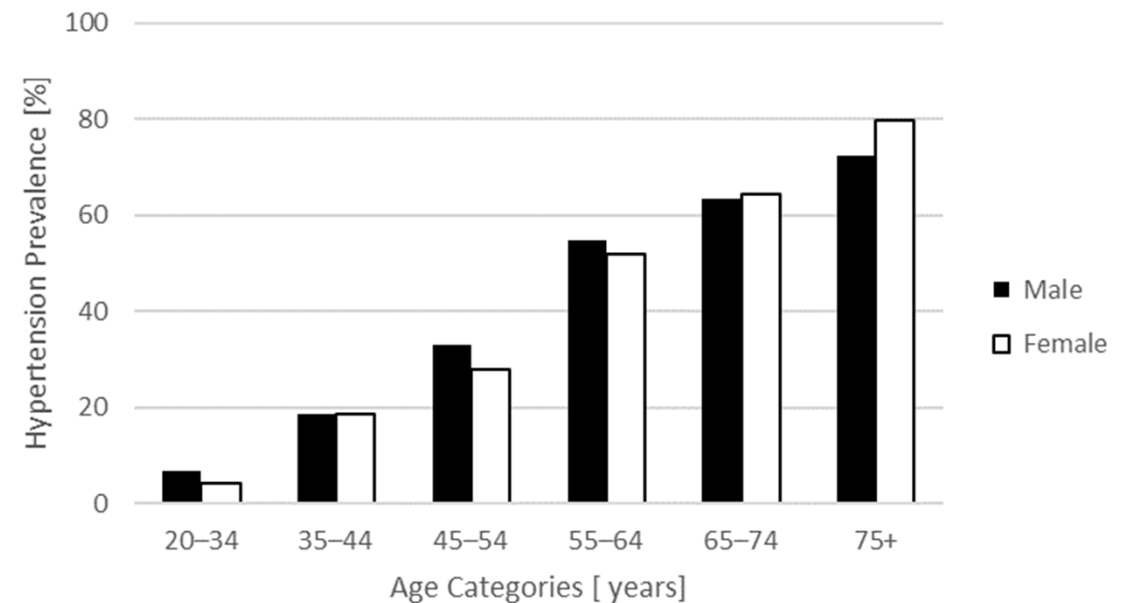
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Plan of the presentation

- Hypertension in older adults
 - Prevalence
 - Association with CVD risk and mortality
- Discrepancies between cohorts and trials
 - Effect modification by frailty?
- Conclusion
- Research agenda

Hypertension in older adults

- Prevalence
 - General population: 25-30%
 - Older adults: up to 75%
- Major cause of cardiovascular diseases (CVD)
- Due to population ageing: hypertension in older adults is a major and growing burden for the health care system
- Association with CVD risk in older adults:
 - Evidence from cohort studies
 - Evidence from clinical trials



Forouzanfar et al. JAMA. 2017; Yoon et al. NCHS Data Brief. 2015

Evidence from cohort studies

Table 2 All-cause and cause-specific mortality risks for participants without a history of cardiovascular disease ($n=4,612$) by baseline SBP categories, adjusted for age and sex

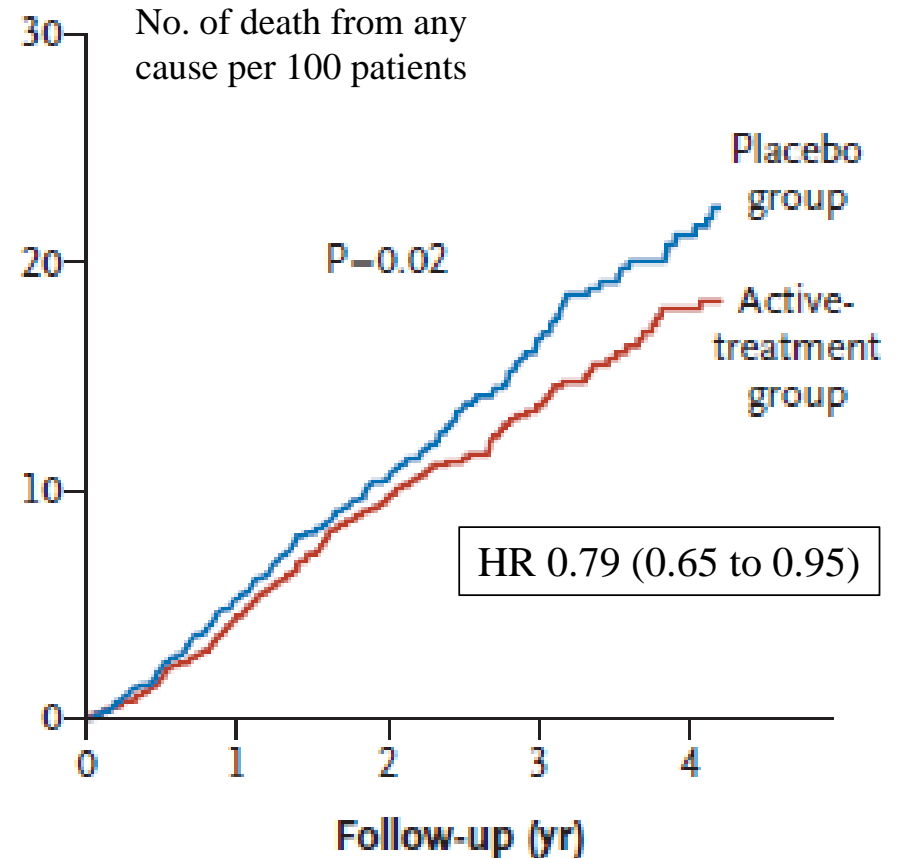
	Events ^a	SBP (mmHg)			<i>p</i> for trend	
		AR ^b <140	<140 <i>n</i> =2,632	140–159 <i>n</i> =1,288		≥160 <i>n</i> =692
All-cause mortality						
55–64 years	363	10.7	1	→ 1.2 (0.9–1.5)	→ 1.7 (1.2–2.2)	<0.001
65–74 years	730	30.5	1	→ 1.2 (1.0–1.4)	→ 1.3 (1.0–1.5)	0.006
75–84 years	567	75.5	1	→ 1.1 (0.9–1.3)	→ 1.3 (1.0–1.6)	0.047
≥85 years	131	219.0	1	→ 0.7 (0.5–1.1)	→ 0.7 (0.4–1.1)	0.286
<i>p</i> for trend			<0.001	<0.001		

- Several cohort studies have found that oldest-old participants, i.e., above the age of 80 years, with higher BP at baseline had lower mortality rates

Blom et al. Age (Dordr). 2013

Evidence from clinical trials

- Only 2 RCTs targeting older patients have been conducted
- HYVET, 2008
 - 3845 participants, 80 years and older
 - Randomization to active treatment vs placebo
 - Results: reduction by 21% in all-cause mortality
- SPRINT, 2016
 - 2636 participants, 75 years and older
 - Randomization to intensive vs standard treatment (BP target: 120 vs 140 mm Hg)
 - Results: reduction by 33% in all-cause mortality



Beckett et al. N Engl J Med. 2008; Williamson et al. JAMA. 2016

Discrepancies between cohorts and trials

- Several cohort studies with older adults have shown that participants with low BP had higher mortality rates
- RCTs consistently show benefits of treating hypertension, including in older adults aged 80 years and more
- Why these discrepancies?
 - Selection of patients in trials: external validity?
 - Reverse causality?
 - The association between BP and CVD events and mortality in older adults might be modified by frailty?

Effect Modification by frailty?

- Definition of frailty: multidimensional geriatric syndrome characterized by increased vulnerability and loss of adaptability to stress; state characterized by an increased risk of adverse health outcomes
- Fried's phenotype model
 - Unintentional weight loss
 - Self-reported exhaustion
 - Low energy expenditure
 - Slow gait speed
 - Weak grip strength
- 0 feature = non frail
- 1-2 features = pre-frail
- 3-5 features = frail

Santos-Eggimann B et al. BMC Geriatr. 2008; Fried et al. J Gerontol A Biol Sci Med Sci. 2004; Clegg et al. Lancet. 2013; Macklai et al. BMC Geriatr. 2013

Effect Modification by frailty?

- Several cohort studies have found that the association between BP and mortality was modified in frail participants
 - Non-frail: high BP, lower survival
 - Frail: high BP, higher survival

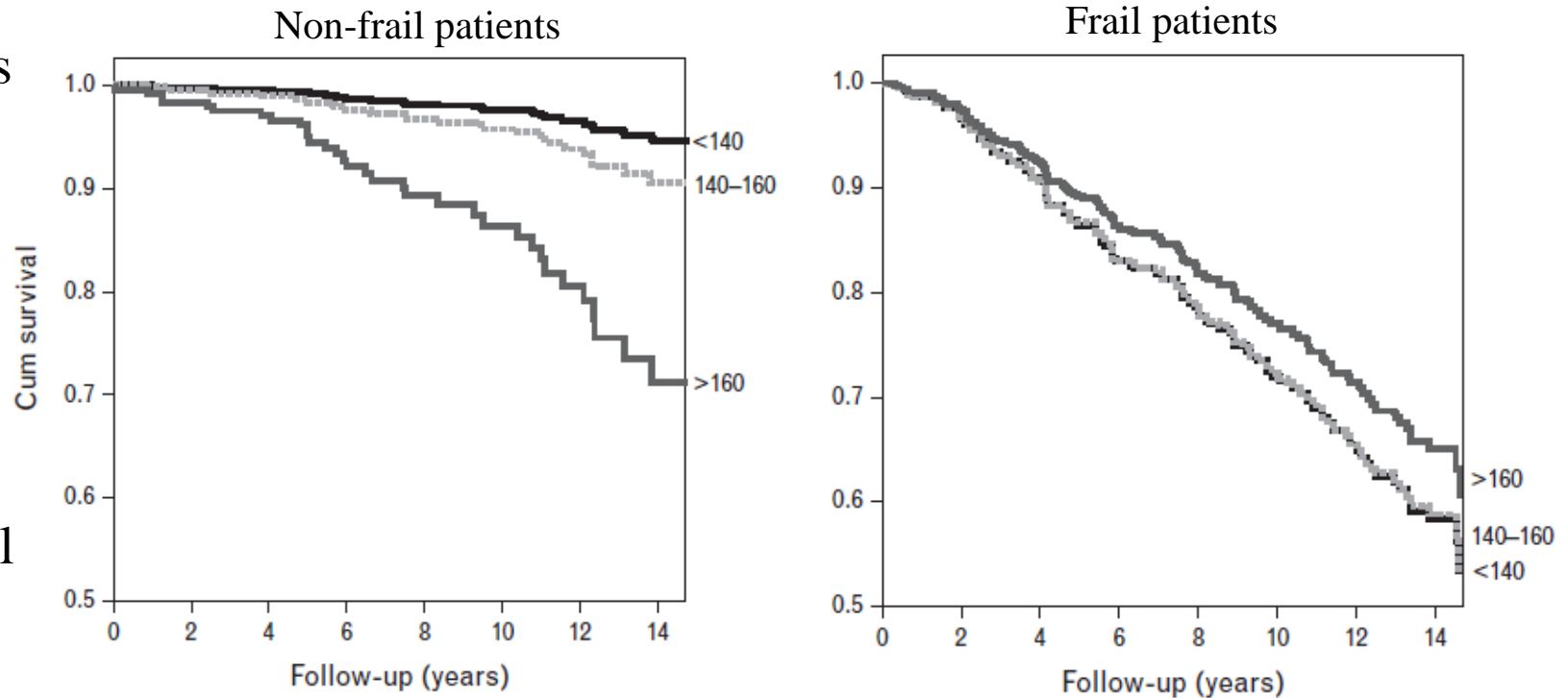


FIGURE 1 Systolic blood pressure and cardiovascular mortality in nonfrail and frail patients aged 60 years and older

Effect Modification by frailty?

- No trials primarily designed to assess the benefits and harms of hypertension treatment among multimorbid or frail older adults
- Post hoc analyses in 3 trials, no consistent findings:
 - SHEP trial: beneficial effect of antihypertensive treatment **only** in participants without limitations in physical ability
 - HYVET and SPRINT trials: beneficial effect of antihypertensive treatment seen in **both** non-frail and frail participants

Williamson et al. JAMA. 2016; Charlesworth et al. Am J Hypertens. 2016; Wawrick et al. BMC Med. 2015

Conclusion

- The association between BP and CVD events and mortality in older adults is complex
- Lack of high quality evidence for a favorable harm-benefit balance of antihypertensive treatment among oldest-old adults
- Among frail or multimorbid older adults,
 - low BP may be associated with worse outcomes and antihypertensive treatment may cause more harm than benefit
 - Research needed to guide hypertension screening and treatment recommendations

Research agenda

- Further studies needed to
 - evaluate the effect of lowering BP on CVD risk and mortality,
 - determine the optimal target BP, and
 - better understand the relationship between BP, frailty, and health outcomes

- Our ongoing research

- Aim: Association between frailty and BP in the cohort Lc65+
- Method: 4500 participants aged 65-70 years at inclusion, recruited in 2004, 2009 and 2014; follow-up ongoing (PI: Prof Santos-Eggimann)
- Hypotheses: 1) frail have lower BP than non-frail individuals; 2) low BP is a predictor for the occurrence of frailty; 3) BP is associated with mortality, and frailty is an effect modifier of this association

Thank you for your interest

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