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Benefici-risc del control intensiu de la pressió arterial versus control estàndard.

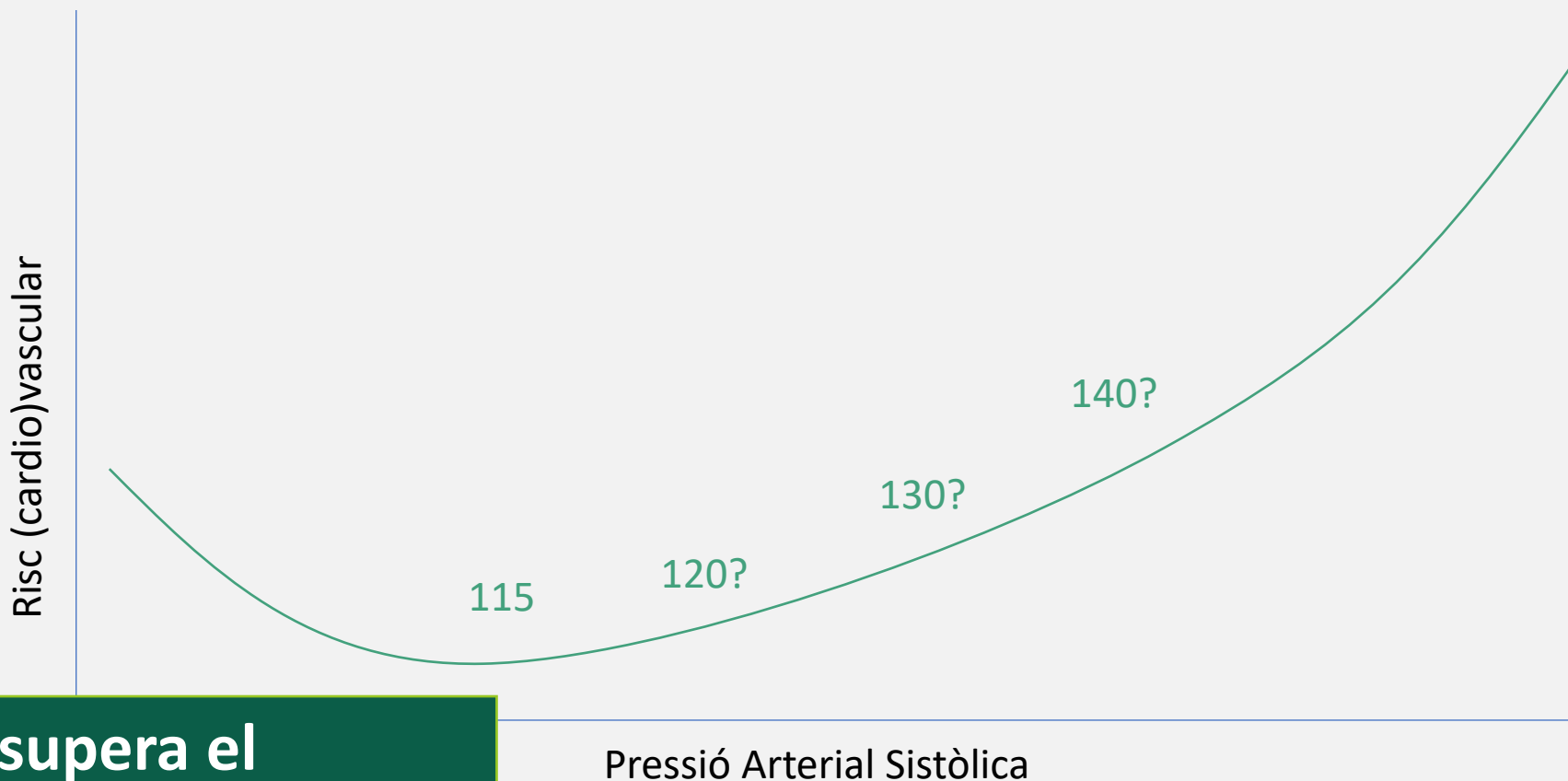
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La PA marca un risc (cardio)vascular que augmenta de forma progressiva i contínua.



Quan el risc supera el benefici de seguir baixant?

Pressió arterial: fins on l'hem d'abaixar?

Benefit-harm trade-offs of intensive blood pressure control versus standard blood pressure control on cardiovascular and renal outcomes: an individual participant data analysis of randomised controlled trials

Xiaofan Guo*, Guozhe Sun*, Yu Xu*, Shiyu Zhou*, Qirui Song*, Yan Li*, Nanxiang Ouyang, Guangxiao Li, Zhongde Cheng, Ning Ye, Jun Wang, Ying Zhou, Hongmei Yang, Chuning Shi, Chang Wang, Songyue Liu, Wensheng Zhu, Andrew E Moran, Guang Ning, Yufang Bi†, Weiqing Wang†, Jun Cai†, Jing Li†, Yingxian Sun†, for the BPRULE Study Group

- Metanàlisi. Dades individuals agrupades.
- Revisió de +1000 articles → 6 ECAs: ACCORD BP, SPRINT, ESPRIT, BPROAD, STEP, CRHCP.
- Criteris d'eligibilitat:
 - 1) comparació Objectiu: Intensiu (PAS<120-130 mmHg) VS Estàndard (PAS<140-150 mmHg)
 - 2) resultat: variable principal composta cardiovascular (IAM, ictus, IC i mortalitat CV)
 - 3) estandardització en el registre d'efectes adversos (renals o d'interès com hipotensió o síncope)
 - 4) n>2000 amb dades individuals.

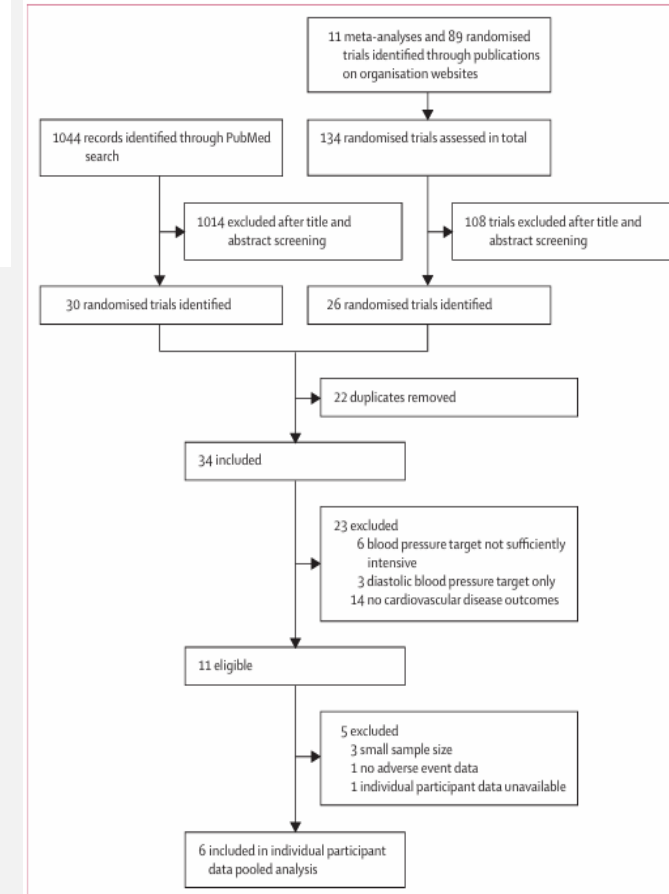


Figure 1: Study flow diagram

	Overall (n=80 220)	Intensive treatment group (n=40 503)	Standard treatment group (n=39 717)
Age, years	64.0 (59.0–70.0)	64.0 (58.5–70.0)	64.0 (59.0–70.0)
Sex			
Female	41 177 (51.3%)	20 801 (51.4%)	20 376 (51.3%)
Male	39 043 (48.7%)	19 702 (48.6%)	19 341 (48.7%)
Race or ethnic group			
Asian	66 290 (82.6%)	33 535 (82.8%)	32 755 (82.5%)
Non-Hispanic White	8097 (10.1%)	4077 (10.1%)	4020 (10.1%)
Non-Hispanic Black	3871 (4.8%)	1897 (4.7%)	1974 (5.0%)
Hispanic	1303 (1.6%)	658 (1.6%)	645 (1.6%)
Other	659 (0.8%)	336 (0.8%)	323 (0.8%)
High school education or above	27 738 (34.6%)	13 919 (34.4%)	13 819 (34.8%)
Smoking status			
Never smoked	49 129 (61.2%)	24 909 (61.5%)	24 220 (61.0%)
Former smokers	13 850 (17.3%)	6957 (17.2%)	6893 (17.4%)
Current smokers	17 241 (21.5%)	8637 (21.3%)	8604 (21.7%)
BMI, kg/m ²	26.9 (4.4)	26.9 (4.4)	26.8 (4.4)
Systolic blood pressure, mm Hg	148.4 (16.9)	148.7 (17.3)	148.1 (16.6)
Diastolic blood pressure, mm Hg	82.9 (11.5)	83.1 (11.6)	82.6 (11.4)
History of major cardiovascular disease*	14 156 (17.6%)	7304 (18.0%)	6852 (17.3%)
History of stroke	11 132 (13.9%)	5768 (14.2%)	5364 (13.5%)
History of diabetes	26 362 (32.9%)	13 245 (32.7%)	13 117 (33.0%)
History of chronic kidney disease	5273 (6.6%)	2675 (6.6%)	2598 (6.5%)
Use of antihypertensive medications	63 464 (79.1%)	32 557 (80.3%)	30 907 (77.8%)
Antihypertensive medications	1.2 (0.9)	1.2 (0.9)	1.2 (0.9)
Use of aspirin	20 143 (25.1%)	10 176 (25.1%)	9967 (25.1%)
Use of statins	22 343 (27.9%)	11 139 (27.5%)	11 204 (28.2%)
Total cholesterol, mg/dL	182.1 (45.9)	182.5 (46.1)	181.6 (45.6)
LDL cholesterol, mg/dL	100.4 (34.5)	100.7 (34.7)	100.2 (34.3)
HDL cholesterol, mg/dL	48.8 (14.9)	48.9 (15.0)	48.6 (14.8)
Triglycerides, mg/dL	128.4 (90.3–189.5)	129.2 (90.3–189.6)	128.0 (89.5–188.7)
Estimated glomerular filtration rate, mL/min per 1.73 m ² †	91.9 (19.7)	92.0 (19.7)	91.7 (19.6)
Atherosclerotic cardiovascular disease 10-year risk strata‡			
Low or borderline risk (<7.5%)	15 162 (18.9%)	7788 (19.2%)	7374 (18.6%)
Intermediate risk (7.5–19.9%)	30 080 (37.5%)	15 171 (37.5%)	14 909 (37.5%)
High risk (≥20%)	34 978 (43.6%)	17 544 (43.3%)	17 434 (43.9%)

Data are median (IQR), n (%), or mean (SD). *Major cardiovascular disease includes myocardial infarction, stroke, and heart failure. †Estimated glomerular filtration rate was calculated based on the 2021 Chronic Kidney Disease Epidemiology Collaboration creatinine equations. ‡Atherosclerotic cardiovascular disease risk was calculated based on the American College of Cardiology and American Heart Association Pooled Cohort Equations.

Table: Baseline characteristics of participants in the six included trials^{23,5,721}

Grups comparats:

- ≈40k individus cadascun
- 51,3% dones
- Mediana 64 anys
- 82,6 asiàtics
- Mediana de temps de seguiment 3,2 anys

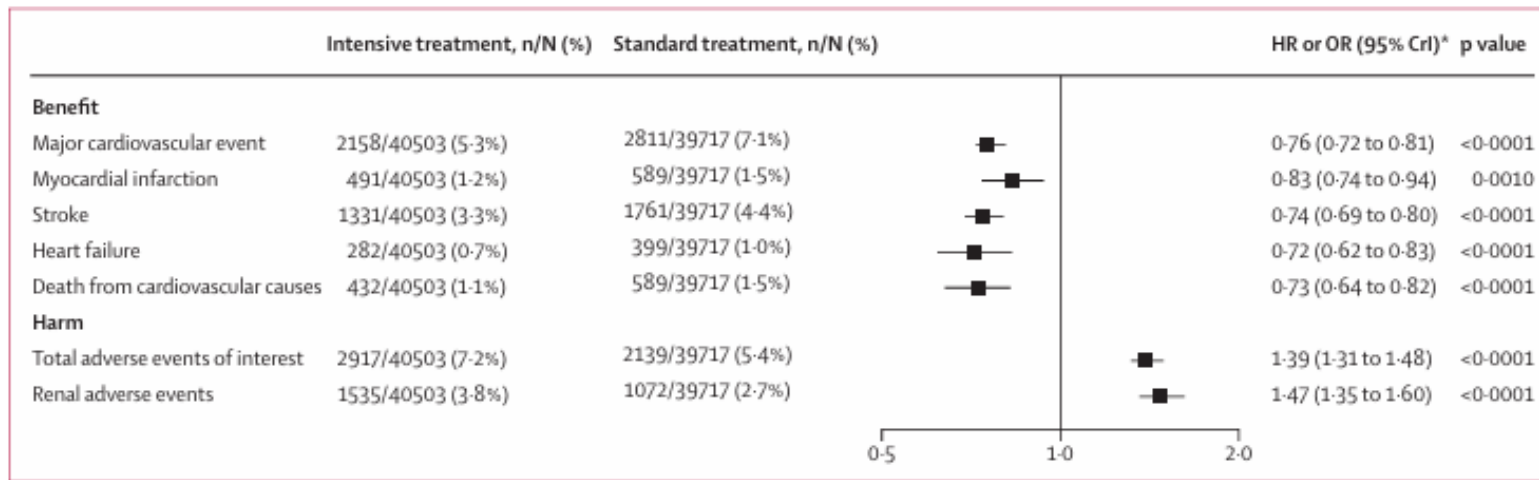


Figure 2: Pooled estimates of treatment effects for intensive versus standard blood pressure control on benefit and harm outcomes

Major cardiovascular events included myocardial infarction, stroke, heart failure, and cardiovascular death. Total adverse events of interest included hypotension, syncope, injurious fall, arrhythmia, angio-oedema and renal adverse events. Renal adverse events included acute kidney injury, renal failure, end-stage renal disease or dialysis, a reduction of 50% or more in estimated glomerular filtration rate in patients with chronic kidney disease at baseline, or a reduction of 30% or more in estimated glomerular filtration rate to <60 mL/min per 1.73 m² in patients without chronic kidney disease at baseline. CrI=credible interval. HR=hazard ratio. OR=odds ratio. *Benefit outcomes are accompanied by HRs, and harm outcomes by ORs.

Variable principal (MACE):

- Favorable al grup intensiu (HR 0,76, IC95% 0,72-0,81, p<0,0001, reducció PA -12,6/-3,7 mmHg).
- Reducció absoluta del risc 1,73% (NNT 58)
- Risc absolut augmentat d'efectes adversos 1,82 % (NNH 55), renals 2,08 % (NNH 93)

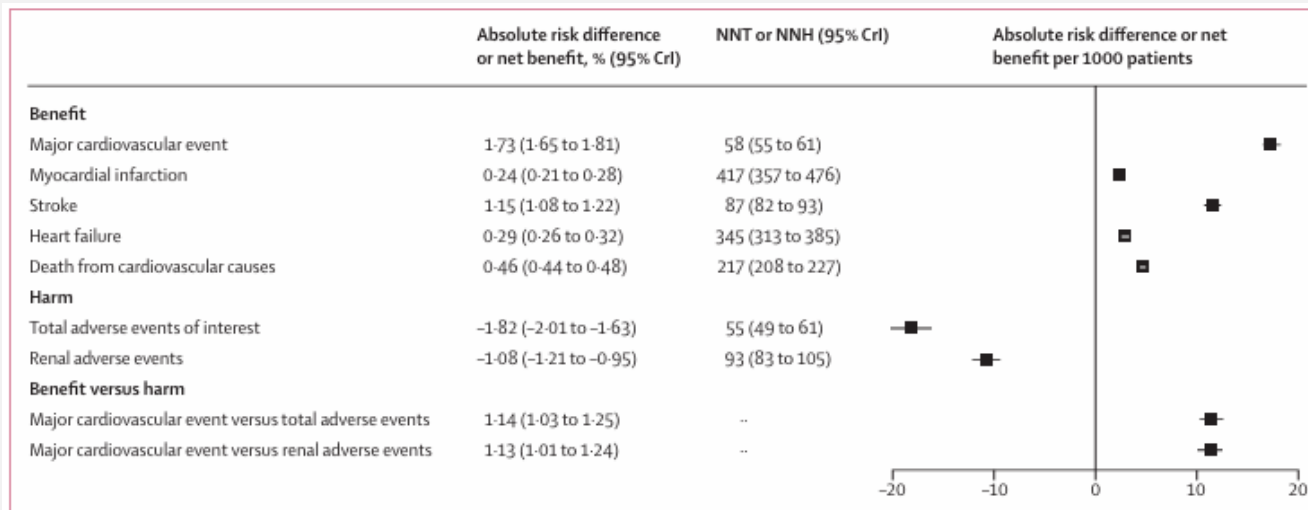


Figure 3: Net benefit analysis comparing intensive versus standard blood pressure control

Major cardiovascular events included myocardial infarction, stroke, heart failure, and cardiovascular death. Total adverse events of interest included hypotension, syncope, injurious fall, arrhythmia, angio-oedema and renal adverse events. Renal adverse events included acute kidney injury, renal failure, end-stage renal disease or dialysis, a reduction of 50% or more in estimated glomerular filtration rate in patients with chronic kidney disease at baseline, or a reduction of 30% or more in estimated glomerular filtration rate to <60 mL/min per 1.73 m² in patients without chronic kidney disease at baseline. All NNT and NNH values were based on a median follow-up of 3.2 years (IQR 3.0–3.5). CrI=credible interval. NNH=number needed to harm. NNT=number needed to treat.

Benefici-risc ajustat favorable al control intensiu 1,14 (IC95% 1,03-1,25)

- Ajustament en tres passos incloent mortalitat per totes les causes, opinió de metges i pacients en la ponderació de cada esdeveniment.
- Benefici més clar en joves, ictus previ, manca d'afectació renal i diastòliques ≥70 mmHg.

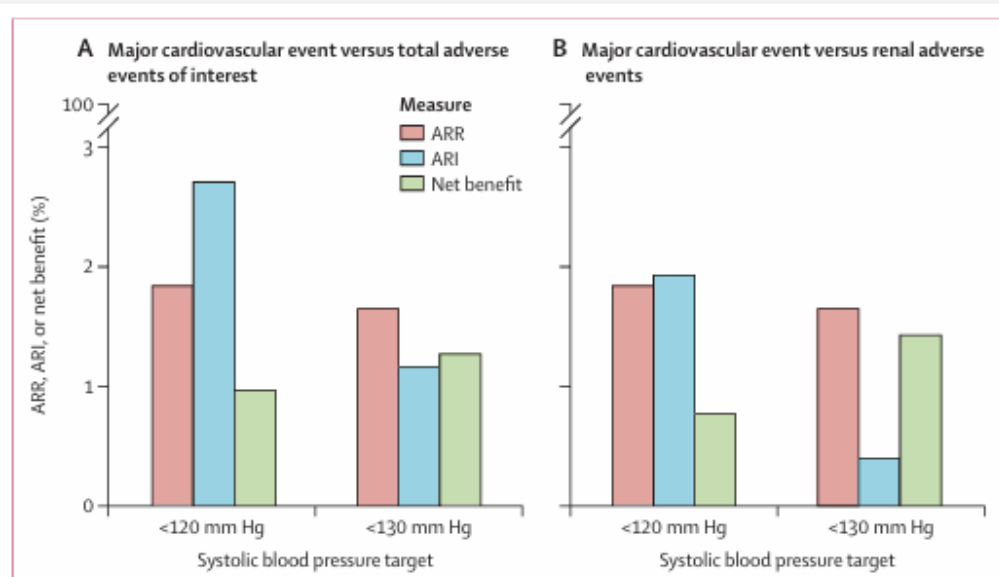


Figure 4: Net benefits of intensive versus standard blood pressure control in trials with different systolic blood pressure targets (<120 mm Hg and <130 mm Hg)
 (A) Major cardiovascular events versus total adverse events of interest, weighted at 1.0:3.1. (B) Major cardiovascular events versus renal adverse events, weighted at 1.0:1.8. Net benefit is defined as the absolute risk reduction minus the weighted absolute risk increase, expressed as a percentage. Values greater than 0% indicate a net benefit; values of less than 0% indicate net harm. Trials with a systolic blood pressure target of <120 mm Hg were ACCORD BP,²¹ SPRINT,² ESPRIT,⁴ and BPROAD,⁷ and those with a systolic blood pressure target of <130 mm Hg were STEP³ and CRHCP.⁵ ARI=absolute risk increase. ARR=absolute risk reduction.

Conclusió dels autors:

- Objectius de PAS <120-130 mmHg enfront de <140-150 mmHg comporten major reducció del risc.



Comentari GdT HTA CAMFiC:

- Sense tenir comparació directe de PAS<120 amb <130 mmHg, el risc d'efectes adversos augmenta en els objectius més baixos.
- Objectius intermitjos (PAS < 130 mmHg) podrien compensar millor el balanç benefici risc.

Població	Objectiu	Consideracions
Població general, independent de la resta de FR o comorbiditats	Aconseguir PA < 140 i 80 mmHg Millor PA < 130 i 80 mmHg (Totes las societats)	Valorar sempre tolerància i efectes adversos.
Gent gran ≥80 anys	PA < 150 i 80 mmHg (ESH 2023) Però si no hi ha fragilitat: mateixos objectius que més joves (ESC 2024)	Quan es presentin: Individualitzar objectius
Fragilitat	Individualitzar	Prioritzar la seguretat Benefici sempre ha de ser superior al risc

ESH 2023, NICE 2025, ESC 2024, Canadian 2025, AHA 2025



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