Decline in blood pressure control trends in the US: a real step back: Comment on National Health and Nutrition Examination Survey (NHANES) data


Key points

- This analysis conducted by National Health and Nutrition Examination Survey (NHANES) investigated the changes in blood pressure (BP) control rates between 1999–2000 and 2017–2018, spanning ten 2-year cycles.
- The primary outcome of BP control was defined as systolic BP level <140 mm Hg and diastolic BP level <90 mm Hg. The secondary outcomes were hypertension awareness and use of antihypertensive medication.
- Among the included 18,262 hypertensive adults (from a total sample of 51,761 individuals), the age-adjusted estimated proportion of adults with controlled BP increased from 1999–2000 through 2007–2008, remained stable from 2007–2008 through 2013–2014, and decreased from 2013–2014 through 2017–2018. BP control rates were higher among older compared to younger participants (50% among those aged 45–64 years vs. 37% among those aged 18–44 years).
- BP control, awareness, and antihypertensive medication use were more likely among non-Hispanic white adults, those with health insurance, and those who were undergoing regular follow-up visits.
- Temporal trends in age-adjusted proportion of adults with hypertension and controlled BP did not change using the tighter thresholds recommended by 2017 American College of Cardiology/American Heart Association (ACC/AHA) BP guidelines.

Comment

The key importance of the analysis of trends of risk factors is well recognized as a factor driving strategic decisions for healthcare systems. The cross-sectional analyses of NHANES continue to provide useful information on the status of BP control, awareness, and prevalence of hypertension in the USA. The current analysis is somehow surprising since the age-adjusted estimated proportion with controlled BP significantly declined from 54% [95% confidence interval (CI), 49–59%] in the 2012–2014 cohort to 44% (95% CI, 40–47%) in the 2017–2018 cohort (P = 0.003 for trend) after a steady, progressive increase from 1999–2000 through 2007–2008, remained stable from 2007–2008 through 2013–2014, and decreased from 2013–2014 through 2017–2018. BP control rates were higher among older compared to younger participants (50% among those aged 45–64 years vs. 37% among those aged 18–44 years).

Does this reflect a true step back of hypertension management in the USA? Or are there other factors that may have played a confounding role? These questions appear quite reasonable if one considers that continuous improvement in BP control has been recorded in recent years in Canada (from ~15% in 1990s to 66% in 2019) and Europe (from 25% in the early-1990s to ~70% in 2019). The NHANES analysis did consider several potential confounding factors such as age, sex, race, type of health insurance, access to care and used standard BP measurement technique. More difficult BP control was reported in very elderly people, non-white Hispanic, and people with lower access to care.

However, other potential contributors are the surprisingly lower prevalence of hypertension in the 2017–2018 cohort, the lesser use of antihypertensive therapy, and the reduced awareness of hypertension from 93% in 2009–2010 to 88% in 2017–2018. The authors do not provide an explanation for the current observation but suggest that the single BP measurement and self-reported awareness and use of medication, life-style factors, or adherence may have had an impact on data. Other factors to be considered are the potential inequalities in the access to care of the contemporary cohort compared to the previous ones, or the adoption of the same selection criteria of 1999 and whether this is still representative of the US adult population.

Further studies should be encouraged to assess differences among countries, the current value of secular trend models of risk factors, and whether they need to be updated.
**Supplementary material**

Supplementary material is available at *European Heart Journal* online.

**Conflict of interest:** M.V. reports personal fees for speaker bureau and/or consulting in Advisory Board from Amgen, Astra Zeneca, Daiichi-Sankyo, Menarini Int, MSD, Novartis Pharma, and Novo Nordisk outside the submitted work. C.P. reports personal fees from Acticor Biotech, personal fees from Amgen, personal fees from Bayer, personal fees from GlaxoSmithKline, personal fees from Tremeau, personal fees from Zambon, grants from AIFA (Italian Drug Agency), grants from European Commission, and other from Scientific Advisory Board of the International Aspirin Foundation outside the submitted work.

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**Weekly Journal Scan**

**Early rhythm control for early atrial fibrillation?**

Comment on the EAST-AFNET 4 Trial

The results of EAST-AFNET 4 have been presented during ESC 2020 and simultaneously published in *The New England Journal of Medicine* (DOI: 10.1056/NEJMoa2019422).

**Key points**

- This is an investigator-initiated, parallel-group, open, blinded-outcome-assessment trial including 2789 patients with atrial fibrillation (AF) diagnosed < 1 year earlier (median, 36 days), who were older than 75 years, had had a previous transient ischaemic attack or stroke, or met two of the following criteria: age > 65 years, female sex, heart failure, hypertension, diabetes mellitus, severe coronary artery disease, chronic kidney disease, or left ventricular hypertrophy.
- While receiving conventional treatment for cardiovascular conditions, oral anticoagulation (in approximately 90% of patients), and rate control (beta-blocker in approximately 81%), patients were randomized to early rhythm control including antiarrhythmic drugs or AF ablation, as well as cardioversion of persistent AF, vs. usual care in which rhythm control was limited to the management of AF-related symptoms.
- The trial was stopped at the third interim analysis after a median of 5.1 years of follow-up, when the first primary endpoint of death from cardiovascular causes, stroke, or hospitalization with worsening heart failure or acute coronary syndrome had occurred in 249 of the patients assigned to early rhythm control (3.9 per 100 person-years) and in 316 patients assigned to usual care (5.0 per 100 person-years) (hazard ratio = 0.79, 96% confidence interval 0.66–0.94; \( P = 0.005 \)). Each component of the first primary endpoint contributed to the overall benefit of an absolute difference of 1.1 events per 100 person-years (NNT = 91). There was no significant difference in the second primary endpoint of the mean number of nights spent in the hospital between treatment groups.
- Rhythm-control-related serious adverse events occurred in 4.9% of the patients assigned to early rhythm control and 1.4% of the patients assigned to usual care, but the incidence of the overall safety outcome events was similar in the two groups.

**Comment**

In a meta-analysis of five earlier randomized trials comparing rhythm control vs. rate control strategies in a total of 5239 patients with persistent AF or AF that was considered likely to be recurrent, no significant difference was observed between the rate- and the rhythm-control groups regarding all-cause mortality, although a clear trend in favour of a rate-control approach was observed. EAST-AFNET-4 was designed to answer the question as to whether an early and comprehensive rhythm control strategy applied on top of oral anticoagulation and rate control can improve outcomes as compared to usual care in patients with recent-onset AF and cardiovascular conditions. EAST-AFNET-4 demonstrates that early rhythm control is able to improve clinical outcomes vs. conventional rate control in this specific clinical setting. The inclusion of AF ablation in the rhythm control armamentarium, as well as the early initiation of rhythm control, are likely to