

P5727

## All-cause mortality and cardiovascular death according to blood pressure thresholds recommended by ACC/AHA

G. Joseph<sup>1</sup>, J.L. Marott<sup>2</sup>, P. Sogaard<sup>3</sup>, T. Biering-Sorensen<sup>4</sup>, M.B. Johansen<sup>5</sup>, G. Nielsen<sup>6</sup>, G.B. Jensen<sup>2</sup>, R. Mogelvang<sup>7</sup>

<sup>1</sup>Aalborg University, Aalborg, Denmark; <sup>2</sup>Frederiksberg University Hospital, The Copenhagen City Heart Study, Frederiksberg, Denmark; <sup>3</sup>Aalborg University Hospital, Department of Cardiology, Aalborg, Denmark; <sup>4</sup>Gentofte University Hospital, Department of Cardiology, Gentofte, Denmark;

<sup>5</sup>Aalborg University Hospital, Unit of Clinical Biostatistics, Aalborg, Denmark; <sup>6</sup>Vendsyssel Hospital, Department of Cardiology, Hjørring, Denmark;

<sup>7</sup>Rigshospitalet - Copenhagen University Hospital, Department of Cardiology, Copenhagen, Denmark

On behalf of The Copenhagen City Heart Study

**Funding Acknowledgement:** Danish Heart Foundation

**Background:** The cut-off values for defining hypertension remains a matter of debate. Recently published guidelines from American College of Cardiology (ACC) /American Heart Association (AHA) defines hypertension at blood pressure (BP) of  $\geq 130/80$  in contrast to guidelines from European Society of Cardiology (ESC) defining hypertension as  $\text{BP} \geq 140/90$ . Adopting the ACC/AHA recommendation will lead to higher prevalence of hypertension in the general population and probably unnecessary medical treatment of persons at a low cardiovascular risk.

**Aim:** We aimed to explore whether the new definition of hypertension as defined from the ACC/AHA guidelines is associated with higher risk of mortality and cardiovascular death in the general population compared to their definition of normal BP.

**Methods:** A random sample of 20,000 Caucasian men and women aged 20–98 years were examined in a prospective cardiovascular population study. The population sample went through four examinations in 1976–78, 1981–83, 1991–94, and 2001–03. We defined the blood pressure levels according to the ACC/AHA guidelines: normal  $< 130/80$  mmHg; Stage 1 hypertension:  $130\text{--}139/80\text{--}89$  mmHg; Stage II hypertension:  $\geq 140/90$  mmHg. The population was followed until April 2018 or until death. Cox regression with time varying covariates was performed. The analysis was adjusted for following confounders: age, sex, body mass index, level of daily physical activity, previous cardiovascular disease, diabetes, educa-

tional status, smoking status, cardiac medication, cholesterol, and calendar time. Univariable and multivariable analyses were performed. Primary outcome was all-cause mortality. Secondary outcome was cardiovascular death defined as death from acute myocardial infarction, stroke, or heart failure.

**Results:** All outcomes were assessed according to the ACC/AHA BP thresholds. Primary outcome: Considering normal BP ( $< 130/80$  mmHg) as reference, we did not find higher mortality in stage 1 hypertension ( $130\text{--}139/80\text{--}89$  mmHg) in the multivariable analyses [HR 0.98 (95% CI: 0.93–1.05),  $p=0.67$ ]. In stage 2 hypertension ( $\geq 140/90$  mmHg), the mortality was significantly higher [HR 1.13 (95% 1.07–1.20),  $p<0.001$ ]. We found the same pattern for the secondary outcome: The risk of cardiovascular death in stage 1 hypertension ( $130\text{--}139/80\text{--}89$  mmHg) did not differ significantly from normal BP ( $< 130/80$  mmHg) [HR 1.08 (95% CI: 0.95–1.22),  $p=0.25$ ]. In stage 2 hypertension ( $\geq 140/90$  mmHg), cardiovascular death was significantly higher [HR 1.50 (95% CI 1.35–1.66),  $p<0.001$ ].

**Conclusion:** Hypertension as defined by the ACC/AHA guidelines is not associated with higher all-cause mortality or cardiovascular death in the general population. Applying ACC/AHA guidelines might lead to unnecessary medical treatment of a low-risk population. In contrast, the ESC-definition of hypertension refers to a high-risk population in terms of all-cause mortality and cardiovascular death.

