Population Heterogeneity in Midlife Trajectories of Blood Pressure

Background Age-related changes in blood pressure (BP) show increases around middle age. Such increases may be an early indication of arterial aging or a disease process. We investigated the presence of subpopulations with different underlying trajectories (latent classes) of midlife systolic (SBP) and diastolic blood pressure (DBP) in men and women.

Design Prospective UK birth cohort study.

Participants 1840 males and 1819 females.

Outcome BP at age 36, 43, and 53 years.

Analysis Unconditional linear growth mixture models were fitted to SBP and DBP to obtain latent classes. To examine the relevance of the extracted classes, we compared the distribution of early-life body size, midlife body mass index (BMI) and weight change, lifetime socioeconomic position (SEP), antihypertensive medication (HypRx) use and self-reported angina in each class.

Results In men, 2 class models for SBP and DBP had the best fit in terms of the Bayesian information criterion. For SBP, the majority were in the “Normal” class characterised by a lower BP at age 36 and a gentle midlife increase (+0.9 mmHg per year). The other class (“Increaser”) had a higher increase (+3.1 mmHg per year). Similar classes were found for DBP. A “Normal” and “Increaser” class were also observed among women, together with an additional class (“High”) with high BP at age 36 (SBP = 170, DBP = 100 mmHg) and no evidence of a change with age. In both sexes, a smaller proportion were in the “Normal” SBP class compared to the “Normal” DBP class—for example, 94.3% of men were in the “Normal” SBP class vs 97.6% in the “Normal” DBP class. Individuals in the “Normal” classes were heavier at birth, taller at age 7, had a lower midlife BMI and midlife weight change, and were less likely to be on HypRx compared with those in other classes. Manual childhood SEP was associated with the “Increaser” SBP class in men. Undiagnosed angina (Rose Questionnaire) was more prevalent in the male “Increaser” SBP class. GP diagnosed angina (self-reported) and HypRx use were most prevalent in the “High” female SBP and DBP classes. Women in this group also had the lowest midlife weight change suggesting this was an extant morbid group.

Conclusion There was heterogeneity in the progression of midlife BP. This analytical approach may be useful for exploring determinants of BP and for identifying individuals at a high risk of future hypertension/CVD.

Association Between Birthweight and Obesity in Adult Females

Objective Adult obesity is associated with a variety of acute and chronic illnesses. Although high birthweight is known to predict obesity in middle age, the relationship between low birthweight and obesity is less clear. This study examines the association between birthweight and obesity in middle-aged women, and investigates whether the association is modified by other factors.

Methods The Million Women Study is a large population-based prospective cohort study of middle-aged UK women. This analysis is based on 372,542 women who reported their birthweight, current body size, and other information in a follow-up survey administered approximately 3 years after recruitment (mean age 38 years at follow-up). Logistic regression was used to estimate relative risk for being obese in adulthood (body mass index $\geq$ 30 kg/m$^2$) by birthweight, both unadjusted and adjusted for reported adult height, parental heights, and a range of social and lifestyle factors, including socio-economic status, parental smoking at birth, being breast fed, reproductive history and health behaviours.

Results There was a U-shaped relationship between birthweight and adult obesity. Compared to women of intermediate birthweight (3.0–3.5 kg), the relative risk of being obese was 1.26 (95% CI 1.23 to 1.29) for women with low birthweight (<2.5 kg), and 1.38 (1.30 to 1.47) for women with high birthweight (>4.0 kg). After adjustment for height, the relative risk of being obese associated with low birthweight was attenuated (from 1.26 to 1.15), while the relative risk associated with high birthweight was increased (from 1.38 to 1.44). Other health and lifestyle characteristics did not substantially change the obesity-related relative risks at different birthweight.