Effects of smoking on arterial distensibility, central aortic pressures and left ventricular mass.

The effects of smoking on central aortic pressures and the age-related increase in left ventricular mass (LVM) are largely unknown. We studied the relationship between smoking, arterial distensibility, central aortic pressures and left ventricular mass in two population-based studies. Data was obtained from two German population-based studies (KORA and SHIP, participants' ages 25-84 years). We identified 114 normotensive current smokers and 185 normotensive all-time non-smokers in KORA as well as 400 and 588 such individuals in SHIP. Echocardiographic LVM was obtained at baseline (T0) and follow-up after ten years (T1) in KORA and at follow-up (T1) in SHIP. Additionally, pulse-wave analysis-based central aortic pressure and augmentation index (AIx) were measured at T1 in KORA. Cross-sectional analysis, using KORA T0 and SHIP T1, revealed in both studies a higher covariate-adjusted LVM and left ventricular mass index (LVMI) in smokers as compared with non-smokers. Moreover, in the KORA T1 examination, the smokers demonstrated a more pronounced increase, relative to baseline, of LVM.
(+13.5%) and LVMI (+13.4%) compared to non-smokers (+8.59% and +8.65%; p=0.036 and 0.042, respectively). Additionally, at KORA T1 smokers had a higher central systolic blood pressure and higher AIx than non-smokers (p=0.012 and p=0.001, respectively). The difference in central aortic pressure due to enhanced and more prolonged wave reflection may explain our finding of a further pronounced increase in left ventricular wall thickness and mass over time in smokers.