

Longitudinal Strain Is Not Associated With Clinic Central Systolic Blood Pressure in a Young Normotensive Population

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Objectives: Increased central systolic blood pressure (cSBP) is associated with target organ damage (TOD) of the heart as traditionally quantified by left ventricular mass (LVM).¹ However, longitudinal strain (LS), a sensitive marker of left ventricular (LV) function, was recently reported as reduced in hypertensive patients with normal LVM.² This marker may be a more sensitive indicator of sub-clinical TOD than LVM. The purpose of this study was to determine if cSBP was more strongly associated with LS than LVM in a young normotensive population.

Methods: Seventy-four young healthy normotensive adults (23 ±4yrs, 45% male) took part in the study. LVM and LS were measured using 2-D and speckle tracking echocardiography respectively (Vividq, GE Healthcare) with LVM indexed to body surface area (LVMI). Supine office peripheral SBP (pSBP) and cSBP were measured using a validated automated device which was calibrated using peripheral diastolic and mean BP (Mobil-O-Graph, IEM). The relationships between cSBP and LVMI and LS were explored using Pearson product moment correlation.

Results: Participants had normal pSBP (120 ±11 mmHg) and LVMI (84 ±17g/m²) values. Central SBP averaged 133 ±21 mmHg while mean LS was -18 ±2 %. Central SBP was significantly associated with LVMI ($r=0.486$, $P<0.0001$) but not associated with LS ($r=0.137$, $P=0.252$).

Conclusion: Despite a strong association with LVMI, cSBP was not associated with LS in the current study population. Normotension may be an insufficient haemodynamic stimulus to impact LV LS in healthy young adults. Future studies should investigate how incremental chronic increases in cSBP affect LS. This may elucidate at what point cSBP becomes a negative influence on LS and whether changes to this physiological marker precede clinically relevant changes to LVMI.

¹ Protogerou AD et al. J Hypertens 2007; 2: 265-72.

² Imbalzano E et al. Echocardiography 2011; 6: 649-657.