**CMR DEROIVED CENTRAL AORTIC SYSTOLIC PRESSURE IS A SUPERIOR PREDICTOR OF AFTERLOAD IN REPAIRED COARCTATION**

**Poster Contributions**  
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**Background:** Hypertension is one of the major causes of late mortality in patients with repaired coarctation of the aorta (CoA) even in the absence of significant recoarctation. However, brachial systolic pressure (BSP) may not accurately reflect central systolic pressure (CASP), which is the driver of pathology. Recently, it has been shown that it is possible to accurately estimate CASP using CMR data and a simple exponential model of the arterial pressure-area relationship. The aims of this study were i) To demonstrate that it is feasible to measure CASP in patients with CoA and ii) To demonstrate that CASP is a better indicator of afterload represented by increased LV mass (LVM); compared with conventional metrics, such as coarctation index (CI) and BSP.

**Methods:** 50 subjects, 34 patients with repaired CoA, mean age 28±2yrs (76% male) and 16 healthy controls, 25±2yrs (69% male) were recruited. Ascending aorta area curves were obtained using a spiral phase-contrast CMR flow sequence. CASP was derived by calibrating area curves to, brachial oscillometric, mean and diastolic pressures using a validated exponential pressure-area model. LVM was obtained using cine CMR and CI was measured from 3D angiographic data. The determinants of LVM index were assessed using multivariable linear regression analysis.

**Results:** Differences between patients and controls were more significant with CASP (117±2 vs 104±2mmHg, p=0.0003) than BSP (126±3 vs 116±3mmHg, p=0.02). There were no differences between patients and controls in mean or diastolic blood pressure. LVM index was higher in patients 75.2±2.8g/m2 compared to controls 60.7±2.2g/m2, p=0.0002. In CoA patients, only gender (β=0.5, p=0.003) and CASP (β=0.4, p=0.008) were independently associated with LVM index, model R=0.69. Importantly, there were no independent associations of LVM index with BSP or CI.

**Conclusion:** In this study we have shown that noninvasive CASP is an important biomarker for increased afterload following CoA repair. Importantly, conventional metrics, CI and BSP were not independently associated with LVM in this study. CASP may represent a superior target for cardiovascular risk reduction in this condition and is easily measured using CMR.