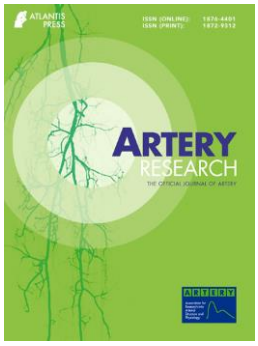

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Poster Presentation Abstract

P4 — Clinical Science

P4.02
ASSESSING VENTRICULAR—VASCULAR INTERACTIONS NON-INVASIVELY IN HEALTHY ADOLESCENTS☆

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Background: Characterization of normal ventricular—vascular interactions by non-invasive assessment in healthy adolescents may provide new mechanistic insights into altered physiological states in congenital and acquired heart disease in this age group.
Methods: Ventricular and vascular measures were non-invasively determined in 113 healthy adolescents (57 females, aged 10—18 years) on the same occasion. Ventricular assessment included standard echocardiographic M-mode and 2D volumetric techniques, and pulse and tissue Doppler imaging. Vascular assessment included carotid and brachial artery ultrasound, applanation tonometry and echo-Doppler of the aorta. Arterial (Ea) and left ventricular (LV) end-systolic (Ees) elastance were estimated noninvasively and their ratio used to assess ventricular-arterial coupling. Sample characteristics were assessed against a standard normal distribution. Relationships were tested using Pearson's correlations. Statistical significance was considered at $p<0.01$.
Results: All measures were normally distributed. Carotid intima-media thickness (CIMT) had significant positive correlations (see Table) with LV mass-indexed to BSA, LV mean velocity of circumferential fibre shortening corrected (VCFc), mitral valve (MV) pulse/tissue Doppler velocity ratio (E/E′) and Ea/Ees ratio, but a negative correlation with Ees. Central pulse wave velocity (PWV) around the aortic arch by echo-Doppler assessment had significant positive correlations with LV ejection fraction (EF) and myocardial performance index (MPI). Aortic PWV from carotid to femoral artery by applanation tonometry and flow-mediated dilatation (FMD) showed no significant correlations.
Conclusions: Ventricular-vascular interactions were found with proximal rather than distal aortic and arterial structure and function. These non-invasively determined ventricular-vascular interactions may be of benefit in monitoring progression and therapeutic response in adolescent disease populations.

Variable	CIMT	FMD	Aortic PWV	Central PWV
Mean±SD	0.431±0.046 mm	7.4±3.1%	5.0±0.9 m/s	4.5±1.1 m/s
LV EF 61±6%	$r=+0.06$, $p=0.54$	$r=+0.07$, $p=0.53$	$r=-0.01$, $p=0.99$	**$r=+0.26$, $p<0.01$**
LV VCFc 1.13±0.17 circ/s	**$r=+0.28$, $p<0.005$**	$r=-0.06$, $p=0.57$	$r=+0.01$, $p=0.91$	$r=+0.19$, $p=0.05$
LV mass-indexed 65±12 g/m^2	**$r=+0.25$, $p<0.01$**	$r=-0.08$, $p=0.42$	$r=-0.08$, $p=0.43$	$r=+0.09$, $p=0.37$
LV MPI 0.3±0.09	$r=+0.17$, $p=0.08$	$r=+0.05$, $p=0.63$	$r=+0.03$, $p=0.73$	**$r=+0.30$, $p<0.01$**
MV E/E′ 5.2±0.9	**$r=+0.25$, $p<0.01$**	$r=-0.08$, $p=0.44$	$r=+0.06$, $p=0.56$	$r=+0.15$, $p=0.12$
Ea 1.63±0.44 mmHg/ml	$r=-0.17$, $p=0.08$	$r=+0.06$, $p=0.55$	$r=-0.13$, $p=0.18$	$r=+0.15$, $p=0.11$
Ees 3.13±1.01 mmHg/ml	**$r=-0.27$, $p<0.01$**	$r=+0.08$, $p=0.40$	$r=-0.11$, $p=0.26$	$r=+0.07$, $p=0.46$
Ea/Ees 0.54±0.12	**$r=+0.28$, $p<0.01$**	$r=-0.14$, $p=0.17$	$r=+0.03$, $p=0.74$	$r=+0.09$, $p=0.36$

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