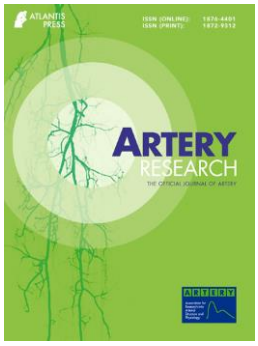

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PO-10: VASCULAR FUNCTION IN INDIVIDUALS WITH DOWN SYNDROME

Sang Ouk Wee, Alexander J. Rosenberg, Kanokwan Bunsawat, Garett Griffith, Tracy Baynard, Bo Fernhall

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1A). For recipient group, mean SBP, DBP, and BMI trended down after transplantation. However, these values increased to almost the same levels of pre-transplantation at 3-month post-transplant, and only DBP and BMI trended up beyond pre-transplant values at 6-month post-transplant (Figure 1B). Among 24 donors, 13 and 11 patients were living-related (LRD) and living unrelated donors (LUD), respectively. SBP, but not DBP continuously decreased in both LRD and LUD. Conversely, BMI was up trending in LRD, but decreased at 2-week post-donation, and then rebounded at 6-month (Figure 2A and 2B). Of all 24 recipients, 13 and 11 patients were living-related (LRR) and living unrelated renal transplant recipients (LUR), respectively. SBP, DBP, and BMI in LRR decreased until 1-month post-transplant and increased to above pre-transplant levels at 6-month post-transplant without statistical significance (Figure 2C). LUR group had the same patterns of SBP, DBP, and BMI, but SBP and DBP at 1-week and 1-month post-transplantation almost significantly decreased from the pre-transplant levels (Figure 2D).

Conclusion: BP and BMI in both donors and recipients seem to be positively correlated, and BMI rebounded beyond the pre-donation and pre-transplant levels. Early post-transplant SBP and DBP appear to be better improved in LUR than LRR group.

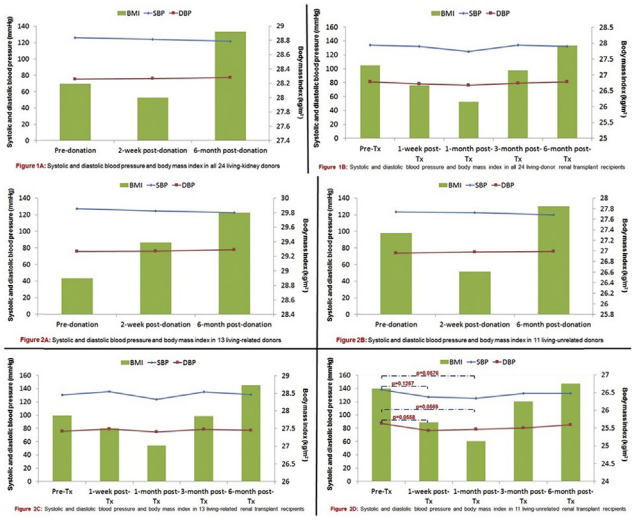

Figure 1A: Systolic and diastolic blood pressure and body mass index in all 24 living-kidney donors

Figure 1B: Systolic and diastolic blood pressure and body mass index in all 24 living-donor renal transplant recipients

Figure 2A: Systolic and diastolic blood pressure and body mass index in 13 living-related donors

Figure 2B: Systolic and diastolic blood pressure and body mass index in 11 living-unrelated donors

Figure 2C: Systolic and diastolic blood pressure and body mass index in 13 living-related renal transplant recipients

Figure 2D: Systolic and diastolic blood pressure and body mass index in 11 living-unrelated renal transplant recipients

young obese adults with normal metabolic profile still exhibited comparable central hemodynamics and arterial stiffness as normal-weight adults, suggesting preserved vascular health despite initial carotid vascular remodeling.

Table 1 Comparisons of central hemodynamics and arterial stiffness in normal-weight and obese adults.

	Normal-Weight (n=11)	Obese (n=13)
Percent body fat (%) *	31.1±1.7	41.9±1.7
Total cholesterol	180±14	176±11
High density lipoprotein (mg/dL)	62±3	51±5
Low density lipoprotein (mg/dL)	103±14	110±12
Triglycerides (mg/dL)	100±19	85±11
Glucose (mg/dL)	96±4	98±5
Brachial SBP (mmHg)	109±1	109±3
Brachial DBP (mmHg)	70±2	73±2
Aortic SBP (mmHg)	93 ±3	96±3
Aortic DBP (mmHg)	65±2	69±2
HR (bpm)	62±2	58±3
cIMT (mm) *	0.37±0.01	0.44±0.02
CAVI	6.0±0.2	6.0±0.2
β-Stiffness	5.5±0.4	5.2±0.4
Ep (kPA)	66.3±5.3	62.8±5.3
AC (%)	1.02±0.07	1.20±0.09
AIx (%)	7±4	6±3
AIx@75 (%)	0±3	-2±3
AP (mmHg)	2±1	2±1
FPH (mmHg)	25±1	25±1
RPH (mmHg)	38±6	34±6
RI (%)	19±4	24±9

Data are mean±SE. BMI, body mass index; cIMT, carotid intima-media thickness; CAVI, cardio-ankle vascular index; β-stiffness, beta stiffness; Ep, elastic modulas; AC, arterial compliance; SBP, systolic blood pressure; DBP, diastolic blood pressure; MAP, mean arterial pressure; HR, heart rate; AIx, augmentation index; AIx@75, augmentation index normalized to heart rate of 75 bpm; FPH, forward pulse height; RPH, reflected pulse height; RI, reflection index. *significant group difference based on an independent *t*-test ($P<0.05$).

PO-09
CENTRAL HEMODYNAMICS AND ARTERIAL STIFFNESS IN YOUNG OBESE ADULTS: THE PRELIMINARY FINDING

K. Bunsawat, G. Grigoriadis, T. Hilgenkamp, B. Fernhall, T. Baynard
Integrative Physiology Laboratory, Department of Kinesiology and Nutrition, University of Illinois at Chicago, Chicago, IL, United States

Changes in central hemodynamics and arterial stiffness are associated with augmented cardiovascular risks and have been reported in obese adults with metabolic syndrome. It is unclear whether this observation may also be present in young healthy obese adults with normal metabolic profile.

Objectives: To compare measures of central hemodynamics and arterial stiffness in young normal-weight vs. obese adults.

Methods: There were 11 normal-weight (female=6; age 25±2 yrs; BMI 22.4±0.6 kg/m^2) and 13 obese adults (female=6; age 27±1 yrs; BMI 32.7±0.6 kg/m^2). Central hemodynamics were measured using SphygmoCor and wave separation analysis. Ultrasonography was used to measure carotid intima-media thickness (cIMT) and arterial stiffness (beta stiffness (β), elastic modulus (Ep), arterial compliance (AC)). Cardio-ankle vascular index (CAVI) was measured using VaSera and is another index reflecting the stiffness of the artery from the heart to ankles. Percent fat was determined using DEXA.

Results: Obese adults exhibited higher percent body fat and cIMT than normal-weight adults ($P<0.05$), with no group differences in metabolic profile. No group differences were observed for brachial and aortic blood pressures, heart rate, arterial stiffness, and wave separation variables.

Conclusion: The larger carotid intima-media thickness in young obese adults suggest early remodeling of the vasculature as a result of obesity. However,

PO-10
VASCULAR FUNCTION IN INDIVIDUALS WITH DOWN SYNDROME

Sang Ouk Wee, Alexander J. Rosenberg, Kanokwan Bunsawat, Garett Griffith, Tracy Baynard, Bo Fernhall
University of Illinois at Chicago, Chicago, IL, United States

Individuals with Down syndrome (DS) experience premature aging. Arterial stiffness increases with advancing biological age and predicts cardiovascular disease. However, only limited studies investigated arterial function in individuals with DS. Thus, the impact of DS on vascular function still remains poorly understood.

Purpose: To compare vascular function between individuals with and without DS (control).

Methods: Twenty-seven volunteers (DS=13, Control=14) participated in this study. Central arterial stiffness indices (β-stiffness, Ep and circumferential strain) were measured by carotid ultrasonography and analyzed with B-mode, echo tracking and strain analysis. Cardio-ankle Vascular Index (CAVI) and carotid blood pressure (carBP) were measured using a limb cuff system and applanation tonometry (SphygmoCor), respectively. In addition, heart rate (HR) was recorded by finger photoplethymography.

Results: There were significant differences in CAVI (lower) and circumferential strain (higher) in individuals with DS compared to individuals without DS ($p<0.05$). No group differences were observed for β-stiffness and Ep.

Conclusions: Our results suggest that individuals with DS have lower arterial stiffness than that of individuals without DS. Interestingly, circumferential carotid strain was greater in persons with DS, with no differences in β-stiffness, suggesting the greater strain may have been a function of greater pulse pressure in individuals with DS.

	DS (N = 13)	Control (N = 14)
carSBP (mmHg)	133 ± 22	126 ± 14
carDBP (mmHg)	74 ± 8	75 ± 9
HR (bmp)	62.5 ± 11.9	64.3 ± 13.1
Circumferential Strain ‡	9.94 ± 3.37	7.48 ± 2.56
R-CAVI ‡	4.86 ± 0.83	5.84 ± 0.68
L-CAVI ‡	4.97 ± 0.95	5.81 ± 0.68
β-Stiffness	5.24 ± 1.40	5.65 ± 1.99
Ep	72.38 ± 20.84	76.29 ± 20.48

‡ Significant group difference. Mean ± SD, Significance level, $p < 0.05$

PO-11
MULTIPLE SCLEROSIS PATIENTS EXPERIENCE MORE DECREMENTS IN CAROTID ARTERY FUNCTIONAL PROPERTIES WITH AGING THAN AGE-MATCHED PEERS

Garett Griffith [1], Thessa Hilgenkamp [1], Rachel E. Klaren [2], Sang Ouk Wee [1], Robert W. Motl [2], Tracy Baynard [1], Bo Fernhall [1]
[1]*Integrative Physiology Laboratory, University of Illinois at Chicago, IL, United States*
[2]*Exercise Neuroscience Research Laboratory, University of Illinois at Urbana-Champaign, Champaign, IL, United States*

Introduction: Peak prevalence of multiple sclerosis (MS) is approaching 60 years of age, suggesting an aging patient population compared to past reports. Aging is independently associated with increased cardiovascular disease risk. Additionally, arterial function is compromised with aging. Carotid artery stiffness serves as a non-invasive method to quantify aspects of arterial function. As MS patients increase their average lifespan, it is unclear if they may experience differential changes in aspects of carotid artery function compared to their healthy age-matched peers.
Objective: To compare carotid artery structure and function between young and older subjects with and without MS.
Methods: After 10 minutes of supine rest, 120 subjects (MS=89, Control=31) underwent applanation tonometry and ultrasonography of the carotid artery. Subjects were classified as young or older (<50 and ≥50 years, respectively).
Results: See table below. In those with MS, carotid artery pulse pressure (PP), carotid intima media thickness (IMT), beta stiffness, and elastic modulus were higher, and arterial compliance was lower, in the older group compared to young subjects, whereas no differences were detected between young and older subjects in the control group.
Conclusion: These data show that older subjects with MS exhibit more structural and functional alterations in carotid artery indices than older controls compared to their young counterparts. This highlights the importance of increased efforts to explore early interventions to preserve arterial function in those with MS.

	Control (n=31)		MS (n=89)	
	Young (n=15)	Older (n=16)	Young (n=44)	Older (n=45)
Carotid SBP (mmHg)	113.5 ± 3.7	116 ± 3.0	103.2 ±1.6	112.0 ± 3.6
Carotid DBP (mmHg)	74.8 ± 2.2	76.8 ± 2.2	70.3 ± 1.2	74.1 ± 1.7
Carotid MAP (mmHg)	90.1 ± 2.5	91.9 ± 2.4	84.0 ± 1.3	90.3 ± 1.9
Carotid PP (mmHg)	38.7 ± 2.2	39.2 ± 2.4	32.9 ± 0.9	40.1 ± 1.4*
Carotid IMT (mm)	0.41 ± 0.02	0.48 ± 0.02	0.48 ± 0.01	0.61 ± 0.02*
Beta Stiffness (AU)	6.30 ± 0.46	7.38 ± 0.56	6.02 ± 0.30	8.68 ± 0.40*
Elastic Modulus (kPa)	77.31 ± 6.68	93.67 ± 7.32	68.76 ± 3.57	109.27 ± 5.56*
Arterial Compliance (mm^2/kPa)	1.11 ± 0.10	0.87 ± 0.05	1.17 ± 0.67	0.81 ± 0.05*

Mean ± SEM. *Significant difference between Young and Older groups.

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PO-12
RELATIONS BETWEEN AORTIC STIFFNESS AND LEFT VENTRICULAR MECHANICAL FUNCTION

Vanessa C. Bell [1], Elizabeth L. McCabe [2], Martin G. Larson [2,3], Jian Rong [3], Allison A. Merz [4], Ewa Osypiuk [3], Birgitta T. Lehman [3], Plamen Stantchev [3], Jayashri Aragam [5], Emelia J. Benjamin [3,6,7], Naomi M. Hamburg [7,8], Ramachandran S. Vasan [3,6,7], Gary F. Mitchell [1], Susan Cheng [3,4]
[1]*Cardiovascular Engineering, Inc., Norwood, MA, United States*
[2]*Department of Biostatistics, Boston University School of Public Health, Boston, MA, United States*
[3]*Framingham Heart Study, Framingham, MA, United States*
[4]*Division of Cardiovascular Medicine, Department of Medicine, Brigham and Women's Hospital, Boston, MA, United States*
[5]*Veterans Administration Hospital, West Roxbury, MA, United States*
[6]*Department of Epidemiology, Boston University School of Public Health, Boston, MA, United States*
[7]*Whitaker Cardiovascular Institute, Preventive Medicine and Cardiology Sections, Boston University School of Medicine, Boston, MA, United States*
[8]*Evans Department of Medicine, Boston University School of Medicine, Boston, MA, United States*

Objectives: Left ventricular contraction produces longitudinal strain in the proximal aorta. As a result, aortic stiffening may impair optimal mechanical ventricular-vascular coupling and left ventricular (LV) systolic function, particularly in the long axis. LV global longitudinal strain (GLS) has recently emerged as a sensitive measure of early cardiac dysfunction. In this study, we investigated the relation between aortic stiffness and GLS in a large community-based sample.
Methods: In 2516 participants (age 39-90 years, 57% women) of the Framingham Offspring and Omni cohorts, free of cardiovascular disease, we performed tonometry to measure aortic stiffness and echocardiography to assess cardiac function. Aortic stiffness was evaluated as carotid-femoral pulse wave velocity (CFPWV) and as characteristic impedance (Zc), and GLS was calculated using speckle tracking-based measurements.
Results: In multivariable analyses adjusting for age, sex, height, systolic blood pressure, augmentation index, LV structure, and additional cardiovascular disease risk factors, increased CFPWV (β±SE: 0.122±0.030 SD strain per SD CFPWV, P<0.0001) and Zc (0.091±0.029 SD/SD, P=0.002) were both associated with worse (less negative) GLS. We observed effect modification by sex of the relation between Zc and GLS (P=0.004); in sex-stratified multivariable analyses, the relation between greater Zc and worse GLS persisted in women (0.145±0.040, P=0.0003) but not in men (P=0.73).
Conclusion: Higher aortic stiffness was associated with worse GLS after adjusting for hemodynamic variables. Parallel reductions in LV long axis shortening and proximal aortic longitudinal strain in individuals with a stiffened proximal aorta may represent a manifestation of abnormal direct mechanical ventricular-vascular coupling.

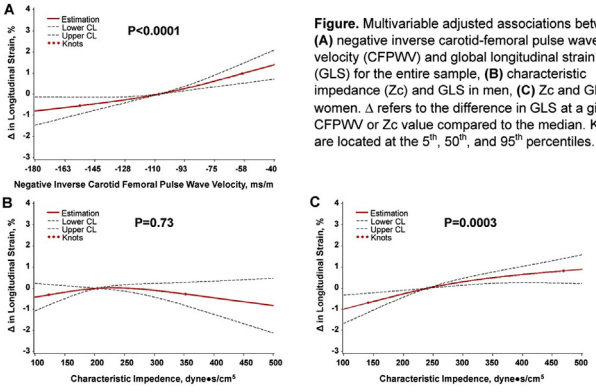

Figure. Multivariable adjusted associations between **(A)** negative inverse carotid-femoral pulse wave velocity (CFPWV) and global longitudinal strain (GLS) for the entire sample, **(B)** characteristic impedance (Zc) and GLS in men, **(C)** Zc and GLS in women. Δ refers to the difference in GLS at a given CFPWV or Zc value compared to the median. Knots are located at the 5th, 50th, and 95th percentiles.