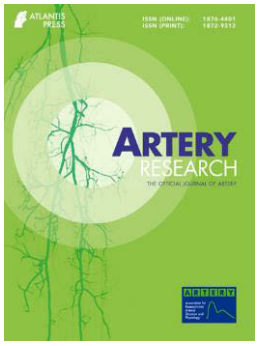

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NAA1: NICOTINAMIDE RIBOSIDE SUPPLEMENTATION REDUCES AORTIC STIFFNESS AND BLOOD PRESSURE IN MIDDLE-AGED AND OLDER ADULTS

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in systolic/diastolic BPs and pulse pressure averaged 11.8/−1.6, 12.7/−1.8 and 10.3/−1.2 mmHg and 13.4, 14.4 and 11.5 mmHg, respectively ($P < 0.0001$). Cornel voltage and index averaged 1.18 mV and 114.8 mV × ms. The Cornell voltages were 0.104/0.086 and 0.082/0.105 mV higher in relation to brachial 24-h and asleep systolic/diastolic BP (per 1-SD), respectively, and 0.088/0.90 mV and 0.087/0.107 mV higher in relation to central BP. The corresponding estimates for the Cornel indexes were 9.6/8.6 and 8.2/105 mV × ms peripherally and 8.6/8.9 and 8.8/10.7 mV × ms centrally. The regression slopes were similar for brachial and central BP ($P \geq 0.054$). Associations of the ECG measurements with awake BP, PP, the augmentation ratio and pressure amplification did not reach significance.

Results: NIAGEN® safely and effectively raised circulating levels of NAD^+ and related metabolites. Although no effect was observed on endothelial function, NIAGEN® significantly lowered PWV as well as systolic (SBP) and diastolic blood pressure (DBP) in all subjects ($P < 0.05$). When separated by baseline BP status, the BP-lowering effect of NIAGEN® was observed in pre-hypertensive (pHTN, n = 13) but not normotensive (N = 11) individuals ($P < 0.01$). Interestingly, NIAGEN® was lowered in all subjects regardless of baseline BP status.

Conclusion: Chronic NIAGEN® supplementation lowers SBP in pHTN older adults and reduces aortic stiffness, independent of baseline blood pressure status.

Table Association of ECG Cornell voltage and indexes with peripheral and central BP.

	Cornell voltage ($S_{V3} + R_{aVL}$, mV)				Cornell index (Cornell voltage × QRS duration, mV·ms)			
	Peripheral BP		Central BP		Peripheral BP		Central BP	
	Estimate (95% CI)	*P*	Estimate (95% CI)	*P*	Estimate (95% CI)	*P*	Estimate (95% CI)	*P*
Systolic BP								
24-h	0.104 (0.016 to 0.191)	0.021	0.088 (0.0003 to 0.177)	0.049	9.61 (0.65 to 18.57)	0.036	8.58 (−0.40 to 17.56)	0.061
Awake	0.086 (−0.001 to 0.175)	0.054	0.062 (−0.026 to 0.151)	0.17	7.69 (−1.30 to 16.69)	0.093	5.80 (−3.23 to 14.82)	0.21
Asleep	0.082 (−0.006 to 0.170)	0.068	0.087 (−0.001 to 0.175)	0.053	8.17 (−0.82 to 17.16)	0.075	8.76 (−0.217 to 17.74)	0.056
Diastolic BP								
24-h	0.086 (−0.002 to 0.174)	0.056	0.090 (0.002 to 0.178)	0.045	8.57 (−0.41 to 17.55)	0.061	8.93 (−0.04 to 17.90)	0.051
Awake	0.056 (−0.032 to 0.145)	0.21	0.060 (−0.029 to 0.149)	0.18	5.62 (−3.42 to 14.65)	0.22	5.97 (−3.06 to 15.00)	0.19
Asleep BP	0.105 (0.017 to 0.192)	0.020	0.107 (0.019 to 0.194)	0.017	10.53 (1.60 to 19.47)	0.021	10.71 (1.78 to 19.64)	0.019
Pulse pressure								
24-h	0.040 (−0.049 to 0.129)	0.38	0.016 (−0.073 to 0.105)	0.72	3.07 (−5.99 to 12.13)	0.50	1.31 (−7.76 to 10.38)	0.77
Awake	0.048 (−0.041 to 0.137)	0.29	0.012 (−0.077 to 0.101)	0.78	3.63 (−5.43 to 12.68)	0.43	0.68 (−8.40 to 9.74)	0.88
Asleep	0.001 (−0.091 to 0.088)	0.98	0.001 (−0.087 to 0.090)	0.98	−0.29 (−9.37 to 8.78)	0.95	0.21 (−8.86 to 9.28)	0.96

ECG refers to electrocardiography. BP stands for blood pressure. Cornell voltage is the voltage sum of S wave in precordial V3 lead (S_{V3}) and R wave in limb aVL lead (R_{eVL}), while Cornell index is the product of QRS duration multiplied by the Cornell voltage. The estimate (95% Confidence Interval, CI) of the association was unadjusted and expressed as 1-SD increase of BP. *P* value is for significance of the estimate. The association estimates of Cornell voltage ($P \geq 0.054$) and index ($P \geq 0.079$) with central BP were not significantly different from those estimates with peripheral measurements.

Conclusions: The diurnal rhythm of peripheral and central BP run in parallel. Central BP does not improve the association of Cornell voltage or index with peripheral BP.

Joint Session with LATAM and North American Artery

NAA1

NICOTINAMIDE RIBOSIDE SUPPLEMENTATION REDUCES AORTIC STIFFNESS AND BLOOD PRESSURE IN MIDDLE-AGED AND OLDER ADULTS

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Purpose: Regular calorie restriction (CR) improves endothelial function and lowers aortic stiffness in older mice and humans; however, adherence to sustained CR remains poor, and possibly unsafe in normal weight older adults. Nicotinamide adenine dinucleotide (NAD^+) is an important signaling molecule involved in the beneficial effects of CR and we have recently demonstrated that boosting NAD^+ reverses these measures of arterial aging in older mice. The purpose of this study was to determine if supplementation with nicotinamide riboside (NIAGEN®; ChromaDex, Inc.), a naturally occurring precursor to NAD^+, would similarly improve vascular function with aging in humans.
Methods: Healthy middle-aged and older adults (65 ± 2 yrs, n = 24) received oral NIAGEN® (500 mg, 2x/day) and placebo capsules for six weeks each in a randomized, placebo-controlled crossover study. Blood pressure (BP), aortic stiffness (carotid-femoral pulse wave velocity [PWV]), and endothelial function, (brachial artery flow-mediated dilation [FMD]), were measured at the end of each intervention phase.

LAA1

HEMODYNAMIC AND STRUCTURAL ARTERIAL PARAMETERS' ASSOCIATION WITH INTERINDIVIDUAL VARIATIONS OF BODY MASS INDEX IN CHILDHOOD AND ADOLESCENCE

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Background: Several works analyze arterial parameters' (stiffness levels, wall thickness, etc.) association with variations of body mass index (BMI) in pediatric populations.
However, none integrate different arterial parameters as comparable continuous (standardized) variables, in order to assess their association with standardized (age- and sex-independent) BMI scores (zBMI).
Aims: To analyze the association of standardized arterial parameters with interindividual variations of zBMI.
Methods: 609 children and adolescents (mean age/range: 12/4−18 years, 45% females) were studied. Body mass index (BMI) was calculated. zBMI scores were derived from population-based tables. Non-invasive arterial assessment was performed: oscillometric measurements of peripheral systolic (pSBP), diastolic (pDBP) and pulse pressure (pPP), and central (applanation tonometry) systolic (cSBP), diastolic (cDBP) and pulse pressure (cPP); ultrasonographic measurements of common carotid (CCA), femoral (CFA) and brachial (BA) diastolic diameters (DD), and CCA intima-media thickness (cIMT). Arterial elastic moduli (EM) were calculated. Arterial parameters were standardized with equations derived from a reference population (no cardiovascular risk factor exposure). Simple linear regression models were obtained for the different standardized arterial parameters with zBMI as the independent variable. Statistical threshold was 0.05.
Results: We found a positive and significant association between zBMI and standardized pSBP ($\beta = 0.210$), pPP ($\beta = 0.150$), cSBP ($\beta = 0.204$) and cPP ($\beta = 0.188$), CCA DD ($\beta = 0.145$), FCA ($\beta = 0.143$), BA ($\beta = 0.210$), cIMT ($\beta = 0.135$), and CCA EM ($\beta = 0.117$).