

Vascular Function in individuals with Down Syndrome

*Sang Ouk Wee, Alexander J. Rosenberg, Kanokwan Bunsawat, Garrett 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 B-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
B-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, $p < 0.05$