

Multiple Sclerosis Patients Experience More Decrements in Carotid Artery Functional Properties with Aging than Age-Matched Peers

Garett Griffith¹, Thessa Hilgenkamp¹, Rachel E. Klaren², Sang Ouk Wee¹, Robert W. Motl², Tracy Baynard¹, Bo Fernhall¹

¹*Integrative Physiology Laboratory, University of Illinois at Chicago, 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.

Supported by the National Multiple Sclerosis RG 4702A1/2