Differences in Carotid Arterial Characteristics Based On Years since Diagnosis in Relapsing Remitting Multiple Sclerosis Patients

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INTRODUCTION: Persons with multiple sclerosis (MS) experience a decreased life expectancy and greater burden of cardiovascular disease (CVD) compared to age-matched healthy peers. Carotid artery dysfunction in the form of increased stiffness and reduced compliance are often precursors to the clinical manifestation of CVD. Carotid artery dysfunction is a common effect of aging, and may occur earlier in those with MS as the progression of CVD may be accelerated in this population. **OBJECTIVE:** To study the differences in carotid arterial characteristics in both young and older persons with MS based on length of clinical diagnosis. **METHODS:** Twenty seven persons with MS (Expanded Disability Status Scale of 0 – 4.0) were divided into young (i.e. ≤ 50 years) or older (i.e. > 50 years) cohorts. Additionally, length of diagnosis (Dx) was determined to be short (i.e. ≤ 10 years) or long (i.e. > 10 years). Subjects completed echo tracking ultrasound assessments of the carotid artery (Aloka Hitachi) and results were analyzed using a 2 X 2 analysis of variance (ANOVA). Statistical significance was set at $p<0.05$. **RESULTS:** Carotid arterial function parameters were significantly better in the young subjects compared to older subjects. In the young group, Beta Stiffness Index and Elastic Modulus were significantly lower, and Arterial Compliance was significantly higher, in the short Dx group compared to the long Dx group. In the older group, no significant differences were observed in the short Dx group compared to the long Dx group. **CONCLUSION:** These data show an expected decline in arterial function as individuals with MS age. The differential stiffness and compliance properties seen in the young group based on length of diagnosis suggests that MS influences arterial health independent of age. This may be a result of the decrease in physical activity seen in chronic disease populations such as MS.

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	Young (n=16)		Older (n=11)	
	Short Dx (n=8)	**Long Dx (n=8)**	**Short Dx (n=3)**	**Long Dx (n=8)**
Age (years)[#]	35 ± 2	40 ± 2	54 ± 2	59 ± 2
Beta Stiffness Index (AU)[#]	4.89 ± .44*	6.14 ± .31	8.23 ± 1.37	8.05 ± .66
Elastic Modulus (kPa)[#]	55.01 ± 5.50*	69.19 ± 3.62	123.17 ± 23.28	99.50 ± 10.30
Arterial Compliance (mm^2/kPa)[#]	1.47 ± .12*	1.16 ± .08	1.04 ± .35	.96 ± .13

All data are presented as Mean ± SEM. *Significant difference between short and long Dx groups.
[#]Significant difference between young and older groups.