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7.3 ASSESSMENT OF BLOOD PRESSURE AND HEART RATE VARIABILITY IN MULTIPLE SCLEROSIS

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Background: Reported cardiovascular autonomic dysfunction (CAD) prevalence in Multiple Sclerosis (MS) varies between studies. As CAD lowers quality of life and may contribute to sudden death in MS, early CAD detection may assist treatment and risk identification.

Methods: In 23 MS patients and age and gender matched controls (38 ± 12 years, 15 female), continuous electrocardiogram and finger blood pressure were non-invasively acquired during 5 minutes supine rest. Baroreceptor sensitivity (BRS) was quantified through sequence and coherence analysis. Heart rate variability (HRV) was analysed in the standard manner and systolic blood pressure variability (SBPV) quantified in the very low (0.0033-0.04 Hz), low (0.04-0.15 Hz) and high (0.15-0.5 Hz) frequency ranges.

Results: HRV did not differ between the groups. BRS in the high frequency band was lower in MS than control (22 ± 13 and 39 ± 25 ms/mmHg, p = 0.007) as was normalised low frequency SBPV (0.70 ± 0.19 and 0.82 ± 0.14, p = 0.006). Normalised high frequency SBPV was greater in MS subjects (0.31 ± 0.19 and 0.18 ± 0.14, p = 0.006). Differences in high frequency SBPV indicate differences in respiratory feedback (not directly measured in this study) and in the low frequency range, differences in baroreceptor and/or chemoreceptor cardiovascular control.

Conclusions: These results indicate that MS subjects have altered degree of cardiovascular autonomic control compared to healthy subjects and the effect of the respiratory pathway warrants further investigation.

7.4 HIGHER CAROTID STRAIN IN INDIVIDUALS WITH DOWN SYNDROME AT REST AND DURING HYPOVOLUMIC SYMPATHOEXCITATION

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Background: Arterial stiffness and large artery function are independent risk factors for cardiovascular disease. (1) Individuals with Down Syndrome (DS) have autonomic dysfunction and known to have lower incidence of cardiovascular disease. (2) Limited literatures showed no difference in arterial stiffness in DS compared to a healthy, non-DS population using a longitudinal view of the carotid artery. (3) However, it is unknown if individuals with DS exhibit different circumferential strain compared to individuals without DS at rest or during a sympathoexcitation stimulus.

Purpose: To examine the differences in the carotid artery strain and its responsiveness to sympathoexcitation by hypovolemic lower body negative pressure (LBNP) in individuals with and without DS.

Methods: Twenty four volunteers (DS = 11, 23 yrs Control = 13, 23 yrs) participated in this study. Circumferential strain was measured by ultrasonography B-mode and radial strain from the longitudinal view was calculated using echo tracking analysis at rest, during and after sympathoexcitation stimulation by LBNP. Changes in hemodynamics (HR, BP) were recorded continuously.

Results: Compared with controls, individuals with DS have significantly higher strain values at all stages (p < 0.05) with no group interaction with hypovolemic sympathoexcitation stimulation. However, there were no differences in β-Stiffness or EP, suggesting that the differences in strain were due to differences in blood pressure.

Conclusions: Our results demonstrate significantly higher strain value, which indicates greater arterial movement in individuals with DS. However, these differences were likely due to higher BP in persons with DS.

1. References