

Pressor and Sympathetic Responses to Graded Skeletal Muscle Metaboreflex Activation in Females with Relapsing-Remitting Multiple Sclerosis

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ABSTRACT

Multiple sclerosis (MS) is a progressive disease characterized by demyelination in the central nervous system which disproportionately impacts females. Previous studies suggest MS-related exercise intolerance may be due to abnormal control of arterial blood pressure (BP) via the skeletal muscle metaboreflex. However, few studies have been performed and equivocal results reported. Discontinuity in prior data may be due to limited perturbation of metaboreflex activation using only low and moderate intensity exercise. **PURPOSE:** The purpose of this investigation was to test the hypothesis that females with MS have blunted BP and sympathetic responses to graded static handgrip (HG) exercise and isolated metaboreflex activation during postexercise ischemia (PEI) compared to healthy controls. **METHODS:** In 7 females with relapsing-remitting MS and 9 healthy female controls beat-to-beat BP (finometer) and muscle sympathetic nerve activity (MSNA; peroneal microneurography) were recorded at rest and during two minutes of handgrip performed at 30% and 40% maximum voluntary contraction followed by two minutes of PEI to isolate the muscle metaboreflex. **RESULTS:** There were no differences in resting mean arterial pressure (MAP; $P=0.16$) or MSNA burst frequency ($P=0.15$) between MS and controls. MAP and MSNA increased during 30% HG (MS: $\Delta 19.8 \pm 9.1$ mmHg vs. Con: $\Delta 17.8 \pm 5.4$ mmHg; $P=0.30$ and MS: $\Delta 17 \pm 12$ bursts/min vs. Con: $\Delta 18 \pm 17$ bursts/min; $P=0.46$) and 40% HG (MS: $\Delta 29.3 \pm 8.0$ mmHg vs. Con: $\Delta 30.0 \pm 6.9$ mmHg; $P=0.43$ and MS: $\Delta 36 \pm 16$ bursts/min vs. Con: $\Delta 40 \pm 9$ bursts/min; $P=0.30$) with no differences between groups. Likewise, MAP and MSNA responses were also not different during PEI post 30% HG (MS: $\Delta 15.8 \pm 7.6$ mmHg vs. Con: $\Delta 15.8 \pm 6.4$ mmHg; $P=0.50$ and MS: $\Delta 15 \pm 9$ bursts/min vs. Con: $\Delta 11 \pm 7$ bursts/min; $P=0.19$) or PEI post 40% HG (MS: $\Delta 25.8 \pm 6.3$ mmHg vs. Con: $\Delta 22.6 \pm 8.2$ mmHg; $P=0.43$ and MS: $\Delta 23 \pm 13$ bursts/min vs. Con: $\Delta 24 \pm 7$ bursts/min; $P=0.46$) between MS and controls. **CONCLUSION:** These preliminary data suggest intact skeletal muscle metaboreflex control of arterial BP in females with MS.