Effect of Fatigue on Spasticity in Multiple Sclerosis

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Introduction:
Disturbance in gait is known to occur in approximately 80% of persons with multiple sclerosis (MS) [1]. Fatigue and spasticity are among the most common and debilitating symptoms in this population and both have been shown to affect gait quality, speed and endurance. Fatigue is known to worsen with physical performance in MS [2], and there are anecdotal reports that spasticity is associated with worsening fatigue. However, the current literature provides little information regarding the relationship between spasticity and fatigue in persons with MS.

Discussion:
Contrary to our hypothesis, fatigue did not result in worsening of spasticity, resulting instead in significant increase. Clinically this suggests that the worsening of gait seen over time in persons with MS may be due to reasons other than spasticity. It is possible that the MAS was not sufficiently sensitive a measurement to accurately assess changes in spasticity, or that a fatigue inducing task other than walking may have resulted in different findings.

Methods
This study utilized a randomized crossover design. After obtaining informed consent, subject characteristics and demographics, subjects were randomized into walking (W) and resting (R) groups. All subjects received spasticity testing using the Modified Ashworth Scale (MAS). Subjects in the W group then underwent a 6-minute walk (6MW) to induce fatigue, while subjects in the R group laid supine for 6 minutes to minimize fatigue. Immediately following either 6-minute condition, MAS testing was repeated. This was performed on three separate trials over the course of a 5-day period, followed by a 2-week detraining period. Subjects then crossed over, so that those originally in the W group underwent the R protocol, and the subjects in the R group underwent the W protocol. Fatigue was measured using the Visual Analog Scale of Fatigue (VAS-F) before and after each 6 minute walk or rest.

Results:
16 subjects (EDSS 3.59) completed the study (See table 1). Mean MAS scores decreased significantly following the 6-minute walk from 1.054 to .827 (p=.015, SD=.089). MAS scores also decreased non-significantly in the non fatigued condition from .841 to .840 (p=.996, SD=.091). (See Fig 1) Mean VAS-F scores increased 29.5mm (p <.001) following the 6-minute walk indicating that MAS testing was performed in a fatigued condition.

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References