The Effects of PRE versus DAPRE on Fatigue, Strength and Quality of Life in Patients with Multiple Sclerosis

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Background
Conventionally, physical therapists do not prescribe rigorous strength training to individuals with Multiple Sclerosis (MS) due to fear of fatigue and exacerbation of symptoms.

Objectives/Purpose
This pilot study compared conventional, less aggressive strength training techniques of progressive resistance exercises (PRE) to a more aggressive strength training protocol of daily adjustable progressive resistive exercises (DAPRE) in individuals with MS. The purpose of this study was to examine the effects of three exercises for the triceps muscles utilizing PRE and DAPRE protocols on levels of fatigue and quality of life (QOL) in adults with MS. We hypothesized that there would be no significant differences in levels of fatigue between the PRE and the DAPRE conditions in adults with MS. Due to the standard 5-8 week requirement for strength changes we did not anticipate significant strength changes during this study, however, prior studies confirm that eliciting fatigue each training day will produce increased strength over time.

Methods
A repeated measures cross-over design was utilized. Data was collected on 6 Subjects with moderate degree of disability who were randomly assigned to one of the two exercise protocols, which was performed for one week, followed by a one week rest period, followed by one week of the other exercise protocol. Fatigue was measured with the Neurological Fatigue Index (NFI-MS), 36-item Short Form Health Survey (SF-36) and Visual Analog Fatigue Scale (VAFS). Strength of the triceps was measured with the MicroFet 2 dynamometer and QOL with the Functional Assessment of Multiple Sclerosis (FAMS).

Subjects
N=6 (1 Male, 5 Female)
Relapsing Remitting MS 2
Secondary Progressive 3
Primary Progressive 1
Mean Age 57.17 years
Median EDSS 6.25

Table 1: Subject Demographics

Results
The Wilcoxon Signed-Ranks Test was used to compare differences between fatigue, strength, and QOL after each exercise protocol. No significant differences were found between the two conditions (p=0.116 to 0.753). Therefore, we retained the null hypothesis and accepted our research hypothesis.

Table 4: Comparison of fatigue outcome measures at follow-up between PRE and DAPRE protocols

Conclusions
The findings of this study suggest that the expected immediate increase in fatigue following the DAPRE has no negative effects on the individuals QOL or Energy/Fatigue. Therefore, it may be possible to prescribe more aggressive exercise regimens for individuals with MS. Continued research could provide additional evidence that an individual with MS can benefit from the same levels of training as a person without MS. Future plans are to extend the time frame of each protocol to allow for a comparison of strength gains and to add additional muscle groups.

Discussion
The Results of this Pilot study support the current treatment trends of increasing the intensity for exercise training for individuals with MS. This represents a necessary paradigm shift into aggressive treatment of secondary symptoms of MS to allow for individuals to live a full life.

Table 2: PRE/DAPRE Protocols

Table 3: DAPRE Adjusted Working Weight

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