Effects of a Weight Based Training Program on MS Patients

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Introduction:

Low bone density, poor cognition, and depression are health risks in older adults, and especially people with multiple sclerosis (MS) due to steroid treatments and less mobility. Bone density is a measurement of how dense or strong bones are. Weight-based training may be one method in strengthening bones and providing a beneficial treatment for MS patient rehabilitation. Weight based training involves performing exercises without the use of actual weights, and instead with one's own bodyweight.

Objective:

This study aims to look at the effects of a weight-based training program on bone mineral density (BMD), cognition (ability to learn and understand), and other quality of life issues in MS patients.

Conclusions:

- Weight-based exercises can improve bone mineral density, cognition, and quality of life
- Improving these factors can mitigate health risks

Study Design:

- The subjects performed a 6 week training cycle which includes one session per week via zoom led by physical therapy and two session per week performed independently at the subject's home (video guide distributed).
- N=24 patient interventional series. Must be diagnosed with MS and have EDSS score less than 5.5
- Prior to the training phase, each subject will have a DEXA scan performed and must complete SDMT and MSIS-29 evaluations.
- Subjects would complete the SDMT and MSIS-29 evaluations again within two weeks of the completion of the training phase.
- 8 weeks after completion of the training phase of the study, each subject will return for a second bone density DEXA scan and complete both the SDMT and MSIS-29 evaluations for a third time.

Results:

- Significant differences between MSIS Time 1 and Time 3 on both the Physical subscale ($t(16)=2.67; p<.05$; Cohen's $d=1.17$)) and the Psych subscale ($t(16)=2.72; p<.05$; Cohen's $d= 1.26$)(improved scores).
- No differences between Time 1 and 2, except there was a trend ($p=.056$) of a positive change between Time 1 and Time 2 on the MSIS Physical subscale.
- These differences between T1 and T3 on both scales are clinically meaningful.
- There were no statistical or clinically meaningful changes on SDMT scores
- There were no differences in Dexa Scores between Times 1 and 2.

Training Protocol:

Table 1: Weight-based Training Exercise Regiment

Exercise	Reps	Sets
Wall Push-Ups	10	3
Chair Squats	10	3
Chair Dips	10	3
Step-Ups	10	3
Calf Raises	10	3

Study Limitations:

- Prolonged compliance
- Study performed during COVID pandemic
- Multiple variables in analyses

Recommendations:

- Provide longer training period for more efficacious results.
- Include weights in the training program for future studies.