A critical appraisal of "Effect of exercising at minimum recommendations of the multiple sclerosis exercise guideline combined with structured education or attention control education – secondary results of the step it up randomized controlled trial"

By

Megan Busker Sower, SPT

In partial fulfillment of the
requirements for the course:
PT 7240 Evidence-Based Practice in Physical Therapy

Department of Physical Therapy
Angelo State University
Member, Texas Tech University System

November 10, 2018

Abstract

The purpose of this paper is to perform a critical review of an article as it relates to the clinical question: Is fatigue management more important than physical activity level to manage exacerbation relapse period frequency in patients with Multiple Sclerosis (MS). The article was appraised for its strengths and weaknesses concerning the introduction, methods, results, and discussion sections. Overall the article is very well written and exhibits many strengths. However, the article demonstrates minimal clinical significance once outcomes were obtained. Despite the decreased clinical significance the appraisal will show that the research study performed was a necessary, valid, and provides a framework to continue to explore the relationship between fatigue and physical activity in individuals diagnosed with MS. The importance of this appraisal is to determine if there are option available to decrease exacerbation seen in MS that leads to disability. Also to determine if managing fatigue on a educational and physical activity level results in improved quality of life in those individuals living with MS.

Key words

Multiple Sclerosis, Critical Appraisal, Fatigue, Physical Activity, Exercise

Introduction

Multiple Sclerosis (MS) is a disease that impacts the neurological functions of the body. It is typically diagnosed at various times but it is common that individuals live with this disease for more than 2 decades. As this disease progresses it has multifactorial impacts on an individual's life and ability to participate in community and personal activities. A characteristic of MS is exacerbation periods of the disease that result in increased impact on an individual's life and/or disability. Also, MS individuals battle high levels of fatigue due to decreased efficiency throughout ADL's due to impacts of the disease. My critical appraisal of this article is to attempt to answer the question "Is fatigue management more important than physical activity level to manage exacerbation relapse period frequency in patients with Multiple Sclerosis"?

Methods

U.S. National Library of Medicine (PubMed) and Physiotherapy Evidence Database (PEDro) were used to obtain articles that were relevant to the clinical question. Keywords used in search were Multiple Sclerosis, Exercise, Rehabilitation, Fatigue, Physical Activity, Exacerbation, and Frequency. Limitation placed on search were no review articles could be used but case studies and clinical trials were allowed to maintain clinical relevance. Articles had to be published in the past 10 years. MS medical treatment has advanced significantly in the past decade and I wanted to keep up with interventions that would be relevant with current medical treatments. Free-full-text stipulation was also placed on the research. Once narrowing down searches I obtained 24 articles from PubMed and 29 articles from PEDro. It is of note that PEDro articles were returned prior to exclusion of review articles, inclusion of 10 year publication date, and inclusion of full-free-text. This was done manually upon review of articles.

The research article chosen was from PubMed and is titled “Effect of exercising at minimum recommendations of the multiple sclerosis exercise guideline combined with structured education or attention control education - secondary results of the step it up randomized controlled trial”. The article chosen was published in June of 2017 online to BMC Neurology. The authors were as follows: “Susan Coote, Marcin Uszynski, Matthew P. Herring, Sara Hayes, Carl Scarrott, John Newell, Stephen Gallagher, Aidan Larkin, and Robert W. Motl”. The study was also completed in several areas in Ireland. I chose this article because it placed my interest at the front of the study. It looked at implementing a guideline that is easy to follow for exercise while instituting social cognitive factors to promote exercise and decrease general fatigue. I choose this article based on the potential of it being the most relevant to my future practice as a Physical Therapist. I felt that it addressed exercise and educational factors that I could confidently incorporate if needed. The other articles available lacked clinical significance in my eyes.

Results

Summary of the study

This study focused on individuals diagnosed with MS and hadn’t had exacerbation in 12 weeks. Two groups were used to determine if social cognitive theory (SCT) education or attention control education were effective in decreasing factors associated with MS. Fatigue was not the only outcome measure assessed. Outcome measures were related to functional ability, psychological and psychosocial impact of MS. Each group performed a 10-week exercise program followed by their respective education. The results demonstrated statistical improvements in each group related to exercise and statistical improvements on psychological

and psychosocial factors in SCT compared to attention control education. Outcomes were assessed at 10 weeks and then again 3 months and 6 months. Following the 10 week intervention, individuals were asked to continue exercising on their own and education was no longer implemented. The results varied on the effectiveness of SCT education compared to outcome measures from baseline and to attention control education.

Appraisal of the study introduction

The introduction of the article was well written and was able to convey the need for this study to occur in today's MS population. The authors recognize this is a secondary study to the primary "Step it Up study" and identify that the primary study demonstrated positive correlation between exercise and improvement in functional outcome scales. First, the authors discussed how the exercise guidelines set forth have never been under review or been critically tested. Second, the need to add an educational component was identified due to MS being a multifactorial disease that doesn't impact physical components alone. Last, they stated that studies performed prior are limited in length of study. This study wanted to address long-term impacts of the interventions giving reason to assess outcomes at 10 week, 3 months, and 6 months. There were no limitations identified in this introduction.

Appraisal of the study methods

There were a multitude of strengths in the methods employed by the researchers that has led this article to be clinically valid upon publication. The authors listed the study as an experimental-randomized control trial with double-blind set-up that had a longitudinal duration. It had 65 participants at the beginning with attrition resulting in 54 individuals completing the

study entirely. The authors were upfront about why attrition occurred. The final sample size is a fair representation of MS individuals and the positives that can result from the received interventions. Another strength is 83% of individuals in the study had relapsing-remitting MS, and the average diagnosis date was 7 years prior to the study. Outcome measures used were valid and assessed by trained individuals. The authors provided citation on all outcome measures that can be reviewed independently.

Although the methods are saturated in strengths the limitations are in the details concerning outcome assessment and exercise activities. The authors failed to present on what order outcome measures were taken. Due to having various psychological and psychosocial outcome measures it might be imperative to know if one measure needs to be assessed prior to another so as to not influence the data. Also the authors failed to describe exact strengthening and aerobic activity that were performed during the 10-week intervention.

Appraisal of the study results

The authors were able to present the results in a manner that coordinated with the method introduction. All results addressed the original research question presented in the article. Along with appropriate tables the authors were able to demonstrate a positive correlation that SCT education had on individuals with MS when it came to psychological and psychosocial factors. The authors identified that both types of education groups demonstrated physical and functional improvements related to exercise alone.

The limitations to the results were that statistically significant data didn't relate to clinical significance. The p-values obtained for the outcome measures are small and therefore don't show a change that justifies significance for a clinical setting. The authors also neglected to include

MCID (minimal clinically important difference) and NNT (number needed to treat) into their result or discussion section.

Appraisal of the study discussion

There were some strengths within the discussion session of this paper but they are somewhat outweighed by the limitations. One strength is that the authors were up front about the limitations of their study. The authors identified that their functional outcomes were too numerous and therefore, they were not able to focus the study and present more clinically relevant results. However, the authors do feel this is a good base to start from and that they hope further, focused research is presented in relation to MS and its psychological, psychosocial, and physical factors.

The authors had a difficult time relating the results to meaningful clinical aspects. They also failed to tie most of the results to existing literature at this point. Though they identified that limited research had been done on the exercise guideline and the benefit of SCT education in the beginning; they did not tie the results of certain factors to previous research. I feel this somewhat diminishes the significance of the results because there is no presented supported information. The authors also cited several articles in the discussion that either had missing dates of publications or were over 9 years old at the point of publication of this article.

Discussion

This study resulted in minimal clinical significance at this time. Overall the study did demonstrate improved statistics on outcome measures related to fatigue at the end of the 10-week intervention. This result was seen in both the SCT educated and attention control education

groups. At the 3 and 6 month assessments only the SCT educated group demonstrated statistically significant improvements, from baseline and not in comparison to attention control group, and the results listed were not related to fatigue. Overall after appraisal of this article it demonstrated minimal clinical significance to the general population and to my clinical question.

Despite the study's limitation I feel the strengths overall make this article significant to future research. I am in favor of the research that was performed and feel it sets the base to further research MS and its multiple factors. Continued research needs to be done with more acuity to outcomes to determine what can have a positive effect on fatigue of an individual with MS and if limiting fatigue while maintaining general level of exercise can benefit the MS individual. Then I feel that research will need to focus on if limiting fatigue with improved or maintained exercise decrease exacerbation period frequency, duration, intensity.. I believe this would lead to decreased progression of the disease overall and allow decreased disability experienced by those diagnosed with MS. By decreasing disability and increased functional ability we should see a decrease negative psychological and psychosocial impact that is contributed to the diagnosis of MS.

As far as future treatment of patients is concerned I don't feel like this article provides a base for me to implement SCT education continuously. There was not enough statistically significant results that promote me to rely on SCT education to improve my patient's overall psychological and psychosocial impact. I do feel that the benefits seen with the implementation of aerobic and strengthening exercises was enough to warrant me implementing these strategies to my future patient population. The fact that both groups showed benefit without regard to education tells gives me enough validity to implement these exercises into my own practice. I

feel the authors were able to present enough information in support of the two exercise interventions that I could implement them without negative effect to the MS individual.

To end this appraisal it's imperative to understand that these authors demonstrated strengths and weaknesses to their research. The authors started strong in their introduction and methods. The limitations started presenting themselves during the results and discussion sections. The overall outcome was the article was not clinically significant with concern to implementing SCT education in the treatment of MS at this time. Also the exercise results were statistically significant with minimal clinical relevance, on paper. At the end I still feel that implementing aerobic and strengthening exercises would benefit the MS population as a whole with concerns to not negatively impact an individual’s psychological and psychosocial factors related to MS.

AMA Citation

Coote S, Uszynski M, Herring MP, et al. Effect of exercising at minimum recommendations of the multiple sclerosis exercise guideline combined with structured education or attention control education – secondary results of the step it up randomized controlled trial. BMC Neurology. 2017; 17(119)