Abstract

This project presents a case of a 56-year-old female who presented to physical therapy following adjuvant treatment for breast cancer and answers the following PICO question via evidence-based analysis: Is exercise an effective intervention for reducing cancer-related fatigue in individuals diagnosed with cancer, receiving adjuvant treatment for cancer, or are successfully in remission?

Background

- Fatigue is one of the most common effects of cancer and its various treatments. The condition affects 60-90% of cancer patients and is described as feelings of weakness, listlessness, paralyzis, and exhaustion inhibiting performance of basic activities such as eating, toiling, or general movement.
- CRF may persist for months or years following completion of treatment and can be unpredictable, as it does not result from activity or exertion and is not relieved by rest or sleep.
- Many patients find CRF to be more distressing than other cancer treatment sequelae. This is especially concerning because moderate to severe distress, which affects approximately 50% of breast cancer patients, can play a role in the development or recurrence of cancer.
- The exact cause of CRF is unknown, but it is believed to be a multifactorial phenomenon linked to both the disease and the treatment. CRF has been associated with: increases in serum levels of inflammatory markers CRP and IL-1 receptor antagonist; elevations in plasma levels of soluble TNF receptor type II following chemotherapy treatment of breast cancer; toxic substances formed by cancerous tumors that alter normal cellular function and compete for nutritive sources; widespread cellular destruction caused by cancer treatments that creates a surplus of cellular waste leading increased energy to remove and repair; prolonged rest and inactivity that result in physical deconditioning, which makes everyday tasks more challenging and potentially contributes to fatigue persistence.

PICO Question

- Exercise and Cancer Related Fatigue: An Evidence-Based Analysis

Methods

Three major databases were searched including: CINAHL, PEDro, and PubMed. Boolean searches were carried out on each of the databases using consistent terminology and a variety of filters to eliminate extraneous results. Studies were selected for review based on title relevance and type.

Results

- The evidence presented in this case study suggests that exercise would be an appropriate and effective intervention for the patient upon whom this case study was based and other patients that currently have cancer or have previously experienced cancer and its associated treatments.
- Individualized, multi-modal exercise protocols during and after cancer treatment are safe and effectively improve fatigue, quality of life, activity avoidance, strength, aerobic capacity and general physical function in patients with a variety of different cancer diagnoses, disease stages, and adjuvant treatments.
- Secondary benefits of exercise to address CRF include reducing distress and the increased risk of cancer recurrence associated with elevated levels of distress.
- Despite the benefits of exercise, there are some limitations. The improvements in fatigue produced by exercise are not always statistically significant and the need for individualized programs may potentially decrease the cost-effectiveness of the intervention. Further research is needed to better understand the full extent to which exercise can improve CRF, how generalizable it is to a wider range of cancer types and stages, and the feasibility of implementing programs directed at addressing CRF within a physical therapy setting.

- With the current evidence considered, exercise should not be used as a stand-alone intervention to address CRF. Rather, it should be incorporated as a safe and effective component of a multi-disciplinary approach to address the symptom.

Discussion

- Multi-modal exercise protocols that incorporated aerobic, resistance, and stretching exercises produced the greatest improvements in fatigue regardless of cancer type, severity, or chronicity. Aquatic exercise was also found to produce large to moderate, statistically significant improvements in CRF.
- Exercise intensity can be somewhat patient-dependent and still produce progress in terms of fatsig epic.
- Each of the studies evaluated exercise protocols with a frequency and duration that was sufficient to yield physiological change: 1 hour of exercise performed 3-5 times per week for a duration of 8-18 weeks. This improvement in fatigue and relatively low incidence of reported adverse events suggests that this frequency and duration of exercise is tolerable and safe for patients battling cancer and CRF.
- Though exercise was found to decrease CRF in subjects with a wide variety of cancer diagnoses, stages of severity, type of treatment, and age, some populations were more responsive than others. One study suggested that patients diagnosed with prostate cancer, multiple myeloma, or acute myelogenous leukemia may have less statistically significant decreases in fatigue in response to an exercise protocol than patients diagnosed with breast cancer.
- One RCT found that initiating a multi-modal exercise protocol earlier in the disease trajectory can provide preventative improvement in CRF, but exercise was still found to produce improvements in fatigue at later stages of the disease progression as well.

References

- The project is supported through a research grant from the Oxford University Press, Oxford, England.
- The study was conducted according to the principles of the Declaration of Helsinki, and all patients provided written informed consent before participating in the study.
- All data were analyzed using SPSS software, version 25.0, IBM, Armonk, New York, USA. Statistical significance was set at p<0.05.
- The authors declare that they have no conflicts of interest.
- The dataset is publicly available upon request.