Effects of Exercise on Pain Catastrophizing and Chemotherapy-Induced Peripheral Neuropathy: A Pilot Randomized Controlled Trial in Sixteen Patients with Cancer

Amelia Wagenknecht, B.A.S., Thushini Manuweera, Ph.D, Ian Kleckner, Ph.D, M.P.H.
University of Maryland-Baltimore: Department of Pain and Translational Symptoms Sciences, School of Nursing

Cancer Control Mind & Body Lab
To understand how the body and brain produce subjective feelings, and to translate that knowledge into treatments that help patients with cancer feel better.

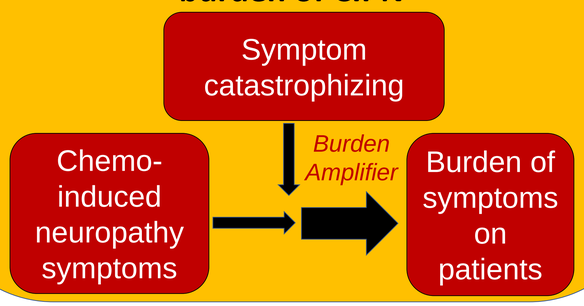
Background

Chemotherapy-induced peripheral neuropathy (CIPN) is a severe, dose-limiting toxicity affecting **2/3** of patients receiving neurotoxic chemotherapy (Seretny et al., 2014).

Symptoms include
- Numbness
- Tingling
- Pain (hands and feet)

Maladaptive cognitive processes (i.e., *pain catastrophizing*) surrounding pain can predict reduced physical activity (Zhaoyang et al., 2020), and pain chronicity (Wilson et al., 2022).

Pain catastrophizing can amplify the burden of CIPN



Barrier #1: Most available treatments focus on the *symptoms* of CIPN, not the *reactions to the symptoms.*

Goal: To test the hypothesis that resistance and light aerobic exercise during neurotoxic chemotherapy alleviates symptoms of CIPN and pain catastrophizing.

This is an exploratory secondary analysis of a clinical trial designed to assess the effects of exercise on CIPN (NCT03021174)

Study Methods

Pre-Intervention (Baseline)
- CIPN-20
- PCS

Mid-Intervention (Week 6)
- CIPN-20
- PCS

Exercise (n=7)
Progressive at-home low-to-moderate intensity resistance band exercise and aerobic walking regimen

Control (n=9)
Time and Attention Behavioral placebo control

Post-Intervention (Week 12)
- CIPN-20
- PCS

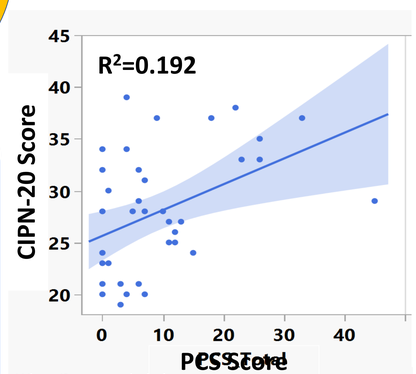
12-week Intervention

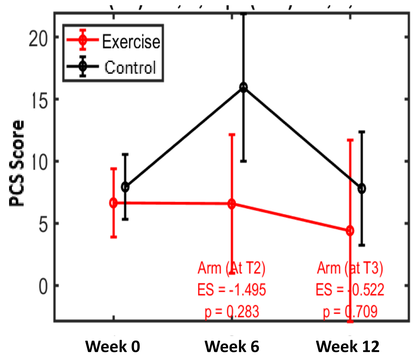
Neurotoxic Chemotherapy

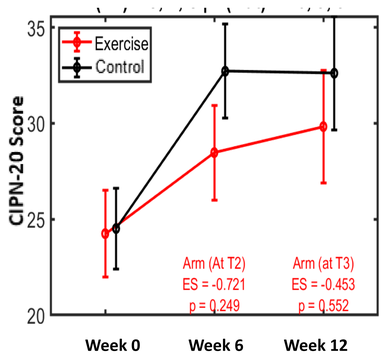
***Pain catastrophizing and CIPN were measured using the Pain Catastrophizing Scale (PCS) and CIPN-20**

Participants:
Total: 16 (8 female, 8 male)
Age: 63 ±12yrs

Cancer Types:
Breast (50%), Gastrointestinal, Multiple Myeloma, Genitourinary







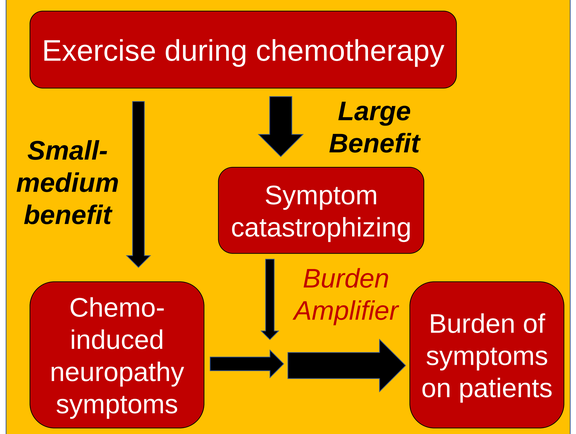
Results

- Pain catastrophizing was positively correlated with CIPN severity (R^2=0.19).
- Exercise caused a moderate to large reduction in pain catastrophizing at weeks 6 (ES=1.5) and 12 (ES=0.5).
- Exercise also reduced CIPN severity (ES=0.2 and 0.5 at 6 and 12 weeks, respectively).

Discussion

Exercise reduces both CIPN and pain catastrophizing.

Exercise may reduce symptom burden through multiple pathways



When delivered by trained professionals, exercise is a safe, relatively low-cost therapy that can be delivered concomitantly with medical treatments.

Limitation

Given our small sample size and exploratory study, future research is needed to test for replication.

Amelia Wagenknecht, BAS, ACSM-CEP
Clinical Research Specialist
Cancer Control Mind & Body Lab
awagenknecht@umaryland.edu

Twitter & Instagram
@AmeliaSciences