Impact of a Home-Based Exercise Program on Cardiovascular Disease Biomarkers in Men with Prostate Cancer

ANGELA GONZALEZ[1], CRISANN MOON[1], AMBER M. GALLEGOS[1], BILAL SHEIKH[1], SARAH VARDEMAN[1], MICHAEL A. LISS[2], DARPAN I. PATEL[1]

[1]Biobehavioral Laboratory, School of Nursing; [2]School of Medicine; UT Health San Antonio; San Antonio, TX

Category: Undergraduate

Advisor / Mentor: Patel, Darpan (pateld7@uthscsa.edu)

ABSTRACT

Patients with prostate cancer (PCa) tend to live a sedentary lifestyle and fail to meet national physical activity requirements putting them at a greater risk for developing weight-related co-morbidities and cancer recurrence. Physical activity after cancer diagnosis is known to improve body composition, physical function, and overall quality of life. The inclusion of a home-based exercise regimen may increase their physical activity and reduce the risk of weight related illness. **PURPOSE**: To gather preliminary data regarding the impact of a home-based exercise program on body composition and cardiovascular disease (CVD) biomarkers. **METHODS**: A single group self-controlled study design was used to test the hypothesis that a home-based exercise program can reduce CVD risk in men with PCa. Fifteen men with PCa under active surveillance were recruited to complete a 24-week home-based exercise program consisting of both aerobic and strength-based exercises. Each week, participants were asked to complete 5 days of light-to-moderate intensity walking at a heart rate reserve of 40-60% and 3 days of bodyweight-based exercises including 3 sets of 15 reps of squats, incline push-ups, and hip thrusts. Serum was collected at baseline and end of study to quantify circulating CVD biomarkers: a-2 macroglobulin (A2M), C-reactive protein (CRP), fetuin-A, a-1 acid glycoprotein (AGP), fibrinogen, L-selectin, serum amyloid P (SAP), platelet factor 4 (PF4/CXCL4), and adipsin using an 8-protein multiplex (Millipore Sigma, Billerica, MA). T-tests were performed with significance established at $p < 0.05$. **RESULTS**: A total of 15 men consented and 9 men saw the trial to completion (Age: 72.0 ± 8.52; Weight: 85.31 ± 6.41 kg; BMI: 27.77 ± 2.93 kg/m2). There was a 40% rate of attrition observed due to COVID-19. No significant changes occurred in average weights and BMI from pre to post trial visits. Though not significant, tendencies for increased concentrations of the anticoagulant, A2M (Pre: 99.83 ± 81.19 pg/mL; Post: 126.7 ± 102.5; p=0.064) and the inflammatory protein, SAP (Pre: 0.63 ± 0.32 pg/mL; Post: 0.86 ± 0.46; p=0.09) were seen. We also observed a 1.5-fold increase in CRP (Pre: 0.47 ± 0.38 pg/mL; Post: 1.19 ± 2.209) perhaps, as a result of an increase in SAP, or indicative of increased levels of stress due to COVID-19. No other significant differences were found. **CONCLUSION**: The reduced sample size may have contributed to the lack of significance found in the analysis. Although there were no statistically significant findings, the tendencies seen in A2M suggest that a home-based exercise program may protect against certain facets of CVD in this

overweight population. However, our enthusiasm is blunted by the observed increases in SAP and CRP. Further investigation is necessary to validate these results.