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Home-Based Exercise Training Reduces In Vitro Prostate Cancer Cell Viability: Roles of Adherence, Fitness, and Inflammation

Exercise attenuates many treatment-related declines, with a growing interest in the direct impact on prostate cancer (PC) cell viability. While supervised exercise decreases PC cell growth, it is unknown if home-based exercise or serum from men with advanced PC have similar impacts. PURPOSE: To assess the effects of home-based exercise training on LNCaP and PC-3 viability in men with metastatic castration resistant PC (mCRPC). The influence of body composition, aerobic capacity, exercise adherence, and cytokine levels on viability was also explored. METHODS: 14 men with mCRPC [71±8 yr, 33.6±6.3 % fat, 18.9±4.4 ml/kg/min] completed a 12 week home-based mixed modality intervention. Participants performed physiological testing [VO2peak, DXA, muscle strength] and provided resting blood samples before (Pre) and after (Post) the intervention. Complete media containing 10% serum from Pre and Post were incubated with LNCaP and PC-3 cells. Cell viability was evaluated using AlamarBlue at 72h and 96h. Data are presented as mean ± SD or mean difference (MD) with 95% confidence intervals. RESULTS: No changes were observed at 72h. At 96h, overall LNCaP cell viability at Post was decreased (MD: -9.6%, 95%CI [-16.7,-2.5], p=0.020), with only a TNF x training interaction (p=0.003) revealing that lower TNF levels further reduced viability (-22.0%, [-31.6,-12.5], p<0.001). No overall PC-3 viability effect was observed (-2.7%, p=0.407). There were interactions for training x VO2peak (p=0.037), total (p=0.019) and resistance training (p=0.025) adherence, and % fat (p=0.023). At Post, lower PC-3 viability was observed with higher VO2peak values (-11.5%, [-23.1,0.2], p=0.053), higher total (-9.6%, [-18.5,-0.7], p=0.037) and resistance training adherence (-9.3%, [-18.4, -0.2], p=0.046), and lower % fat (-9.2%, [-18.1,-0.3], p=0.044). CONCLUSION: Home-based exercise indicates robust effects with longer exposure in androgen-sensitive cells (LNCaP). Androgen-receptor null cells (PC-3) showed only conditional improvements, based on higher adherence and fitness levels and lower % fat.

Keywords

cancer growth, androgen deprivation therapy, androgen receptor pathway inhibitors, inflammation

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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