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Ventilatory and metabolic thresholds in colorectal, breast and prostate cancer patients throughout a 6-month home-based exercise intervention –data from the CRBP-TS-study

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Background: Cardiovascular diseases are the second leading cause for increased morbidity and mortality in cancer survivors. With ongoing advances in surgical and adjuvant cancer therapies, an increasing number of survivors are living longer and require targeted support to manage long-term cardiovascular risk factors.

Methods: This secondary subgroup analysis includes participants who underwent an additional two-test protocol cardiopulmonary exercise testing (CPET) at baseline and follow-up. The analysis evaluates the effects of a 6-month home-based exercise rehabilitation program in postoperative patients, compared to usual care. Primary outcomes were changes in lactate turning point (LTP) and respiratory compensation point (RCP) and secondary outcomes weekly exercise duration and heart rate during exercise.

Results: A total of 68 participants (45.5% women, 58.5 years [49.3; 63.0], prostate cancer 47.7%, breast cancer 40.1%, colorectal cancer 12.5%) completed the pre and post examinations (intervention group, IG: n=36; control group, CG: n=32). Participants in the IG accumulated an average of 64.9 [43.6; 84.3] additional minutes of exercise per week, at a mean heart rate of 99.1 ± 14.3 bpm (67.1 ± 7.4 %/HRmax) during activities. After 6 months both thresholds were detected at a higher workload in the IG (LTP Δ : 10.8 ± 18.7 watt; $p < 0.001$; RCP Δ : 10.1 ± 17.0 watt; $p < 0.001$), whereas no significant changes occurred in the CG: For the RCP a significant group \times time interaction ($p = 0.006$) was observed.

Discussion & Conclusion: The observed improvements in metabolic thresholds are comparable to those reported in supervised endurance training programs, despite lower exercise intensity in our home-based training setting. These findings suggest that digitally supported, individualized home-based exercise can effectively enhance markers of submaximal cardiorespiratory fitness in cancer survivors. Future research should explore individual variability in adherence, training duration, and intensity to refine personalized exercise prescriptions and optimize long-term outcomes.

Keywords

cancer, exercise rehabilitation, lactate turning point, respiratory compensation point

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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