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Feasibility and preliminary efficacy of aerobic acute exercise prior chemo-immunotherapy infusion in patients with metastatic non-small cell lung cancer: a randomized controlled trial

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PURPOSE: Preclinical evidence suggests that acute exercise can modulate immune responses and enhance tumor perfusion, potentially improving chemo-immunotherapy (ChemoIO) efficacy. The ERICA trial (NCT04676009) evaluated the feasibility, safety, and preliminary effects of acute aerobic exercise performed immediately prior to ChemoIO in patients with metastatic non-small cell lung cancer.

METHODS: Newly diagnosed mNSCLC patients were randomly assigned (2:1) to the exercise or control group. The exercise intervention included supervised, individualized acute exercise before each of four ChemoIO cycles plus a 3-month home-based walking program with an activity tracker and step goals. Feasibility outcomes included adherence, acceptability, tolerability, and safety. Secondary endpoints were assessed at baseline and after 3 months using objective and self-reported measures of physical activity behaviour, cardiorespiratory fitness, muscle strength, body composition, Patient Reported Outcomes's, treatment completion rates and immune biomakers.

RESULTS: Twenty-six patients (mean age 60.6 ± 10.7 years) were enrolled, with an acceptance rate of 90.9%. In the exercise group (n = 17), adherence to acute exercise sessions averaged 80.8%, with a median interval of 38 minutes (IQR 20–60) between exercise and ChemoIO administration. No exercise-related adverse events were observed. Participants in the exercise group achieved a median daily step count of 8,550, and 60% were classified as physically active. Acute exercise induced minimal immune changes at diagnosis; however, after 3 months of ChemoIO, it was associated with a redistribution of T cells toward more differentiated phenotypes and reduced HLA-DR expression on dendritic cells.

CONCLUSION: Acute aerobic exercise performed immediately before ChemoIO is feasible, acceptable, and safe in patients with mNSCLC. This innovative integration of exercise into cancer management, represents a promising, non-pharmacologic strategy to enhance therapeutic response and patient well-being. Larger trials are warranted to evaluate its efficacy on clinical outcomes and biological mechanisms.

Keywords

lung cancer; metastatic; exercise; immunotherapy; immune system

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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