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Exercise Training Before, During, and After TIL Therapy in Malignant Melanoma

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Background
Tumor-infiltrating lymphocyte (TIL) therapy is an intensive adoptive T-cell treatment for meta-static malignant melanoma (MM) that can induce sustained clinical responses in patients with advanced disease, including after failure of immune checkpoint inhibitors. The treatment in-volves tumor excision, ex vivo TIL expansion (5–7 weeks), lymphodepleting chemotherapy, and high-dose interleukin-2. It typically requires a ~3-week inpatient stay and is associated with substantial toxicity and psychological and physiological burden. Exercise training (ET) improves quality of life, physical capacity, and immune function in cancer populations, but its role during TIL therapy is unknown. This study evaluates the feasibility and potential effects of ET before, during, and after TIL therapy on patient-reported outcomes and physiological and biological parameters.
Methods
Fifteen patients (performance status 0–1, Danish- or English-speaking, and no major comor-bidities) with advanced MM scheduled for TIL therapy at Herlev Hospital, Denmark, will be enrolled. This phase II study includes ET across three phases: (1) a ~6-week supervised pre-admission program; (2) individualized daily ET, including strength training, during ~3 weeks of hospital admission; and (3) a 4–5-week supervised post-discharge program. ET in phases 1 and 3 consists of supervised cycling three times weekly, including continuous and high-intensity interval training, delivered either center-based or in-home depending on patient pref-erence.
Outcomes
The primary outcome is feasibility, assessed as adherence (%) to the prescribed ET dose.
Secondary outcomes include health-related quality of life and emotional distress, VO_2peak, skeletal muscle and abdominal adipose tissue volumes, adverse events, immune cell pheno-typing, tumour-specific T cells, circulating cytokines, tumour microenvironment characteris-tics, and gut microbiome composition.
Assessments occur at baseline, during admission (selected outcomes), and six weeks post-discharge.
Perspectives
This study will determine whether ET can be feasibly integrated throughout the TIL treatment trajectory and inform supportive care strategies and future randomized trials. Expected initia-tion is autumn 2026, pending approvals.

Keywords

Tumor-infiltrating lymphocyte therapy (TIL therapy)

Metastatic melanoma

Exercise training

Feasibility study

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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