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Pre- and postoperative energy expenditure in major liver resection: what do we ask of a patient?

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Background:
Major liver resections are associated with high postoperative complication rates, reported in up to 43% of cases. Prehabilitation programs that improve preoperative aerobic fitness enhance postoperative outcomes, yet the metabolic demands during recovery remain unclear. Insight into postoperative energy expenditure relative to preoperative metabolism and aerobic capacity is essential to understand how surgery affects the body's metabolic reserve. This study aims to quantify differences in pre- and postoperative energy expenditure in patients undergoing major liver resection and relate these findings to preoperative aerobic capacity.
Methods:
This ongoing prospective observational study intends to include 10 patients undergoing elective major liver resection at Maastricht University Medical Center+. Energy expenditure is measured pre- and postoperatively using doubly labeled water and indirect calorimetry. Cardiopulmonary exercise testing (CPET) assesses aerobic capacity, accelerometers monitor physical activity, and blood samples evaluate metabolic and immune parameters.
Results:
To date, 8/10 patients have been included of which 5 were male. Age ranged between 56 and 83 years old. In 7/8 patients, surgery was performed with a resection time ranging from 248 up until 574 minutes. For 6 out of 8 patients, postoperative measurements of indirect calorimetry and aerobic capacity could be performed. Postoperative energy expenditure is expected to increase compared with preoperative values. Patients with lower aerobic capacity are anticipated to show higher metabolic demands and complication rates. Physical activity is expected to decline postoperatively, with faster recovery in fitter patients. Correlations between immune and metabolic markers and changes in energy expenditure may clarify the role of aerobic fitness in recovery. Preliminary data will be presented at the congress.
Conclusions:
By exploring the relationship between energy expenditure and aerobic fitness, this study seeks to provide valuable insights into the metabolic challenges patients face during postoperative recovery, potentially leading to tailored prehabilitation programs for patients undergoing major liver resections.

Keywords

energy expenditure, aerobic capacity, personalized prehabilitation, indirect calorimetry

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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