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Effects of Perioperative Exercise on Patients with Gastroesophageal Cancer: A Systematic Review and Meta-Analysis

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Background

Gastric and esophageal cancers remain major contributors to global cancer mortality, and surgical treatment is frequently associated with substantial morbidity and delayed postoperative recovery. Reduced cardiorespiratory fitness and muscle strength are strongly linked to postoperative complications and prolonged length of hospital stay (LOS), potentially impairing treatment continuity and prognosis. Although exercise interventions may improve these outcomes, evidence from randomized controlled trials (RCTs) in gastroesophageal cancer (GEC) remains limited, with prior meta-analyses largely focused on physiotherapy-based approaches rather than conventional exercise.

Objective

To evaluate the effects of pre-, post-, and peri-operative exercise interventions on functional and clinical outcomes in patients undergoing surgery for gastroesophageal cancer.

Methods

A systematic review and meta-analysis of RCTs was conducted. Of 22 eligible trials, 12 were included in the quantitative synthesis. Risk of bias was assessed using the Cochrane RoB 2 tool. Outcomes included VO_2 max/peak, 6-minute walk distance (6MWD), handgrip strength (HGS), length of hospital stay (LOS), major postoperative complications (Clavien–Dindo \geq III), and 30-day hospital readmission.

Results

Exercise interventions significantly improved functional capacity, including VO_2 max/peak (mean difference [MD]: +3.31 mL/kg/min; 95% CI: 0.47–6.14) and 6MWD (MD: +39.85 m; 95% CI: 7.40–72.30). HGS improved significantly in pre-operative exercise programs (MD: +2.23 kg; 95% CI: 0.56–3.90) but not in postoperative or mixed-timing interventions. Exercise significantly reduced postoperative LOS by 1.81 days (95% CI: –3.48 to –0.14). Reductions in major complications (RR: 0.74) and hospital readmission (RR: 0.73) did not reach statistical significance but consistently favored exercise. Overall risk of bias was rated as low to some concerns.

Conclusions

Exercise interventions improve functional outcomes and reduce hospital stay in patients undergoing GEC surgery, supporting their role as a safe and clinically relevant adjunct to perioperative care.

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Keywords

Exercise Medicine, Perioperative Intervention, Gastroesophageal Cancer, Gastric Cancer

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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