Goal-directed fluid therapy for oesophagectomy surgery

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Editor—We read with great interest the study by Mukai and colleagues[1] in the *British Journal of Anaesthesia*. In their multicentre RCT of 232 patients undergoing transthoracic oesophagectomy, the authors reported a 16% lower incidence of major complications in patients randomised to a goal-directed fluid therapy (GDFT) group compared with a control group. We congratulate the authors for having performed such a rigorous study, especially in a very high-risk population in which evidence of the beneficial effects of GDFT was lacking.

However, we were surprised that a small (550 ml) difference in total amount of fluid received over nearly 10 h of surgery can result in such a highly significant difference in the primary outcome between the two groups. We wonder if both groups were really comparable. Indeed, despite the randomised design, the number of patients receiving chemotherapy and radiation therapy preoperatively was much lower in the GDFT group than in the control group. We understand results of statistical tests are not provided for baseline characteristics, but the differences were probably significant. This might contribute to the lower incidence of respiratory failure, ventilation time, atelectasis, respiratory failure requiring tracheostomy, and pneumonia in the GDFT group.

We were also surprised to see that the incidence of re-operation was so different (1 subject in the GDFT group *vs* 9 subjects in the control group) whereas the incidence of anastomotic leak (main reason for re-operation) was comparable (7 *vs* 8 subjects). This perhaps results from an unfortunate imbalance in favour of the GDFT strategy over the control group. A summary of advanced haemodynamic variables might help to understand the study results better. Data for MAP, stroke volume index, cardiac index, and stroke volume variation during the case and the percentage of procedure time with stroke volume variation >12% would facilitate comparison of the haemodynamic profile achieved in the two groups. Other studies have reported small fluid differences between groups in GDFT trials, emphasising that post-operative outcomes depend more on achievement of the haemodynamic target than on the difference in the overall fluid volumes.[2–4] As reported by Noblett and colleagues,[5] maintenance of a better haemodynamic profile also depends on the timing of fluid administration rather on the amount of fluids given. Analysis of the advanced haemodynamic variables will also allow assessment of protocol compliance. It is evident that clinicians' compliance with the application of hemodynamic protocols remains poor, ranging between 62% and 87%, even under ideal study conditions.[4,6,7] Compliance of less than 50% to protocols is reported in daily practice across different medical specialties,[8,9] but at least 80% adherence is required to observe improved clinical outcomes.[10] Demonstration of high protocol adherence could also help explain the beneficial effect on outcome obtained by application of a GDFT strategy in the present study.

Declarations of interest

The authors declare that they have no conflicts of interest.

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A randomised pilot trial of combined cognitive and physical exercise prehabilitation to improve outcomes in surgical patients

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Editor—Millions of patients require surgery each year, and many experience a decline in their cognitive and functional status after the operation including perioperative neurocognitive disorders[1] and new disabilities in basic functions of self-care or more complex tasks necessary for independent living.[2,3] Changes may persist for months to years after an operation. Improving quality of life after surgery and preventing acquired cognitive impairment and disability is a public health problem that needs to be addressed. Functional decline after surgery is traditionally managed with rehabilitation programs. A newer approach focuses on increasing baseline reserve before major surgery to prevent significant decline in the postoperative period, termed prehabilitation. The benefits of resistance-based physical activity for community-dwelling older adults on health, quality of life, and physical and cognitive function have been established.[4] In the surgical population, nutritional and functional prehabilitation has demonstrated success in reducing time to recovery of baseline function, although data are mostly preliminary, the optimal dose and type of exercise remain unknown, and programs often require specialised equipment or frequent trips to exercise facilities.[5–7] Further, programs have started to include mindfulness techniques for stress reduction[8] but have not commonly incorporated activities for enhancing cognitive function. We, therefore, sought to investigate the feasibility of a novel, pragmatic combined cognitive and physical prehabilitation program that can be completed at home in the weeks before a major operation. We hypothesised that prehabilitation with both cognitive and physical exercises would be feasible and associated with improved postoperative outcomes when compared with an active attention control group.

This study was approved by the Institutional Review Board of Vanderbilt University Medical Center, Nashville, TN, USA (Study #161802) and registered (NCT03094988). Written informed consent was obtained from all participants. We conducted an open-label, randomised, controlled pilot feasibility trial in a convenience sample of patients ≥18 yr old awaiting major noncardiac surgery requiring ≥3 days hospitalisation. We enrolled participants during an appointment at our preoperative evaluation clinic where surgeons refer patients for evaluation and medical optimisation before surgery. The majority of patients at this clinic are older, have multiple comorbidities, and require major noncardiac surgery. Participants were excluded if <1 week remained before surgery, pre-existing conditions prevented