Goal-directed hemodynamic therapy versus restrictive normovolemic therapy in major open abdominal surgery: A randomized controlled trial

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Background: The aim of this study was to compare the occurrence of postoperative complications in patients undergoing elective open abdominal surgery and receiving intraoperative goal-directed hemodynamic therapy or restrictive normovolemic therapy.

Methods: A total of 401 patients were randomized in the goal-directed hemodynamic therapy or restrictive normovolemic therapy groups. A cardiac output monitor was used in all goal-directed hemodynamic therapy patients and was left at the discretion of anesthetists in charge of patients in the restrictive normovolemic therapy group. The primary outcome was a composite morbidity endpoint (30-day mortality and complications grade 2-4 according to Dindo-Clavien classification). Secondary outcomes were the hospital duration of stay, the incidence of pulmonary, cardiovascular, and renal complications up to 30 days after surgery, and midterm survival.

Results: Intraoperatively, the goal-directed hemodynamic therapy group received higher intravenous fluid volumes (mean of 10.8 mL/kg/h and standard deviation of 4.0) compared with the restrictive normovolemic therapy group (mean of 7.2 mL/kg/h and standard deviation of 2.0; $P < .001$). On the first postoperative day, similar fluid volumes were infused in the 2 groups. The primary outcome occurred in 57.7% of goal-directed hemodynamic therapy and 53.0% of restrictive normovolemic therapy (relative risk, 1.09 [95% confidence interval, 0.91-1.30]), and there was no significant difference between groups for any secondary outcomes.

Conclusion: Among patients undergoing major open abdominal surgery, the goal-directed hemodynamic therapy and the restrictive normovolemic therapy were associated with similar incidence of moderate-to-severe postoperative complications and hospital resource use.