Intraoperative pleth variability index-based fluid management therapy and gastrointestinal surgical outcomes in elderly patients: a randomised controlled trial

Wang Y, Zhang Y, Zheng J, Dong X, Wu C, Guo Z, Wu X. *Perioper Med* (Lond). 2023 May 12;12(1):16. doi: 10.1186/s13741-023-00308-0.

Background: Intraoperative goal-directed fluid therapy (GDFT) has been reported to reduce postoperative complications of patients undergoing major abdominal surgery. The clinical benefits of pleth variability index (PVI)-directed fluid management for gastrointestinal (GI) surgical patients remain unclear. Therefore, this study aimed to evaluate the impact of PVI-directed GDFT on GI surgical outcomes in elderly patients.

Methods: This randomised controlled trial was conducted in two university teaching hospitals from November 2017 to December 2020. In total, 220 older adults undergoing GI surgery were randomised to the GDFT or conventional fluid therapy (CFT) group (n = 110 each). The primary outcome was a composite of complications within 30 postoperative days. The secondary outcomes were cardiopulmonary complications, time to first flatus, postoperative nausea and vomiting, and postoperative length of stay.

Results: The total volumes of fluid administered were less in the GDFT group than in the CFT group (2.075 L versus [vs.] 2.5 L, P = 0.008). In intention-to-treat analysis, there was no difference in overall complications between the CFT group (41.3%) and GDFT group (43.0%) (odds ratio [OR] = 0.935; 95% confidence interval [CI], 0.541-1.615; P = 0.809). The proportion of cardiopulmonary complications was higher in the CFT group than in the GDFT group (19.2% vs. 8.4%; OR = 2.593, 95% CI, 1.120-5.999; P = 0.022). No other differences were identified between the two groups.

Conclusions: Among elderly patients undergoing GI surgery, intraoperative GDFT based on the simple and non-invasive PVI did not reduce the occurrence of composite postoperative complications but was associated with a lower cardiopulmonary complication rate than usual fluid management.

Trial registration: This trial was registered with the Chinese Clinical Trial Registry (ChiCTR-TRC-17012220) on 1 August 2017.