

Goal-directed fluid therapy guided by Plethysmographic Variability Index (PVI) versus conventional liberal fluid administration in children during elective abdominal surgery: A randomized controlled trial

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Background: PVI has been shown to be an accurate predictor of fluid responsiveness in paediatric patients. Evidence regarding the role of PVI to guide intraoperative fluid therapy in paediatric abdominal surgery is lacking. We aimed to assess the effect of PVI-guided fluid therapy on the volume of intraoperative fluids administered and post-operative biochemical and recovery profile in children undergoing elective abdominal surgery.

Methods: 42 children, 6 months-3 years scheduled for elective open bowel surgery were randomised to receive either 'conventional liberal intraoperative fluids' (liberal group) or 'goal-directed intraoperative fluids' (GDT group). PVI < 13 was targeted in the GDT group. The primary outcome was the volume of intraoperative fluids administered. Postoperative serum lactate, base excess, hematocrit, recovery of bowel function and duration of postoperative hospital stay were the secondary outcomes.

Results: The mean fluid administered intra-operatively was significantly lower in the GDT group as compared to the liberal group (24.1+9.6 ml/kg vs 37.0+8.9 ml/kg, $p<0.001$). The postoperative hemoglobin concentration (g%) was significantly lower in the liberal group as compared to the GDT group (8.1+1.3 vs 9.2+1.4, $p=0.008$). Recovery of bowel function (hours) was significantly delayed in the liberal group as compared to the GDT group (58.2+17.9 vs 36.5+14.1, $p<0.001$).

Conclusion: Intraoperative PVI-guided fluid therapy significantly reduces the volume of intravenous crystalloids administered to children undergoing open bowel surgery. These children also had faster recovery of bowel function and less hemodilution in the immediate postoperative period, compared to those who received liberal intraoperative fluid therapy.