

New Study Investigates The Utility Of Masimo PVi® In Patients Undergoing Colorectal Surgery



Masimo Radical-7® with PVi®, SpHb®, and RD rainbow SET™

[Masimo](#) (NASDAQ: MASI) has announced the findings of a recently published study in which researchers at Kocaeli University in Turkey compared the performance of conventional fluid management (CFM) to goal-directed fluid management (GDFM) using Masimo PVi® (pleth variability index, measured noninvasively and continuously using SET® pulse oximetry sensors) in patients undergoing elective colorectal surgery. The primary points of comparison were the amount of crystalloids administered and blood lactate and serum creatinine levels during the intraoperative period.¹

In the study, Dr. Cesur and colleagues, noting the importance of intraoperative fluid management in terms of postoperative organ perfusion and complications, sought to compare the effects of CFM (guided by clinical assessment and heart rate, arterial blood pressure, and invasively measured central venous pressure) with GDFM (guided by clinical assessment and noninvasive Masimo PVi monitoring). They enrolled 70 ASA I-II adult patients undergoing elective colorectal tumor surgery, who were divided randomly into CFM and GDFM groups. PVi was measured using a Masimo Radical-7® Pulse CO-Oximeter® with software version 7.0.3.3 and SET® sensors. In the CFM group, an NaCl solution was administered at the rate of 4-8 ml/kg/h; when mean arterial pressure (MAP) fell below 65 mmHg or 30% baseline MAP, the speed of infusion was increased, colloid was initiated, and ephedrine was administered. In the GDFM group, the same solution was administered at the rate of 2 ml/kg/h; if PVi rose above 13% for more than 5 minutes, colloid and then ephedrine were administered. Treatments in both groups were continued until values were restored to each protocol's pre-treatment threshold."

The researchers found that intraoperative crystalloid administration, urine output, and end-surgery fluid balance were significantly lower in the GDFM (PVi) group:

Characteristic	Median value (25-75 percentile values): CFM group	Median value (25-75 percentile values): GDFM (PVi) group	P-value
Intraoperative Crystalloid administration	1946 ml (1500-2500 ml)	900 ml (800-1060 ml)	<0.001
Urine output	400 ml (250-600 ml)	300 ml (200-400 ml)	0.018
End-surgery fluid balance	1400 ml (960-2250 ml)	620 ml (410-1000 ml)	<0.001

Durations of anesthesia and of surgery, as well as the amounts of intraoperative bleeding and administered colloid, were similar. The length of hospital stay was also found to be similar between the two groups.

The researchers noted that a limitation of the study was that they chose the number of subjects based on the needs of their primary objective, the comparison of intraoperative fluid volume between the two protocols, so they may not have evaluated enough subjects to effectively compare secondary outcomes such as length of stay: "We determined the primary goal of this study as the amount of intraoperative fluid volume and established 35 patients were needed for each group; if postoperative complications, the length of hospital stay[, were] determined as the primary goal, perhaps our numbers [in] each group [w]ould be different."

Reference

1. Cesur S, Cardakozu T, Alparslan K, Turkyilmaz N, and Yavuz O. Comparison of conventional fluid management with PVi-based goal-directed fluid management in elective colorectal surgery. *J Clin Mon*.14 June 2018. <https://doi.org/10.1007/s10877-018-0163-y>

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