

The Effectiveness of Pleth Variability Index to Predict Hypotension Induced by Spinal Anesthesia for Cesarean Delivery.

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Introduction

Pleth variability index (PVI) is used to predict fluid responsiveness in mechanically-ventilated patients. We investigated whether preoperative values of PVI were potentially correlated with hypotension induced by spinal anesthesia for cesarean delivery.

Methods:

Parturient women undergoing elective cesarean delivery without pregnancy-induced hypertension received spinal anesthesia with 0.5% hyperbaric bupivacaine (10 mg) and fentanyl (10 µg) at the third lumbar intervertebral space. Immediately after spinal tap, 500 mL of 6% hydroxyethyl starch was rapidly administered before delivery. Arterial pressure and heart rate were measured twice at 1-min intervals and averaged, and a bolus injection of phenylephrine was administered immediately when the mean arterial pressure (MAP) decreased below 80% of the baseline value. PVI was continuously measured using pulse oximetry (Radical 7TM, Masimo Co, Irvine, CA) on the left index finger. Values, with $P < 0.05$ were considered statistically significant, and data were expressed as mean \pm standard deviation(SD).

Results

Nineteen parturients were enrolled in this study. Baseline MAP was 77.5 ± 8.5 mmHg and decreased significantly to 60.4 ± 9.6 mmHg after spinal anesthesia. MAP was returned to 68.1 ± 5.6 mmHg after administration of hydroxyethyl starch; phenylephrine was administered to 10 parturients. Baseline PVI was $15.9 \pm 5.2\%$, and PVI at the right lateral position was significantly changed to $22.1 \pm 7.0\%$ before the spinal tap. Administration of hydroxyethyl starch restored PVI to $8.8 \pm 3.5\%$. Simple regression analysis revealed a significant correlation between baseline PVI and minimum MAP, and between PVI at the right lateral position and minimum MAP ($r = -0.52, -0.69$, respectively; $P < 0.05$).

Conclusion:

PVI could predict hypotension induced by spinal anesthesia for cesarean delivery. In particular, the value of PVI at the right lateral position would be a more precise predictor of hypotension responding to a decrease in the left ventricular preload.