

Pleth variability index can predict spinal anaesthesia-induced hypotension in patients undergoing caesarean delivery.

Acta Anaesthesiol Scand. 2017 Oct 16. doi: 10.1111/aas.13012.

Kuwata S, Suehiro K, Juri T, Tsujimoto S, Mukai A, Tanaka K, Yamada T, Mori T, Nishikawa K.

BACKGROUND: Spinal anaesthesia carries a risk of hypotension. We hypothesized that pleth variability index and perfusion index would assess maternal volume status, and thus, allow identification of patients at higher risk of developing hypotension after spinal anaesthesia for caesarean delivery.

METHODS: Fifty patients undergoing elective caesarean delivery were enrolled. All patients received spinal anaesthesia with 0.5% hyperbaric bupivacaine (10 mg) and fentanyl (10 mcg). Blood pressure was measured every minute. Pleth variability index and perfusion index were automatically measured throughout the procedure using pulse oximetry on the index finger. In case of hypotension (systolic blood pressure below 90 mmHg or 80% of the baseline value), ephedrine 5 mg was administered. Receiver-operating characteristic and multivariate logistic regression analyses for spinal anaesthesia-induced hypotension were performed.

RESULTS: Hypotension occurred in 32 patients (64%). The areas under the receiver-operating characteristic curve were 0.751 (95% confidence interval: 0.597-0.904) for pleth variability index before anaesthesia, 0.793 (95% confidence interval: 0.655-0.930) for pleth variability index after anaesthesia and 0.731 (95% confidence interval: 0.570-0.892) for perfusion index change (percent change in perfusion index induced by spinal anaesthesia). The optimal threshold value of pleth variability index (after anaesthesia) for predicting hypotension was 18% (sensitivity: 78.1%, specificity: 83.3%). Pleth variability index after spinal anaesthesia was an independent factor for hypotension (odds ratio: 1.21, $P = 0.041$).

CONCLUSIONS: Pleth variability index after spinal anaesthesia was a good predictor of spinal anaesthesia-induced hypotension in patients undergoing caesarean delivery. In addition, perfusion index change after spinal anaesthesia has the potential to predict hypotension.