

Pleth variability index during preoxygenation could predict anesthesia-induced hypotension: A prospective, observational study

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Study objective: To determine whether changes in the pleth variability index (PVi) during preoxygenation with forced ventilation for 1 min could predict anesthesia-induced hypotension.

Design: Prospective, observational study.

Setting: A tertiary teaching hospital.

Patients: Ninety-six patients who underwent general anesthesia using total intravenous anesthesia were enrolled.

Interventions: Upon the patient's arrival at the preoperative waiting area, a PVi sensor was affixed to their fourth fingertip. For preoxygenation, forced ventilation of 8 breaths/min in a 1:2 inspiratory-expiratory ratio was conducted using the guidance of an audio file. One minute after preoxygenation, anesthetic administration was initiated. Blood pressure was measured for the next 15 min.

Measurements: We calculated the difference (dPVi) and percentage of change (%PVi) between the PVi values immediately before and after forced ventilation. Anesthesia-induced hypotension was defined as a mean arterial pressure of <60 mmHg within 15 min after the infusion of anesthetics.

Main results: Overall, 87 patients were included in the final analysis. Anesthesia-induced hypotension occurred in 31 (35.6%) of the 87 patients. Receiver operating characteristic curve analyses identified a cut-off value of -2 for dPVi, with an area under the curve of 0.691 (95% confidence interval [CI], 0.564-0.818; $P < 0.001$) and a cut-off value of -7.6% for %PVi, with an area under the curve of 0.711 (95% CI, 0.589-0.832; $P < 0.001$). Further, multivariate logistic regression analysis showed that a low %PVi with an odds ratio of 9.856 (95% CI, 3.131-31.032; $P < 0.001$) was a significant determinant of anesthesia-induced hypotension.

Conclusions: Hypotension frequently occurs during general anesthesia induction and can impact outcomes. Additionally, the percentage change in the PVi before and after preoxygenation using deep breathing can be used to predict anesthesia-induced hypotension.