

Pulse oximetry-derived pleth variability index can predict dexmedetomidine-induced changes in blood pressure in spontaneously breathing patients.

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STUDY OBJECTIVE: Hypertension or hypotension in patients receiving continuous infusions of dexmedetomidine (DEX) is often due to changes in vascular resistance caused by α_2 receptor stimulation. We investigated whether baseline perfusion index (PI) and pleth variability index (PVI), derived from pulse oximetry readings, could predict DEX-induced changes in the hemodynamic status in spontaneously breathing patients.

DESIGN: Observational study.

SETTING: Operating room.

PATIENTS: Patients (American Society of Anesthesiologists performance status 1 or 2) scheduled to undergo lower extremity or abdominal procedures under regional anesthesia were approached.

INTERVENTIONS: The PI and PVI were set as baseline upon arrival in theater and were then measured at 2.5-minute intervals. Upon attaining stable hemodynamic status under spontaneous breathing, intravenous administration of DEX was initiated at $6 \mu\text{g kg}^{-1} \text{h}^{-1}$ for 10 minutes, followed by continuous infusion at $0.6 \mu\text{g kg}^{-1} \text{h}^{-1}$.

MEASUREMENTS: Blood pressure, heart rate, PI, and PVI were measured. Hypertension was defined as an increase in systolic blood pressure (SBP) $>15\%$ and hypotension as a decrease in SBP $<15\%$ from baseline.

MAIN RESULTS: Baseline PI and PVI correlated with the degree of change in SBP.

The maximum percentage increase as well as the maximum percentage of decrease in SBP from baseline correlated with baseline PI ($r=0.418$ [$P=.005$] and $r=0.507$

[$P < .001$], respectively) and PVI ($r = -0.658$ [$P < .001$] and $r = -0.438$ [$P = .003$], respectively). PVI < 15 identified DEX-induced hypertension (sensitivity 94%, specificity 85%) and PVI > 16 identified DEX-induced hypotension (sensitivity 83%, specificity 64%).

CONCLUSIONS: PVI may predict DEX-induced changes in blood pressure in spontaneously breathing patients.