

Impact of acute changes in perfusion index and blood pressure on the accuracy of non-invasive continuous hemoglobin concentration measurements during induction of anesthesia.

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PURPOSE: Several factors affect the accuracy of non-invasive continuous hemoglobin concentration (SpHb) measurements. We had previously shown an increase in the perfusion index (PI) following induction of anesthesia which was associated with an increase in the difference between SpHb and total hemoglobin (tHb) (SpHb-tHb). We hypothesized that blunting the increase in PI by maintaining blood pressure during induction of anesthesia would improve the agreement between SpHb and tHb measurements.

METHODS: Twenty-nine adult patients were enrolled. Patients were randomly assigned by use of sequentially numbered, opaque sealed envelopes to a control (group C) or a phenylephrine group (group P). Anesthesia was induced and maintained with propofol, remifentanyl, and ketamine. In group P, phenylephrine was infused at 0.5 µg/kg/min during induction of anesthesia. SpHb and PI were monitored with a Radical-7 Pulse CO-Oximeter. tHb and hematocrit were measured with the ABL800 blood gas analyzer.

RESULTS: Following induction of anesthesia, PI increased significantly in both groups ($p < 0.001$ and $p < 0.05$ in groups C and P, respectively). However, the increase in PI was significantly smaller in group P than in group C (2.6 ± 1.3 vs $0.8 \pm 1.4\%$, $p < 0.001$). Similarly, the change in SpHb-tHb was significantly smaller in group P than in group C (0.40 ± 0.78 vs 0.97 ± 0.70 g/dl, $p < 0.05$). Changes in SpHb-tHb are correlated with changes in PI ($r = 0.46$, $p < 0.05$).

CONCLUSIONS: The findings suggest that blunting the increase in PI by maintaining arterial pressure during induction of anesthesia improves the agreement between

SpHb and tHb values.