

Perfusion Index and Plethysmographic Variability Index in Patients with Interscalene Nerve Catheters.

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Background

Interscalene nerve blocks provide adequate analgesia, but there are no objective criteria for early assessment of correct catheter placement. In the present study, pulse oximetry technology was used to evaluate changes in the perfusion index (PI) in both blocked and unblocked arms, and changes in the plethysmographic variability index (PVI) were evaluated once mechanical ventilation was instituted.

Methods

The PI and PVI values were assessed using a Radical-7 finger pulse oximetry device (Masimo Corp., Irvine, CA, USA) in both arms of 30 orthopedic patients who received an interscalene catheter at least 25 min before induction of general anesthesia. Data were evaluated at baseline, on application of local anesthetics; five, ten, and 15 min after onset of interscalene nerve blocks; after induction of general anesthesia; before and after a 500 mL colloid fluid challenge; and five minutes thereafter.

Results

In the 25 patients with successful blocks, the difference between the PI values in the blocked arm and the PI values in the contralateral arm increased within five minutes of the application of the local anesthetics ($P < 0.05$) and increased progressively until 15 min. After induction of general anesthesia, the PI increased in the unblocked arm while it remained relatively constant in the blocked arm, thus reducing the difference in the PI. A fluid challenge resulted in a decrease in PVI values in both arms.

Conclusion

The perfusion index increases after successful interscalene nerve blockade and may be used as an indicator for successful block placement in awake patients. The PVI values before and after a fluid challenge can be useful to detect changes in preload, and this can be performed in both blocked and unblocked arms.