

Effect of Hypercapnia on Pleth Variability Index during Stable Propofol: Remifentanil Anesthesia.
Mousa WF. *Saudi J Anaesth.* 2013 Jul;7(3):234-7.

Background

The pleth variability index (PVI), which is calculated from respiratory variations in the perfusion index (PI), has been shown to predict fluid responsiveness in mechanically ventilated patients; however, vasomotor tone changes induced by hypercapnia can affect PI and hence may slim down the accuracy of PVI. This study was designed to find out the impact of mild hypercapnia on PVI.

Methods

A total of 30 patients were randomized after induction of general anesthesia with target controlled infusion propofol and remifentanil to either hypercapnia, (etCO₂ =45 mmHg), (group 1, 15 patients) or normocapnia (etCO₂ =35 mmHg) (group 2, 15 patients). After a stabilization period of 10 min, patients were crossed over to the other intentional level of etCO₂. Heart rate (HR), mean arterial pressure (MAP), PI, PVI were collected at the end of each stabilization period.

Results

Patient characteristics and baseline values of HR, MAP, PI and PVI were comparable between the groups. Carryover effect was statistically excluded. Hypercapnia significantly increased PI and decreased PVI with significant negative correlation.

Conclusion

Hypercapnia retracts back PVI values compared with normocapnia. Precise judgment of fluid responsiveness as indicated by PVI necessitates its comparison against similar etCO₂ levels.