Perfusion Index – A Valuable Tool to Assess Changes in Peripheral Perfusion Caused by Servoflurane.

Hager H, Reddy D, Kurz A. *Anesthesiology* 2003; 99: A593.

Introduction

Continuous evaluation of peripheral perfusion during the perioperative period would be useful for the assessment of circulatory status, thermoregulatory responses and the effects of vasoactive agents such as the anesthetic, servoflurane. Skin temperature gradients are a validated measure of fingertip perfusion but this method lacks the sensitivity to detect changes in peripheral perfusion due to some clinical conditions like pain and hypovolemia. Perfusion index (PI), a parameter available on some pulse oximeters, is a measurement of the pulsatile strength at the sensor site and therefore can be an indirect measurement of peripheral perfusion. Hager and coworkers at Washington University compared the sensitivity of Perfusion Index from a Masimo SET pulse oximeter to forearm-fingertip temperature gradient measurements for correlating with endtidal sevoflurane concentration during anesthesia in abdominal surgery patients.

Methods

Seven abdominal surgery patients underwent an anesthesia protocol of propofol and fentanyl followed by sevoflurane and morphine. Forearm-finger tip temperature gradients of each patient were measured with thermacouples taped to the index finger. Perfusion Index was monitored with the Masimo SET pulse oximeter. Data from both devices was recorded 20 minutes after induction of anesthesia to the end of the surgery then analyzed with Pearson's correlation coefficient to determine a linear relationship. 129 paired data points were used for the analysis.

Results

n=129 data points from 7 abdominal surgery patients	Correlation with end-Expiratory Servoflurane (R)
Masimo SET Perfusion Index	0.48, (p<0.001)
Forearm Finger-tip Temperature Gradient	0.05, (p= 0.5)

Perfusion index showed a significant correlation with end expiratory sevoflurane whereas the forearm-finger tip gradient did not. Likewise, perfusion index did not correlate with forearm-finger tip gradients (R= 0.22. p = 0.15).

Authors' Conclusions

"The perfusion index appears to be an accurate tool to assess changes in peripheral perfusion caused by an inhalational agent like servoflurane. It might thus be of future value in assessment of perioperative changes in peripheral perfusion due to different anesthetic conditions."