AN ANALYSIS OF SpO2 AND END TIDAL CO2 MONITORING IN HIGH-RISK POST-SURGICAL PACU PATIENTS
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Introduction: The accuracy of nasal capnography (end tidal CO2-EtCO2) to arterial CO2 pressure has been demonstrated.

Identification of the Problem: Capnography monitoring is often implemented as the standard of PACU care, yet the relationship of EtCO2 to SpO2 in detecting trends in desaturation has not been adequately studied.

Purpose of the Study: An observational study was conducted to examine patterns of EtCO2 and SpO2 readings over time, and their correlation.

Methodology: A convenience sample of 66 post-surgical PACU patients at high risk for respiratory issues was monitored with continuous pulse-oximetry and nasal capnography (both central and portable). Risk was determined by ASA Classification 2 (n=12) or 3 (n=54), surgery (thoracic n=42 or laparoscopic bariatric n=23), age (24.2% > 65), and/or BMI (35.4% ≥ 40). All received systemic or epidural opioids and supplemental oxygen. Measurements of SpO2 and EtCO2, sedation, respiratory rate, and other variables were documented every 15 minutes for 90 minutes. Statistical analyses measured co-variations of SpO2 and ET CO2 relative to clinical variables.

Results: Variations in EtCO2 readings were observed; whereas SpO2 readings remained relatively unchanged. Mean difference for EtCO2 from one measurement to the next as a constant was 0.29 ± 1.2, range -2.3 to 4.3 (central) and -0.1 ± 1.1, -5.3 to 2.3 (portable). Minimal correlation with SpO2 to EtCO2 was noted (r=0.03). ASA Classification 3 was associated with decreases in SpO2, and meaningful changes in EtCO2 central (P= 0.098) and portable (P=0.09). Correlations of SpO2 to EtCO2 are analyzed along with other variables across 647 data points. Desaturation was observed with 5.1% of SpO2 readings, and EtCO2 readings showed an earlier upward trend in a portion of these episodes. Overall, a high-low significant (r=0.29 P<0.05) correlation was found between the means for both capnography methods.

Discussion: SpO2 and EtCO2 readings showed no meaningful co-variations. Supplemental oxygen influences SpO2, and therefore, changes in SpO2 may not be an early sign of ensuing respiratory issues.

Conclusion: Trends in desaturation were associated with earlier changes in EtCO2.

Implications for Perianesthesia Nurses and Future Research: Technology-supported monitoring provides useful information regarding a patient’s clinical status. More research is needed to establish the value of capnography in detecting earlier trends in desaturation when patients are receiving supplemental oxygen.