

Improved accuracy of the Masimo SET Oximeter (MSO) Increases Caregiver Confidence in Saturation Values

Rostow SK, Durbin CG. *Respiratory Care* 2001;46(10):1104

Introduction

During a prospective study of the impact of improved oximetry on clinical practice, the authors found that caregivers more rapidly weaned cardiac surgery patients from a high F_iO_2 while obtaining fewer ABGs, when the clinicians had access to data from an Masimo SET oximeter (MSO as compared to a conventional pulse oximeter (CPO) (Ohmeda 3740).^{1,2} In this report the authors examine the relationship between saturations determined from clinically indicated ABGs and the saturations reported simultaneously to evaluate their accuracy.

Methods

86 adult patients were studied following CABG surgery. On arrival in the ICU, both a CPO and a MSO were attached to the same hand and the output from both monitors continuously recorded via computer until 4 hours following extubation or for a maximum of 24 hours. Patients were randomly assigned to display only one device to the bedside caregivers with the other device "blinded". No clinical interventions were changed. Any time an ABG was obtained, comparison of the saturation reported for each oximeter and that calculated from the ABG was made.

Results

"283 ABGs were studied, 134 while the MSO was unblinded and 149 while the CPO was unblinded. The bias (mean + sd) was calculated as the difference between the SpO_2 and the average of the SpO_2 and SaO_2 , for each oximeter, for all blood gas samples obtained. For the MSO the difference was $.53 \pm 1.7\%$; for the CPO $-.82 \pm 2.8\%$, $p < .05$. Limiting analysis to unblinded data failed to improve the results for the CPO. The frequency distribution of the bias was counted and grouped. MSO produced a bias $> 5\%$ significantly less frequently than CPO; 3% versus 15% of all ABGs ($p < .05$)."

Bias Range	0-2	3-4	5-6	7-10	> 10
Masimo SET (% of ABGs within range)	86	11	2	0	1
CPO (% of ABGs within range)	73	11	5	2	8

Authors' Discussion and Conclusion

"The MSO had a smaller bias than CPO. The CPO had more errors greater than 5% saturation. This improved accuracy, as demonstrated by the smaller average bias and the narrower range of biases seen with the MSO device, is one reason why clinicians had greater confidence in the MSO data, weaned patients faster and obtained fewer confirmatory ABGs in our study patients."

1. Durbin, Jr. CG, Rostow SK: Improved pulse oximetry changes caregiver practice patterns: Masimo SET vs. conventional pulse oximetry. *Respiratory Care* 45(8); 986, 2000.

2. Durbin, Jr. CG, Rostow SK: Pulse oximetry performance can affect caregiver time utilization. *Anesthesiology* 93 (3A); A556, 2000