

Improved Accuracy of the Masimo SET® Oximeter (MSO) Increases Caregiver Confidence in Saturation Values.

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Introduction

During a prospective study of the impact of improved oximetry on clinical practice, we found that caregivers more rapidly weaned cardiac surgery patients from a high FiO₂ while obtaining fewer ABGs, when they had access to data from an MSO as compared to a conventional pulse oximeter (CPO) (Ohmeda 3740).^{1,2} In this report we examine the relationship between saturations determined from clinically indicated ABGs and the saturations reported simultaneously to evaluate their accuracy.

Methods

After obtaining consent, 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 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 SpO₂ and the average of the SpO₂ and SaO₂, 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 (Figure). MSO produced a bias $>5\%$ significantly less frequently than CPO; 3% versus 15% of all ABGs ($p < .05$).

Conclusions

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.: *Respir Care* 45(8); 986, 2000.; 2. Durbin, Jr. CG, Rostow SK: *Anesthesiology* 93 (3A); A556, 2000.