Masimo – A New Reliable Non Invasive Method of Detecting Oxygen Saturation in Critically Ill.

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Introduction

Pulse oximetry is a ubiquitous and mandatory tool for the monitoring of oxygenation in the operating room and critical care units. This study evaluates the performance Masimo SET Pulse Oximetry on critical care patients, after another pulse oximetry technology was unable to obtain accurate readings.

Methods

Twenty critical care or operating room patients, (age range from two days to 67 yrs with a mean age of 47.5 yrs), who were being treated for a wide variety of clinical conditions such as head injuries, multi-organ dysfunction, hepatic surgery, heart surgeries and hip replacement were included in the study. Most of the patients had hypotension and exhibited motion during the study due to shivering or transport. Patients were eligible for the study if the attending clinician could not obtain an oxygen saturation reading with an Agilent M3046A M4, FAST SpO_2 pulse oximeter after repositioning the sensor several times. Once the attending physician determined that the Agilent device could not obtain a SpO_2 reading, the Masimo SET pulse oximeter sensor was applied to the patient's finger adjacent to the Agilent probe. When the Masimo SET pulse oximeter gave a SpO_2 reading, an arterial blood sample was drawn for blood gas analysis (ABG). The pulse rate was recorded from the Agilent device and the Masimo SET device for comparison with the pulse rate displayed on the ECG.

Results

SpO_2 Readings

In the 20 patients used in this study, the Masimo SET pulse oximeter obtained SpO_2 readings in all twenty cases. The SpO_2 readings from the Masimo SET were exact or within 1% of the ABG readings in 17 of the 20 cases. In the other three cases, the Masimo SET was within 5% of the ABG readings. The Agilent device gave a zero reading in 6 cases, a low signal in 7 cases, no signal in 3 cases and erroneous saturation readings (more than 10% off compared to the ABG) in 3 cases. One case was not recorded.

Pulse Rate Readings

The Masimo SET obtained accurate pulse rate readings in 19 of 20 cases and was within 2 bmp of the ECG pulse rate in the remaining case. The Agilent device obtained a pulse rate reading in 10 of the 20 cases but only one of these reading was accurate. The other 9 pulse rate readings from the Agilent device were erroneous.

Authors' Conclusions

"Masimo SET pulse oximetry has shown reliable results in patients with hypoperfusion, hypothermia and motion artifacts. It has reduced the false alarms in the intensive therapy units, thereby increasing caregiver efficiency to a large extent. Masimo SET pulse oximetry promises to be the standard of non-invasive monitoring of oxygen saturation in the critically ill in the near future."