Performance of Pulse Oximeters in Tracking Heart Rate Variability.

Deshpande G.G., Torres A. *Crit Care Med* 2004*;* 32 (12): A117.

Introduction

The objective of this project was to determine the reliability of the latest generation of pulse oximeters for tracking hear rate changes in preterm infants. We hypothesized that the Nellcor N-595 pulse oximeter was as reliable or superior as the Masimo Radical for tracking pulse rate in preterm infants.

Methods

2 pulse oximeter sensors (Nellcor MAX-N or Nellcor MAX-I and a Masimo LNOP Neo) were attached to separate distal extremities and their respective pulse oximeters (N-595, rev 3.0, Nellcor, Pleasanton, CA; Radical, v3, Masimo Corp., Irvine CA). Both oximeters and an ECG monitor (Nellcor N-3200) were connected to a computer for continuous data recording (1 Hz) during the 4-hour study per patient. True bradycardia events were defined as pulse rates >100 bpm detected simultaneously by a minimum of 2 of the 3 monitors for >/= 10 sec. A trained observer confirmed all events. A significant difference in true events, false events and % time pulse rate undetected between oximeters was determined with chi square or Fisher's exact test. A p value <0.05 was considered significant.

Results

19 infants with median (range) age and wt of 14 d (1-84) and 1910 gm (920-3750), respectively, were studied in a NICU. There were a total of 57 true bradycardia events.

Conclusions

We conclude that the N-595 and Radical pulse oximeters report significantly fewer false alarms than the N-3200, with the best performance coming from the N-595. Although there was a statistical difference between oximeters in pulse rate undetected, this accounted for less than one percent of the total monitoring time. All three monitors performed equally well detecting true bradycardia events.