

Comparison of Heart Rate and Oxygen Saturation Measurements from Masimo and Nellcor Pulse Oximeters in Newly Born Term Infants

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Background

Pulse oximetry is increasingly used in the delivery room (DR) to measure heart rate (HR) and oxygen saturation (SpO₂). There are few data comparing the accuracy of HR measurements in the DR from two commonly used models of pulse oximeter. *Objective:* To compare HR measurements from Nellcor and Masimo oximeters, against HR measured via three-lead electrocardiography (HRECG) and to compare SpO₂ between these two oximeters, in infants immediately after birth.

Design/Methods

Soon after birth, ECG leads were placed on the infant's chest. Masimo (SET Radical v4) and Nellcor (Oximax N-600x) oximeter sensors were randomly allocated to each foot. Displays from the oximeters and ECG monitor were video recorded for 10 mins. HR, SpO₂ and signal quality were extracted from the video every 2s. Bland-Altman plots were used to determine agreement between HR and SpO₂ measurements from each device. Poor signal quality data were excluded.

Results

44 infants born by elective Caesarean section with mean (SD) gestational age 38 (1) weeks' and birthweight 3246 (527) grams were studied. 4 infants received resuscitation. More than 8000 paired data points were recorded for each comparison. There was no difference between devices for the median (IQR) time taken to display HR from birth: Masimo 102 (80-115)s versus Nellcor 105 (94-138)s. Overall the mean difference between HR from either oximeter compared to the ECG was < 1 bpm. Overall agreement between SpO₂ from the two monitors was good, mean difference 3% (95% CI ± 15%). At SpO₂ < 70% measurements from the Masimo were consistently lower than those from the Nellcor mean difference 19% (95% CI ± 23%).

Conclusions

Performance of the monitors was similar with respect to HR. At oxygen saturations < 70% clinically important differences between the two monitors appeared.

