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

Dawson J., Saraswat A., Simionato L., Thio M., Kamlin C., Owen L., Schmölzer G., Davis P. *Acta Paediatr*. 2013 Jun 25.

Aim

To compare heart rate (HR) measurements from Masimo and Nellcor pulse oximeters (POs) against HR measured via a three lead electrocardiograph (ECG) (HRECG). We also compared peripheral oxygen saturation (SpO2) measurements between Nellcor and Masimo oximeters.

Method

Term infants born via elective caesarean section were studied. ECG leads were placed on the infant's chest and abdomen. Masimo and Nellcor PO sensors were randomly allocated to either foot. The monitors were placed on a trolley, and data from each monitor screen captured by a video camera. HR, SpO2 measurements and signal quality were extracted. Bland-Altman analysis was used to determine agreement between HR from the ECG and each oximeter, and between SpO2 from the oximeters.

Results

We studied 44 infants of whom 4 were resuscitated. More than 8000 pairs of observations were used for each comparison of HR and SpO2. The mean difference (±2SD) between HRECG and HR Nellcor was -0.8(±11) beats per minute (bpm); between HRECG and HR Masimo was 0.2(±9) bpm. The mean (±2SD) difference between SpO2Masimo and SpO2Nellcor was -3(±15)%. The Nellcor PO measured 20% higher than the Masimo PO at SpO2 <70%.

Conclusion

Both oximeters accurately measure HR. There was good agreement between SpO2 measurements when SpO2 ≥70%. At lower SpO2, agreement was poorer.