Accuracy of Pulse Oximetry Measurement of Heart Rate of Newborn Infants in the Delivery Room.

Kamlin C.O., Dawson J.A., O'Donnell C.P., Morley C.J., Donath S.M., Sekhon J., Davis P.G.

J Pediatr. 2008 Jun;152(6):756-60.

Objective

To determine the accuracy of heart rate obtained by pulse oximetry (HR(PO)) relative to HR obtained by 3-lead electrocardiography (HR(ECG)) in newborn infants in the delivery room.

Methods

Immediately after birth, a preductal PO sensor and ECG leads were applied. PO and ECG monitor displays were recorded by a video camera. Two investigators reviewed the videos. Every two seconds, 1 of the investigators recorded HR (PO) and indicators of signal quality from the oximeter while masked to ECG, whereas the other recorded HR(ECG) and ECG signal quality while masked to PO. HR (PO) and HR (ECG) measurements were compared using Bland-Altman analysis.

Results

We attended 92 deliveries; 37 infants were excluded due to equipment malfunction. The 55 infants studied had a mean (+/-standard deviation [SD]) gestational age of 35 (+/-3.7) weeks, and birth weight 2399 (+/-869) g. In total, we analyzed 5877 data pairs. The mean difference (+/-2 SD) between HR(ECG) and HR(PO) was -2 (+/-26) beats per minute (bpm) overall and -0.5 (+/-16) bpm in those infants who received positive-pressure ventilation and/or cardiac massage. The sensitivity and specificity of PO for detecting HR(ECG) <100 bpm was 89% and 99%, respectively.

Conclusions

PO provided an accurate display of newborn infants' HR in the delivery room, including those infants receiving advanced resuscitation.