

Pulse Oximeter Probe Placement in Delivery Room Resuscitation: A Randomized Controlled Trial

Louis D., Sundaram V., Kumar P. *Pediatric Academic Societies Annual Meeting* 2013 May 4-7, 2013
Washington, D.C. Abs# E-PAS2013:1510.132

Background

Neonatal Resuscitation Program (NRP) 2010 recommends applying pulse oximeter sensor first to the baby and then to the oximeter to acquire early signal. However, different sensor application techniques have not been evaluated in a rigorous trial.

Objective

To compare 2 methods of pulse oximeter probe placement during delivery room resuscitation for faster detection of reliable heart rate and pulse saturation.

Design/Methods

Open label, stratified (28-30; 31-33; 34 weeks) randomized controlled trial. All consecutive deliveries 28 weeks were randomized to one of the two techniques. Technique 1: Pulse oximeter 'ON' with extension cable attached; sensor applied first to infant and then to extension cable to complete the circuit. Technique 2: Machine 'ON' with extension cable and sensor attached; sensor applied to infant to complete the circuit. Primary outcome: Time from circuit completion to first display of reliable heart rate and pulse saturation; reliable was defined as stable display of heart rate and saturation without blinking. Secondary outcomes: Time from birth to beginning of sensor application, time for sensor application, total time (from birth to appearance of reliable signal) and need to reapply sensor. A Masimo Pulse-oximeter RAD-7 model with a multisite LNOP Y1 neonatal sensor was used.

Results

A total of 150 neonates were randomized. Mean gestation and birth weight of whole study population was 33 4 weeks and 1810 756 grams. Baseline characteristics were comparable. Mean (SD) time (in seconds) from circuit completion to a reliable signal was significantly longer with technique 1 versus 2 [16.6 6 vs. 11.4 9.3; Mean Difference 5.2 (95% CI 2.7, 7.7), $p<0.001$]. A trend towards longer time to reliable signal from birth was observed with technique 1 versus 2 [67.3 32 vs. 58 15, $p=0.09$]. Need to reapply sensor was more common with technique 1 [8 (11%) vs. 1 (1.3%); $p<0.001$]. No difference was observed in other secondary outcomes. On subgroup analysis, the difference between the two interventions was more significant in 28-30 weeks stratum [17 (15,17) vs. 9 (6, 13); $p<0.001$]. No difference between the techniques was observed in asphyxiated neonates ($n=19$).

Conclusions

In a delivery room setting, sensor attached to the pulse oximeter first and then to the infant picked saturation and heart rate signals earlier than to the baby first and then to the oximeter. This difference was more significant in the 28-30 weeks stratum.