"New-Generation" Pulse Oximeters in Extremely Low-Birth-Weight Infants: How Do They Perform in Clinical Practice?

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Abstract

The aim of this study was to evaluate the performance of "new-generation" pulse oximeters in extremely low-birth-weight ([ELBW] ≤1000 g) infants.

In a prospective crossover observational study, the performance of pulse oximeters of 3 brands (Masimo, Nellcor, and Philips) was evaluated by dual SpO2 measurement in ELBW infants. Disposable probes of either equal or different brands were placed around both feet of the patient simultaneously for approximately 4 hours. Probes were switched between feet every hour. Absolute differences in SpO2 values (ΔSpO2) and the bias between brands were studied.

Nine ELWB infants were included (gestational age: mean ± SD = 26/7 ± 1/7 weeks). The median (range) ΔSpO2 was 2% (0%-26%). In 9% of the time, ΔSpO2 was 5% or more. The variance of the difference of the 3 pulse oximeter brands was not significantly different. No consequent bias between brands was found. Simultaneously obtained pulse oximeter measurements from the feet of ELBW infants differ from each other.

Our results suggest that it is not the brand but the handling of the pulse oximeter in clinical practice, such as the place and positioning of the probe, that influences the performance of the pulse oximeter the most. Improvement in the accuracy of oxygen-monitoring techniques for ELBW infants is required.