

[2849.280] Comparison of Simultaneous Cerebral Oximeter and Pulse Oximeter Data in Preterm Infants with RDS

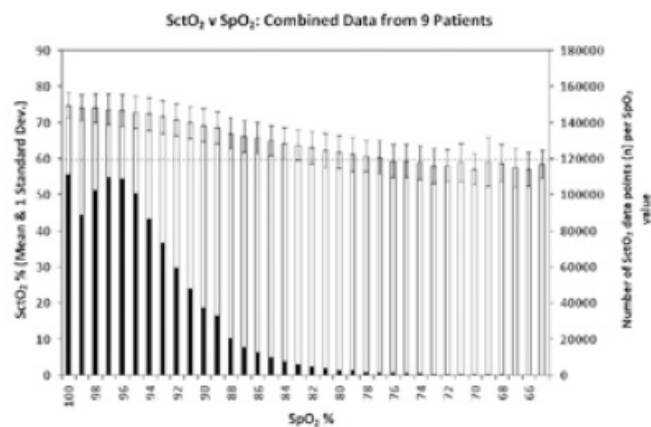
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BACKGROUND: Preterm infants' ability to adequately extract and utilize oxygen remains largely unknown. These infants also have immature cerebral vascular autoregulation. Corresponding measures of NIRS brain oxygen saturation (SctO₂) to peripheral arterial oxygenation (SpO₂) have not been reported in this population. NIRS may provide guidance on adequacy of cerebral oxygenation in the face of peripheral hyper- and hypoxemia SpO₂ data.

OBJECTIVE: In this study, we monitored both pulse and cerebral oximetry in preterm infants with respiratory distress syndrome (RDS) and compared the measurements.

DESIGN/METHODS: After obtaining parental consent, we used a 4-wavelength NIRS device to monitor brain SctO₂ (FORE-SIGHT®, CASMED, Branford, CT USA) and simultaneous SpO₂ data (Radical®, Masimo Corp., Irvine, CA USA). Data were collected every 2 seconds for a total of 72 hours/infant and organized by grouping the SctO₂ data with decremented SpO₂ values (100, 99, 98, etc).

RESULTS: Nine preterm neonates with gestational age of 29-32 weeks and weighting 980-1650 g were monitored. All subjects had RDS but had no known brain issues. 4 of 9 subjects experienced bradycardia during the study. The figure contains an aggregate of SctO₂ (mean and 1 SD) for each SpO₂ value for all 9 subjects combined. 24.3 days of data were recorded where SpO₂ was less than 80% for 1.1% of the total time.



CONCLUSIONS: The accepted clinical range in this population of SpO₂ is 85-95%. Assuming a SctO₂ range of 60-90%, some infant brains may tolerate a lower SpO₂ due to the body's compensatory mechanisms (assuming peripheral organs are not compromised). This is also supported by the SpO₂-SctO₂ difference, which decreases with SpO₂. It is well known that pulse oximeter accuracy falls as SaO₂ drops below 80% and worsens with vasoconstriction. NIRS can provide reassurance of adequate brain oxygenation during transient SpO₂ changes, even in the presence of severe hypotension since SpO₂ pulsations are not required for NIRS measurements.

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