A Randomised Crossover Trial of Clinical Algorithm for Oxygen Saturation Targeting in Preterm Infants with Frequent Desaturation Episodes.

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Objectives: Strategies for oxygen therapy for preterm infants, such as the Vermont-Oxford's 'Breathsavers' guidelines, seek to strike a balance between the potential risks of the extremes of hyperoxia and hypoxia in preterm infants. Using an algorithm based on those guidelines, we aimed to compare the proportion of time spent within the SpO2 target range during algorithm-based management of oxygen delivery compared with routine nursing care.

Study Design: In a randomized crossover trial, maintenance of SpO2 over a 4-hour period during routine care was compared with algorithm-based control (administered by a dedicated research nurse). SpO2 target (88-92%) and alarm limits (86-94%) were identical in both arms. Infants <32 weeks' gestation were eligible if having >8 desaturations episodes to <85%/4 h while receiving continuous positive airway pressure/synchronised intermittent mandatory ventilation. Data was recorded via the Powerlab system from Masimo oximeters and Babylog 8000+ ventilators.

Results:
16 infants with a gestation of 26.7 ± 1.3 weeks (mean ± SD) and birth weight 901 ± 193 g were studied at a postmenstrual age of 30.5 ± 2.4 weeks. The percentage of time spent within target range was 34.6 ± 28.5% during routine care versus 38.3 ± 29.3% during algorithm-based care (p = 0.23). Compliance with alarm limits was 58.4 ± 21.8% during routine versus 64.7 ± 22.1% for algorithm-based care (p = 0.091). The frequency of desaturations, episode severity or number of FiO2 adjustments did not differ between the two care strategies.

Conclusions: The observation that algorithm-based control did not improve time spent within the SpO2 target and alarm limits suggests nursing care has reached an optimum in the unit studied. Our finding indicates that significant modifications to the algorithm are likely to be necessary to improve target range compliance.