Achieved versus Intended Pulse Oximeter Saturation in Infants Born Less Than 28 Weeks' Gestation: The Aviox Study.

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Objective

The objective of this study was to document pulse oximeter saturation levels achieved in the first 4 weeks of life in infants who were born at < 28 weeks' gestation, compared with the levels that were targeted by local policy, and examine factors that are associated with compliance with the target range.

Methods

Infants who were < 28 weeks' gestation and < or = 96 hours of age were enrolled in a prospective, multicenter cohort study. Oximetry data were collected with masked signal-extraction oximeters for a 72-hour period in each of the first 4 weeks of life. Data were compared with the pulse oximeter saturation target range prescribed by local institutional policy. Factors that were associated with intended range compliance were identified with hierarchical modeling.

Results

Fourteen centers from 3 countries enrolled 84 infants with mean +/- SD birth weight of 863 +/- 208 g and gestational age of 26 +/- 1.4 weeks. Oxygen saturation policy limits ranged between 83% and 92% for lower limits and 92% and 98% for upper limits. For infants who received respiratory support, median pulse oximeter saturation level achieved was 95%. Center-specific medial levels were within the intended range at 12 centers. Centers maintained infants within their intended range 16% to 64% of the time but were above range 20% to 73% of the time. In hierarchical modeling, wider target ranges, higher target range upper limits, presence of a policy of setting oximeter alarms close to the target range limits, and lower gestational age were associated with improved target range compliance.

Conclusions

Success with maintaining the intended pulse oximeter saturation range varied substantially among centers, among patients within centers, and for individual patients over time. Most noncompliance was above the intended range. Methods for improving compliance and the effect of improved compliance on neonatal outcomes require additional research.