Use of an Oxygen Saturation Histogram Increases Time Infants Are within Target Saturation Range

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Background

The Keep Oxygenation at Appropriate Levels for Age (KOALA) protocol for very low birth weight infants provides guidelines for adjusting supplemental oxygen to maintain oxygen saturations (SpO2) between 88-95% in our NICU. When KOALA was initially instituted there was an increased compliance in maintaining appropriate SpO2; however, over time compliance waned. *Objective*: We aimed to improve nursing compliance with prescribed oxygen saturation ranges by incorporating histogram distribution data into the charting to improve target SpO2 range compliance.

Design/Methods

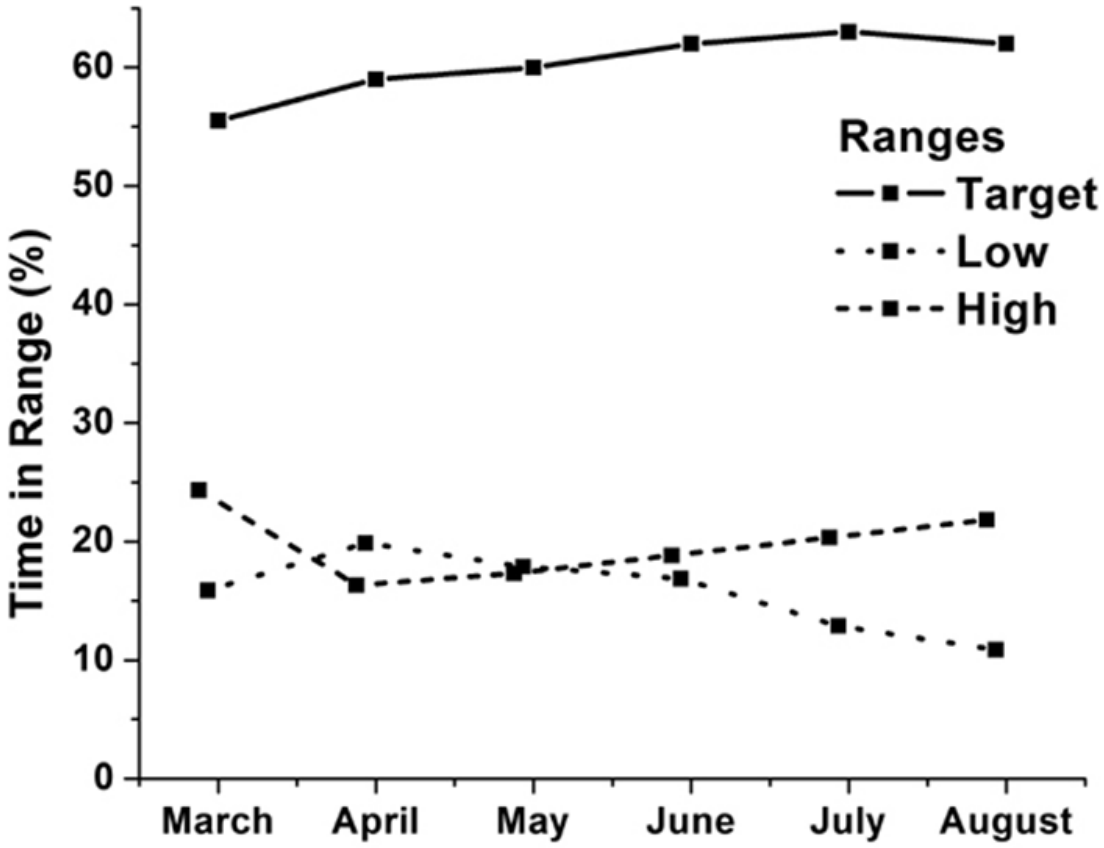
This study is an observational analysis of SpO2 histogram distribution data. Infants were eligible if their birth weight was less than 1,500 grams. All infants who were ventilated, including NIMV, CPAP, and nasal cannula, were included, if they required a FiO2 $\geq$ 0.25 for >25% of the time. Infants with cyanotic heart disease and persistent pulmonary hypertension were excluded. Data was obtained from the SpO2 histogram function from a Masimo pulse oximeter. Nursing staff was taught how to retrieve the SpO2 histogram for their 12 hour nursing shift. From March 2011 until September 2011, nursing staff charted the histogram output twice daily in the electronic medical record. Data from the 6 month period was assessed for improvement in KOALA protocol compliance.

Results

There were 36 infants observed during the study period. Overall, there was a significant increase in time infants spent within the target SpO2 range, 55% to 62% ($p < 0.001$). There was also a significant decrease in the amount of time infants spent above and below target range ($p < 0.001$).

Conclusions

Nurses serve as gatekeepers for administration of supplemental oxygen. Reporting the SpO2 histogram output increases awareness about the amount of time infants are spending outside of prescribed SpO2 ranges and increases efforts to maintain target saturation ranges.


Time in Range (%)
0
10
20
30
40
50
60
March
April
May
June
July
August
Ranges
Target
Low
High