Pulse oximeter with longer averaging time and missed chronic hypoxia in preterm infants

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Background: Targeted oxygen saturation in preterm infants has been an area of debate for decades. Mild chronic hypoxia exposes some infants to significant comorbidities like pulmonary artery hypertension (PAH). The pulse oximeters vary in technical properties and setting; pulse oximeters with shorter SpO_2 averaging time may provide a more accurate oxygen assessment.

Aim: To evaluate the readiness of preterm infants for discharge based on the current unit's protocol which uses standard pulse oximetry with an averaging time of 20s, as opposed to a pulse oximeter with a shorter averaging time (2s).

Methods: The study was a prospective observational pilot study included all infants <32 weeks' postmenstrual age (PMA) with no cardiovascular or respiratory pathology other than related to prematurity, such as bronchopulmonary dysplasia (BPD) and persistent ductus arteriosus. All infants underwent Echocardiography studies after the 2nd week of life and after 36 weeks to exclude PAH. All infants older than 36 weeks PMA who were off oxygen and ready to be discharged home as per unit's protocol underwent final oxygen assessment for a minimum of 6 h using motion resistant oximeter with a SpO_2 short averaging time of 2s.

Results: Thirty-five infants underwent the oxygen pulse oximetry testing. Of them, 42% were found to have chronic hypoxia (defined as 5% of recorded time with $SpO_2 \leq 90\%$) and fulfilled the diagnostic criteria for BPD.

Conclusions: A significant number of infants at 36 weeks' PMA with chronic hypoxia were missed using the current unit's oxygen assessment. With the prevalence being higher in infants diagnosed with BPD, a future study must be conducted to investigate the correlation between missed chronic hypoxia in infants with BPD and late-onset PAH.