

## LOWER CEREBRAL OXYGEN SATURATION IN PRETERM COMPARED WITH TERM INFANTS DURING THE FIRST 24 HOURS OF LIFE

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**Background and aims:** Frequency-domain near-infrared spectroscopy (FD-NIRS) enables longitudinal measurements of cerebral tissue oxygen saturation (StO<sub>2</sub>). The objective was to evaluate changes in cerebral oxygenation in preterm versus term infants during the first days of life.

**Methods:** StO<sub>2</sub> was repeatedly measured by FD-NIRS (Oxiplex TS, ISS Inc., Champaign, IL, USA) in preterm (n=11, gestational age 34+3/7 (32+1/7-35+5/7) weeks, birth weight 2.125 (1.150-2.922) kg) and term (n=8, gestational age of 39+6/7 (37+0/7-40+6/7) weeks, birth weight 3.535 (2.360-4.390) kg) infants within the following postnatal time intervals: 0-12h, 12h-24h, 24-36h, 36-48h and 48-72h. The optode was placed over the right temporo-parietal region. For each measurement, 3 separate recordings of at least 2 minutes each at 1Hz sampling rate were combined. Median (min.-max.) p-values by Wilcoxon rank-sum test are depicted.

**Results:** At 6h and 18h, preterm infants had lower StO<sub>2</sub> values 55.6 (54.2-57.6)% and 60.5 (47.3-66.0)% compared to term infants (64.9 (59.4-74.8)% and 68.7 (59.3-75.8)%; p=0.004 and p=0.024). In contrast, at 42h and 60h StO<sub>2</sub> values were similar: 63.1 (57.0-69.0)% and 60.1 (54.1-67.4)% compared with 65.1 (58.9-72.4)% and 61.4 (56.6-70.5)%; p=0.262 and p=0.358.

**Conclusion:** These results suggest that preterm infants have lower StO<sub>2</sub> levels compared with term infants during the first day after birth. Inadequate cardio-respiratory adaptation may contribute to this finding.

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