

## **Regional tissue oxygenation in association with duration of hypoxaemia and haemodynamic variability in preterm neonates.**

[Petrova A, Mehta R.](#)

### **Source**

UMDNJ/Robert Wood Johnson Medical School, Department of Pediatrics, One Robert Wood Johnson Place, New Brunswick, NJ 08903, USA. [petroran@umdnj.edu](mailto:petroran@umdnj.edu)

### **Abstract**

#### **OBJECTIVE:**

To assess the effect of the duration of spontaneous hypoxic episodes and variations in haemodynamic parameters on cerebral and renal tissue oxygenation (rSo(2)C and rSo(2)R) in clinically stable preterm infants.

#### **DESIGN:**

Observational study.

#### **SETTING:**

Neonatal intensive care unit of a university-affiliated children's hospital. Patients rSo(2)C and rSo(2)R and haemodynamic parameters were recorded for 2-3 h (once or twice) in clinically stable preterm neonates (n=10) using near-infrared spectroscopy, GE DASH 4000 and Bedmaster Software.

#### **MAIN OUTCOME MEASURES:**

rSo(2)C and rSo(2)R and fractional oxygen extraction (cerebral and renal fractional oxygen extraction: FOE-C and FOE-R, respectively) in association with the duration of pulse oximetry desaturation (pulse oximetry saturations (Sao(2)) < or =84%), bradycardia (heart rate < or =90 beats/min) and hypotension (mean blood pressure (MBP) <30 mm Hg).

#### **RESULTS:**

Among the 14 sets of recorded measurements, 128 hypoxic episodes with 5-10 (n=41), 15-20 (n=26), 25-30 (n=78), 35-40 (n=14), 45-50 (n=25) and > or =55 s (n=16) duration were identified. Prolongation of hypoxic episodes for more than

30 s was associated with major reductions in  $SaO_2$ ,  $rSo_2C$  and  $rSo_2R$  without any significant changes in the regional FOE. Bradycardia occurred during 43.8% of hypoxaemic episodes of  $\geq 55$  s duration ( $p < 0.01$ ) and impacted the severity of the tissue deoxygenation. Decreased  $rSo_2R$  and increased FOE-R were observed in association with mild hypotension irrespective of the systemic oxygenation status.

## **CONCLUSIONS:**

Prolongation of hypoxaemia contributes to the severity of the deoxygenation (systemic and regional) and development of bradycardia. In stable preterm neonates, mild decreases in MBP independently affect the renal but not cerebral tissue oxygenation and oxygen utilisation.