

[1534.587] Cerebral Oxygenation of Healthy Term Newborns during Transition to Neonatal Life

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BACKGROUND: Measurement of the cerebral tissue oxygenation (SctO₂) by near infrared spectroscopy might be helpful to monitor cerebral oxygen delivery in critically ill newborns during transition.

OBJECTIVE: The aim of this study was to determine reference values of SctO₂ during transition of healthy term newborns using a calibrated laser light source cerebral oximeter (FORE-SIGHT; Casmed, Branford, CT) after different modes of delivery.

DESIGN/METHODS: 46 healthy newborns were enrolled in this study, who did not require any respiratory support such as invasive or noninvasive ventilation or supplemental oxygen. We studied 3 groups of infants: 1. Newborns after spontaneous vaginal delivery (n=20; birthweight: 3512 (3197-3805) g), 2. Newborns after operative vaginal delivery (n=4; birthweight: 3120 (2972-3357) g), 3. Newborns after caesarean section (n=22; birthweight: 3295 (3143-3658) g). After delivery infants were placed prone on the mother's chest or in the father's arm if caesarean section was performed. Immediately a sensor for measurement of SctO₂ was placed on the infant's forehead and fixed with adhesive tape. In addition a pulse oximetry sensor (Masimo, Irvine, CA) was attached to the right hand to measure arterial oxygen saturation and heart rate. This study was approved by the local ethics committee of the University of Ulm and informed consent was obtained.

RESULTS: The following values of SctO₂ (median (interquartile ranges)) were determined during normal transition of healthy newborns (Table). 1', 5', 10' Apgar-Scores were similar in the three groups (ANOVA).

Cerebral oxygenation in term neonates during transition

Mode of delivery	2 min	3 min	5 min	10 min
Spontaneous (n=20)	42 (39;46)	51 (41;55)	61 (57;71)	70 (62;79)
Operative vaginal (n=4)	36 (20;53)	53 (34; 67)	68 (61;74)	76 (69;76)
Caesarean section (n=22)	42 (30;52)	55 (36;64)	64 (57;72)	73 (64;77)

No difference between groups (Repeated Measures ANOVA)

CONCLUSIONS: Postnatal SctO₂ was low after delivery and increased to a steady state in the range of 60-77% within approximately 7 minutes after birth. In healthy term newborns the mode of delivery had no relevant impact on the increase of SctO₂ after birth.

First Author is a Fellow in Training

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