September 21st, 2023 11:00 - 12:30

PARALLEL SESSION 15 - CIRCULATION 2

ID 159. CORRELATION BETWEEN HEART RATE AND REGIONAL CEREBRAL OXYGEN SATURATION IN PRETERM UND TERM NEONATES DURING IMMEDIATE TRANSITION AFTER BIRTH

Doctor Nina Hoeller[1], Alexandra Raberger[1], Doctor Daniel Pfurtscheller[1], Doctor Bernhard Schwaberger[1], Doctor Nariae Baik–Schneditz[1], Prof. Berndt Urlesberger[1], Prof. Gerhard Pichler[1]

[1]Medical University of Graz, Graz, Austria

Background: Recent publications described an association between heart rate (HR) and cerebral oxygenation in neonates, measured non–invasively using near–infrared spectroscopy (NIRS). An association between cerebral oxygenation and HR may indicate an impairment of cerebral autoregulation, which in turn may increase the risk of cerebral injury, especially in preterm neonates.
Aim of the study was to investigate the correlation between HR and regional cerebral oxygenation saturation (crSO2) during immediate transition after birth in preterm and term neonates.

Methods: A retrospective analysis of secondary outcome parameters of prospective observational studies was performed. Preterm and term neonates, in whom continuous HR and crSO2 measurements during the first 15 minutes after birth were performed, were eligible. Preterm neonates were included independently of need of medical support and term neonates (control group) were included only without any medical support. HR and arterial oxygen saturation (SpO2) were continuously and non–invasively monitored using pulse oximetry applied on the right hand or wrist.

CrSO2 was measured continuously on the left forehead, using the INVOS 5100C (Medtronic, Minneapolis, U.S.A.). Spearman–rank–correlation was used for correlation analysis of HR and crSO2 for every minute in each neonate from minute 10 to 15 after birth (after the initial increase of HR and SpO2 in the first minutes). Afterwards in preterm and term neonates mean values and standard deviations (SD) of the correlation coefficients were calculated for every minute and preterm and term neonates were compared.

Results: 311 neonates (106 preterm and 205 term neonates) were included. Mean gestational age of the preterm and term neonates was 34.0±2.1 and 38.9±0.8 weeks (p–value < 0.001) and mean birth weight was 2012±548 and 3280±493 g (p–value < 0.001), respectively. During immediate transition 62 (58%) preterm neonates received non–invasive respiratory support and 4 (4%) received mechanical ventilation. Mean correlation coefficients and SD during minutes 10 to 15 after birth in preterm and term neonates are presented in table 1.
Conclusion: Correlations between HR and crSO2 were predominantly positive in preterm neonates during immediate transition after birth compared to term neonates, with mainly negative correlations. Positive correlations in preterm neonates may indicate immature or impaired cerebral autoregulation.

Time after birth (minute)	PRETERM NEONATES	TERM NEONATES	p-value
	Correlation coefficient ($HR/crSO_2$)	Correlation coefficient ($HR/crSO_2$)	
10	0.027 ± 0.411	-0.051 ± 0.376	0.132
11	0.045 ± 0.456	-0.101 ± 0.403	0.011
12	0.010 ± 0.412	-0.059 ± 0.364	0.185
13	-0.013 ± 0.471	-0.045 ± 0.386	0.569
14	0.065 ± 0.423	-0.096 ± 0.368	0.003
15	0.000 ± 0.535	-0.036 ± 0.477	0.594

Mean correlation coefficients ± standard deviation (SD) of preterm and term neonates during immediate transition after birth. A p–value <0.05 was considered statistically significant.

Mean correlation coefficients ± standard deviation (SD) of preterm and term neonates during immediate transition after birth. A p–value <0.05 was considered statistically significant.

None declared

ID 982. Near-Infrared Spectroscopy Monitoring in Extremely preterm Infants: Effect on Cerebral Oximetry guided treatment as Measured by MRI: A secondary study of Safeboosc III trial

Doctor Miguel Alsina-Casanova[1], Doctor Adriana Cuaresma[1,2], Doctor Mathias Lühr-Hansen[3], Dra. Victoria Aldecoa[1], Dra. Ruth del Rio[2], Dr. Pierre Maton[4], Dr. Kosmas Safaridis[5], Dr. Zachary Vesoulis[6], Dra. Pamela Zafra[7], Dr. Emmanuele Mastretta[8], Dra. Ilia Bresesti[9], Dra. Marta Gomez-Chiari[10], Dra. Mónica Rebollo[10], Dr. Baltatzidis Aggelos[11], Dra. Isabel Benavente[7,13], Dr. Massimo Agosti[9], Dra. Nuria Carreras[2], Dr. Anastasiou Athanasia[11], Dr. Manuel Lubian[7], Dra. Francesca Dessimone[9], Dr. Markus Harboe Olsen[12], Dra. Thais Agut[2,13], Dr. Gorm Greisen[3]

[1]Department of Neonatology, Hospital Clínic Barcelona, BCNatal-Barcelona Center for Maternal-Fetal and Neonatal Medicine,, Barcelona, Spain, [2]Department of Neonatology, Hospital Sant Joan de Déu, Barcelona, Spain, [3]Department of Neonatology, Copenhagen University Hospital — Rigshospitalet , Copenhagen, Denmark, [4]Service de Néonatologie, Clinique CHC Montlégia, Liege, Belgium, [5]1st Department of Neonatology of Aristotle University of Thessaloniki, Ippokrateion General Hospital of Thessaloniki, Thesaloniki, Greece, [6]Department of Pediatrics, Division of Newborn Medicine, Washington University School of Medicine , St. Louis, United States, [7]Neonatal Intensive Care Unit, Puerta del Mar University Hospital, Cadiz, Spain, [8]SC Neonatologia, Osp. S.Anna – Città della Salute e della Scienza di Torino, Turin, Italy, [9]Department of Neonatology, Neonatal Intensive Care Unit and Pediatrics, "Filippo Del Ponte" Hospital, University of Insubria, Varese, Italy, [10]Department of Radiology, Hospital Sant Joan de Déu. , Barcelona, Spain, [11]Department of Radiology, Ippokrateion General Hospital of Thessaloniki, Thessaloniki, Greece, [12]Section of Biostatistics, Department of Public Health, University of Copenhagen, Copenhaguen, Denmark, [13]Fundación Nene, , Spain

Background: The SafeboosC–III phase 3 trial investigated the effect of cerebral oximetry monitoring in the first 72 hours after birth on mortality and severe brain injury, as measured by cranial ultrasound, in extremely preterm infants. However, the impact of cerebral oximetry–guided treatment on brain injury, as measured by magnetic resonance imaging (MRI), remains unclear. This study is a secondary analysis of the SafeboosC–III trial aimed at investigating the effect of cerebral oximetry–guided treatment on global brain injury in preterm infants, as assessed by MRI at term equivalent age (TEA).

Methods: MRI scans were obtained at TEA (36–44 weeks postmenstrual age) as per local protocol in the 8 participating centers. The Kidokoro score was used to evaluate the MRI scans. Two independent evaluators, blinded to the group allocation, evaluated the MRI scans. In case of differences, a consensus between them was obtained. The intervention effect was assessed using the non–parametric Wilcoxon rank sum test for median difference and 95% Hodghes–Lehmann (HL) confidence intervals (CI). Furthermore the intraclass correlation coefficient (ICC) was used to assess the agreement between the two blinded assessors.

Results: A total of 193 infants were included, of whom 121 underwent MRI at TEA (79% of alive patients): 57 in the cerebral oximetry–guided treatment group and 64 in the usual care group. There was a good correlation between the two independent evaluators for the Kidokoro score (ICC–agreement: 0.93, 95% CI: 0.91–0.95). The results showed no significant difference in the Kidokoro score between the cerebral oximetry–guided treatment group (median 2, interquartile range (IQR): 1 to 4) and the usual care group (median 3, IQR 1 to 4; median difference –1 to 0, 95% HLCI: –1 to 0; p–value 0.1196).

Conclusions: In extremely preterm infants the use of cerebral oximetry–guided treatment for the first 72 hours after birth did not lead to significant alterations in brain injury, as determined by MRI at TEA. Importantly, the robust correlation between the independent evaluators improved result reliability. These findings highlight the value of the Kidokoro score in research and clinical practice, offering a standardized method for evaluating brain injury in this vulnerable population.

None declared