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ROLE OF CEREBRAL BLOOD VOLUME, TISSUE OXYGENATION INDEX, TROPONIN I AND NEURO-PHYSIOLOGICAL VARIABLES IN BIRTH ASPHYXIA, RELATED TO OUTCOME.

P ZARAMELLA¹, E SARACENI¹, F FREATO¹, E FALCON¹, A SUPPIE¹, AM LAVERDA¹, L CHIANDETTI¹ ¹DEPARTMENT OF PEDIATRICS-NICU, UNIVERSITY OF PADOVA, PADOVA HOSPITAL (ITALY)

AIM: To evaluate cerebral blood volume (DCBV), tissue oxygenation index (TOI), troponin I and neuro-physiological variables in term neonates affected at birth by cardiorespiratory depression or asphyxia and their correlation with outcome.

DESIGN/METHODS: Case-control study. Inclusion criteria: arterial pH less or equal to 7.25, excessive base deficit (BE) and Apgar at 5 min less or equal to 6. We evaluated grade of encephalopathy (HIE) at birth as well as neurodevelopmental performance at 12 months. The 15 control neonates were with Apgar score more or equal to 9 at 5 min, with near infrared spectroscopy (NIRS) and troponin I at the same age. Optodes were placed on the frontotemporal area in the first 14±7.6h after birth. DCBV was calculated from $D[Hb\ sum] \times 0.89/Hb$ (g/dL). We assessed troponin I and blood gases (before 1 hour of life) on admission. Brain ultrasound (US) were performed at 24 hours and somatosensory evoked potentials (EP), at 2 weeks of life. Data are presented as mean±SD.

RESULTS: Troponin I increased in the asphyxiated or depressed group in comparison with controls (0.39±0.54 vs 0.09±0.08, p=0.04) (Mann-Whitney test). ANOVA analysis showed a correlation between HIE grade at birth with EEG (p=0.03), EP (p=0.00009), US (p=0.009). A multiple regression model, including EEG, US and EP as independent variables and one year-outcome as dependent one, presents for EP a p=0.02 and Beta 0.57. Another multiple regression model including pH, BE, troponin I as well as DCBV and TOI as independent variables and one year-outcome shows for BE a p =0.008.

CONCLUSION: In asphyxiated or depressed term newborn infants EEG, EP and US scan correlated with grade of HIE at birth, EP and BE correlated with one year outcome. DCBV and TOI seem not to indicate early and one-year outcome.

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EARLY- VERSUS LATE-CORD CLAMPING: HEMODYNAMIC EFFECTS IN HEALTHY TERM NEWBORN INFANTS.

P ZARAMELLA¹, F FREATO¹, V QUARESIMA², M FERRARI², S SECCHIERI¹, L CONTE¹, E SARACENI¹, L CHIANDETTI¹ ¹DEPARTMENT OF PEDIATRICS-NICU-UNIVERSITY OF PADOVA-PADOVA HOSPITAL, ²DEPARTMENT OF BIOMEDICAL SCIENCES AND TECHNOLOGIES, UNIVERSITY OF L'AQUILA (ITALY)

Aim: To evaluate whether clamping time could affect peripheral and heart hemodynamics, in a group of healthy term newborns.

Subjects and Methods: We evaluated 9 early cord clamping (ECC) (30 seconds) in comparison with 10 late cord clamping neonates (LCC) (4 minutes) at the mean age of 68.7 hrs. The following variables were evaluated: hematocrit (Ht %), hemoglobin (Hb g/dL), total bilirubin (TB mg/dL), heart left diastolic ventricular diameter LDV(D) (cm) by a sonographer (HDI 3000 CV); calf blood flow (mL/100g/min), calf Hb flow (micromoles/100 mL/min), calf O₂ delivery (DO₂), O₂ consumption (VO₂) (micromoles/100 mL/min), using near-infrared spectroscopy (NIRS, NIRO 300 oximeter). Perfusion index (PI) were obtained using a Masimo SET radical pulse oximeter with a sensor placed on the foot contralateral. Data are presented as mean (SD). Mann Whitney test was used to compare the two groups values. A p value less than 0.05 was considered significant.

Results: Ht 55.5 (4.8) vs 64.5 (5.3) (p 0.004) in ECC and LCC groups respectively, Hb 15.2 (1.2) vs 17.9 (1.4) (p 0.002), TB 8.2 (3.6) vs 7.3 (2.8) (ns), calf Hb flow 2.1 (1.4) vs 1.9 (0.9) (ns), calf BF 0.7 (0.4) vs 0.7 (0.3) (ns), calf DO₂ 10.1 (1.3) vs 11.2 (1.1) (ns), calf VO₂ calculated by arterial occlusion 0.4 (0.1) vs 0.3 (0.1) (ns), LDV(D) 1.5 (0.08) vs 1.7 (0.1) (p 0.01), and foot PI 1.08 (0.3) vs 1.1 (0.3) (ns).

Conclusion: Our study shows that LCC group has an increased placental transfusion, that was expressed by higher hematocrit and hemoglobin, in comparison with ECC group; so a bigger left ventricle diameter at the diastole. There was no evidence of changing in both calf Hb flow and blood flow, as well as in oxygen tissue metabolic demand and foot PI. The increased blood volume seems not to increase the jaundice risk.

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CHARACTERISTICS OF NEONATAL UNITS THAT CARE FOR VERY PRE-TERM BABIES IN EUROPE. RESULTS FROM THE MOSAIC STUDY

J ZEITLIN¹ ¹THE MOSAIC RESEARCH GROUP (FRANCE)

Context: Studies show that birth in a maternity unit with onsite neonatal intensive care (often labelled level III unit) improves survival for very preterm babies. This analysis explores the organisational characteristics of neonatal units that care for very preterm babies in 10 European regions.

Methods: Study of neonatal units (n=112) in the ten European regions in the MOSAIC study (1) which admitted 5 or more babies <32 weeks for their first consecutive 48 hours in 2003 (primary admissions). Structured questionnaires recorded Unit characteristics.

Results: Annual primary admissions of babies <32 weeks varied from 5 to 310 (median 34) and 63% of units had fewer than 50. Smaller units ranged from 75–80% of units in Lazio (Italy) and the Northern Region (Portugal) to 25% in Flanders (Belgium). NIC cots varied from 0 to 35. 75% of units had a physician on site at night (25% to 100% by region). Among locally defined level III units, variability was as marked: < 32 weeks admissions ranged from 5 to 310 and 36% had fewer than 50 (range: 75% in the Italian and Portuguese regions to 0% in the regions in Poland, the Netherlands and Denmark). These units had between 2 and 35 NIC cots; 21% had <5 cots; 86% had a physician on-site at night (59% a neonatologist, 27% a doctor in-training).

Conclusions: Characteristics of neonatal units were highly variable both within and between regions. Studies comparing outcome by locally defined levels of care need to consider differences in the organisation of neonatal care. 1. Eur J Obstet Gynecol reprod biol 2005;118:272–4