

PO-0464 DID THE INTRODUCTION OF THE BHUTANI NOMOGRAM HELP REDUCE CASES OF SEVERE HYPERBILIRUBINAEMIA IN INFANTS OF UNKNOWN DIRECT COOMBS STATUS?

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Background and aims Infants with severe hyperbilirubinaemia can develop kernicterus and have significant adverse outcomes.

A previous study in this hospital showed a significant number of infants presenting with an initial serum bilirubin (SBR) above exchange transfusion level.

Since that study the Bhutani Nomogram has been introduced. Our main aim was to see if the introduction of this Nomogram helped to reduce presentations with severe hyperbilirubinaemia.

Methods We looked at initial SBRs taken in infants ≥ 36 weeks gestation and ≥ 2.5 kgs birth weight born in 2012. We excluded infants of mothers with known antibodies as these infants may have had cord blood tested for direct Coombs status (DCT). We looked at infants whose DCT status was not known.

Results We compared our results to those obtained in the previous study from 2007/2008.

Abstract PO-0464 Table 1

	2007/2008	2012
All infants ≥ 36 weeks ≥ 2.5 kgs	15851	8288
Number of infants with at least 1 SBR	1644	1001
Max SBR ($\mu\text{mol/l}$)	673	349
Mean SBR ($\mu\text{mol/l}$)		
$p < 0.001$	209	173
Mean time of first SBR (Hours)		
$p < 0.001$	65.4	57.1
Infants above exchange transfusion		
$p = 0.002$	14 (0.85%)	0

There has been a significant reduction in infants reaching exchange transfusion level with no infant above this level in 2012.

Conclusions The Bhutani Nomogram is an effective tool in helping to reduce cases of severe hyperbilirubinaemia.

The original study performed by Bhutani *et al.* to develop this Nomogram excluded DCT positive infants. This study shows that this Nomogram is effective in a population where the DCT status is not known.

PO-0465 REGIONAL CEREBRAL TISSUE OXYGEN SATURATION DURING NEONATAL TRANSITION: IS THERE AN INFLUENCE OF GENDER?

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Objective Gender definitely plays an important role for mortality and morbidity in preterm infants. Furthermore, recent studies have shown gender-specific differences favouring females with the use of supplemental oxygen during resuscitation. Female

preterm infants showed less oxidative stress and increased anti-oxidant activity.

Therefore, the aim of the present study was to investigate, whether there are differences due to gender in the course of regional cerebral tissue oxygen saturation (crSO₂) during transition after birth.

Material and methods In a prospective observational study during 2009–2012, crSO₂ was measured using near infrared spectroscopy (NIRS) (Invos 5100 cerebral/somatic oximeter monitor; Somanetics Corp, Troy, Michigan) during the first 15 min after birth for term and preterm neonates requiring no medical support and/or supplemental oxygen. The NIRS sensor was placed on the left forehead. Peripheral oxygen saturation (SpO₂) and heart rate (HR) were continuously measured by pulse oximetry. Cerebral fractional oxygen extraction (cFTOE) was calculated. Data were analysed regarding gender for all study groups (term/vaginally delivered-VD_{term}; term/caesarean delivered-CD_{term}; preterm/caesarean delivered-CD_{preterm}).

Results Out of a total of 479 measured infants during the study period, 374 were considered for further analysis. In the group of term infants, there was a gender difference in those with cesarian delivery (CD_{term} group, n = 268): males showed significantly higher values for SpO₂ (p = .009) and crSO₂ (p = .009); whereas no difference was seen in HR. FTOE values were lower in males, very close to significance (p = 0.055).

There was no significant difference in any parameter in vaginally delivered term infants (VD_{term} group, n = 80), as well as in preterm infants (CD_{preterm} group, n = 26). The power analysis showed, that in these two groups the number of infants was too small to draw significant conclusions.

Conclusion There was a significant difference in course of crSO₂ and SpO₂ due to gender in term infants after cesarian section delivery, male infants did show significantly higher oxygen saturation values compared to female infants.

PO-0466 3.5 YEAR NEURODEVELOPMENTAL OUTCOME OF PRETERM INFANTS RANDOMISED TO DELAYED CORD CLAMPING (DCC) OR MILKING OF THE CORD (MC)

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Background Placental transfusion at birth either facilitated by DCC or MC has been described to reduce intraventricular haemorrhage and donor blood transfusion in preterm infants. Few studies have reported on neurodevelopmental outcomes.

Aims To assess neurodevelopmental outcome of ex-preterm survivors (< 33 weeks gestation) enrolled into our randomised trial of DCC (30 seconds) versus 4 times MC (Rabe Obstet and Gynecol 2011) at 3.5 years corrected age with Bayley-III examination.

Methods Prospective cohort study. Results were analysed by a statistician blinded to the group allocation using ANCOVA (significance level at the .05 alpha).

Results Bayley-III assessments were obtained in 29/ 51 survivors (56%). The MC group (9 male, 9 female) performed better on language (115 SD18 vs 105 SD23), cognitive (127 SD20 vs 120 SD27) and motor (113 SD23 vs 108 SD21) subscales than the DCC group (5 male, 6 female), which did not reach statistical significance.

Conclusions Only one study (Mercer 2010) reported a better neurodevelopmental outcome at 7 months of age for preterm infants receiving placental transfusion via DCC. To our knowledge this is the first report on 3.5 year follow-up in infants with DCC or MC. Our results indicate that MC could safely be used as an alternative to DCC. There were no excess events of typical prematurity related co-morbidities in the MC group. Ex-preterm infants seem to benefit from MC and DCC in their neurodevelopmental outcome. Large studies are needed to confirm the findings.

The study is reported on behalf of the Brighton Perinatal Study Group.

PO-0467 MATURATION OF ECHOGENICITY IN PRETERM STRIATUM

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Background and aims Preterm infants are at risk of brain injury. Cranial ultrasound is frequently used in neonatal care to detect and monitor brain injury. Anatomical structures and abnormalities can be distinguished by differences in echogenicity.

Our primary objective was to reliably measure sonographic grey values in basal ganglia. Secondary objectives included the influence of gestational age at birth on echogenicity and aspects of deep grey matter change at 30 weeks corrected GA.

Methods We prospectively collected CUS-data of 229 preterm infants (<29 weeks gestation). Parasagittal images through the gangliothalamic ovoid were assessed on mean grey value in putamen and globus pallidus. Intra- and interobserver for placement of ROI were analysed.

Results The method used produced a reliable globus pallidus to putamen ratio (GPP ratio). Mean GPP ratio was 0.786 (± 0.085). Extreme preterm infants have significantly lower GPP at birth than did preterm infants above 28 weeks (0.755 ± 0.081 vs 0.808 ± 0.091 ; P-value <0.01). At 30 weeks corrected GA this was still the case (0.723 ± 0.051 vs 0.818 ± 0.063 ; P-value <0.01).

Conclusion The putamen of extremely preterm infants is more hyperechoic than putamen of preterm infants of 29 weeks of gestation. Objective measurement of grey values can help to study brain injury.

PO-0468 ERYTHROPOIETIN FOR THE REPAIR OF CEREBRAL INJURY IN VERY PRETERM INFANTS (EPOREPAIR) – A RANDOMISED, DOUBLEBLIND AND MULTICENTRE INTERVENTIONAL STUDY

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Background Preterm infants suffering from intraventricular haemorrhage (IVH) are at increased risk for neurodevelopmental

impairment. Observational data suggest that recombinant human erythropoietin (EPO) aimed at preventing anaemia also improves long-term cognitive outcome in infants with IVH (Neubauer AP *et al.*, *Annals Neurology*, 2010). The recently completed first early high-dose EPO trial in very preterm infants did not raise any significant safety concerns (Fauchère J-C. *et al.*, ESPR Annual Meeting, 2012). **Hypothesis:** High-dose EPO improves long-term neurodevelopmental outcome in preterm infants with IVH.

Methods Design: Double blind, 1:1 randomised clinical study in 11 perinatal centres (Germany and Switzerland). **Patients:** 120 very preterm (gestational age <32 weeks) and/or very low birth weight (<1500 g) infants with IVH (>I°) diagnosed by cranial ultrasound during the first 4 days of life. **Intervention:** 5 intravenous applications of EPO (2000 U/kg) or placebo spread over 3 weeks. **Primary objective:** Neurodevelopmental outcome at 5 years of age (Kaufmann-ABC or Son-R). **Secondary objectives:** (1) safety; (2) MRI at term equivalent age to quantitatively analyse brain injury and growth; (3) psychomotor development at 2 years of age (BSID-III). **Recruitment:** March 2014 to February 2016.

Results and conclusions Given the fact that long-term neurodevelopmental outcome cannot be reliably assessed until preschool age, the primary outcome of this study providing evidence as to whether high-dose EPO improves restitution of brain damage in preterm infants will not be reported before 2021. However, MRI data can be reported much earlier. (Funded by the Swiss National Science Foundation; Clinical Trials Registry: NCT02076373).

PO-0469 ALLOMETRIC SCALING OF BRAIN GROWTH IN PRETERM INFANTS AND IN PIGLETS

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Background The relationship between brain size (measured as head circumference) and body weight in human infants is allometric. This means that the relative growth rates of the body and the brain stays in a constant relation during infancy. We are in the process of developing a preterm piglet model to study nutritional interventions on the brain. Here we present an analysis of the growth pattern during the first weeks of life.

Materials and methods Piglets (n = 146) were delivered by planned C-section at 90% and 100% gestation. All piglets were part of nutritional intervention studies in which daily body weight gain and body and brain weight upon euthanasia (d0–26) were obtained.

Results An allometric scaling model was established by linear regression using the log-transformed values of brain and body weight for piglets at 4 different ages at euthanasia: -10d (preterm at birth), 0d (term at birth), 5d and 26d for term piglets. Preterm piglets aged 4–26 days at euthanasia (n = 52) gained less weight after birth compared to term (12 vs. $26\text{g}/(\text{kg}\cdot\text{d})$, (p < 0.01), but the relation between body and brain weight did not deviate from the allometric scaling model (mean Z-score 0.014, p = 0.94).