

**Design/Methods** A secondary analysis of prospectively gathered data from a randomised trial of different cord management strategies. 38 preterm infants were monitored between 6 and 18 hours after birth. Echocardiogram measurements of right and left ventricular output (RVO, LVO) and superior vena cava flow (SVC) were performed. cEEG and changes in cerebral blood oxygenation were determined by NIRS at 6 and 12-hour timepoints. Development and grade of IVH was assessed by cranial ultrasound (CRUS) at 24 hours. Quantitative features were determined for cEEG and NIRS values. Spearman rank correlations were calculated between RVO, LVO, SVO and the NIRS and EEG quantitative features in infants with and without IVH.

**Results** Of the 38 infants analysed (median GA 28.0 weeks [23.6–31.6], median BW 950 g [530–2040 g]) 13 preterm infants developed IVH within 24 hours. Following analysis, a notable difference in relations between LVO, RVO and EEG quantitative features was found between those infants with and without IVH. Correlations of EEG features such as IBI Length max ( $r=0.71$ ,  $p$  value 0.01), IBI burst% ( $r=-0.61$ ,  $p$  value 0.05) and rEEG asymmetry ( $r=0.74$ ,  $p$  value 0.01) with LVO showed significant relationships at both 6 hrs and again IBI Length max ( $r=0.71$ ,  $p$  value 0.01), IBI burst% ( $r=-0.66$ ,  $p$  value 0.05) and rEEG asymmetry ( $r=0.65$ ,  $p$  value 0.05) at 12-hour timepoints in the IVH subgroup. No significant correlations were found between NIRS and CO measures in both groups.

**Conclusion(s)** Correlation of early continuous EEG quantitative data with LVO measures demonstrated a significant difference in features between preterm infants with IVH and those without. These results may indicate that incorporation of CO measurements and cEEG into a multi-modal method of neonatal monitoring may permit early identification of preterm infants at increased risk of IVH.

OC60

#### EVALUATION OF PERINATAL DEVELOPMENT OF OFFSPRING BORN TO MOTHERS WITH GESTATIONAL DIABETES

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**Background** According to The Hyperglycemia and Adverse Pregnancy Outcome Study (HAPO Study) 2008, hyperglycemia caused by maternal gestational diabetes mellitus (GDM) is an important contributor to adverse fetal programming and maternal complications.

**Aim** To assess the associations between the GDM and perinatal outcomes.

**Design** The study comprised 228 women who were divided into two groups: Group 1 (Gr1) included 157 women with GDM, group 2 (Gr2) - 71 women without GDM. The diagnosis of GDM has been confirmed according to the HAPO criteria. Retrospective analysis of pregnancy, delivery and early neonatal period were performed. Newborn anthropometric characteristics were assessed and interpreted according to INTERGROWTH-21<sup>st</sup> recommendations. Statistical significance was estimated using Mann-Whitney U and chi-squared tests.

**Results** The rate of vaginal deliveries in both groups was similar (Gr1 81.7%; Gr2 73.5%,  $p = 0.19$ ). The presence of

GDM was associated with an increased risk of obstetric injuries (OR 4.1, 95% CI 1.9–8.5;  $p = 0.00004$ ) and hypoglycemia in the newborn (OR 5.4, 95% CI 2.2–13.1;  $p = 0.00002$ ). No significant differences were found in birth weight (Gr1: Me 3500  $\pm$  400 g vs Gr2: Me 3450  $\pm$  500 g,  $p = 0.7$ ), birth length (Gr1: Me 52  $\pm$  0.2 cm vs Gr2: Me 52  $\pm$  0.2 cm,  $p = 0.3$ ), weight/length ratio (Gr1: Me 6.7  $\pm$  0.5 kg/cm vs Gr2: Me 6.6  $\pm$  0.7 kg/cm,  $p = 0.9$ ) and head circumference (Gr1: Me 35.2  $\pm$  2.3 cm vs Gr2: Me 35.0  $\pm$  1.3 cm,  $p = 0.05$ ). The risk of being born with 'upper average' weight was associated with presence of maternal GDM ( $> 1$  SDS  $< 2$  SDS) (OR 2.47; 95% CI 1.2–5.1;  $p = 0.01$ ). However, no association was found between GDM and neonatal weight exceeding 2 SDS, known as 'macrosomia' (OR 1.1; 95% CI 0.3–3.7;  $p = 0.83$ ). Maternal GDM was also associated with increased risk of neonatal head circumference in the 'upper average' range ( $> 1$  SDS) (OR 2.4; 95% CI 1.4–5.9;  $p = 0.005$ ).

**Conclusion** Maternal GDM was associated with increased risk of obstetric injuries, which can be explained by higher rates of increased newborn weight and head circumference. However, there was no increased number of children with macrosomia born to GDM mothers, which indicates a limited impact of GDM on fetal development compared to diabetes type 1 or 2. Neonatal hypoglycemia was associated with maternal GDM as well.

OC61

#### A SYSTEMATIC REVIEW OF SERUM BIOMARKERS IN NEONATAL ENCEPHALOPATHY TO PREDICT SHORT TERM OUTCOME

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**Background** Neonatal Encephalopathy (NE) describes central nervous system dysfunction from all causes and has a multifactorial aetiology. NE is difficult to diagnose, to treat and to predict outcome. Early prognostic information is important to initiate early intervention of therapies, to counsel parents and to redirect care. There is no gold standard early biomarker to predict outcome at present.

**Methods** The review protocol was prospectively registered with Prospero. A comprehensive search with relevant search terms of online databases Em Base, PubMed, Cochrane and Web of Science for Biomarkers in Neonatal Encephalopathy to Predict outcome was performed. The short term outcomes examined include severity of Neonatal Encephalopathy, MRI brain and survival in the neonatal period.

Two independent reviewers used Covidence software to select the studies. Quality assessment was performed using Cochrane Collaboration Tool for Risk of Bias Assessment and quantitative analysis was completed using Revman software (5.3).

**Results and Discussion** 1613 papers were identified after duplicates were excluded, and narrowed to 314 papers following abstract review for full text examination. Following full text

review 107 papers were included to examine serum biomarkers to predict short term outcome.

Raised mean serum levels of IL-6 (p value 0.04, 95% CI -44.5 to -0.66) and lactate (p value <0.001, 95% CI -6.19 to -2.81) are associated with worse short term outcome in NE. The large confidence intervals, however, reflect the small number of studies included and consequently the small population cohorts. Multiple other meta-analyses had substantial heterogeneity and were not statistically significant. A large proportion of studies were excluded due to variety of measured outcomes and methods of data reporting. Establishment of Core Outcomes in NE will benefit future research.

OC62

#### THE IMPACT OF CHORIONICITY AND ASSISTED REPRODUCTIVE THERAPIES IN OBSTETRIC AND NEONATAL OUTCOMES: A RETROSPECTIVE STUDY IN 1783 PORTUGUESE TWINS

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**Introduction** Multiple gestations' incidence has risen worldwide in the last years, much due to assisted reproductive therapies (ART).

Monozygotic twins have been associated to adverse neonatal outcomes, however the effect of ART is still unknown.

The goal of this study was to analyze obstetric and neonatal outcomes of twin pregnancies in a level 3 maternity.

**Methods** A retrospective study including all twins born in a period of 12 years (2003–2014) in a level 3 maternity was conducted. Data were collected from clinical records.

Analysis comparing spontaneous monochorionic and dichorionic twins and spontaneous and ART dichorionic twins were performed.

**Results** The sample included 1783 newborns from 875 mothers. Mean maternal age was 31 years, with 616 spontaneous pregnancies and 259 through ART.

Prematurity occurred in 77%. Congenital malformations were found in 6%, with cardiac malformation being the most common (n=48), followed by reno pelvic (n=40) and skeletal (n=29). Mortality rate was 3% (n=51).

- Spontaneous monochorionic and dichorionic twins

A total of 1202 newborns were found, 428 monochorionic and 774 dichorionic.

Gestational diabetes was more common in dichorionic pregnancies (9% vs 5%, p=0.009).

Monochorionic twins had higher prematurity (79% vs 72%, p=0.017) and very low birthweight (VLBW) rate (19% vs 14%, p=0.015).

Congenital anomalies (9% vs 6%, p=0.022), especially cardiac malformations (4% vs 2%, p=0.013), Respiratory Distress Syndrome (23% vs 18%, p=0.049), patent ductus arteriosus (7% vs 4%, p=0.021), anemia (11% vs 5%, p<0.001), periventricular hemorrhage (5% vs 3%, p=0.047), cardiac (7% vs 4%, p=0.019) and surgical (4% vs 2%, p=0.026) diseases, mechanical ventilation (16% vs 10%, p=0.001) and mortality (4% vs 2%, p=0.015) were higher in monochorionic twins.

- Dichorionic spontaneous and ART twins

The sample included 1264 newborns (770 spontaneous and 464 ART).

Maternal age > 35 years (35% vs 27%, p=0.006), gestational diabetes (14% vs 9%, p=0.006) and hypertension (12% vs 7%, p=0.002) were more common with ART.

Alcohol (1 vs 0%, p=0.028) and tobacco (18% vs 6%, p<0.001) consumptions were higher in spontaneous pregnancies.

Prematurity (72% vs 79%, p=0.01) and VLBW (18% vs 14%, p=0.03) were higher in ART twins.

There was no difference in the rate of congenital malformations.

**Conclusion** As described in the literature, monochorionic pregnancies were associated to worst obstetric and neonatal outcomes.

In this study ART was associated with higher risk of prematurity and very low birthweight. Unlike what has been described, ART was not associated with congenital anomalies.

OC63

#### NEONATAL ABSTINENCE SYNDROME (NAS): HOW THE TIMING OF PRESENTATION INFLUENCES A SAFE DISCHARGE POLICY

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**Background** Incidence of NAS from in-utero exposure to opioids has increased dramatically over the years in parallel with the general opioid uptake in societies. Management of NAS places social, emotional and financial burden on families and the health care systems. Age at which symptomatic NAS require pharmacological treatment is reported variably. Consequently, there is lack of consensus regarding the duration of observation to ensure safe discharge of the infant.

**Objective** To determine the optimal duration of postnatal hospital observation for at-risk infants following in-utero exposure to opioids.

**Design/Methods** A retrospective 5 year review of infants (≥36 weeks gestation) born between 2013–2017 to mothers with opioid dependency. Maternal and infant characteristics were abstracted from patient records and electronic database of the Mother and Child Dependency Program at Metro Health System, Cleveland, Ohio, USA. Age in hours of life (HOL) when pharmacological treatment was started for NAS as per guidelines was noted and confidence interval was defined. We compared infants who required pharmacological treatment within 96 to those who were treated beyond 96 hours using non-parametric tests.

**Results** Of the 355 infants with in-utero opiate exposure studied, 255(88.4%) required pharmacological treatment for NAS. Medications were initiated at a median age of 44.5 HOL (IQR 23–74.5 hours). 90±3% of infants were commenced on pharmacological treatment by 96 HOL; 93±3% by 120 HOL and 98±1% by 168 HOL (Figure-1). Infants who received treatment within 96 HOL (n=199) compared to those treated at >96 HOL (n=26) were more likely to have a urine toxicology positive for both mother and baby, have higher mean NAS score in first week of life, require a higher maximum dose of morphine and longer hospital stay. After adjusting for gestational age, breast milk exposure, methadone vs. buprenorphine maintenance programme, NICU vs. Special Care Unit admission; infants and mothers negative for drug