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## ABS 1

### VACUUM EXTRACTION AND RISK OF NEONATAL COMPLICATIONS: A POPULATION-BASED COHORT STUDY

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## INTRODUCTION

The aim of the present study was to investigate the association between birth weight, use of vacuum extractor and neonatal outcome among infants born at term with a birth weight  $\geq 4,500$  g.

## METHODS

This population-based cohort study used data from the Garda Hospital from 2001 to 2016, including 370 births at gestational age  $> 36$  completed weeks. We categorized our sample into non-instrumental vaginal delivery (VD), vacuum extraction (VE) or cesarean section following attempted vacuum extraction (VE + CS). The following outcomes were assessed: 5-min Apgar score  $< 7$ , neonatal convulsions, intracranial hemorrhage, and brachial plexus injury.

## RESULTS

The odds ratios for all complications increased among infants born after VE/VE + CS and VD. The highest risks were seen after VE/VE + CS with an adjusted odds ratio for neonatal convulsions of 8.4 (95% CI 5.3-11.2) among infants with a birthweight  $\geq 4,500$  g. The corresponding adjusted odds ratios for intracranial hemorrhage were 8.7 (95% CI 4.3-14.6) and for brachial plexus injury 85.4 (95% CI 75.9-103.4).

## CONCLUSIONS

Vacuum extraction is a risk factor for negative neonatal outcomes, in particular when used in infants born at term with a birthweight  $\geq 4,500$  g.

## ABS 2

### ELECTIVE CAESAREAN SECTION AND RESPIRATORY MORBIDITIES IN TERM INFANTS

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## INTRODUCTION

Green top guidance from Royal College of Obstetrics UK, suggests:

- Elective caesarean sections (El. C/S) should be performed at  $\geq 39$  weeks gestation to reduce respiratory morbidity.
- Antenatal steroids (ANS) must be offered to all mothers when El. C/S is planned at  $\leq 39$  weeks.

## METHODS

A 5-year (Jan 2010-Dec 2014) data from a single level three neonatal unit (NICU) in north east of England was inspected retrospectively to ascertain ANS administration and admission with signs of respiratory distress needing respiratory support (oxygen supplementation or any form of non-invasive and mechanical ventilation support) in infants  $\geq 37$  weeks gestation. Maternal data was obtained from the maternity database and infant data was collected from the National Neonatal Care Record (BadgerNet) maintained by the unit.

## RESULTS

A total of 21,788 deliveries occurred during the five-year period. 4,031 (18%) infants were delivered at  $\geq 37^{+0}$  and  $\leq 38^{+6}$  weeks' gestation. 2,609 (64.7%) infants were delivered by spontaneous vaginal delivery and 25 (0.95%) of them required NICU admission, with 17 infants (0.65%) who needed respiratory support. 420 (10.4%) infants were delivered by El. C/S and 11 infants required NICU admission. Only 7 (1.6%) infants needed respiratory support. All but one infant needing NICU admission received ANS. Thus, Odds of developing respiratory distress following El. C/S was 2.5 (95% CI 1.06 to 6.26) compared to spontaneous vaginal delivery (SVD) at same gestation. 406 (10%) infants were delivered by assisted vaginal delivery with 8 (1.9%) infants admitted to NICU and 5 (1.2%) received respiratory support. Thus, odds of

developing respiratory distress compared to SVD at same gestation was 2, (95% CI 0.69 to 5.18). In comparison, 16,018 (73.5%) deliveries occurred after 39 weeks' gestation of which 1,334 (8.3%) were delivered by El. C/S and 8 (0.6%) infants required NICU admission with 7 (0.5%) needing respiratory support for signs of respiratory distress. Thus, odds of developing respiratory distress in infants born at  $\leq 39$  weeks' by El. C/S compared to infants delivered by El. C/S after  $\geq 39$  completed weeks was 3.2, (95% CI 1.12 to 9.21).

#### CONCLUSIONS

- Role of antenatal steroid in preventing NICU admission with respiratory distress cannot be ascertained from our data as all but one infant received ANS prior to El. C/S.
- Despite ANS administration at  $\leq 39$  weeks' gestation, there is a significant risk of developing respiratory distress needing NICU admission in babies delivered by El. C/S compared to infants born by SVD. This risk was three times more compared to infants delivered by El. C/S at  $\geq 39$  weeks gestation. This risk needs to be highlighted in antenatal counselling.
- The trend with increased NICU admission rates with respiratory compromise following instrumental deliveries must be investigated further.

#### ABS 3

#### RISK FACTORS AND OUTCOME IN PRE-VIABLE PPRM AND CURRENT TREATMENT PRACTICE

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#### INTRODUCTION

Preterm and premature rupture of membranes (PPROM) before viability ( $< 24$  weeks of gestation), can lead to significant fetal and neonatal complications such as preterm birth, pulmonary hypoplasia, infection and death. Rates of survival vary among studies and are thought to depend on gestational age at birth, gestational age (GA) at PPRM, amount of amniotic fluid (AF) and additional complications. Counseling parents is therefore difficult. The aims of this study are: 1)

to determine antenatal risk factors associated with bronchopulmonary dysplasia (BPD) or death and 2) to evaluate current treatment practice in Dutch level III perinatal care centers.

#### METHODS

In a retrospective cohort study we included all infants born after 24 weeks of gestation with previable PPRM and a latency of  $\geq 14$  days in the Isala from January 2005 to September 2016. An online survey was conducted among all 10 perinatal care centers in the Netherlands to evaluate current treatment practice in this population. Antenatal factors: fetal growth restriction (IUGR), steroid administration, amount of AF, GA at PPRM, latency of PPRM and delivery mode were extracted from hospital records. Primary outcome measures were death or BPD at 36 weeks corrected age. Secondary outcome measures were time on mechanical ventilation, infant respiratory distress syndrome (IRDS), pneumothorax, sepsis, persistent ductus arteriosus, necrotizing enterocolitis and retinopathy of prematurity.

#### RESULTS

Forty two infants were analyzed, median GA 28.9 weeks, median birth weight 1,267.5 g, median GA at PPRM 20.8 weeks and median latency of 58.5 days. There were no antenatal risk factors identified to be associated with risk of BPD or death (**Tab. 1**). Seven infants (all born before 29.1 weeks) died, 6/7 due to respiratory failure as a result of PPRM. 11/35 infants developed BPD. There was a great similarity in treatment practice among perinatal centers. In 6/10 perinatal centers counselling parents was performed by a neonatologist and an obstetrician, already between 16-20 weeks and in 4 centers between 22-24 weeks of gestation. Two centers discuss termination of pregnancy in PPRM  $< 20$  weeks. Other factors influencing fetal management were IUGR, amount of AF and heart-thorax ratio. After maternal administration of steroids all centers started resuscitation at birth from GA 24<sup>+0</sup> weeks onwards.

#### CONCLUSIONS

Contrary to what we expected, time at onset of rupture of membranes and all other antenatal factors were not associated with increased risk of death or BPD. Neonatal factors are of influence but are related to prematurity and can't be predicted in counselling sessions in relation to PPRM. Therefore active treatment after PPRM either before or after 20 weeks gestation seems justified if the pregnancy reaches viability.

**Table 1 (ABS 3).** Antenatal factors in relation to bronchopulmonary dysplasia (BPD) and death.

Antenatal factors	Non BPD (n = 24)	BPD (n = 11)	Sign	Survivors (n = 35)	Died (n = 7)	Sign
IUGR	1 (4.2)	1 (9.1)	NS	2 (5.7)	0	NS
Antenatal steroids	21 (95.5)	11 (100)	NS	32 (97)	7 (100)	NS
Oligohydramnios or anhydramnios	14 (60.9)	9 (90)	NS	23 (67.6)	4 (100)	NS
GA at PPROM, weeks	20.8 (13-23.7)	20 (17.7-22.56)	NS	20.8 (13-23.7)	320.7 (18.8-22.7)	NS
Latency of PPROM, days	74.2 ± 7.03	52.4 ± 6.428	NS	61 (14-148)	50 (15-72)	NS
PPROM < 20 weeks	6 (25)	4 (36.4)	NS	9 (25.7)	3 (42.9)	NS
C-Section	16 (66.7)	7 (63.6)	NS	24 (68.6)	4 (57.1)	NS

Mean ± SD, median (lower range-upper range), n (%).

BPD: bronchopulmonary dysplasia; IUGR: fetal growth restriction; GA: gestational age; PPROM: preterm and premature rupture of membranes.

## ABS 4

### ASSESSMENT OF FUNCTIONAL STATUS IN PRETERM INFANTS: ONLINE SURVEY TO INFORM SCORING OF A CLINICIAN-REPORTED OUTCOMES (CLINRO) TOOL

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## INTRODUCTION

Length of NICU stay, which is often used to inform preterm infants' overall health in economic/clinical studies, is an imprecise measure that is confounded by variations in NICU practices and availability of resources for home support in different geographies. To evaluate the effectiveness of interventions in this population, we are developing a ClinRO tool to assess functional status. A literature search, expert interviews, Delphi panel and cognitive interviews were previously completed to identify and refine factors, and gradations within each factor, reflecting functional status in preterm infants. We report results of an online survey, conducted to advise on ClinRO scoring.

## METHODS

The ClinRO evaluates 8 factors: respiratory support, oxygen administration, apnea, bradycardia, desaturation, thermoregulation, feeding, and weight gain, each scored on between 3-6 gradations.

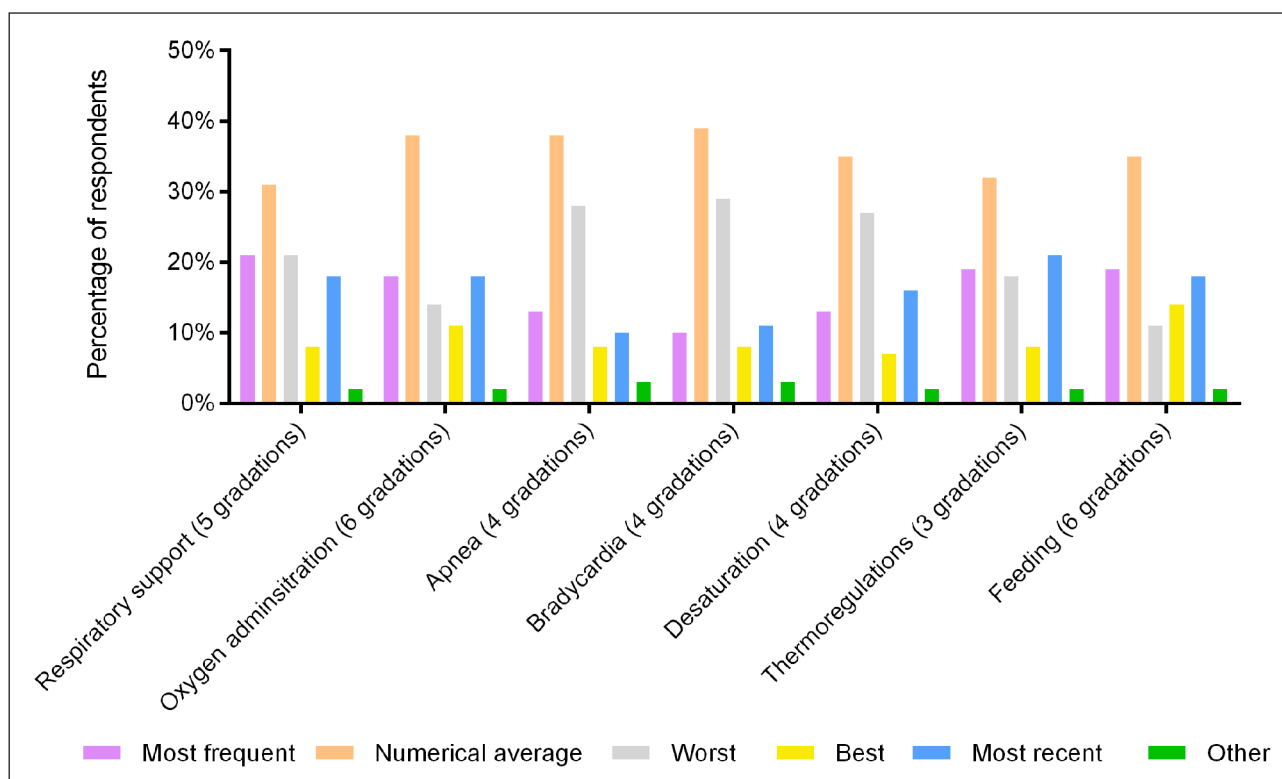
The survey included questions exploring scoring aspects, including: 1) best method to calculate daily factor scores from individual factor ratings (most frequent rating, numerical average, worst, best, most recent or other); 2) relative importance (on a scale of 1 = "most important" to 8 = "least important") of each factor in rating an infant's functional status (respondents were allowed to equally rank multiple factors); and 3) best method to calculate a weekly summary functional status score. The survey was conducted among 201 healthcare providers (neonatologists/paediatricians) from 15 countries.

## RESULTS

Of the 201 respondents, 68% were specialised in paediatrics and 32% in neonatology. Overall, numerical average was the preferred method for calculating daily factor scores for each of the 7 applicable factors (weight gain was excluded from this assessment due to weight not being measured repeatedly across shifts; **Fig. 1**). Respiratory support, apnea, and bradycardia were ranked most frequently as "most important" in rating the infant's overall functional status (for 60%, 31%, and 23% of respondents, respectively). Weight gain was most frequently ranked as 'least important' (for 21% of respondents). With regard to calculating a weekly summary score, the trend over the past 3 days was considered most important (supported by given examples), with trend and the worst score over the past 7 days having independent effects in determining respondents' ratings of weekly summary functional status.

## CONCLUSIONS

Our findings confirm the feasibility and utility of developing a ClinRO tool to assess functional status in preterm infants. The survey has helped to refine scoring of the ClinRO and will help determine evaluation of change over time. ClinRO scoring will be explored further with real-world data in a



**Figure 1 (ABS 4).** Numerical average was the preferred method for calculating daily factor scores for each of the 7 applicable factors (weight gain was excluded from this assessment due to weight not being measured repeatedly across shifts).

planned psychometric validation study, which will assess responder definition.

#### DECLARATION OF INTEREST

This study was funded by Shire Human Genetic Therapies Inc. M. Turner, I. Hansen-Pupp, J. Higginson, and R. Ward were paid consultants to Shire Human Genetic Therapies Inc in connection with this study (Dr Turner's payment was received by his institution). I. Hansen-Pupp also owns stock/stock options in Premalux AB. M. Vanya, E. Flood, E. Schwartz, and H. Doll are employees of ICON Plc, who were paid consultants to Shire Human Genetic Therapies Inc in connection with this study. A. Tocoian, A. Mangili, N. Barton, and S. Sarda are employees of, and own stock/stock options in Shire PLC. The authors thank V. Boissel, PhD, of Excel Scientific Solutions, who provided medical writing assistance funded by Shire Human Genetic Therapies Inc.

#### ABS 5

### INFANTS AND MATERNAL OUTCOME OF PREGNANCIES COMPLICATED BY H1N1 INFECTION NEEDING ECMO THERAPY: A UK ECMO CENTRE EXPERIENCE

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#### INTRODUCTION

During the 2009 H1N1 influenza A pandemic, pregnant women appeared to be especially susceptible to the development of severe respiratory complications particularly adult respiratory distress syndrome. Although, less than 1% of women require intensive care support for severe cardio-respiratory disease in pregnancy, the maternal and foetal mortality is high. There is a paucity of data on the neonatal outcomes especially in women who were refractory to conventional ventilation and required ECMO support.

#### METHODS

We reviewed the neonatal and maternal outcomes in critically ill obstetrics patients with H1N1 Influenza A needing ECMO support, between July 2009 and Dec 2009. Maternal and Infant data was collated prospectively onto the relevant ITU, obstetric and neonatal databases. Pertinent maternal and infant data were collected by review of maternal and infant notes from the index hospital or by directly

**Table 1 (ABS 5).** Showing maternal and neonatal characteristics.

Maternal and neonatal characteristics (n = 12)		
Maternal age	19-35, median: 29	
Parity	1-3, median: 2	
Multiparty	Singleton	
Ethnicity	White Caucasian 9 (75 %) Afro-Caribbean 1 (8%) Asian 2 (16%)	
Gestation at the onset of illness	23 <sup>+5</sup> -40, median: 30 <sup>+4</sup> weeks	
Infants gender	Male: 3 (25%), female: 9 (75 %)	
ECMO at delivery/post-partum	Needed ECMO post-partum (n = 7)	Gestation range: 30-40 weeks, median: 34 <sup>+3</sup> weeks Weight range: 1,350-3,360 grams, median: 2,535 grams
	Delivered on ECMO (n = 5)	Gestation range: 26-28 <sup>+6</sup> , median: 26.78 weeks Weight range 890-1,165 grams, median: 1,000 grams
SOFA score	Range: 6-14, median: 10	
Mortality (%) in relation to SOFA score	SOFA score (0-10)	Maternal mortality: 33%
	SOFA score (11-20)	Maternal mortality: 60%

contacting the referral unit for transferred cases. Data collection included both maternal and foetal demographic details, mortality outcome for mothers and babies when babies were delivered prior to going on ECMO and while on ECMO support (**Tab. 1**). SOFA score and its relation to maternal mortality rate (%) (**Tab. 1**). Data was subjected to simple descriptive statistics and expressed as range, median and percentages. This is a quality review project and did not require ethical approval.

## RESULTS

12 mothers were critically ill with swine flu needing ECMO support during the review period. 7 (58%) needed ECMO therapy post-delivery. 3/7 mothers died (43%). 5 (42%) delivered whilst on ECMO. 2/5 died (40%). The overall maternal mortality was 42%. High mortality rate was in keeping high SOFA scores. The infant deaths were restricted entirely to those who were delivered whilst the mother was receiving ECMO therapy. The 3/5 deaths (60%) in this subgroup included two still births and one neonatal death. The remaining two babies born when mother was on ECMO therapy were delivered preterm (median gestation: 27<sup>+5</sup> weeks). This poor outcome contrasts with those of the seven infants born before mothers started ECMO therapy whose infants all survived and were delivered at more advanced gestations (median: 34<sup>+3</sup> weeks). The overall infant mortality was 25% in this cohort of 12.

## CONCLUSIONS

This case series shows an increase in risk of poor outcomes in women infected with 2009/H1N1 needing ECMO support. Also, an increased neonatal mortality in those delivered while on ECMO. The

clinical application of findings would be most relevant to professionals who undertake antenatal counselling of highrisk pregnancies. This area could be a target for further epidemiological research to gain a better understanding of neonatal outcomes.

## ABS 6

### THE ASSOCIATION OF NEONATAL MORBIDITIES AND MORTALITY OF PRETERM INFANTS WITH DIFFERENT COURSES OF ANTENATAL STEROIDS

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## INTRODUCTION

To evaluate the association of neonatal morbidities and mortality of preterm infants < 30 gestational weeks exposed to no antenatal steroids (ANS) or partial or complete courses of ANS.

## METHODS

In this observational cohort study, 616 infants with a gestational age < 30 weeks admitted to NICU of Zekai Tahir Burak Maternity Teaching Hospital were enrolled. The demographic and clinical characteristics of the study infants were reviewed. The association of neonatal morbidities and mortality of preterm infants with different exposure to ANS was evaluated.

## RESULTS

There were 199 infants in the no ANS group, 143 in the partial ANS group, and 274 in the complete ANS group; the median (IQR) gestational ages were 28 (27-29.2), 28.2 (27-29.2), 28.4 (27.3-29.2) weeks, and the median (IQR) birth weights were 1,080 (890-1,260), 1,030 (870-1,250), 1,065 (890-1,210) g, respectively. A higher rate of clinical chorioamnionitis was found in the complete ANS group when compared to other two groups. ( $p = 0.008$ ,  $p = 0.004$ ; respectively). There was a decrease in the incidence of RDS treated with poractant alfa among infants exposed to a complete course of ANS when compared to the other groups (56.6%, 67.3%, 74.3%). The rate of mortality was found to be decreased in the complete ANS group when compared to no ANS and partial ANS groups (18.6%, 17.6%, and 12.8%, respectively), however the difference was not statistically significant. Severe intraventricular hemorrhage (9.5%, 11.9%, 8.4%), death or severe intraventricular hemorrhage (23.6%, 25.9%, 18.2%), death or necrotizing enterocolitis (19.1%, 20.9%, 15.9%), death or bronchopulmonary dysplasia (32.2%, 30.4%, 24.5%) did not significantly differ among the no, partial, and complete ANS groups.

## CONCLUSIONS

Study results might support the administration of ANS even if a complete course of ANS is not possible because of the potential benefit of even an incomplete course on neonatal outcomes.

## ABS 7

### MONITORING AND ASSESSMENT OF NEONATAL CARE IN KYRGYZSTAN

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## INTRODUCTION

At present, effective perinatal practices have been integrated in the Kyrgyz Republic over the past 13 years, based on WHO strategies. Annually in the country there are about 160 thousand births. The indicator of perinatal mortality is 20.3 ppm, also of neonatal mortality 11.5 ppm. The purpose of monitoring and evaluating the introduction of effective neonatal care technologies: assessment and identification of neonatal care problems; carrying

out and implementing measures to improve the quality of neonatal services.

## METHODS

The monitoring tool used is the “Tool for Assessing and Improving the Quality of Inpatient Care for Women and Newborns” (WHO, 2<sup>nd</sup> Edition, 2014). The tool includes 4 different sources of information: 1) assessment of infrastructure, management of the organization of the provision of medical services in maternity wards (HO); 2) statistics of the maternity ward, medical records; 3) direct observation of the practice of medical specialists; 4) conversations with staff and patients/users (parturient women, puerperas, partners). Coverage: 40 maternity wards HO (Health Organisation) of 1<sup>st</sup> level and 8 maternity wards HO of 2<sup>nd</sup> level.

## RESULTS

The results of the researches on the 1<sup>st</sup> level HO are presented below:

1. only 40% “Basic care of newborn” is close to the standard;
2. 15% of hospitals “Assistance to a sick newborn” is close to the standard;
3. in 20% of HO “Assistance to a sick newborn” practically isn’t given;
4. in 27% of HO “Monitoring and next observation” is close to the standard.

The results of the researches on the 2<sup>nd</sup> level HO are presented below:

1. “The basic care of newborns” corresponds to the standard in 12.5% of HO; close to the standard in 62.5% of HO; in 25% of HO are required improving the technologies of neonatal care;
2. “Assistance to a sick newborn” is at the standard level in 12.5% of HO; approximated to the standard of 37.5%; requires a significant improvement in the quality of care in 50% of HO;
3. “Specialized care for a newborn” is close to the standard in 50% of HO. It requires improvement in the quality of care in 50% of regional HO;
4. “Monitoring and follow-up” is close to the standard in 50% of HO, in 37% of HO requires a significant improvement.

## CONCLUSIONS

Thus, on the basis of monitoring and evaluation of neonatal effective technologies in the Kyrgyz Republic, it is established that: a) there is a weak professional skills/competence of medical staff to help a healthy and sick newborn; b) there are no clear criteria for the redirection and transportation of women and newborns, with the relevant standards; c) a weak commitment of managers to maintain and ensure effective neonatal technologies; d)

inadequate integration of the elements of quality of medical care in the country's HO.

## ABS 8

### EVOLUTION OF PERINATAL MANAGEMENT AT THE LIMIT OF VIABILITY IN THE LAST DECADE

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#### INTRODUCTION

Available data on perinatal management of extremely low gestational age infants display a wide variation. The objective of this study was to review changes in perinatal management at the limit of viability during the last decade.

#### METHODS

This is a single centre (level IIIc) cohort study, over a period of 9 years (2008-2016). We included all intrapartum stillbirths (IS) and live births between 23<sup>0/7</sup> and 25<sup>6/7</sup> weeks gestational age born at our hospital. Perinatal management was analyzed in these patients. Patients with major congenital anomalies were excluded.

#### RESULTS

210 patients were included in this study: 194 live births and 16 intrapartum stillbirths. The percentage of intrapartum stillbirths decreased from 16.6% in 2008 to 4.3% in 2016. Prenatal steroids administration (at least one dose) increased from 66.7% (2008) to 87% (2016). Indication of c-section varied widely: 16.7% in 2008, 42.3% in 2013 and 21.7% in 2016. Finally, active management in the delivery room (including intrapartum stillbirths) increased from 83.3% in 2008 to 91.3% in 2016. Advanced resuscitation (chest compression with or without adrenalin administration) decreased from 8.3% to 4.3%.

#### CONCLUSIONS

Perinatal management at the limit of viability should be analyzed periodically and, in our opinion, IS should be included in these reviews. An improved and more active perinatal management at the limit of viability was observed during the last decade.

## ABS 9

### EARLY ONSET INTRAUTERINE GROWTH RESTRICTION: AN INDEPENDENT RISK

### FACTOR FOR POOR PERINATAL OUTCOME IN VERY PRETERM INFANTS?

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#### INTRODUCTION

Intrauterine growth restriction (IUGR) represents a complex pathological condition that is characterized by the fetus' failure to achieve its optimal growth potential. The quest for its early identification has led to a plethora of heterogeneous definitions and blurred the boundaries between IUGR and small for gestational age (SGA) that is constitutional. This inconsistency in terminology has a profound impact on our understanding of its true role in adverse outcome in infants exposed to IUGR. The aim of this retrospective cohort study was to assess the independent contribution of early onset IUGR to neonatal mortality and morbidity in very preterm infants.

#### METHODS

Infants with 24-to-32 weeks of gestational age (GA) born alive in our center between 2000 and 2013 were included. Exclusion criteria were major malformations or a priori palliative care. IUGR was defined as an estimated fetal weight < 5<sup>th</sup> centile and umbilical artery Doppler (UAD) resistance index > 97<sup>th</sup> centile and SGA as a birth weight < 10<sup>th</sup> and normal UAD parameters. Main outcomes included neonatal death and five morbidities (necrotizing enterocolitis, sepsis, bronchopulmonary dysplasia, retinopathy of prematurity > grade 2, major brain injury) that were compared between IUGR and SGA infants and to control infants with birth weight > 10<sup>th</sup> centile. Controls were 1:1 matched to the IUGR group for sex, GA, multiple births, prenatal steroids and birth year. Logistic regression was applied.

#### RESULTS

Among 1,652 live-born infants, data from 119 (7%) IUGR infants, 25 (1.5%) SGA and 119 (7%) control infants were analyzed. Perinatal and demographic characteristics of IUGR infants, SGA and control infants were similar except in birth weight and the caesarean section rate that was significantly lower and higher, respectively, in IUGR infants compared to the controls. Univariate comparison showed higher mortality (OR = 3.6, 95% CI [1.7, 7.3]) and higher composite neonatal morbidity (OR = 2.3, 95% CI [1.3, 4.2]), i.e. the presence of one



morbidity is sufficient, in IUGR infants compared to controls. There was no between group differences of morbidity rate at single level. The investigated morbidities are known to have a predictive value of neurodevelopmental outcome at 2 years of age. After adjusting for birth weight, there were no differences observed in the neonatal outcome between groups.

#### CONCLUSIONS

In this cohort of very preterm infants, the factor IUGR did not appear to be an independent predictor of neonatal mortality and morbidity when compared to the matched control group. The lack of any differences between IUGR and SGA groups may be explained by the small SGA sample size or owing to the fact that in this GA range birth weight exerts the highest impact on neonatal outcome. The IUGR effect may be more prominent in a later stage of life.

#### ABS 10

##### THE EFFECT OF GENDER ON NEONATAL MORBIDITIES AND MORTALITY ON TWIN PAIRS

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#### INTRODUCTION

The incidence of respiratory morbidity and mortality is more frequent in preterm male infants compared with female infants both in singletons and twins. The basic mechanisms underlying sex-specific patterns of morbidity and mortality are partially understood. The hormonal disposition of the male fetus is the most probable mechanism, which worsens the pulmonary development of the male fetus. We hypothesized that having a female pair in intrauterine life could be an advantage by means of neonatal morbidity/mortality for male infants and compared the neonatal outcomes/mortality in like-and unlike-sex pairs of twins from a single-center database.

#### METHODS

Twin pairs born at  $\geq 24$  weeks' gestation with both co-twins admitted to a Level 3 NICU between January 1, 2014, and December 31, 2016, were retrospectively identified from the database. Additional risk factors and potential confounding maternal and neonatal variables were recorded. Outcome variables were interpreted in four groups (same-sex male: SSM, same-sex girl: SSG, opposite-sex male: OSM and

opposite-sex girl: OSG). Outcomes representing neonatal mortality or morbidities were compared in each group.

#### RESULTS

292 twin pairs and a total of 584 infants were analyzed. There were 184 infants in SSM, 190 in SSG, 105 in each opposite sex groups. Gestational ages were  $31.7 \pm 2.7$ ,  $32.8 \pm 3$  and  $32.1 \pm 3.8$  weeks and birth weights were  $1,695 \pm 433$ ,  $1,847 \pm 460$  and  $1,710 \pm 480$  grams respectively. Maternal and neonatal risk factors were similar except antenatal steroid administration rates. An incidentally higher rates of antenatal steroid therapy were observed in same-sex twin pregnancies (69.6 vs 52.4%;  $p = 0.005$ ). The highest incidence of severe respiratory distress syndrome (RDS) was seen in SSM group (31.5%) and was significantly higher than OSM group (22.9%) despite the higher antenatal steroid therapy rates ( $p = 0.04$ ). No difference was seen in the incidence of patent ductus arteriosus, intraventricular hemorrhage, necrotizing enterocolitis, bronchopulmonary dysplasia, retinopathy of prematurity and mortality rates between groups.

#### CONCLUSIONS

Results of our study suggest that male infants are at risk of higher severe RDS rates consistent with earlier findings. Sharing intrauterine life with a female sibling is associated with decreased RDS rates and seemed to be advantageous possibly due to some hormonal and paracrine effects that prevents female infants from respiratory morbidities.

#### ABS 11

##### IN VITRO FERTILIZATION – NEONATAL OUTCOME

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#### INTRODUCTION

According to the data in the literature, the neonates born from *in vitro* fertilization pregnancies have an increased risk for perinatal complications: premature births, congenital abnormalities, perinatal death. These complications have been largely attributed

to the associated maternal pathology, advances maternal age at reproduction, and to fertility treatments. Aim: The authors tried to evaluate the neonatal prognosis of the children born from pregnancies obtained with *in vitro* fertilization.

#### METHODS

For the case-control study we selected from the database the newborns born from pregnancies obtained after *in vitro* fertilization between 2010-2015, delivered in the maternity hospital of Sibiu. The control case was the next neonate with similar gestational age and a birth weight of  $\pm 100$  g. We analyzed the epidemiological data – gender, residence, weight, length, cranial circumference, presentation at birth, and delivery mode – and the perinatal pathology – adaptation difficulties, congenital minor and major anomalies, Apgar score, and hospitalization length. The statistical analysis was performed using SPSS® for Windows® 10.0, *p* was considered statistically significant if  $< 0.05$  (confidence interval of 95%).

#### RESULTS

The group of neonates born after *in vitro* fertilization obtained pregnancies consisted from 98 infants with a mean gestational age of  $37.1 \pm 2.2$  weeks (60 of them being delivered at gestational ages less than 37 weeks – 61.2%) and a mean birth weight of  $2,802.9 \pm 665.8$  g while the group of newborns delivered after naturally occurring pregnancies (98 cases) had a mean gestational age of  $37.1 \pm 2.2$  weeks ( $p = 0.948$ ) and a mean birth weight of  $2,789.3 \pm 657.6$  g ( $p 0.886$ ). The neonates born from pregnancies obtained using *in vitro* fertilization were significantly more often residents in urban areas (74.5% versus 59.3%,  $p 0.023$ ), had a statistically significant increased rate of abnormal presentations at birth (15.3% versus 4.1%,  $p 0.008$ , CI 2.52 [1.04-60.9], malformations (43.9% versus 25.5%,  $p 0.007$ , CI 1.55 [1.09-2.19], minor and major congenital anomalies (46.9% versus 26.5%,  $p 0.003$ , CI 1.61 [1.14-2.26], 5.1% versus 0%,  $p 0.023$ , respectively) and increased rate of deliveries via cesarean section (95.9% versus 29.6%,  $p 0.000$ , CI 4.01 [2.90-5.54]). No significant differences were observed as regards the gender, Apgar score at 1 and 5 minutes, neonatal respiratory pathology, cerebral hemorrhage diagnosed with ultrasound, and hospitalization length ( $p > 0.05$ ); no death was seen in the study groups. Interestingly, even though no significant differences were found between the length of the infants, the neonates delivered from pregnancies obtained after *in vitro* fertilization had a significantly increased cranial

circumference as compared to those born after naturally occurring pregnancies ( $32.8 \pm 1.9$  cm versus  $32.2 \pm 1.9$  cm,  $p 0.039$ ).

#### CONCLUSIONS

The results of the comparative analysis of the neonatal prognosis in pregnancies obtained after *in vitro* fertilization confirms the data in the literature: these infants demonstrate an increased rate of prematurity and congenital abnormalities. A concomitant analysis of the various aspects of these pregnancies may also identify risk factors for prematurity and congenital anomalies as advanced maternal age and pregnancy associated pathologies.

#### ABS 12

#### NEONATAL JAUNDICE AND PHOTOTHERAPY: ARE WE DOING IT RIGHT? – A RETROSPECTIVE STUDY

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#### INTRODUCTION

Phototherapy is the most widely used treatment for neonatal jaundice. There are well established guidelines published by the American Academy of Pediatrics (AAP) in 2004 for when to start phototherapy. However, there is no consensus regarding when to stop the treatment. In February 2017, Chang et al. suggested a prediction rule to estimate the risk of rebound hyperbilirubinemia after stopping phototherapy [1]. In this study, we intend to apply this model to identify the newborns with a high risk of hyperbilirubinemia rebound and to analyze if a premature discharge resulted in a bad outcome.

#### METHODS

We performed a retrospective study of the medical records of newborns admitted to the regular nursery of a tertiary northern Portuguese hospital, between November 2016 and February 2017. Newborns needing intensive care were excluded. We analyzed if the newborns who underwent phototherapy met the AAP criteria and then applied the formula suggested by Chang et al. to predict rebound hyperbilirubinemia. To identify the newborns who had rebound hyperbilirubinemia, we contacted the parents of all those who underwent phototherapy. The data were analyzed with the program IBM® SPSS® statistics (v. 24).

## RESULTS

Among the 302 newborns included in the study, 205 (67.9%) presented neonatal jaundice (61.8% male), with a mean age at the time of diagnose of 37.2 hours (SD 1.47). From those, 77 (38%) underwent phototherapy during a mean duration of 37 hours (SD 20.57). We found that 22.7% didn't meet the criteria for phototherapy according to AAP. Applying the formula of Chang et al, 7 of the newborns who underwent phototherapy (9.2%) had a risk of over 15% of hyperbilirubinemia rebound at the time of hospital discharge. Data regarding post-discharge hyperbilirubinemia was known in 63 patients. From those, only 2 newborns (3.2%) were readmitted to undergo phototherapy and both had an estimated rebound hyperbilirubinemia risk under 15% (0% and 2.5%, respectively).

## CONCLUSIONS

In this study, we noticed an overdiagnosis of neonatal jaundice requiring phototherapy. The majority of our newborns were discharged with a low estimated risk of rebound hyperbilirubinemia, and we found a low percentage of effective rebound after phototherapy. A larger prospective study aiming to identify the newborns at high risk of rebound is needed.

## REFERENCE

[1] Chang PW, Kuzniewicz MW, McCulloch CE, Newman TB. A Clinical Prediction Rule for Rebound Hyperbilirubinemia Following Inpatient Phototherapy. *Pediatrics*. 2017;139(3):e20162896.

## ABS 13

### REVIEW OF OUTCOMES OF BABIES WITH BIRTH WEIGHT LESS THAN 500 GRAMS IN A NEONATAL INTENSIVE CARE UNIT

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## INTRODUCTION

Determining the limits of viability for resuscitating a baby is important to avoid unnecessary interventions. Establishing these boundaries is an ethical dilemma that has been under constant debate. There is greater clarity and guidance on gestational age for limits of viability as compared to weight criteria. A birth weight less than 500 grams is usually taken as guide for limits of intensive care. The aim of this study was to evaluate the in-hospital mortality and morbidity in babies born less than 500 grams.

## METHODS

Retrospective data was collected from Badger database over a 8 year period from April 2009 to March 2017 looking at the mortality and morbidity in babies with birth weight less than 500 grams in a neonatal intensive care unit.

## RESULTS

There were 26 babies in the study cohort. The mean gestational age was 24 weeks (range 22<sup>+6</sup>-28<sup>+4</sup>) with 46% survival. There were 12 males and 14 females, with higher mortality in males (75% versus 36% in females). 3 babies had oesophageal perforation with nasogastric tube and 12 had necrotizing enterocolitis, which was managed conservatively. 7 babies had grade 3-4 intraventricular haemorrhages and 1 baby required laser therapy for retinopathy of prematurity. Two babies were discharged home on oxygen. The average hospital stay for the surviving infants was 109 days.

## CONCLUSIONS

Despite advances in neonatal practice, our single center data shows that the outcome of babies born with a birth weight of less than 500 grams remains very poor. The management of these babies is challenging requiring significant neonatal resources.