www.jpnim.com Open Access eISSN: 2281-0692
Journal of Pediatric and Neonatal Individualized Medicine 2014;3(2):e030208
doi: 10.7363/030208
Published online: 2014 Jun 15

Selected Abstracts of the 22nd European Neonatal Workshop

SIENA (ITALY) · CARTHUSIA PONTINIANI · JUNE 15TH-18TH, 2014

WORKSHOP'S PRESIDENT

Giuseppe Buonocore (Siena, Italy)

MD, Professor and Chairman of Paediatrics and Neonatology, President of EURope Against Infant Brain Injury (EURAIBI) Foundation Onlus, President of Union of European Neonatal Perinatal Societies (UENPS), President of the Tuscan Section of the Italian Society of Neonatology (SIN), Director of UOC Pediatria Neonatale, Policlinico S. Maria alle Scotte, AOUS, Siena, Italy

WORKSHOP'S SECRETARY

Mariangela Longini (Siena, Italy)

Assistant Professor, Department of Developmental and Molecular Medicine, University of Siena, Italy

Guest Editor: Giuseppe Buonocore

It was my great pleasure to organize the 22nd European Neonatal Workshop. It tooks place at Carthusia Pontiniani (www.pontignano.unisi.it), near Siena. The Carthusian Monastery of Pontignano is located in the Chianti area (municipality of Castelnuovo Berardenga), about 8 km far from Siena center, where the countryside is characterized by the typical Tuscan white roads, woods, olive groves, orchards and farmhouses. The Carthusia dates back to the 14th century and has been expanded and modified over the centuries according to its various uses. In 1959 it was bought by the University of Siena and used as a hall of residence for certain students and academics.

The workshop has been a site of widespread confrontation, advance powerful ideas, creative knowledge in a warm and friendly atmosphere.

The Congress Abstracts are published online in the *Journal of Pediatric and Neonatal Individualized Medicine*, the Official Journal of European Neonatal Perinatal Societies (UENPS), thanks to my friend and colleague Vassilios Fanos who is the Editor-in-Chief.

The *Journal of Pediatric and Neonatal Individualized Medicine* is a peer-reviewed interdisciplinary journal which provides a forum on new perspectives in pediatric and neonatal medicine.

Mariangela Longini helped me in organizing the workshop and the abstracts collection, participating also to their revision together with Vassilios Fanos, to whom I am deeply grateful for his strong collaboration.

Giuseppe Buonocore

How to cite

[Abstract's authors]. [Abstract's title]. In: Selected Abstracts of the 22nd European Neonatal Workshop; Siena (Italy); June 15-18, 2014. J Pediatr Neonat Individual Med. 2014;3(2):e030208. doi: 10.7363/030208.

ABS 1

INCIDENCE AND RISK FACTORS OF INTRAVENTRICULAR HEMORRHAGE (IVH) IN INFANTS LESS THAN 32 WEEKS OF GESTATION

G. Mitsiakos, A. Papageorgiou

McGill University, Jewish General Hospital, Montreal, Canada

BACKGROUND

IVH is the most important cause of cognitive and motor disabilities in preterm infants.

AIM

To evaluate the incidence of IVH in VLBW and indentify possible risk factors associated with its development.

METHODOLOGY

The electronic data of all 1,474 infants born < 32 weeks of gestation in our perinatal center were analysed over a period of twelve years. We compared incidence and outcome of IVH for the entire group, as well as week by week from 23 to 31 6/7 weeks.

RESULTS

The overall incidence for all grades of IVH was 14.9% (220/1,474) and for severe, 4.2%. As expected, gestational age (GA) and birth weight were significantly different between infants with IVH vs no IVH (27 ± 2.5 weeks and 982 ± 360 grams vs 28.7 ± 2.3 weeks and 1,204 ± 406 grams [p value = 0.000]), as was also mortality (32.7 vs 9.0%). **Table 1** indicates predisposing factors and **Figure 1** indicates mortality, incidence and severity of IVH by GA.

Aside prematurity, statistically significant factors predisposing to IVH were found to be the lack of antenatal steroids, vaginal delivery, chorioamnionitis, male gender, anemia and neonatal hypotension (**Table 1**).

CONCLUSION

Incidence and severity of IVH were practically similar in all infants born < 26 weeks of gestation. Low incidence and severity of IVH remained unchanged during the last 15 years. From 26 to 31 weeks, a significant improvement is noted, which is particularly impressive for severe IVH.

Table 1. Perinatal factors: comparison between neonates with IVH and group without IVH.

	no IVH n (%)	IVH n (%)	p
Antenatal steroids	843 (67.2)	129 (58.6)	0.013
Vaginal delivery	482 (38.4)	117 (53.2)	0.000
Chorioamnionitis	160 (12.8)	60 (27.3)	0.000
Gender male	661 (52)	135 (61)	0.018
Anemia	948 (75.6)	192 (87.3)	0.000
Neonatal hypotension	144 (11.5)	81 (36.8)	0.000

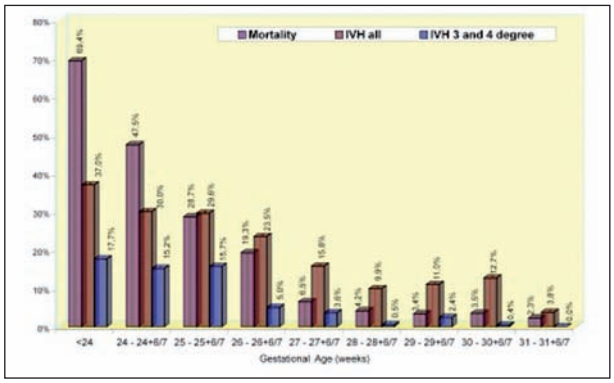

Figure 1. Mortality, incidence and severity of IVH by GA.

ABS 2

CORD BLOOD CONCENTRATIONS OF THE MYOKINE IRISIN IN FETAL MACROSOMIA

D.D. Briana[1], T. Boutsikou[1], M. Boutsikou[1], S. Baka[1], A. Marmarinos[2], D. Hassiakos[1], D. Gourgiotis[2], A. Malamitsi-Puchner[1]

[1]Department of Neonatology, Athens University Medical School, Athens, Greece

[2]Laboratory of Clinical Biochemistry – Molecular Diagnostics, 2nd Department of Pediatrics, Athens University Medical School, Athens, Greece

OBJECTIVE

Excessive fetal growth is associated with increased adiposity and reduced insulin sensitivity at birth, as well as with obesity development and higher cardiometabolic risk later in life. Irisin is a novel muscle-derived hormone, which increases whole body energy expenditure and improves tissue metabolic profile. This study aimed to investigate fetal irisin concentrations in large-for-gestational-age (LGA) versus appropriate-for-gestational-age (AGA) pregnancies and correlate them with several perinatal variables.

MATERIALS AND METHODS
Thirty women with LGA and 20 women with normal singleton full-term pregnancies were recruited. Plasma irisin and insulin concentrations were quantified by ELISA in mixed arteriovenous cord blood samples at the time of birth. Fetuses were classified as LGA or AGA, based on customized birth-weight standards adjusted for significant determinants of fetal growth.
RESULTS
Fetal irisin concentrations were similar in LGA cases, compared with AGA controls and positively correlated with birth-weight, as well as customized centiles ($r = 0.457$, $p = 0.043$, and $r = 0.458$, $p = 0.042$, respectively). Fetal insulin concentrations were higher in LGA cases, compared to AGA controls ($p = 0.036$). In the LGA group, fetal irisin concentrations positively correlated with fetal insulin ones ($r = 0.374$, $p = 0.042$).
CONCLUSIONS
Myokine irisin may not be directly implicated in the metabolic disturbances characterizing fetal macrosomia. However, irisin upregulation with increasing birth-weight and customized centile may contribute to a slower fat gain during early infancy ("catch-down"), by promoting high total energy expenditure. Furthermore, the positive correlation between irisin and insulin concentrations in the LGA group may represent a compensatory mechanism to counterbalance the documented hyperinsulinemia, which is partly responsible for the excessive fetal fat deposition in the LGA fetus.

ABS 3

ASYNCHRONOUS CHEST COMPRESSIONS IMPROVE SURVIVAL IN A NEONATAL PIGLET MODEL OF ASPHYXIAL CARDIAC ARREST

N. Iacovidou[1], A. Aggelina[2], A. Papalois[3], A. Douvanas[2], P. Pliatsika[2], T. Xanthos[2]

[1]Neonatal Department, National and Kapodistrian University of Athens, Medical School, Athens Greece

[2]National and Kapodistrian University of Athens, Medical School, Athens, Greece

[3]ELPEN Research - Experimental Centre, Athens, Greece

BACKGROUND
Limited data exist in neonatal resuscitation as to the optimum mode of delivering chest compressions (CC). The currently recommended (ILCOR) method of 1 breath : 3 CC is based on expert consensus and extrapolated data from pediatric and adult models. We aimed at comparing asynchronous CC (90 CC : 30 breaths/min) with the currently recommended method, in a neonatal piglet model of asphyxial cardiac arrest.
METHOD
Asphyxia was induced by clamping of the endotracheal tube in 14 male Landrace/Large White newborn piglets (age 1 ± 1 day old) until either severe bradycardia (HR < 60 bpm) or severe hypotension (MAP < 15 mmHg) occurred; piglets were randomly allocated in 2 groups (7 animals/group); control group C and group CC which received the currently recommended 3:1 resuscitation and asynchronous CC respectively. All animals were resuscitated according to the 2010 ILCOR guidelines, intubated with a NeoPuff.
RESULTS
There was a trend to quicker resuscitation of group CC but the study at the moment is underpowered. Three animals out 7 of group C and 1 out of 7 of group CC did not achieve return of spontaneous circulation (ROSC). Five animals in group CC survived at 2 hours, while none in the control group C survived ($p = 0.021$).
CONCLUSIONS
In newborn piglets subjected to asphyxia, delivery of asynchronous CC improves survival at 2 hours when compared to 3:1 resuscitation.

ABS 4

HUMAN CYTOMEGALOVIRUS (CMV) CONGENITAL INFECTION. IMPLEMENTATION OF A SCREENING PROGRAM DURING PREGNANCY

I. Dorronsoro[1], M. Lopez-Azorin[1], M. Caballero[1], J. García-Flores[2], M. Recio[3], A. Pellicer[1,4], F. Cabañas[1,5]

[1]Department of Pediatrics and Neonatology, Quiron University Hospital, Madrid, Spain

[2]Department of Obstetrics and Gynecology, Quiron University Hospital, Madrid, Spain

[3]Department of Radiology, Quiron University Hospital, Madrid, Spain

[4]Department of Neonatology, La Paz University Hospital, Madrid, Spain

[5]Biomedical Research Foundation, La Paz University Hospital-IDIPAZ, Spain

BACKGROUND
Human CMV congenital infection is a major cause of morbidity and mortality. Most infected infants will be asymptomatic at birth but will develop neurological sequelae during childhood. Intra-uterus and early postnatal treatment have shown a positive

effect on infant's outcome. However, serological screening during pregnancy remains controversial.

OBJECTIVES

We aimed to identify the prevalence of human CMV primary infection during pregnancy, the foetal transmission rates and the long-term outcomes of affected infants in our institution, to sort out whether systematic serological screening test during pregnancy is justified.

METHODS

From January 2010 to January 2012, all pregnant women underwent systematic serological screening test for CMV infection (IgG and IgM) on each trimester of gestation. In case of seroconversion monthly high resolution ultrasound scans (HRUS) were performed and amniocentesis and fetal MRI were offered. Treatment with CMV-specific hyperinmune globulin was offered in confirmed primary infection. Newborns underwent urine CMV-PCR (polymerase chain reaction) test within 48 hours of birth. Infants with positive urine were classified as congenitally infected so entered into a specific diagnostic and follow-up programme.

RESULTS

Pregnancy outcomes

A total of 5,546 pregnant women were screened. Primary infection was diagnosed in 26 indicating a seroconversion rate of 0.47%. HRUS during pregnancy were normal in the whole cohort. CMV-PCR in amniotic fluid was positive in 4 out of 14 mothers who consented amniocentesis. Two of these mothers received a single immunoglobulin dose at 29 and 30 weeks' gestation, respectively. End of pregnancy was decided in 2 out of 26 seroconversions, one case following amniocentesis confirmed infection. There was a stillbirth at 38 weeks' gestation due to unknown reasons that was not screened for congenital CMV infection. Among the remaining 23 patients, all but three delivered at our institution.

Neonatal outcomes

Five newborns had the diagnosis of congenital CMV infection indicating 23.8% transmission rate (1 abortion plus 20 followed neonates). Newborns were asymptomatic at birth. Neuroimaging showed only minor cranial ultrasound and MRI findings. Four out of 5 infants received treatment with ganciclovir/valganciclovir. At present, all the infants remain asymptomatic.

CONCLUSIONS

1. CMV infection represents a leading cause of congenital infection in our population although the impact on the infant's health is still unclear.
2. Large controlled studies are needed to define recommendations for universal screening in pregnant women and the effectiveness of antenatal and postnatal treatment.

ABS 5

STEPS FORWARD THE BiAR-COH METHOD IN AUTOREGULATION ANALYSIS: ASSESSMENT OF CAUSALITY

J. Riera[1,2], F. Cabañas[3], J.J. Serrano[2], M.C. Bravo[1], P. López-Ortego[1], L. Sánchez[1], R. Madero[5], A. Pellicer[1]

[1]Department of Neonatology, La Paz University Hospital, Madrid, Spain

[2]Center for Biomedical Technology, Technical University, Madrid, Spain

[3]Biomedical Research Foundation, La Paz University Hospital, Madrid, Spain

[4]Biomedical Research Networking Center in Bioengineering Biomaterials and Nanomedicine (CIBER-BBN), Zaragoza, Spain

[5]Division of Statistics, La Paz University Hospital, Madrid, Spain

BACKGROUND

Cerebral autoregulation (AR) is a complex, developmentally regulated process still not well characterized in neonates. A number of factors interact with the smooth muscle cells regulating cerebral arterial tone and perfusion. Correlation, coherence and transfer function gain methods have been applied for this purpose. None of these methods provide information about how 2 analyzed signals are time-related. We have recently proposed an alternative analysis in the frequency domain of the temporal relationship between two biological signals (BiAR-COH) to provide information about the mutual dependence of the signals [1]. The BiAR-COH is superior to frequency domain methods in predicting adverse outcomes in infants. However, AR is a multifactorial process, therefore future developments of the method should provide information on synchronicity and causality.

OBJECTIVE

The temporal causality between two biological signals in the frequency-domain was analysed by quantifying the influence of each signal on the other across the frequencies. The predictive capacity of the method to classify infants at risk for adverse neonatal outcome was evaluated.

METHODS

Partial directed coherence (PDC) [2] and spectral coherence (COH) methods were used to analyze the relationship between spontaneous changes in mean arterial blood pressure (MABP) and near-

infrared cerebral oximetry (tissue oxygenation index: TOI). $PDC_{MABP->TOI}$ indicated that changes in TOI were induced by MABP changes and $PDC_{TOI->MABP}$, the opposite.

RESULTS

$PDC_{MABP->TOI}$ and $PDC_{TOI->MABP}$ values differed. $PDC_{MABP->TOI}$ and COH predicted low superior vena cava (SVC) flow (≤ 41 ml/kg per min) with an area under the ROC curve of 0.68 (95% CI: 0.63-0.77; $p < 0.001$) and 0.60 (95% CI: 0.51-0.70; $p < 0.05$), respectively; whereas $PDC_{TOI->MABP}$ did not ($p < 0.248$). The $pPDC_{MABP->TOI}$ and pCOH were calculated as the averaged value per patient. $pPDC_{MABP->TOI}$ but not pCOH predicted mortality.

CONCLUSIONS

$PDC_{MABP->TOI}$ is a good classifier for infants at risk of brain hypoperfusion and adverse outcome. $PDC_{MABP->TOI}$ allows a non-invasive physiological interpretation of the pressure-AR process in neonates.

REFERENCES

[1] Riera J, Cabañas F, Serrano JJ, Bravo MC, López-Ortego P, Sánchez L, Madero R, Pellicer A. [Submitted].

[2] Baccalá L, Sameshima K. Partial directed coherence: a new concept in neural structure determination. Biol Cyber. 2001;84(6):463-74.

ABS 6

COMPARISON OF DELIVERY ROOM CARE IN THREE COUNTRIES: THERE ARE MANY WAYS OF SKINNING A CAT

S. Walter[1], B. Simma[2], J. van Vonderen[3], A.B. te Pas[3], H. Küster[1]

[1]Neonatology, University Children's Hospital Göttingen, Germany

[2]Children's Hospital Feldkirch, Austria

[3]Neonatology, University Medical Center Leiden, The Netherlands

BACKGROUND

Delivery room care has undergone substantial changes during the last years. Guidelines exist from different international organizations that aim for a standardized approach worldwide.

AIM

To describe differences in delivery room care of very low birth weight infants in three centers in three different European countries.

METHODS

In the Video Apgar Trial, anonymized videos of delivery room care of very low birth weight infants were recorded prospectively in large level three perinatal centers using a standardized protocol. Videos of three centers were analyzed by a person not involved in patient care in any of the centers and 48 parameters correlated with short term outcome.

RESULTS

From each center 40 videos were analyzed. Mean gestational age of the infants was 29 weeks, mean birth weight 1,243 g. Time spent in the delivery room differed significantly between centers. Suctioning was done twice as often in one center compared to the others (mean 0.6, 0.7, 1.3 times per infant) while the duration of a single suctioning was similar (mean 10 sec). Auscultation of heart rate was in mean performed 3 times per infant in all centers but the duration of a single auscultation was different (10, 13 and 19 sec). The time between fixation of an oxygen saturation sensor and the first correct signal was 19, 22 and 49 sec. Videos showed numerous manipulations that were contradictory, erratically or without apparent aim. E.g. the plastic wrap covering the infant was changed 5.4, 5.9 and 9.3 times in average in a single infant. Only 28%, 32% and 44% of the time in the delivery room was spent on active observation without any intervention.

CONCLUSION

Beyond being useful as a quality control instrument, videotaping in the delivery room demonstrated that local structural conditions have a significant influence on delivery room care. Beyond these structural prerequisites certain procedures done routinely in one center are performed in other centers in only half of the cases without obvious reasons. In addition, differences in the technical equipment or its use may be the reason for the differences found in the delivery room care.

ABS 7

DIAPHRAGMATIC FUNCTION IN CONVALESCENT PRETERM INFANTS WITH CHRONIC LUNG DISEASE

G. Dimitriou, A. Vervenioti, S. Fouzas, P. Pelekouda

Neonatal Intensive Care Unit, Department of Paediatrics, School of Medicine, University of Patras, Greece

BACKGROUND

In infancy, various diseases could increase respiratory loading. Preterm infants may present limited ability to adapt to additional respiratory

loads and may be at high risk of developing respiratory muscle fatigue. Infants with chronic lung disease (CLD), in particular, are breathing against increased ventilatory loads and could develop respiratory failure with minimal stress. Diaphragmatic pressure-time index (PTI_{di}) is a measure of the load-capacity ratio of the diaphragm. In adults, a PTI_{di} greater than 0.15-0.18 may indicate impending diaphragm fatigue.

OBJECTIVE

To compare PTI_{di} measurements in convalescent preterm infants with or without CLD.

METHODS

Preterm infants with gestational age ≤ 32 weeks were studied before discharge. CLD was defined as oxygen dependency at 28 days of life. All infants were breathing on room air when studied. PTI_{di} was calculated as the product of the mean to the maximum transdiaphragmatic pressure ($P_{di\ mean}/P_{di\ max}$) and the inspiratory duty cycle (T_i/T_{tot}).

RESULTS

Fifty four infants of median gestational age 30.5 (range 25-32) weeks were studied at a median postconceptional age of 35.3 (range 30.7-42.3) weeks. Fourteen infants (25.9%) had CLD. The CLD infants compared to controls had significantly higher PTP_{di} values (median [range], 0.102 [0.060-0.143] vs. 0.072 [0.032-0.128], respectively, p = 0.0005). Multivariable linear regression analysis revealed that CLD was significantly related to (logarithmic-transformed) PTI_{di} measurements (regression coefficient beta -0.624; p = 0.0002), independently of gender (beta -0.076; p = 0.552) postconceptional age (beta -0.021; p = 0.901), intrauterine growth restriction (beta -0.138; p = 0.288) and days of mechanical ventilation (beta -0.230; p = 0.201).

CONCLUSION

These results indicate an impaired effectiveness of the diaphragm of preterm infants with CLD and thus a higher risk of diaphragmatic muscle fatigue under conditions that increase the respiratory load.

ABS 8

STEM/PROGENITORS IN THE NEWBORN KIDNEY: AN UNDISCOVERED RESOURCE TO PREVENT KIDNEY FAILURE LATER IN LIFE?

G. Faa[1], C. Gerosa[1], A. Sanna[1], M. Puddu[2], D. Fanni[1], V. Fanos[2]

Department of Surgical Sciences [1]Division of Pathology and [2]Neonatology Department and NICU center, University of Cagliari, Cagliari, Italy

BACKGROUND/AIMS

Traditional stem cell-based regenerative medicine, when applied to kidneys disrupted by end-stage renal disease (ESRD), has been shown to be unable to regenerate the damaged organ. The theme of this work is to hypothesize a new approach to the prevention of chronic kidney disease, based on the management of the huge amount of stem/progenitors physiologically present in the kidney of preterm babies at birth.

METHODS

In order to evaluate the stem cell burden in the human kidney at birth, kidneys of 40 consecutive newborns, ranging from 24 up to 40 weeks of gestational age (GA) were evaluated by histology. Immunohistochemistry for multiple molecular factors including *WT1* and Bcl-2 was also performed in order to better characterize the stem/progenitor cells inside the nephrogenic zone.

RESULTS

The stem cell burden appeared extremely variable from one case to the next. In general, it was inversely related to GA: the highest levels of non-induced stem cells were detected in extremely low birth weight neonates, whereas renal stem cells were practically absent in older than 38 weeks newborns. Significant interindividual variability in stem cell number was found even in neonates of the same GA, suggesting a major role for epigenetic factors acting during pregnancy in preserving, or alternatively in affecting, renal stem survival. *WT1* appeared mainly expressed in undifferentiated stem cells, whereas induced cap mesenchymal cells were mainly reactive for Bcl-2.

CONCLUSIONS

Our data clearly show that the kidney of preterm newborns at birth is characterized by a relevant amount of stem cells. Given that the nephrogenic potential of these progenitor cells normally ends at 4-6 weeks after birth ending with oligonephronia, we suggest that a better knowledge of the molecular factors able to maintain stemness for a longer period might represent the primary prevention of ESRD later in life. *WT1* and Bcl-2 expression in the renal progenitors represent two possible targets for a new renal regenerative medicine to be initiated in the perinatal period, allowing preterm infants to restore their nephron endowement, escaping susceptibility to hypertension and ESRD later in life.

ABS 9

PLACENTAL HISTOLOGICAL PATTERNS AND OXIDATIVE STRESS IN THE OFFSPRING

S. Perrone[1], S. Negro[1], M.S. Cori[1], M.G. Alagna[1], P. Toti[2], M.S. Toti[1], C. Felici[1], M. Longini[1], M.L. Tataranno[1], G. Buonocore[1]

[1]Department of Developmental and Molecular Medicine, General Hospital "Santa Maria alle Scotte", University of Siena, Italy

[2]Department of Medical Biotechnologies, General Hospital "Santa Maria alle Scotte", University of Siena, Italy

BACKGROUND

Oxidative stress (OS) occurs during hypoxia or inflammation and has been associated to fetal growth restriction (FGR) and increased risk of preterm-premature rupture of membrane. Little is known regarding biomarkers of OS in the cord blood of preterm infants and its association with placental histological patterns.

AIM

To test the hypothesis that placental lesions indicating chorioamnionitis (CA) or vascular underperfusion (VU) are associated with increased peroxidation products in the offspring compared with controls.

METHODS

120 neonates born between 23 and 32 weeks of gestational age (GA) (mean GA: 28.2 ± 2.5 wks; mean birth weight: 1,142 ± 416 g) and histological characteristics of respective singleton placentas from their mothers were included in this prospective study. Placental lesions, diagnosed according to consensus nomenclature and standardized criteria [1], were classified as histological CA (n = 41), VU (n = 48; including abruption, infarction or thrombosis, perivillous fibrin deposition and syncytial knots). 31 normal placentas served as controls (CTRL group, n = 31). Plasma concentrations of isoprostanes (IsoPs, pg/ml), non protein bound iron (NPBI, μmol/l) and advanced oxidative protein products (AOPP, μmol/l), were determined in cord blood. Data elaboration was carried out separately for each biomarker. ANOVA univariate analysis with Bonferroni correction and multivariate regression model were performed.

RESULTS

IsoPs and NPBI were significantly increased in CA group compared to CTRL group (respectively: p = 0.003, p = 0.007), while for AOPP the mean difference was not significant. Higher IsoPs levels were also found in VU group than CTRL group (p = 0.022) The multivariable regression model, adjusted for GA, maternal age, parity, maternal diabetes, maternal obesity and presence/absence of FGR, showed a significant association between the presence of CA and increased level of OS biomarkers (IsoPs: B = 41.45, 95% CI 13.16-69.74, p = 0.006; NPBI: B = 6.72, 95% CI 1.46-11.99, p = 0.014; AOPP: B = 56.17, 95% CI 16.76-95.57, p = 0.007). The presence of VU placental lesions was significant associated with higher IsoPs, NPBI and AOPP levels in cord blood (respectively, IsoPs: B = 32.98, 95% CI 9.37-56.59, p = 0.008; NPBI: B = 4.58, 95% CI 1.83-7.32, p = 0.002; AOPP: B = 15.66, 95% CI 0.80-30.52, p = 0.040). Neonates of mothers with VU placental lesions showed significant associations between high AOPP levels and low GA (B = -7.37, 95% CI -11.71 - -3.04, p = 0.002) and between high AOPP levels and presence of FGR (B = 19.81, 95% CI 4.60-35.03, p = 0.014).

CONCLUSIONS

Histological placental lesions indicating CA and VU are associated with increased cord blood levels of OS biomarkers. Data indicate increased neonatal susceptibility to oxidative injury in pregnancies complicated by CA and maternal placental VU suggesting the need of antioxidant protection.

REFERENCE

[1] Redline RW, Heller D, Keating S, Kingdom J. Placental diagnostic criteria and clinical correlation – a workshop report. Placenta. 2005;26(Suppl A):S114-7.

ABS 10

PLACENTAL HISTOLOGICAL PATTERNS AND NEONATAL FOLLOW-UP

S. Perrone[1], S. Negro[1], M.G. Alagna[1], M.S. Cori[1], M.S. Toti[1], P. Toti[2], G. Turrisi[1], M.L. Tataranno[1], G. Buonocore[1]

[1]Department of Developmental and Molecular Medicine, General Hospital "Santa Maria alle Scotte", University of Siena, Italy

[2]Department of Medical Biotechnologies, General Hospital "Santa Maria alle Scotte", University of Siena, Italy

BACKGROUND

The placenta plays a leading role mediating the transport of substances at the fetal-maternal interface and in this context it reflects disorders of both mother and fetus. The placental histological features in pathological pregnancy course may predict adverse neonatal outcomes.

AIM
To test the hypothesis that histological placenta features, independently of other risk factors, are associated with morbidity and mortality in very-low-birth-weight infants.
METHODS
120 neonates born between 23 and 32 weeks of gestational age (GA) (mean GA: 28.2 ± 2.5 wks; mean birth weight: 1,142 ± 416 g) were enrolled. Their respective placenta histological characteristics, were included in this prospective study. Placental lesions were diagnosed according to consensus nomenclature and standardized criteria [1], as histological chorioamnionitis (CA, n = 41) and vascular underperfusion (VU, n = 48; including abruption, infarction or thrombosis, perivillous fibrin deposition and syncytial knots). 31 normal placentas served as controls (CTRL group, n = 31). Outcomes, including retinopathy of prematurity (ROP), bronchopulmonary dysplasia (BPD), need for intubation (INT), necrotizing enterocolitis (NEC), patent ductus arteriosus (PDA), periventricular leukomalacia (PVL) and intraventricular hemorrhage (IVH) were recorded and a comparison between groups was carried out.
RESULTS
Univariate regression model showed a significant association between CA and ROP, IVH high grade (grade 3 and 4), INT and death ($p < 0.005$). VU lesions were significantly associated with PVL ($p < 0.005$). After correcting for GA and birth weight, only the presence of ROP (grade 1-3) was significantly associated with maternal CA (B = 0.205, 95% CI 0.039-0.370, p = 0.016).
CONCLUSIONS
Neonatal morbidities are significantly higher in pregnancies complicated by CA and VU than in pregnancies without a specific pathological placental pattern. Histological CA is associated with an increased risk of ROP independently from BW and GA.
REFERENCE
[1] Redline RW, Heller D, Keating S, Kingdom J. Placental diagnostic criteria and clinical correlation – a workshop report. Placenta. 2005;26(Suppl A):S114-7.

ABS 11

FOUNDLING INFANTS IN THE CENTURIES

L. Cataldi[1], M.G. Gregorio[2]

[1]*Institute of Pediatrics, Catholic University School of Sacred Heart, Rome, Italy*
[2]*Pediatric Health Service, U.O.C.C., ASL 8, Cagliari, Italy*

BACKGROUND
In the past, newborn infant exposure and abandonment was commonly practiced in many cultures. Most of those so called "infant exposure" were truly considered a form of infanticide.
Some children survived, only because they were saved by some people, rarely interested to have them as sons or daughters, but rather to use them as servants or slaves.
It is important to know that in the medieval time some law codices prescribed that the person who had bring up the exposed child was entitled to the child's service as a slave.
On the other side, starting the 8th century of the Christian Era, in Italy the first "hospice" was established in order to give house and care to foundling newborn infants and children. Along the century, many hospitals were opened in Rome, Florence, Siena and other towns.
Most of the infants were abandoned without notice about their baptism, family or given name. So the priest, during the baptism, used to give also a name to the babies. A very important issue concerned nutrition: only few infants were fed with human milk, so gastroenteritis and death were very common.
GOAL
To obtain data concerning the level of morbidity and mortality in such population, reading numerous classical and ancient books. A special investigation concerned the names given to the foundling infants. Some of them were very particular or strange.
RESULTS
Apart from Oedipous, Daphnes and Cloes and other mithical subjects, our report starts in the medieval era, from the priest Dateo founding the first foundling infants hospital. This study confirms the terrible high level of morbidity and mortality in such babies houses (or hospitals, from the ancient latin word "hospes", meaning "host").
Authors will explicate some of the older words, most of latin origin, given in the ancient time to those newborn infants as a new family name.
Nevertheless, still today many "strange" family names exist as heritage of the status of "foundling" infant.
CONCLUSION
Because still today newborn infants are abandoned, the Authors outline the importance of a correct nutrition schedule for improving health and saving life.

ABS 12

PROSPECTIVE VALIDATION OF VANCOMYCIN DOSING IS NEEDED AND SHOULD BE DRIVEN BY GFR MATURATION MODELLING

K. Allegaert

Neonatal Intensive Care Unit, University Hospitals Leuven, Belgium

OBJECTIVE

Vancomycin is commonly used to treat neonatal late-onset sepsis, but dosing regimens vary and are not validated. We aimed to illustrate the relevance of validation of neonatal vancomycin dosing by exploring trough levels achieved using 2 published dosing regimens, either based on postmenstrual age (PMA) and serum creatinine, or PMA and postnatal age (PNA). We subsequently applied a previously reported GFR maturational model [1] to vancomycin dosing regimens to further illustrate the limitations of these regimens.

MATERIALS AND METHODS

Therapeutic drug monitoring trough levels quantified after initiation of intravenous vancomycin and clinical covariates were retrospectively collected. The impact of covariates on achieving a suboptimal trough (threshold 10 mg/l) level was explored. Concentration-time profiles were simulated in NONMEM using the previously published GFR model for neonates varying in between 24 and 40 weeks GA and with a birth weight between 600 g and 2,980 g (postnatal age of 2 weeks). Dosing guidelines were simulated according to British National Formulary for Children, Dutch Children's Formulary, Neofax, IDSA, or National Neonatal Formulary.

RESULTS

In total, 294 observations (median [range] current weight [CW] 1,870 [420-4,863] g, PMA 35 [25-56] weeks) were included. Using the previous and new dosing regimens, 66.3% and 76.2% of trough levels were below 10 mg/l. Suboptimal vancomycin trough values were significantly associated with lower weight and age. Using the GFR maturational model [1], neonates of different birth weight were found to be exposed to a large variability in concentrations with unacceptable low trough concentrations (< 10 mg/L) in one or more typical individuals.

CONCLUSION

The majority of vancomycin trough levels in neonates achieved using 2 published dosing regimens did not reach the target. This illustrates the need of prospective validation, and is further supported by the GFR maturational model effort. We anticipate that dosing regimens integrating covariates reflecting renal maturation as well as disease characteristics could improve vancomycin exposure in neonates.

REFERENCE

[1] De Cock RF, Allegaert K, Sherwin CM, Nielsen EI, de Hoog M, van den Anker JN, Danhof M, Knibbe CA. A neonatal amikacin covariate model can be used to predict ontogeny of other drugs eliminated through glomerular filtration in neonates. Pharm Res. 2014;31(3):754-67.

ABS 13

GESTATIONAL PATHOLOGY AND THE SUCCESS OF BREASTFEEDING

A. Pereira[1], D. Morgado[2]

[1]*Neonatal Intensive Care Unit, Hospital Braga, Braga, Portugal*

[2]*The School of Health Sciences, Minho University, Braga, Portugal*

OBJECTIVE

Exclusive breastfeeding is the ideal method of feeding the newborn, since the first hour until the sixth month of age. Gestational pathology can affect breastfeeding in different aspects. The aim of this study is to compare the breastfeeding rates and its duration in mothers with and without gestational pathology, in the moment of clinical discharge and in the first month of the newborn's life and identify the factors that contribute to the success of breastfeeding.

MATERIAL AND METHODS

We made a prospective study, with a sample of 220 dyads mother-baby, gestation age more than 34 weeks, whose newborns were born at Hospital de Braga between 20th of August and 30th of September 2013. For data collection we used the clinical process and a questionnaire gathered at the time of clinical discharge and at the 5-6th weeks of the newborn's life.

RESULTS

Of the sample, 46/220 (20.9%) mothers had gestational pathology. The most frequent pathology was gestational diabetes 31/46 (67.4%). In the group with gestational pathology we verified that there were more caesarean deliveries and babies were more frequently admitted at the neonatology intensive care unit. Breastfeeding at the first hour was predictor of exclusive breastfeeding at the time of hospital discharge. Mother's intentions to

breastfeed and pre-delivery classes were positive predictors of breastfeeding at month of age.

CONCLUSION

In this sample, gestational pathology compromised breastfeeding success at the time of hospital discharge. Breastfeeding in the first hour was important for exclusive breastfeeding at discharge. Giving mother's formation before delivery increases breastfeeding rates at newborn's month of age.

ABS 14

RESPIRATORY MORBIDITY IN VERY PRETERM INFANTS IN THE FIRST TWO YEARS OF LIFE

M. Ferreira, M.F. Magalhães, G. Rocha, H. Guimarães

Neonatal Department, Centro Hospitalar de São João. Faculty of Medicine of Porto University, Porto, Portugal

AIM

To describe the respiratory morbidity at two years of corrected age for very preterm and very low birth weight infants and to identify potential risk factors for its development.

METHODS

Retrospective cohort study of a Portuguese-based population born in a tertiary referral center, between 2009 and 2011. Data was collected from patient's clinical files and using a standardized questionnaire-based clinical interview for parents.

RESULTS

A total of 59 children were included. Thirteen (22%) had recurrent respiratory symptoms and 20.3% were using chronic respiratory medication. Health care utilization for respiratory causes was frequent (57.6%), particularly emergency department attendance (50.8%). Twenty seven (45.8%) had additional outpatient visits for respiratory causes and hospital admission was necessary for 8 (13.6%) patients. Factors associated with increased recurrent respiratory symptoms included maternal hypertensive disorders during pregnancy, umbilical artery flow disturbances, being small for gestational age, bronchopulmonary dysplasia, retinopathy of prematurity, intraventricular hemorrhage and a weight percentile below 3 at 6, 12 and 24 months of corrected age. Premature rupture of membranes was negatively associated with respiratory morbidity.

CONCLUSION

Respiratory morbidity at 2 years of age is a common problem in very preterm and VLBW children from our population. Several perinatal and developmental risk factors were identified for respiratory morbidity. Further studies are needed to clarify the importance of these risk factors, as they can lead to changes in healthcare guidelines.

ABS 15

EVIDENCE OF TRANSITORY HYPO-ALPHA-1-ANTITRYPSINAEMIA WITHIN THE FIRST MONTHS OF LIFE

H. Varendi[1,2], E. Kallas[1,2], J. Kuld[1], P. Külasepp[1], M.A. Vals[1,2], M.K. Uprus[2], L. Saare[2], S. Leedo[3]

[1]Neonatal unit, Children's Clinic of Tartu University Hospital, Tartu, Estonia

[2]Medical Faculty, University of Tartu, Estonia

[3]United laboratories, Tartu University Hospital, Tartu, Estonia

OBJECTIVE

Alpha-1-antitrypsin (AAT) is a glycoprotein that is mostly secreted by hepatocytes. The low AAT level in newborns has been related previously to prolonged obstructive hyperbilirubinaemia with elevated liver enzymes that can predict AAT deficiency. AAT reference ranges for 0-3 months are scarce, with the lower limit between 0.9-1.24 g/l. However, it is suggested that determination of the serum AAT level alone, if < 1.6 g/l in infants with prolonged jaundice, is an indicator for evaluating phenotype for AAT deficiency. The aim of our study was to analyse AAT levels in newborns and infants up to 5 months and find relationship with neonatal hyperbilirubinaemia and liver disease.

METHODS

Database of Tartu University Hospital United laboratories was searched to identify infants of 0-5 months with measurements of AAT levels (using immune nephelometry) between 2008-2014. Additionally data about birth history, gestational age and birth weight, feeding type, weight gain, diagnoses, levels of CRP, bilirubin (incl. conjugated) and liver enzymes, had been collected retrospectively from the hospital electronic patient charts. One infant with PiZZ phenotype (AAT < 0.5 g/l) has been excluded from the analysis.

RESULTS

Altogether 213 blood samples taken from 176 infants (mean GA 38.1 ± 1.8 weeks; birth weight 3,436 ± 647 g) showed that within the 2.-4. postnatal weeks the newborns had AAT levels

lower than the available reference levels (**Table 1**). At the same time, the infants had prolonged indirect hyperbilirubinaemia (breast milk jaundice with sufficient weight gain) but normal levels of liver enzymes (data not shown in the abstract).

Table 1. Distribution of AAT levels in infants at 0-5 months by postnatal age groups.

Postnatal age	days 1-5	days 6-7	days 8-14	days 15-31	days 32-150
mean AAT g/l	1.252*	1.029*	0.894*	0.798*	0.944*
SD	0.253	0.178	0.136	0.148	0.152
n. of tests	46	43	60	39	25

* p-value < 0.001 (t-test, comparison with the next age period).

CONCLUSION

The newborns seem to have transitory period of lower AAT than reference levels in the literature and is not accompanied by signs of liver disease. Moreover, this condition can be related to prolonged, breast milk jaundice. Preparation of adequate reference ranges for young infants to avoid unnecessary phenotyping for AAT deficiency is important and requires targeted studies with larger patient groups.

ABS 16

NEUROLOGICAL MORBIDITY IN VERY PRETERM PRESCHOOL CHILDREN

M. Madureira, A. Vilan, S. Almeida, F. Flor de Lima, A. Martins, H. Guimarães

Neonatal Department, Centro Hospitalar de São João. Faculty of Medicine of Porto University, Porto, Portugal

AIM

To characterize the presence of neurological morbidity and associated co-morbidities in children 3-4 years old born with gestational age less than 32 weeks and/or birth weight less than 1,500 grams.

METHODS

We included newborns hospitalized in an Intensive Care Unit Level III of a University Hospital between January 1, 2009 and December 31, 2010 with a gestational age below 32 weeks and/or birth weight less than 1,500 g (n = 34). We analyzed the clinical processes and evaluated patients at 3-4 years, in consultation or telephone interview.

RESULTS

We observed retinopathy of prematurity in 50%; abnormal vision in 29%, being more common strabismus in 24%; hearing loss in 21% (with hearing aid); cerebral palsy in 12%. Transfontanelar ultrasound: periventricular hiperecogenecidade in 94%, intraventricular hemorrhage in 18% and periventricular leukomalacia in 24%. Brain magnetic resonance revealed changes in 24%, with a significant difference between the groups with and without neurosensory deficits.

CONCLUSION

In our patients, the prevalence of neurosensory deficits is high and brain magnetic resonance imaging proved to be a very helpful tool in their prognosis. Early intervention and multidisciplinary follow-up are essential to minimize the sequelae.