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Abstracts

Selected Abstracts of the 19th National Congress of the Italian Society of Perinatal Medicine (*Società Italiana di Medicina Perinatale*, SIMP)

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ABS 1

THE "WOMAN AND CHILD HOSPITAL" ORGANIZED ON INTENSITY OF CARE IN VERONA: AN OPPORTUNITY TO PROMOTE MATERNAL AND PERINATAL HEALTH

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INTRODUCTION

The hospital organization according to a principle of intensity of care has been recently introduced in Italy. In this model, patient centered medicine, evaluation of the level of required care and optimization of care pathway have a key role to ensure that patients receive the level of care appropriate to their needs. At the Verona University Hospital, which accounted for more than 3,500 births and 6,000 pediatric hospital admissions in 2015, a new "Woman and Child Hospital" will be inaugurated in spring 2017. Two hundred seventy inpatient beds, outpatient services, an area of 27,000 square meters for clinical care, research and teaching activities will be incorporated in the new building complex.

METHODS

The new structure was designed according to different levels of intensity of care. It represents an organizational model that can promote innovation in the performance of various activities, in which the severity of illness determines the level of care. In this model three levels are considered: a) high intensity, for intensive and semi-intensive inpatients; b) medium intensity, mainly for medical or surgical inpatients; c) low intensity, for post-acute patients. Moreover the reorganization of human resources and the 'patient-flow' are relevant features that contribute to defining the new model of care.

RESULTS

The "Woman and Child Hospital" will consist of: a) a platform for pediatric and obstetric-gynecologic emergency and for labor-delivery areas, closely connected with surgery, radiology and general emergency departments; b) two distinct but interconnected buildings, one containing the hospitalization and teaching activities area, whilst the other will accommodate the outpatient and day service area. This new organizational model is structured according to homogeneous areas, which provide patient care on the basis of severity-instability of the clinical case and the complexity of care level needed. It supports the prompt taking charge of the patient, a multi-professional and multi-disciplinary approach for the definition of functions and profiles, and the standardization of care pathways.

CONCLUSIONS

The main goal of the present project is to provide personalized and continuous assistance, where patients are placed at the very center and grouped on the basis of homogeneous clinical needs. This model aims to overcome boundaries between specialized units, in order to promote the integration and optimization of existing resources, specifically through appropriate design of spaces, effective integration among healthcare professionals and implementation of clinical care pathways. This change of perspective is a relevant step to define a new model of care, aiming to improve both safety level and clinical outcome for our patients.

ABS 2

CIRCULATING LEVELS OF NATURAL KILLER T CELLS AND ENDOTHELIAL PROGENITOR CELLS IN PRE-ECLAMPTIC PREGNANT WOMEN

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INTRODUCTION

Natural killer (NK) T cells have bone marrow origin; they represent about 70% of decidua leukocytes and play an important role in remodelling spiral arteries.

Endothelial progenitor cells (EPC) are bone marrow derived cells able to differentiate into endothelial cells. During stress conditions (burns, wounds, coronary artery bypass) a mobilization of these cells from bone marrow in repairing wounds and during pregnancy occurs. The aim of our study was to evaluate the circulating levels of NK lymphocytes and circulating EPC cells in women with overt preeclampsia.

METHODS

Our study population consisted of 39 women in the third trimester of gestation. The patients were divided into two groups: group A with 13 women affected by preeclampsia (diagnosed according to the criteria established by AIPE 2013 guidelines), and a group B composed of 26 patients with normal pregnancy. Of these women, circulating EPC cells (CD34 +) and NK lymphocytes (CD +) were assayed by flow cytometry.

RESULTS

A significant difference between groups was observed, both in EPC values (group A: 1.61 ± 0:29 vs group B: 2.42 ± 0.45 cells per μL, $p < 0.001$) and in NK lymphocytes (group A: 16.08 ± 5.22 vs group B: 7.65 ± 2.54 cells per μL, $p < 0.001$).

CONCLUSIONS

Altered remodelling of the spiral arteries is considered crucial in the development of preeclampsia. NK and EPC cells are involved in this process and the results of our study show how an impaired placentation may cause changes in the number of these cells.

ABS 3

CLASSIFICATION OF THE RISK FACTORS FOR STILLBIRTH FOLLOWING THE IMPLEMENTATION OF A CLINICAL AUDIT METHOD: PRELIMINARY DATA FROM A WIDE AREA IN NORTHERN ITALY

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INTRODUCTION

Stillbirth is defined as the intrauterine death of the fetus, which occurs either beyond 22 weeks of gestation, or when the birthweight is above 500 g and the gestational age is unknown. Its incidence has been unmodified over the last decades accounting for approximately 3/1,000 cases. In the Italian Region of Emilia Romagna, a project of clinical audit has recently been implemented to classify etiology and risk factors for stillbirth by means of a systematic classification system, with the aim to improve clinical practice and prevent such adverse events. In this study we report the results of the implementation of such approach in the Province of Parma.

METHODS

This is a retrospective cohort study including all cases of stillbirth recorded from January 2014 to August 2016 at the University Hospital of Parma and at the Hospital of Fidenza-Vaio. Etiologies and risk factors for stillbirth were evaluated using the classification system "ReCoDe", issued by the Regional Health System.

RESULTS

37 stillbirths/7,849 deliveries were recorded, with a stillbirth rate of 4.71/1,000. 57% (21/37) of patients were migrants from European or non-European countries; 58% (22/37) had only primary education. No significant difference in the stillbirth rate was noted in cases complicated by either chronic or gestational hypertension and diabetes. 54% (20/37) of fetuses who died in-utero were female. In 60% of cases (23/37) stillbirth occurred before 32 weeks and birthweight was < 10th percentile in 40% of cases (15/37); birthweight was < 3rd centile in 40% of cases (6/15). Overall, birthweight was < 50th centile in 80% of stillborn fetuses (30/37). Placental etiology was recorded in 54% of patients (20/37) and consisted in placental insufficiency (13/20, 65%) and abruption (4/20, 20%) or chorioamnionitis (3/20, 15%); overall, according to Philippe's classification, placental weight was below the normal range for the gestation in 62% (23/37) and placental-to-birthweight ratio was reduced in 60% (22/37) (according to Boyd's classification). 14% (5/37) of causes were attributed to thrombosis or entanglement of the umbilical cord; 16% (6/37) were due to congenital anomalies, whereas in 16% (6/37) the etiology could not be established.

CONCLUSIONS

Our data show that most stillbirths occur in fetuses considered appropriately grown and birthweight < 3rd centile represents a major risk factor for stillbirth. The most common underlying etiology is placental, and in such cases placental weight and the placenta-to-birthweight ratio are almost invariably reduced.

ABS 4

CESAREAN SECTION: INDICATIONS AND INCIDENCE IN THE LAST DECADES

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INTRODUCTION

The increasing incidence rate of cesarean section (CS) in our country, particularly in certain regions, has led to study strategies to slow down this process. A great contribution has been provided by the work of Michael Robson, who published a study in 2001, cassifying pregnant women in ten groups, according to precise features related to their mode of delivery. This work allowed to classify pregnancies according to the chance of undergoing a CS, and to follow the trend of this incidence in various categories. The primary aim of our work was to demonstrate the significance of CS as an appropriate choice.

METHODS

We studied the first 500 deliveries occurring in 1970, 2010 and 2013, thus selecting all of the 86 patients who underwent CS during 1970, the 271 patients who underwent CS during 2010, and the 208 patients who underwent CS during 2013. All of the recruited patients were later divided according to the classes of Robson. The collected data was then reprocessed in a comparative way.

RESULTS

Statistically significant differences were observed when comparing data from 1970 and 2013, with an increasing number of CS in patients of Robson class V ($p < 0.0001$), VI ($p = 0.06$) and VIII (< 0.0001). Moreover, we observed a significantly increased incidence of CS in 2013 compared to 2010 in the class I of Robson ($p = 0.02$). On the contrary, a significant reduced incidence of CS in patients who belonged to class II of Robson was reported ($p = 0.0001$). Another significant result is the increased incidence of CS in the class VIII of Robson ($p = 0.008$) in 2013 compared to 2010. Lastly, we reported a significant increase in maternal age at first pregnancy from 1970 to 2013 (24 vs 29 years) and a decrease in parity, with 40% more nullipara in 2013 than in 1970. However, the parameter that influenced more the rate of CS was a previous CS (class V of Robson 17% in 1970 vs 46% in 2013). Another important and significant difference concerns the increase in twin pregnancies, that tripled in 2013, probably following the widespread use of medically assisted procreation.

CONCLUSIONS

Even if the incidence of CS in 2013 appears doubled compared to 1970 (27.7 vs 13.9), there is no evidence of any significant differences in the Robson classes I and II. This result needs further studies because it apparently shows that the indication to primary CS was appropriate, despite the increasing global rate of CS, which mainly follows a previous CS.

ABS 5

MATERNAL NEAR MISS: A 10-YEAR SURVEILLANCE STUDY IN A TERTIARY CARE FACILITY OF NORTHERN ITALY

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INTRODUCTION

Reduction of maternal mortality in high resource countries has caused maternal-death confidential enquiries to become less informative, hence the need for an additional health indicator to be used. In recent years, severe maternal morbidity (near miss) has proven its value as a complementary strategy to promote safe obstetric care. The aim of the study was the assessment of prevalence and causes of maternal near miss and its impact on both feto-maternal wellbeing and facility resources.

METHODS

An observational prospective study was conducted at the University Hospital of Verona during a 10-year period. The criteria adopted were management-based: blood transfusion ≥ 5 units and peri-partum hysterectomy, representing hematological and uterine dysfunctions, respectively. Additional criteria were laparotomy (without hysterectomy), admission to Intensive Care Unit (ICU) and arterial embolization.

RESULTS

A total of 151 near miss cases were identified, giving a rate of 15.1 cases per year and an incidence of 8.6/1,000 deliveries over a total of 17,539 women who gave birth during the same interval. Most of the severe obstetric complications were admitted in ICU (66.9%) or received a massive transfusion (40.4%); the combination of these two criteria identified 145/151 (96.0%) of our cases. The combination of the two dysfunctional criteria, transfusion and hysterectomy identified 104/151 cases (68.9%). The most frequent obstetric morbidity leading to the severe maternal outcome was major hemorrhage, affecting 76 patients

(50.3%): primary underlying causes were placental abnormalities as well as coagulopathy resulting from severe preeclampsia. Other indications to ICU admission, apart from hypertensive disorders and hemorrhagic complications, were other causes affecting the pulmonary, cardiovascular and renal function which made intensive treatment necessary for 42.6% of women. Major abdominal surgery was necessary in 39 women (25.8%), with emergency peripartum hysterectomy in 52 cases (34.4%). Near miss events led to an average blood consumption of 5.7 ± 10.7 units per woman and a mean hospital stay of 10.1 ± 10.0 days, significantly longer ($p < 0.05$) than the average duration of post-delivery care. Intrauterine fetal death and admission to Neonatal Intensive Care Unit (NICU) were significantly associated with near miss cases as well as low birthweight. Maternal age ≥ 40 years (OR 1.87, 95%CI 1.18-2.91), pre-term birth (OR 4.46, 95%CI 3.58-5.57), cesarean section (OR 2.28, 95%CI 1.9-2.76) were factors significantly associated with study cases. Maternal mortality to morbility ratio was 3:151.

CONCLUSIONS

An integrated intervention-based approach effectively monitored institutional near miss cases. Awareness of underlying causes and associated risk factors should help improve quality of care, thus preventing severe maternal morbidity and reducing hospital expenditures.

ABS 6

IS LENTICULOSTRIATED VASCULOPATHY AT HEAD ULTRASOUND AN UNFAVORABLE PROGNOSTIC FINDING IN PATIENTS WITH CONGENITAL CYTOMEGALOVIRUS INFECTION?

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INTRODUCTION

Cytomegalovirus (CMV) infection during pregnancy may cause fetal death, premature birth or a severe congenital disease. Brain involvement is the most serious manifestation of symptomatic congenital CMV (cCMV). Lenticulostriated vasculopathy (LSV) detected at head ultrasound (HUS) has been related to neurological and hearing sequelae in infants with cCMV infection. Aim of this study was to evaluate the role of LSV in predicting neurodevelopmental and hearing outcomes in infants with cCMV infection.

METHODS

We enrolled consecutive infants affected by cCMV infection undergoing HUS within the first month of life. Data on clinical onset and course, laboratory findings, visual/hearing functions and neurodevelopmental outcome were collected. As controls, infants with suspected intrauterine exposure to Toxoplasma with availability of HUS evaluation were considered.

RESULTS

Data from 161 infants with cCMV infection (105 symptomatic) and 133 controls were analyzed. HUS was normal in 66/161 (41%) cCMV patients; specifically no HUS abnormalities was found in 28/105 (26.7%) symptomatic and in 38/56 (67.8%) asymptomatic infants ($p < 0.05$). LSV, as isolated or with other brain abnormalities, was diagnosed in 67.4% of cases, compared to 18% of controls (p 0.05 for both neurological and hearing impairment in presence versus absence of LSV). Similar results were obtained when we limited the analysis to the group of symptomatic cCMV patients.

CONCLUSIONS

Although LSV is a common HUS finding in infants with cCMV infection, its presence is not predictive of an adverse outcome. Our data suggest that HUS as a single neuroimaging investigation is unreliable in selecting candidates to antiviral therapy, particularly in presence of LSV as isolated finding.

ABS 7

MATERNAL IMMUNOSUPPRESSION AND RISK OF SEVERE CONGENITAL CYTOMEGALOVIRUS INFECTION

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INTRODUCTION

Congenital cytomegalovirus (cCMV) infection may occur from either maternal primary or secondary (reactivation of latent virus or reinfection) infection. Although the risk of vertical transmission is low in the case of secondary infection, infected fetuses are

still at risk for symptomatic disease and long term sequelae. Reactivation or reinfection may occur at any time during the life of the human host, although the risk increses in case of both primary or secondary systemic immunosuppression. We present a case of a severe cCMV due to secondary CMV infection of an immunosuppressed mother.

CASE REPORT

A female child was born at term to a mother with amyotrophic lateral sclerosis requiring high dose of steroids during the second trimester of pregnancy. She did not present any symptoms related to CMV infection and virological examination at 14th and 28th weeks of gestational age, showing previous CMV immunization, with low level of IgG CMV antibodies. IgG CMV avidity and amniocentesis were not performed. Fetal ultrasonography was normal, with the exception of a intrauterine growth retardation of 1-2 weeks. The newborn was SGA and microcephalic, but without complications during perinatal period. Laboratory evaluation performed within the first two weeks of life revealed a cCMV infection, with positive CMV DNA on urine and blood samples, and positivity of CMV antibodies (IgG and IgM). Cerebrospinal fluid analysis was normal, with no detection of CMV DNA. Head ultrasound, computed tomography and magnetic resonance showed cerebral multiple microcalcifications and germinolytic cysts, compatible with cCMV infection. Considering the presence of signs of central nervous system involvement, antiviral therapy with Valganciclovir was started.

CONCLUSIONS

CMV reactivation during pregnancy is a possible phenomenon. Severe maternal immunosuppression should be considered a high risk condition for CMV infection of fetus and for the subsequent development of a symptomatic cCMV disease. In these conditions, a strict follow up of CMV antibodies during pregnancy is recommended in order to early identify newborns with cCMV infection. Moreover, children with symptoms suggestive of infection born to immunosuppressed mothers should undergo to screening for infectious diseases.

ABS 8

NEUROIMAGING STUDIES AND NEURO-DEVELOPMENTAL OUTCOME IN A LARGE COHORT OF INFANTS WITH CONGENITAL CYTOMEGALOVIRUS INFECTION

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INTRODUCTION

Congenital cytomegalovirus infection (cCMV) is a condition burdened by a severe neurodevelopmental prognosis. Stratification of patients at risk for more severe outcome may help in management and evaluation of therapeutic interventions. Several attempts to identify clinical and/or neuroimaging findings as predictors of neurological outcome have been performed. Two scoring systems applied to neuroimaging data have been developed (Noyola score and Alarcon score). In both cases, higher scores have been associated with a poor prognosis. However, these studies are based on single neuroimaging study results. The aim of this study was to investigate the ability of a comprehensive neuroimaging investigation in the neonatal period to predict neurodevelopmental outcome in a large cohort of infants with cCMV.

METHODS

Infants born from 2002 to 2015 with cCMV infection diagnosed within the first two weeks of life were considered for enrollment. Data on clinical onset and course, laboratory findings, cerebral neuroimaging study, ophthalmologic, hearing and neurodevelopmental examination were collected. Neuroimaging findings were scored according to the standard Noyola score and to the new Alarcon score.

RESULTS

170 infants with cCMV infection (112 symptomatic) were included. 161 infants received head ultrasound (HUS), 147 patients received computed tomography (CT) and 133 patients underwent magnetic resonance imaging (MRI). Among 112 symptomatic patients, 89 underwent HUS, CT and MRI. HUS detected more abnormal finding than CT and MRI (62.9% HUS, 43.5% CT, 57.1% MRI). In all 56 asymptomatic patients, CT and MRI were negative while HUS was positive in 18 (32.1%) cases. The most frequent finding detected by HUS was lenticulostriated vasculopathy (LSV) (48.6%), calcifications by CT (33.7%), and white matter abnormalities by MRI scans (42.2 %). When we compared results of neuroimaging scores, an almost perfect agreement was found for HUS (Weighted Kappa 0.91 [0.85-0.96]) and CT (Weighted Kappa

0.87 [0.82-0.93]). A moderate agreement was found for MRI (Weighted Kappa 0.54 [0.38-0.69]). For all neuroimaging exams, the sensitivity of the new score in detecting patients at risk for poor neurological outcome was higher than the sensitivity of the Noyola score. CT scan represented the exam with the highest Area under the Curve (AUC) for neurological impairment (AUC 0.83, 95% C.I. 0.76 to 0.91) although the difference was significant only with respect to the HUS exams (p = 0.026). Finally, a risk of 10.3% to observe neurological defect was identified in case of negative neuroimaging.

CONCLUSIONS

HUS should be considered a readily available screening tool but, alone, is poorly reliable in predicting long term outcome of infants with cCMV. CT and/or MRI scans are key diagnostic steps to decide for treatment and make a prognostic neurodevelopmental evaluation.

ABS 9

POSTPARTUM HEMORRHAGE RISK AFTER EXPOSURE TO SSRIs DURING PREGNANCY

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INTRODUCTION

Prevalence of depression during pregnancy has been reported to range between 12.7-18.4% worldwide and reaches 16% in Italy. Selective Serotonin Reuptake Inhibitors (SSRIs) are the drug of choice due to their reported safety and efficacy. Recent studies have linked the use of SSRIs during pregnancy with a higher risk of post partum hemorrhage (PPH) and consequent maternal anemia during puerperium, with serotonin being involved in platelet function. Since platelets do not synthesize serotonin, SSRIs may cause depletion of their serotonin storages, resulting in disrupted aggregation, adhesion and eventual prolongation of bleeding time. Our aim was to evaluate the role of SSRIs use during pregnancy in the risk of PPH.

METHODS

This is a prospective, observational and experimental case-control study. Cases (n = 43) were Caucasian women with a diagnosis of depression and/or anxiety, in treatment with SSRIs during pregnancy. Controls (n = 86) were Caucasian women without a psychiatric diagnosis and not exposed to SSRIs during pregnancy. Exclusion criteria for both groups were other psychotropic drugs, anti-epileptic drugs, drugs of abuse or alcohol addiction, maternal or fetal infectious diseases and fetal/neonatal chromosomal genetic abnormalities. The two groups were compared for demographic, anthropometric and socio-economic variables, and were evaluated for pregnancy and delivery outcomes, with special attention to PPH risk.

RESULTS

The two groups were homogeneous for demographic, anthropometric, socio-economic and obstetric variables except for smoking and mean hemoglobin values before delivery. In the SSRIs population depression was the most frequent disorder (44%), followed by anxiety (26%). Sertraline was the most frequent prescribed drug (42%). The analysis of maternal outcomes did not show relevant differences in gestational age, pregnancy complications or type of delivery. However, SSRIs patients had about twice the number of delivery complications than controls (cases = 12/43 [28%] vs controls = 13/86 [15%] [p > 0.05]). All complications in cases were PPH. Mean blood loss (cases = 412.8 ml vs controls = 306.2 ml, p = 0.07), number of PPH (cases 12/43 vs controls 11/86, p = 0.06) and severity (p = 0.1) of PPH were higher in cases than in controls. These differences were not statistically significant but close to the relevance threshold. When stratifying the population according to type of delivery (vaginal vs cesarean sections), we found that cases had significantly more PPH after vaginal delivery (27.3% vs 7%, p = 0.04).

CONCLUSIONS

We found that women exposed to SSRIs during pregnancy are at increased risk of postpartum hemorrhage after vaginal delivery.

ABS 10

LONGITUDINAL PHARMACOKINETIC AND PSYCHIATRIC EVALUATION OF PREGNANT WOMEN IN TREATMENT WITH SSRIs

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INTRODUCTION

Many pregnancies are complicated by depression, with a prevalence ranging between 12.7 and

18.4% worldwide, and a prevalence of 16% in Italy. Untreated depression during pregnancy can lead to poor health behaviors with negative consequences for the mother, the fetus, birth outcome and child development. The drugs of choice to treat depression during pregnancy are Selective Serotonin Reuptake Inhibitors (SSRIs). Physiological changes of pregnancy can affect the pharmacokinetic of SSRIs and their dose requirements. However, data correlating maternal plasma drug concentration and psychiatric control are not available. Our aim was to evaluate the relationship between drug concentration in maternal plasma throughout pregnancy and psychiatric control.

METHODS

We recruited 43 pregnant women with a diagnosis of depression in treatment with SSRIs and no other psychotropic drugs at their first obstetric evaluation, and followed them longitudinally. The study design included 4 time points: 20 weeks, 30 weeks, delivery and 30 days postpartum. At each visit we collected maternal venous blood samples for pharmacokinetic analysis and administered objective and subjective psychiatric screening tests for depression and anxiety.

RESULTS

We found that drug plasma values were within therapeutic ranges throughout the whole pregnancy, but SSRIs serum levels declined across pregnancy, reaching the lowest levels at delivery. Delivery was also associated to the lowest control of depression and the highest levels of anxiety. Objective and subjective tests showed similar results.

CONCLUSIONS

This is the first report on the relationship between SSRIs pharmacokinetics during pregnancy and longitudinal psychiatric control. Delivery represents the time in pregnancy with the lowest maternal plasma drug concentrations and the worst depression control.

ABS 11

NEONATAL OUTCOMES AFTER EXPOSURE TO SSRIs DURING FETAL LIFE: A PHARMACOKINETIC AND PHARMACOGENETIC ANALYSIS

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INTRODUCTION

Selective Serotonin Reuptake Inhibitors (SSRIs) are the most frequent drugs to treat depression during pregnancy. SSRIs have direct potential effects on the developing embryo including increased risk of abortion, malformations, growth restriction, preterm birth and neonatal complications. SSRIs undergo extensive hepatic first-pass metabolism with the involvement of several cytochrome P450 (CYPs) enzymes. Genetic polymorphisms may influence the expression of CYPs genes. The aim of our study was to investigate the contribution of SSRIs pharmacokinetics and pharmacogenetics during pregnancy on neonatal outcomes.

METHODS

We performed a case-control study: cases (n = 43) were Caucasian women with a diagnosis of depression and/or anxiety, treated with SSRIs for the whole pregnancy. Controls (n = 86) were Caucasian women without a psychiatric diagnosis and not exposed to SSRIs during pregnancy. Exclusion criteria for both groups were other psychotropic drugs, anti-epileptics, drug of abuse, alcohol addiction, maternal or fetal infectious diseases, fetal/neonatal chromosomal genetic abnormalities. Maternal and fetal blood samples were obtained at delivery to measure drug concentrations and to analyse genotype.

RESULTS

The population was homogeneous for demographic, anthropometric, socio-economic and obstetric variables except for smoking and mean hemoglobin values before delivery. Delivery data were also comparable. Newborns exposed to SSRIs during fetal life were significantly more likely to be LBW (birth weight < 2,500 g) ($p = 0.01$), had significantly lower mean Apgar scores at 1' ($p = 0.006$) and at 5' ($p = 0.023$) and worse Apgar distribution at 1' ($p = 0.017$) and at 5' ($p = 0.013$). Clinically these findings were associated to poor neonatal adaptation syndrome (PNAS) in 56% of newborns, respiratory distress syndrome or transient tachypnea of the newborn. The pharmacokinetic/pharmacogenetic analysis at delivery showed no striking differences in the frequencies of obstetric or neonatal complications between those with compared to those without any polymorphism. But for each drug, the worst adverse outcomes were observed in infants born to the mothers with the most altered CYPs activity.

CONCLUSIONS

Here we report that newborns exposed to SSRIs are at increased risk of poor neonatal outcomes in terms of low birth weight, low APGAR scores and,

clinically, poor neonatal adaptation syndrome. The pharmacokinetic/pharmacogenetic analysis showed that the degree of CYPs alterations, that depends on polymorphisms, may influence the severity of outcomes, more than their frequency.

ABS 12

PREVENTION OF ADVERSE MATERNAL-PERINATAL OUTCOMES: FROM PROCEDURE TO CLINICAL PRACTICE THROUGH SIMULATIONS FOR THE MANAGEMENT OF EMERGENT CESAREAN SECTION (ECS-RED)

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INTRODUCTION

Proper management of obstetric emergencies is essential to prevent poor maternal-perinatal outcomes. For this purpose, our Department introduced a "multistep" training project for emergencies including the Emergent Cesarean Section (ECS-Red). Aim of this report is to analyze our ECSs-Red data to understand effectiveness and critical issues of this approach.

METHODS

The process introduced since 2013 in our Department consists of the following steps: 1) development of a CS procedure for classification and designation of each team member's role based on a "urgency-color" classification; 2) introduction of the SBAR method as a standardized communication tool to reduce potential risks associated with lack of teamwork and suboptimal communication; 3) debriefing for identification of delaying obstacles and possible improvement; 4) introduction of periodic simulations for the procedure application and the recognition of the most common errors; 5) data collecting for audit and evaluation (data of all CSs are collected in our labor-ward computerized data system). Recently we have also introduced the Delivery Decision Interval (DDI) as a tool for monitoring decision to delivery interval. A composite early perinatal outcome was obtained considering at least one among fetal acidemia, 5-minute Apgar score < 7, need of resuscitation or NICU admission. Post-partum hemorrhage (PPH) was defined as a blood loss ≥ 1,000 ml.

RESULTS

Since 2013 there were 103 ECSs-Red. Our data confirm that the ECS-Red is a rare event with an annual average of 1.5% of total deliveries and 7% of all CSs, with a monthly rate of 1,25/1,000 deliveries. Nonreassuring fetal heart rate (NRFHR) was the main indication (53.4%). We performed 25 ECSs-Red < 37 gestational weeks (24.2%). Among 103 total births, 39 babies (37.8%) were positive to the composite outcome previously described (27.1% of NICU admissions, 13.5% of fetal acidemia and only 5.8% of 5-minute Apgar score < 7). There were 14 cases (13.5%) of EPP. Preliminary DDI data of 2016 was also analyzed, with a mean DDI of 11 min (range 7-15 min). A 30-minute rule for decision-to-delivery interval (DDI) when ECS is performed has become a common practice and has been adopted by many professional associations.

CONCLUSIONS

ECS-Red is a rare obstetrical event. Our "multistep" approach, also valid for all other obstetric emergencies, is supported by the evidence that standardized interventions and periodic drills will improve the care given, enhancing patient safety and mitigating the severity of adverse outcomes. Further investigation, considering more data (e.g. DDI and long term neonatal-maternal outcomes) in a more prolonged observational period, could lead to a better understanding of the impact of this strategy on emergency obstetric care.

ABS 13

A CASE OF NEONATAL CYTOPENIA: A CONGENITAL RUBELLA SYNDROME OR SOMETHING ELSE?

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INTRODUCTION

Cytopenia could be a sign of congenital Rubella syndrome, together with other clinical signs (eye

abnormalities, sensorineural deafness, congenital heart disease). Moreover, severe cytopenia could be a manifestation of other severe diseases, which go in differential diagnosis with congenital infections. We report a case of cytopenia in a child admitted to the Perinatal Infectious Unit of the Federico II University (Naples) because of a suspicion of congenital Rubella.

CASE REPORT

A male child came to our attention at the age of 40 days because of suspected congenital Rubella infection. His mother presented positive serology for Rubella during pregnancy (both IgG and IgM), with medium IgG avidity (44%), but without symptoms related to the infection. Fetal ultrasonography was normal. He was born at term, with a weight appropriate for gestational age and with normal head circumference. No complications occurred during the perinatal period. Our first evaluation revealed normal fundoscopy and head ultrasound; no echocardiographic or hearing problems were found. The child presented negative serology for Rubella (both IgG and IgM). Laboratory investigation showed presence of anaemia (Hb 7.1 g/dl) and thrombocytopenia (platelets 17,000/mcl). Clinical examination revealed splenomegaly. Immunological and infectious causes of cytopenia were excluded. The peripheral blood smear showed erythroblasts and circulating myeloid precursors; bone marrow aspirate was hypocellular. Chest and skull computed tomography showed diffuse sclerosis of ribs and spine and focal sclerosis of the skull bone. These data, combined with genetic molecular analysis, positive for TCIRG1 gene mutation, confirmed the diagnosis of Autosomal Recessive Osteopetrosis (ARO). The patient underwent Hematopoietic Stem Cell Transplantation (HSCT), with resolution of haematological abnormalities. Currently our patient is in good clinical condition; his mother is expecting another child, therefore chorionic villus sampling has been planned in order to make an early prenatal diagnosis.

CONCLUSIONS

Autosomal Recessive Osteopetrosis (ARO) is a rare genetic disease due to defect in bone resorption by osteoclasts, characterized by increased bone density and medullary cavity filled with endochondral new bone. In case of severe neonatal onset, involving bilinear or trilinear cytopenia, the disease is frequently fatal in the first year of life if undiagnosed or untreated. At present, HSCT represents the only possible curative treatment of ARO. Prenatal diagnosis by molecular analysis on chorionic villus sampling is recommended in families with cases of ARO, in order to plan HSCT before the age of 3 month to improve neurological outcome. In case of negativity of laboratory exams for congenital infections and in presence of abnormal haematological findings, other causes of cytopenia should be considered in order to early detect rare but severe diseases.

ABS 14

PLACENTAL GROWTH FACTOR AS A PREDICTIVE MARKER OF PREECLAMPSIA

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INTRODUCTION

To evaluate the clinical utility of placental growth factor (PlGF) for prediction of preeclampsia (PE).

METHODS

This prospective cohort study included women with a preconception or current risk of developing PE. Blood samples were collected every 4-5 week or during hospitalization from early second trimester until delivery. Plasma levels of PlGF were considered pathological under the 5th centile for gestational age. Sensitivity (Sn), specificity (Sp), positive and negative predictive value (PPV, NPV) were calculated.

RESULTS

A total of 75 pregnancies were included: 51 had pathological PlGF plasma levels while 24 had normal PlGF plasma levels. None of women with normal PlGF plasma levels developed PE, while 20 (39%) women with PlGF < 5th centile developed PE.

CONCLUSIONS

Our data support recent studies about the role of PlGF as biochemical marker of PE with high Sn (100%) and high NPV (100%). In women at risk of developing PE a normal PlGF is related with a favorable pregnancy outcome. Therefore the measurement of a single biomarker would simplify the clinical management and would reduce costs.

ABS 15

CLINICAL AUDIT: A WAY TO REVIEW AND IMPROVE OBSTETRICAL PRACTICE RELATED TO CESAREAN SECTION AT S. ANNA HOSPITAL

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INTRODUCTION

The rate of cesarean delivery is currently increasing all over Europe, particularly in Italy where it reaches 38% of all childbirths. Therefore, it is important to identify and reduce inappropriate cesareans. With this aim we chose the technology of clinical audit, a process that promotes improvement in clinical practice through systematic review of clinical care in relation with explicit standards derived from scientific literature.

METHODS

This is a prospective audit: from March to July 2014 we analyzed the medical records of 150 women who underwent elective cesarean delivery at Gynecological and Obstetrical University Hospital S. Anna. We considered 5 criteria of good practice from the review of national and international guidelines and we elaborated one or more indicators for each criterion: twin pregnancy with both cephalic presentation (dichorionic diamniotic, monochorionic diamniotic); preterm deliveries (≤ 32, ≤ 34 and ≤ 36 weeks of gestational age); maternal request; multidisciplinar indication to CS; previous cesarean delivery. The rate of cesarean sections found in each criterion was compared with the respective standard in literature. We considered performing indicators whose final rate was found to be better or equal to the reference standard.

RESULTS

Indicators:

- dichorionic diamniotic: performing, CS rate in standards ≤ 43%; CS observed rate 44%;
- monochorionic diamniotic: performing, CS rate in standards ≤ 77%, CS observed rate 71%;
- preterm deliveries: performing, CS rate in standards ≤ 32%, CS observed rate 25%;
- maternal request: performing, CS rate in standards ≤ 40%, CS observed rate 12%;
- previous cesarean delivery: non performing, CS rate in standards ≤ 30%, CS observed rate 84%;
- multidisciplinary indication to CS: CS rate in consensus standards ≥ 90%, CS observed rate 60%.

Actions of improvement were applied in order to reduce the excess in repeated CS and results were re-evaluated after a period of time using a sample of 50 women with a previous CS.

The re-audit showed a 20% reduction of repeated CS (64% in re-audit vs 84% in audit) in our unit.

CONCLUSIONS

The majority of the analyzed indicators resulted to be performant. The rate of repeated cesarean sections was significantly higher than the standard value (84% against ≤ 30%). In order to reduce them our clinical audit provides a plan of improvement based on labor induction with cervical ripening baloon, written informations and dedicated counselling for women with previous cesarean sections. The re-audit showed a positive impact of the applied measures on our clinical practice. In conclusion we support the use of clinical audit as a mean to improve health practice.

ABS 16

MULTIETHNIC POPULATION IN PREGNANCY, A RETROSPECTIVE ANALYSIS

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INTRODUCTION

As a result of migration flows in Italy, the multiethnic component has greatly increased. Most of the medical needs of non-EU population concern the obstetric and gynecological sphere: pregnancy, childbirth, abortions and miscarriages. Genetic predisposition to certain diseases and adverse socio-economical conditions determine different distribution of illness among different races. The aim of this study was to identify the different issues of the specific populations examined and to understand how ethnicity influences on them.

METHODS

It has been conducted a retrospective study, through the review of medical records, at the Obstetric Department of Perugia. The four main ethnic groups present in Italy were considered: Caucasian, African, Asian and Hispanic. Among the Caucasian, two distinct sub-populations were analysed: from Eastern and Western Europe. Data on background, age, BMI, obstetric history, weeks of gestation has been collected for each pregnant woman. Diseases in the gestational period, pathologies induced by pregnancy, intra and post-partum maternal complications were researched. For the neonatal

outcome, data related to sex, weight and Apgar scores have been collected.

RESULTS

The average age of Italian pregnant women is higher than all other ethnicities considered, while the youngest mothers are the Caucasians from Eastern Europe. A greater percentage of Italian women is primiparous. A higher frequency of previous abortions/miscarriages among foreign-born mothers was found. BMI was significantly higher among Africans, and it was followed by a higher incidence of GDM. Italians are more at risk for hypothyroidism development. An increased risk for preeclampsia, oligohydramnios, placenta previa and postpartum haemorrhage was found in the Hispanics. The use of elective caesarean section prevails in all groups (except in Asians where the emergency TC was predominant). The main indication for TC was a previous cesarean section for Italians, and a not-reassuring CTG for all foreign groups. In Asian 10% of caesarean sections were due to positivity to HCVand HBV. Increased incidence of hospitalization in IC Unit in the case of babies born to East-European mothers has been highlighted.

CONCLUSIONS

Late pregnancy is common among Italian women, with an average age of 35 and over. There are ethnic differences in pregnancy pathologies. Some of these result from a genetic predisposition, but they are also favoured by modifiable risk factors: BMI, inadequate prenatal screening and access to care. The higher incidence of complications among foreign-born mothers suggests the need for better integration policies. Starting from the territorial structures and counseling services, the aim should be a multidimensional approach to inform the foreign-born mothers, giving them more immediate and easier access to services and improving the education to fertility control. No differences in neonatal outcome were recorded. This is therefore a sign of good care before and during childbirth.

ABS 17

MOSCHCOWITZ SYNDROME IN TWIN PREGNANT WOMEN AFTER OOCYTES DONOR CYCLES: A CASE REPORT

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INTRODUCTION

Oocytes donation program represents an important strategy for women of advanced age with reduced ovarian reserve in order to achieve a pregnancy. The excellent success rate makes this procedure more and more spread in IVF centers and it was estimated that it constitutes currently the 4.5% of all IVF/ICSI cycles. Nonetheless, several concerns are raising regarding pregnancy outcome after IVF/donor cycles. There is evidence that oocytes donation is independently associated with pregnancy-induced hypertensive disorders. This risk seems even higher in twin pregnancies in which higher placental mass exacerbates both immunologic factors and endothelial dysfunctions, which represent the most important pathogenetic triggers.

METHODS

We reported a case of a 45 years old women who underwent egg donation program. While the first pregnancy was carried out successfully without complication, the second twin pregnancy achieved from the same donor was characterized by the development of severe hypertensive disorders at 34th week of pregnancy, which was, in the first step, diagnosed as HEELP syndrome. After emergency cesarean section, the women was transferred to intensive care unit. After deep investigations, the definitive diagnosis was Moschcowitz syndrome. Thrombotic thrombocytopenic purpura (TTP) is a rare blood disorder characterized by microangiopathic hemolytic anemia, thrombocytopenic purpura, neurologic abnormalities, fever, and renal disease. The patient reported a subacute onset of symptoms related to anemia, thrombocytopenia and neurologic dysfunction. Neurologic manifestations included alteration in mental status, seizures, hemiplegia, paresthesias, visual disturbance and aphasia.

RESULTS

Immunological analysis revealed a lower ratio of activated/regulatory T cells suggesting an inadequate counteractive response, which could explains the development of Moschcowitz syndrome in this woman. The woman was subsequently discharged without relevant sequalae.

CONCLUSIONS

This case suggests how even in pregnancies achieved with oocytes donation programs, Moschcowitz syndrome could develop. In addition, as reported by several cases, this syndrome could be easily mismatched with preeclampsia and its severe expression (HELLP syndrome). As reported by other studies, this case supports the hypothesis that in pregnancy achieved with oocytes donation

hypertensive disorders and Moschcowitz syndrome could be part of a spectrum of the same illness with shared underlying endothelial dysfunction but more studies are necessary to confirm the supposed link.

ABS 18

POSTPARTUM HEMORRHAGE AND MATERNAL OUTCOMES AFTER UTERINE TAMPONADE "BAKRI BALLOON": OUR EXPERIENCE

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INTRODUCTION

Postpartum hemorrhage is a cause of maternal mortality and morbidity. We retrospectively evaluated maternal outcomes after uterine tamponade "Bakri balloon" in the management of postpartum hemorrhage from September 2014 to September 2016.

METHODS

In our population uterine tamponade "Bakri balloon" was used after failure of standard treatment of postpartum hemorrhage. The study population was divided into two groups, the first group in which interruption of postpartum hemorrhage was obtained, and the second group in which it was necessary to perform radical surgery.

RESULTS

Uterine tamponade "Bakri balloon" was used in 19 women: 9 (47%) after vaginal delivery and 10 (53%) after cesarean section. Uterine atony was the main cause of bleeding (91%). The overall success rate was 89%. Only in 2 cases of failure a surgical intervention was needed. Demographic and assistance characteristics did not differ significantly between the two groups. No complications were observed directly related with the use of "Bakri balloon".

CONCLUSIONS

Uterine tamponade "Bakri balloon" is an effective tool, secure and easy to use in the treatment of postpartum hemorrhage and could reduce the need for demolitive surgical procedures.

ABS 19

KIND OF PAIN DURING LABOR AND MATERNAL-FETAL EFFECTS OF EPIDURAL ANALGESIA

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INTRODUCTION

The global experience of pain varies according to where the subject is located and to his affective dimension. During delivery pain expectation and anxiety play an important role in the attitude of the patient. Epidural analgesia aims to control pain during labor, allowing the woman to collaborate actively. The main objective of the study is to assess the relative preference to the relationship duration/intensity of pain in women at labor considering maternal and neonatal outcome after epidural analgesia. The knowledge of patients on labor analgesia, their expectations and/or concerns about it has also been evaluated.

METHODS

This is a prospective cohort study; 188 patients were enrolled at the Department of Gynecology and Obstetrics at the Santa Maria della Misericordia Hospital in Perugia. The study period was October 2015 - June 2016. Each subject met the inclusion criteria present in study design. Each patient completed a questionnaire to assess the preference related to duration/intensity of pain before the onset of labor and 24 hours after birth. In the questionnaire, pain intensity was assessed using a numerical scale. The duration of pain was assessed using a full hour periods. The area under the curve is determined by the product between this two elements. For each patient, obstetric and anamnestic characteristics as features of labor/delivery were also recorded; APGAR index, weight, length, sex on the infant, first urination and early lactation were evaluated. The major objective of the study was to assess women's preference between a condition of greater intensity of pain with shorter duration, or a lower intensity with a longer labor, using the questionnaire pre and post delivery.

RESULTS

Of the 188 patients enrolled, 176 completed both questionnaire. Comparing the two groups, there were no significant differences in the observed characteristics. One significant factor was the duration of gestation. The results of the questionnaire showed that all women in the postpartum increased their preference for a less intense pain even if of longer duration. Epidural analgesia was not associated with a greater incidence of operative deliveries and/

or caesarean sections (p = 0.513). The duration of labor was significantly statistically increased in the first and in the second stage (p = 0.000), as during active labor (p = 0.030). There was no significant difference in the wounds between the two groups, while an increased recourse to episiotomies was found in the group who received analgesia (p = 0.002). No significant differences were detected in the two groups regarding the neonate.

CONCLUSIONS

Women who requested epidural analgesia preferred to reduce the intensity of pain. Even those who didn't have this opinion in the pre-partum, after giving birth, they preferred a less painful labor. There were no concerns about neonatal health. Regarding the delivery outcome, the only difference was in the length of labor time.

ABS 20

DIFFERENT 3D TECHNIQUES IN THE STUDY OF FETAL CORPUS CALLOSUM AND ROLE OF 5D CNS PLUS

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INTRODUCTION

In daily practice it is difficult to visualize all the normal fetal cerebral midline structures using the axial planes. These planes do not allow direct evaluation of the corpus callosum (CC) and other midline brain structures, thus limiting detection of these midline anomalies on screening scans. The present paper aims to evaluate the role of 3D techniques in the identification of Central Nervous System (CNS) structures.

METHODS

Fetal cerebral midline structures from 300 low-risk pregnant women were studied prospectively by 2D and 3D ultrasound between 19-23 weeks of gestation during last 5 years. Fetal brain was evaluated by various 3D mode functions such as Oblique technique (OT), OVIX (Oblique View eXtended Imaging), VOCAL and Multi-Slice view. The 3D Multiplanar Imaging allows a simultaneous analysis of the acquired volume in three planes and is used as the first step in the process of volume acquisition, as it is the pre-requisite for later analysis. This allows the section plans to be oriented. If this alignment is properly obtained on C plan, the sagittal and the midsagittal plane containing the CC can be easily visualized. Each volume was processed using the OT and OVIX in order to improve the image resolution in the reconstructed planes. More specifically, a midsagittal view of the midline was obtained, and the OVIX box was adjusted on its central core using a slice thickness of 3mm in order to achieve a coronal view of the CC. Multi-Slice View transforms 3D volume data obtained from a regular ultrasound scan into a series of sequential images captured at intervals of 0.5mm to 5mm segments. Users can instantly view, analyze and understand the more in-depth data, and thereby gain greater diagnostic confidence and accuracy. VOCAL displays sequential parallel slices of 3D anatomy to facilitate more precise volume analysis of the structures. 48 out of 300 patients were also evaluated by 5D CNS plus technique. This technique allows to obtain all the recommended views of the fetal brain for neurosonography, starting from a single axial scan of the fetal head.

RESULTS

The CC anatomy was accurately reconstructed from axial to sagittal plane in all 48 cases. The CC was visualized as a hypoechoic structure and was divided in four parts: rostrum, genu, body and splenium. This approach allows easily the visualization of the CC, to evaluate its shape, to distinguish normal from abnormal CNS volumes and provide possible diagnoses for abnormal volumes. A complete reconstruction of fetal cerebral views was obtained in 45 of 48 patients, submitted to 5D CNS plus technique.

CONCLUSIONS

3D ultrasound enables a precise visualization of the normal and abnormal CC in the median plane. 5D CNS plus was shown to be a reliable technique to obtain in a very short time all the required fetal brain views. No difference was found in terms of time elapsing between the various 3D technique. The OVIX technique may be the most appropriate for the study of CC.

ABS 21

EVALUATION OF UTERINE ARTERIES DOPPLER AND ESTROGEN MILIEU IN OOCYTE DONATION PREGNANCIES

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INTRODUCTION

The number of oocyte donation (OD) cycles has dramatically increased. While OD pregnancies face increased risks of obstetrical complications, especially pregnancy-induced hypertension and preeclampsia (PE), little is known about the physiology and the physiopathology of placentation.

METHODS

We performed a prospective cohort study to analyze uterine arteries Doppler Pulsatility index (PI) and serum maternal 17β-estradiol at 11^{+0}-13^{+6} weeks' gestation. Three groups of singleton pregnancies were studied: OD, *in vitro* fertilization pregnancies with autologous oocytes from fresh cycles (autologous IVF) and spontaneous pregnancies. Outcomes were collected to include only physiological pregnancies.

RESULTS

The analysis by week showed a decreased uterine arteries PI between 11 and 13^{+6} weeks with a similar trend in all groups, but mean uterine artery PI at 11-13^{+6} weeks were significantly lower in OD recipients compared to spontaneous pregnancies and autologous IVF (1.415 [SD 0.486] vs. 1.679 [SD 0.456] vs. 1.706 [SD 0.481] $p < 0.05$). In spontaneous pregnancies, maternal serum levels of 17β-estradiol increased between 11 and 13^{+6} weeks, with a mean level of 2,423 pg/ml at 11.5 weeks, 2,521 pg/ml at 12.5 weeks and 4,654 pg/ml at 13.5 weeks. Interestingly, in the same cohort we found a higher value in female fetuses with a mean of 3,204 pg/ml (SD 1,634) compared to the mean value of male fetuses of 2,436 pg/ml (SD 1,170) with a ratio female/male of 17β-estradiol maternal serum concentration of 1.31 (95% CI: 1.04-1.65). Maternal serum levels of 17β-estradiol in OD-oocyte recipients were significantly lower than in IVF and spontaneous pregnancies (1,705 [SD 380] vs. 2,121 [SD 1,387] vs. 2,844 [SD 1,516] $p < 0.05$).

CONCLUSIONS

Mean uterine artery PI and 17β-estradiol at 11-13^{+6} weeks were significantly lower in OD recipients compared to spontaneous pregnancies and autologous IVF. Oocyte donation has a significant impact on placentation in the first trimester of pregnancy.

ABS 22

EVALUATION OF HORMONAL MILIEU IN THREE DIFFERENT MODE OF CONCEPTION

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INTRODUCTION

The number of infertile couples has dramatically increased, leading to a continuous expansion of the number of assisted reproduction technology (ART) treatment cycles in Europe [1]. In pregnancies obtained by ART, exogenous estrogens and progesterone need to be administered to ensure endometrial receptivity and to maintain pregnancy after embryo transfer. To our knowledge there are few data on estrogen and progesterone maternal blood levels either spontaneous and in ART pregnancies during the first trimester. The first aim of our study was to create 17β-estradiol and progesterone growth curves in spontaneous pregnancy and successively to compare them with those from autologous and oocyte donation pregnancies.

METHODS

From November 2015 to June 2016 three groups of singleton pregnancies were studied: spontaneous, *in vitro* fertilization pregnancies with autologous oocytes (autologous IVF) and oocyte donation (OD) pregnancies. Maternal hormonal venous concentrations were analyzed in our reference laboratory in 85 spontaneous, 23 homologous IVF from fresh cycles and 12 OD pregnancies between 4 and 13^{+6} weeks of gestations. Serum samples were processed and assayed for 17β-estradiol and progesterone using the Electro Chemo Luminescence in Immunoassay method.

RESULTS

In spontaneous pregnancies, maternal venous 17β-estradiol and progesterone concentrations increased according to gestational age. There was a significant relation between progesterone growth and gestational age, with a concentration growth of 0.2 ng/ml per day of gestation. 17β-estradiol and progesterone were linked by a linear correlation expressed by the following formulation: Log (17β-estr) = 2.5933 + 0.0149 x progesterone and the correlation coefficient was equal to 0.388.

Comparing the different mode of conception, maternal serum concentration of 17β-estradiol appeared to be lower in OD donation than in spontaneous and autologous IVF pregnancy in any weeks of pregnancy, while progesterone values were higher in autologous IVF pregnancy than in spontaneous and OD pregnancies.

CONCLUSIONS

Estrogen levels are lower in OD pregnancy in the first trimester of pregnancy. Low estrogen level may enhance an efficient and early invasion of spiral artery by the trophoblast. In autologous IVF the higher progesterone concentration may suggest a revision of progesterone therapy after pick up. It is possible that the correlation between concentration of 17β-estradiol and progesterone could help in prescribing support therapy during the first weeks of pregnancy.

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ABS 23

BREASTFEEDING: BIOLOGICAL AND SOCIAL VARIABLES COMPARED TO MODE OF CONCEPTION

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INTRODUCTION

Breastfeeding produces enduring effects for health throughout the baby and mother's life. For this reason exclusive breastfeeding is recommended in the first 6 months of life by the World Health Organization. In 2014, 10,976 children were born in Italy through ART (Assisted Reproductive Technology) treatment, representing the 2.2% of the total number of children born in the same year. Our aim was to evaluate the influence of social and biological variables and the mode of conception on breastfeeding.

METHODS

This is an observational study including 161 pregnant women with three different mode of conception. The 1st group included cases (n = 45) who had conceived through homologous *in vitro* fertilization, the second one (n = 26) included cases who had conceived through ovum donation and controls (n = 90) were spontaneous pregnancies. Inclusion criteria were singleton pregnancy, maternal age > 30 years and delivery > 34 gestational weeks. Exclusion criteria were multiple pregnancies, neonatal chromosomal genetic abnormalities, maternal diseases that contraindicate breastfeeding such as HIV infectious or psychiatric diseases, which require antipsychotic drugs. Anthropometric neonatal data, type of delivery, socio-demographic and lifestyle characteristics were collected from medical records and neonatal database. Breastfeeding and biological outcomes were obtained through telephone interviews.

RESULTS

The mode of conception did not influence the initiation, duration and exclusivity of breastfeeding. The only maternal variable, which is negatively linked with the duration of breastfeeding, is smoke (OR 6.3). Obstetric and neonatal variables that are associated with the initiation of breastfeeding are type of delivery (women with vaginal delivery breastfeed more [OR 5.70], longer [OR 1.29] and in exclusive way [OR 5.45] than that one with cesarean section), birth weight > 2,500 kg (OR 6.1) and delivery > 37 gestational weeks. Breastfeeding intention (OR 21.54) and the rooming-in (OR 2.97) are positively related with the initiation of breastfeeding. Otherwise skin to skin (OR 2.49) and having received information about all breastfeeding's benefits (OR 2.99) and about nursing centers (OR 2.69) are the most significant variables associated with exclusive breastfeeding and for long time. 22 women who conceived through ovum donation (84.62%) wanted to breastfeed, 19 (73.08%) started it, and among these 13 (68.42%) continued for more than 6 months and 9 (47.37%) in exclusive way.

CONCLUSIONS

The duration and the exclusivity of breastfeeding are mainly related with information, promotion and support and not with the mode of conception. Ovum donation does not have a negative impact on breastfeeding, also because the mammary gland is able to work even after menopause under the control of the estrogens. Finally, FIVET and ovum donation cesarean sections are related to a reduction in breastfeeding.

ABS 24

LAPAROTOMIC MYOMECTOMY AT 18 WEEKS' GESTATION DUE TO UTERINE FIBROID TOR-

SION DURING PREGNANCY: A CASE WITH SUCCESSFUL SURGERY AND SPONTANEOUS VAGINAL DELIVERY AT TERM

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INTRODUCTION

Uterine myomas are usually asymptomatic during pregnancy. However, pedunculated fibroids torsion may occasionally cause acute abdominal pain. Most cases of laparotomic myomectomy described in literature have been performed during a cesarean section, due to the risk of managing them surgically at low gestational age. We present a case of a successful multiple laparotomic myomectomy during the second trimester of pregnancy with a review of the literature.

METHODS

A systematic review was conducted in order to retrieve and report the available published data on the topic. We performed a computerized search using Pubmed, Embase, CINAHL, LILACS (all from inception to Oct. 5, 2014), the Cochrane Central Register of Controlled Trials (http://www.mrw.interscience.wiley.com/cochrane/cochrane_clcentral_articles_fs.html; 1960 to Oct. 5, 2013), ISI Web of Science (http://www.isiknowledge.com; 1960 to Oct. 31, 2013), Research Registers of ongoing trials (www.clinicaltrials.gov, www.controlled-trials.com; www.centerwatch.com; www.anzctr.org.au; http://www.nihr.ac.uk, and www.umin.ac.jp/ctr), and Google scholar. A combination of keywords and text words related to surgical procedures during pregnancy, uterine myomas, preterm labor and delivery was used. To locate additional publications, we reviewed bibliographies of identified studies and review articles. The language was restricted to English.

CASE REPORT

A 36 years old, morbidly obese primigravida presented at our emergency room at 17^{+0} weeks of gestational age complaining of abdominal pain. The sonographic assessment revealed the presence of three subserous uterine myomas located on anterior wall (maximum diameter 13.2 cm), the right wall (maximum diameter 12.6 cm), and the left wall (maximum diameter 11.7 cm) of the uterus, respectively. Due to the persistence of the symptoms, despite of medical treatment, after multidisciplinary discussion, the patient underwent surgery with longitudinal laparotomic approach under general anesthesia. Three huge bulky subserous pedunculated myomas were evidenced, the largest located at the uterine fundus, with a maximum diameter of 15 cm and a torsion of its pedicle. During the following nine days the patient received antibiotics, low molecular heparin and progesterone, and fetal heartbeat was checked daily. Considering the improvement in clinical condition, the patient was discharged with an indication to treatment with progesterone and low molecular heparin. The patient underwent obstetric evaluation every two weeks until she presented in labor and vaginally delivered a healthy female newborn of 2,940 g at 38^{+1} weeks' gestation. The Apgar score was 9/10 at 1' and 5' respectively.

CONCLUSIONS

Surgery for uterine myomas is a feasible procedure during pregnancy. It should be reserved to selected cases, since it increases the risk for preterm labor and preterm rupture of membranes, although none of them was reported in our case.

ABS 25

MALPERFUSION WITH EARLY DISTAL VILLOUS HYPOPLASIA: A HISTOLOGICAL LANDMARK OF THE GREAT OBSTETRICAL SYNDROMES

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INTRODUCTION

Discarded at birth, the placenta is a highly complex and fascinating organ. The recent definition of

this organ provided by Graham J. Burton ("The placenta is the extracorporeal organ that interacts with the endometrium to nourish and protect the fetus and that orchestrates maternal adaptations to pregnancy") evidences the central role played by this organ during pregnancy. This gives the intriguing perception that it can be the venue to better understand the pathophysiology of obstetrical complications, the so called "Great Obstetrical Syndromes". Therefore, the purpose of our study was to study the correlation between placental histology and obstetrical complications.

METHODS

A cohort study was conducted, including all deliveries that occurred between July 2015 and March 2016 at our tertiary medical center. Women were divided into the following groups: 1) women with normal placenta (n = 86); 2) women with abnormal placental histology (n = 236). The study group of altered placental histology underwent further sub-analysis in order to analyze the relation between malperfusion with early distal villous hypoplasia and the development of obstetrical complications. Placental histology was described according to the recent classification of placental lesions published by Raymond W. Redline. Pregnancies with fetal malformation or multiple pregnancies were excluded from the study. A pre-defined set of ICD-9 codes was used to assess variables included within the study.

RESULTS

During the study period, 322 women delivered at our medical center. Placental histology was normal in 86 cases (26.7%), and abnormal in the remaining 236 cases (73.3%). Further analysis was performed for women with placentas showing malperfusion with early distal villous hypoplasia (59 cases). These women were older compared to those with normal placenta, with a higher parity. Of interest, they were more prone to preeclampsia (6.8% vs. 0%, $p = 0.026$). Malperfusion was associated with a significantly lower gestational age at delivery (38.3 ± 2.9 vs. 36.2 ± 4.0, $p < 0.001$). In addition, the rate of development of the Great Obstetrical Syndromes, namely preeclampsia (0% vs. 18.6 %, $p < 0.001$) and IUGR (9.3% vs. 35.6%, $p < 0.001$), was higher in patients with histologically abnormal placenta. Neonates delivered by women belonging to the study group had a significantly lower birthweight (3,008 ± 656 vs. 2,361 ± 822, $p < 0.001$) compared to controls, and were more frequently females (59.3% vs. 41.9%, $p = 0.039$).

CONCLUSION

Placental histology can be useful in giving an additional clue to the understanding of the pathophysiology of the Great Obstetrical Syndromes, as well as increasing the attention on neonatal outcomes. The use of a classification of placental lesions focused on functional aspects in addition to merely histological remarks adds meaning to this field of research.

ABS 26

FAILED VACUUM EXTRACTION – IS IT ASSOCIATED WITH LONG-TERM PEDIATRIC CARDIOVASCULAR, ENDOCRINE, AND INFECTIOUS MORBIDITY OF THE OFFSPRING?

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INTRODUCTION

Obstetricians are aware of the short-term neonatal morbidity associated with failed vacuum delivery, but the impact of a failure in operative vaginal delivery on future long-term morbidity of the offspring is unclear. The study was aimed to investigate the effect of a failed vacuum on long-term pediatric morbidity including cardiovascular, endocrine, and infectious morbidity.

METHODS

A population based cohort study was conducted, including all vacuum deliveries that occurred between the years 1991 and 2013 at a regional tertiary medical center. The risk of long-term morbidity (up to the age of 18 years) was assessed in children born following a successful operative vaginal delivery or a failed vacuum leading to an emergent cesarean delivery. Pregnancies with fetal malformation or multiple pregnancies were excluded from the study. A pre-defined set of ICD-9 codes was used to assess cardiovascular, endocrine, and infectious morbidity during hospitalizations in the study period. Cumulative pediatric morbidity was compared between the groups with a Kaplan-Meier survival

curve, and several Cox proportional hazards models were used to control for confounders.

RESULTS

During the study period, 7,978 neonates were delivered by vacuum extraction. The procedure was successful in 7,733 cases (96.9%), while it failed in 245 cases (3.1%). Total cardiovascular, endocrine, and infectious morbidities were comparable between the groups. The Kaplan-Meier survival curve exhibited no difference in cumulative incidence of total cardiovascular (Log rank p = 0.97), endocrine (Log rank p = 0.51), and infectious morbidity (Log rank p = 0.32). In the Cox regression models, failed vacuum delivery was not associated with increased long-term cardiovascular (aHR 1.05, 95% CI 0.2-4.3, p = 0.9), endocrine (aHR 1.65, 95% CI 0.4-6.9, p = 0.5) and infectious morbidity (aHR 0.81, 95% CI 0.5-1.2, p = 0.3), as compared with a successful procedure, after adjusting for maternal age, preterm delivery, birthweight, gestational diabetes and preeclampsia.

CONCLUSIONS

A failed vacuum delivery, as compared with a successful procedure, is not associated with increased pediatric cardiovascular, endocrine, and infectious morbidity of the offspring followed for up to 18 years.

ABS 27

THE ASSOCIATION BETWEEN FAILED VACUUM AND LONG-TERM PEDIATRIC HEMATOLOGICAL MORBIDITY

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INTRODUCTION

Operative interventions in the second stage of labor may be indicated for fetal or maternal conditions. Such interventions are associated with neonatal short-term complications, and more so if the intervention fails. Data is scarce with regards to the long-term consequences of a failed operative delivery. Thus, we aimed to investigate the effect of failed vacuum procedures on the long-term pediatric hematological morbidity of the offspring.

METHODS

In this population based cohort study, the risk of long-term hematological morbidity (up to the age of 18 years) was evaluated in children born following successful operative vaginal delivery vs. cases of a failed procedure leading to an emergent cesarean delivery. All vacuum deliveries that occurred between the years 1991 and 2013 at our tertiary medical center were included. Multiple pregnancies and fetuses with congenital malformations were excluded. A Cox proportional hazards model was used to control for confounders and a Kaplan-Meier survival curve was constructed to compare cumulative pediatric hematological morbidity. A pre-defined set of ICD-9 codes was used to classify hematological morbidity during hospitalizations across the study period.

RESULTS

A total of 7,978 neonates met the inclusion criteria. Vacuum delivery was successful in 7,733 cases (96.9%), while it failed in 245 cases (3.1%). Total hematological morbidity was comparable between the groups (0.76% vs. 1.63%, p = 0.22). In the Cox regression model, failed vacuum delivery was not associated with increased long-term hematological morbidity compared to a successful procedure, after adjusting for confounding factors such as maternal age, preterm delivery, birthweight, gestational diabetes and preeclampsia (adjusted HR 1.81, 95% CI 0.6-5.1, p = 0.2). The Kaplan-Meier survival curve showed no difference in the cumulative incidence of the total hematological morbidity (Log rank p = 0.22).

CONCLUSION

A failed vacuum delivery is not associated with increased pediatric hematological morbidity of the offspring up to 18 years of age.

ABS 28

PERICONCEPTIONAL MATERNAL BIOMARKERS OF ONE-CARBON METABOLISM ARE ASSOCIATED WITH EMBRYONIC DEVELOPMENT ACCORDING TO THE CARNEGIE STAGES: THE ROTTERDAM PERICONCEPTIONAL COHORT (PREDICT STUDY)

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INTRODUCTION

Derangements in maternal I-C metabolism affect reproductive and pregnancy outcomes, as well as future health of the offspring. We aimed to investigate associations between periconceptional maternal one-carbon (I-C) metabolism and embryonic morphological development in non-malformed ongoing pregnancies.

METHODS

Between 2010 and 2014, 234 singleton ongoing non-malformed pregnancies were enrolled in a prospective periconceptional cohort study, including 138 spontaneous pregnancies with strict pregnancy dating and 96 pregnancies derived from *in vitro* fertilization (IVF), intracytoplasmatic sperm injection (ICSI) or cryo-embryo transfer (IVF/ICSI pregnancies). All participants underwent longitudinal transvaginal three-dimensional ultrasound (3D US) scans from 6^{+0} up to 10^{+2} weeks of gestation. Embryonic development was defined according to the Carnegie classification, using internal and external morphologic criteria in a virtual reality system. Maternal venous blood samples were collected at enrolment for serum vitamin B12, red blood cell (RBC) folate and plasma total homocysteine (tHcy) assessment. Associations between biomarker concentrations and longitudinal Carnegie stages were investigated using linear mixed models.

RESULTS

We performed a median of three 3D US scans per pregnancy (range 1-5), resulting in 600 good quality datasets for the Carnegie stage annotation (80.5%). Vitamin B12 was positively associated with embryonic development in the total study population ($\beta = 0.001$ (95% CI: 0.000; 0.002), $p < 0.05$) and in the subgroup of strictly dated spontaneous pregnancies. Low vitamin B12 concentrations (-2 standard deviation (SD), 73.4 pmol/l) delayed embryonic development by 1.4 days compared to high concentrations (+2SD, 563.1 pmol/l). RBC folate was positively associated with Carnegie stages only in IVF/ICSI pregnancies ($\beta = 0.001$ (95% CI: 0.0005; 0.0015), $p < 0.05$). Low RBC folate concentrations (-2SD, 875.4 nmol/l) were associated with a 1.8-day delay (95% CI: 1.7-1.8) in development compared to high concentrations (+2SD, 2,119.9 nmol/l). tHcy was negatively associated with embryonic development in the total study population ($\beta = -0.08$ (95% CI: -0.14; -0.02), $p < 0.01$), as well as in the IVF/ICSI subgroup. High tHcy concentrations (+2SD, 10.4 μmol/l) were associated with a delay of 1.6 days (95% CI: 1.5-1.7) in embryonic development compared to low concentrations (-2 SD, 3.0 μmol/l).

CONCLUSIONS

Periconceptional maternal I-C biomarkers are associated with embryonic development according to the Carnegie stages in ongoing, non-malformed pregnancies. Combining embryonic size measurements with morphological assessment will better define normal and abnormal embryonic development.

ABS 29

MATERNAL DIETARY PATTERNS AND HUMAN PRENATAL CEREBELLAR GROWTH: THE ROTTERDAM PREDICT STUDY

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INTRODUCTION

The traditional paradigm of the cerebellum as an exclusive as a part of the motor system has been progressively abandoned in the last decades. Several prenatal exposures have been related to impaired fetal cerebellar growth, eventually resulting in neurodevelopmental disabilities, including autism, schizophrenia and behavioral disorders. We aimed to investigate associations between periconceptional maternal dietary patterns and prenatal cerebellar growth trajectories.

METHODS

126 women with singleton viable non-malformed pregnancies were enrolled before 8^{+0} weeks of gestation in a prospective hospital-based birth cohort study between 2013 and 2015. Periconceptional maternal dietary patterns were extracted from food frequency questionnaires using principle component analysis and validated by first trimester blood biomarkers and micronutrient intake. Serial three-dimensional ultrasound (3D US) scans were performed at 9, 11, 22, 26 and 32

weeks of gestation for transcerebellar diameter (TCD) measurement. Linear mixed models adjusted for potential confounders were estimated to investigate associations between periconceptional maternal dietary patterns and longitudinal TCD measurements as a function of gestational age.

RESULTS

We performed a median of 4 scans per pregnancy (range 1-5) resulting in 570 3D US datasets. TCD could be measured in 495 3D US datasets (86.8%), with a success rate depending on gestational age (range 65-100%). The Mediterranean, Western, egg-rich and diary-rich dietary patterns were extracted, explaining 37.2% of the overall variance of maternal food intake. The diary-rich dietary pattern was positively associated with cerebellar growth trajectories (β = 0.02 (95% CI: 0.01; 0.03) $\sqrt{}$mm, p = 0.01). Strong adherence to this dietary pattern increased TCD by 0.44 mm at 9 weeks (+6.8%), 0.88 mm at 22 weeks (+3.6%), and 1.17 mm at 32 weeks (+2.8%) compared to weak adherence. No associations were detected for the Mediterranean, Western and egg-rich dietary patterns.

CONCLUSIONS

This study shows a positive association between periconceptional maternal adherence to a diary-rich dietary pattern and human prenatal cerebellar growth trajectories. Clinical implications for neurodevelopmental outcomes in the offspring still need to be elucidated.

ABS 30

NUTRITIONAL STATUS AND ADHERENCE TO MEDITERRANEAN DIET IN WOMEN AFFECTED BY GESTATIONAL DIABETES MELLITUS

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INTRODUCTION

Gestational diabetes mellitus (GDM), defined as hyperglycemia diagnosed in pregnancy, has been associated with many adverse maternal and newborn outcomes, especially an increased number of cesarean deliveries, newborns large for gestational age, and macrosomia. Age, etnia and familiarity for diabetes are not modifiable risk factors for GDM, but gestational weight gain and dietary habits are modifiable risk factors that should be the target of both GDM prevention and treatment.

The aim of this study was to investigate nutritional status and adherence to Mediterranean diet (dietary pattern related to low risk of diabetes and cardiovascular diseases in general population) in pregnant women with GDM.

METHODS

The study was carried out at the Department of Woman, Mother and Neonate, Buzzi Children's Hospital of Milan (Italy) and included women affected by GDM. Anthropometric measurements, glucose profiles obtained by oral glucose tolerance test (OGTT) and Mediterranean diet adherence, as evaluated by validated questionnaire were collected.

RESULTS

The sample included 32 pregnant women with GDM (age: 34.7 ± 5.1 years; gestational age: 27.5 ± 5.5 weeks). 56% declared familiarity for diabetes. 53% were Italian, while 47% of cases were foreign. The mean pre-pregnant body mass index of the sample was 26.8 ± 6.5 kg/m^2, in other terms overweight, and only 39% was gaining adequately weight as recommended by IOM Guidelines (Institute of Medicine 2009). 31.3% showed impaired fasting glucose (mean basal glucose: 101.3 ± 4.8 mg/dl); 68.7% performed OGTT, (basal glucose was 90.1 ± 10.3 mg/dl, after 1 hour was 182 ± 7.3 mg/dl e two hours after 152 ± 8.1 mg/dl). Fasting glucose was directly associated to maternal subscapular skinfold (r = 0.46, p = 0.01) and arm circumference (r = 0.35, p = 0.05). Evaluation of adherence to mediterranean diet was possible in 19 women. Generally, a low legumes and nuts consumption was observed. A good adherence to Mediterranean diet, defined as score ≥ 8, was observed in 52.8%: these women showed lower plasma glucose at two hours from OGTT than women with low adherence to Mediterranean diet (147 ± 7.3 mg/dl vs 193 ± 8.3, p = 0.03). Moreover, women that were adequately gaining weight showed better score of adherence to Mediterranean diet than others (8.6 ± 0.7 vs 6.4 ± 0.6, p = 0.03).

CONCLUSIONS

Glucose metabolism and adequate weight gestational increment are the two targets of GDM diet therapy were Mediterranean diet could have beneficial effects; longitudinal intervention studies are necessary to test this hypothesis.

ABS 31

THE METALLOME OF HUMAN MATERNAL AND FETAL BLOOD IN GESTATIONAL DIABETES MELLITUS

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INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as "carbohydrate intolerance resulting in hyperglycaemia of variable severity with onset or first recognition during pregnancy". Women who are unable to compensate this demand that grows rapidly during pregnancy develop GDM, that involves several complications. In GDM women, if untreated, hyperglycemia has dangerous effects on the placenta, mother and fetus. Molecular pathways and processes characteristic of GDM are still unknown. "Omics" sciences seem to be promising in the study of various diseases, as they can highlight causes and possible therapies. To the best of our knowledge, the literature shows only ten metallomics studies published up to now, which have been performed on serum/blood/plasma of pregnant women affected by GDM. When considering altogether the results obtained in the papers regarding the metallome of GDM, no definite conclusions can be drawn. The aim of this work was to evaluate statistically significant differences in the elemental composition of plasmatic components between GDM patients and control pregnant women by an inductively coupled plasma mass spectrometry (ICP-MS) approach.

METHODS

This study was carried out in patients recruited in the Maternal Fetal Medicine Unit of University of Padua (Italy). They were diagnosed with GDM after the glucose curve (75 g) executed between 24-weeks of gestation. The control group was enrolled during the third trimester ultrasound scan and presented a normal pregnancy. At delivery, a blood maternal and fetal sample were obtained and stored at -80°C until analysis. Maternal and neonatal data were recorded. The blood was mineralized with HCO_3 69% and then diluted with Milli Q water. Finally, the elementary composition was obtained by inductively coupled plasma mass spectrometry (ICP-MS) approach. Questionnaires were performed to investigate maternal eating habits.

RESULTS

94 blood samples were analyzed (47 GDM patients and 47 controls, maternal and fetal couple). There was a statistically significant difference in different elements (Na, P, S, K, Ca, Mn, Fe, Cu, Zn, Rb and Cs) between mother and fetuses. Their distribution was influenced by the presence of GDM, body mass index, newborn's sex, smoking and ethnicity, in particular for P, Se, Zn and Rb, the last being more expressed in the GDM group.

CONCLUSIONS

Women with GDM and their newborns are more susceptible to oxidative stress conditions due to hyperglycemic status and insulin resistance. This intrauterine condition could influence development in adulthood. In particular Rb, which is more expressed in fetal blood and stimulates the production of catecholamines, could represent a new field of investigation in the context of fetal programming theory, in particularly regarding their cardiovascular risk.

ABS 32

BODY MASS INDEX AND SYMPTOMS OF EATING DISORDERS IN BREASTFEEDING WOMEN

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INTRODUCTION

In the current obesity epidemic, there are limited studies examining the relationship between gestational body mass index (BMI) and symptoms of eating disorders (ED) in breastfeeding women early after childbirth.

METHODS

The study involved 655 consecutive, at term, healthy, breastfeeding mothers, who delivered at the Division of Perinatal Medicine of Policlinico Abano Terme (located in a North-Eastern Italy industrialized area) with advanced educational levels, good socio-economic status, high breastfeeding rates. We analyzed the relationship

between gestational BMI categories, defined according to IOM 2009 guidelines, and symptoms of eating disorders, tested by the Eating Disorders Examination Questionnaire (EDE-Q, Fairburn & Beglin, 2008). This consists of one global Score (GS) and four subscales (Restraint [R], Shape Concerns [SC], Weight Concerns [WC] Eating Concerns [EC]), where higher scores are indicative of higher eating disorders symptomatology.

RESULTS

At term of gestation we found a shift of pre-pregnancy BMI categories in 457/655 women (69.9%). At term, there were no underweight women (pre-pregnancy n = 59, 9%; at term n = 0) and the number of normal weight mothers halved across gestation (pre-pregnancy n = 462, 70.6%; at term n = 199, 30.4%). The number of overweight mothers tripled (pre-pregnancy n = 98, 14.9%; at term n = 134, 48.0%) and the number of obese women quadrupled (pre-pregnancy n = 36, 5.4%; at term n = 141, 21.5%). In addition, gestational BMI categories correlated significantly with global EDE-Q score (GS: rho = 0.173, $p < 0.001$) and related subscales (R: rho = 0.173, $p < 0.001$; E: rho = 0.129, p = 0.001; S: rho = 0.262, $p < 0.001$; W: rho = 0.300, $p < 0.001$).

CONCLUSIONS

Our study population was characterized by an unexpected high prevalence of pre-pregnancy underweight BMI; conversely, at term of gestation, overweight and obese BMI categories tripled and quadrupled. Gestational BMI increase was significantly correlated with worsening symptoms of eating disorders. Women need information and support to gain adequate weight during pregnancy.

ABS 33

ASSOCIATIONS BETWEEN MATERNAL PRE-GESTATIONAL BODY MASS INDEX, ROBSON CLASS AND DELIVERY MODE

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INTRODUCTION

Several studies have investigated the effects of maternal obesity on labour onset and pregnancy outcomes. Maternal obesity has been associated with increased risk of post-term pregnancy and decreased rate of spontaneous labour at term. Our aim was to investigate associations between maternal pregestational body mass index (BMI), Robson class at term and delivery mode.

METHODS

Singleton pregnant women admitted at term (> 37 gestational weeks) were enrolled in an observational study between January 2015 and September 2016 and stratified according to pregestational BMI (underweight, normal weight, overweight, obese). Robson classes were defined at admission and classes 1, 2a, 3 and 4a were included. Gestational age at delivery was compared among groups using Mann-Whitney U test. Pearson's coefficient was calculated to evaluate correlations between maternal BMI, Robson classes and delivery mode. Chi square test was performed to compare Robson class distribution and cesarean section (CS) rates among groups.

RESULTS

1,185 women were enrolled, resulting in 102 underweight, 777 normal weight, 218 overweight and 88 obese women. Labour induction and Robson classes were significantly different among BMI groups (labour induction: underweight 25.5%, normal weight 26.6%, overweight 31.2%, obese 39.8%, $p < 0.05$). Gestational age at delivery was comparable between Robson 1 and 2, for both normal weight and obese women. Cesarean section rate was significantly correlated to maternal BMI ($r = 0.14$, $p < 0.05$). The CS rate for normal weight women was 7.6% in Robson class 1 and 28.9% in Robson class 2 ($p < 0.01$). Conversely, obese women had 30.8% of CS in Robson class 1 and 38.9% in Robson class 2 (p = 0.22). Among multiparous women (Robson 3 and 4a), the CS rate was homogeneous among groups of BMI.

CONCLUSIONS

Maternal pregestational BMI is associated with increased risk of labour induction, resulting in different distribution of Robson classes. Since labour inductions does not seem to affect gestational age at delivery and results in increased CS rate in normal weight women, we suggest to avoid early term induction for both obese and normal weight women. Individual management based on maternal BMI is required.

ABS 34

DOES THE STOP OF MEDITERRANEAN DIET INFLUENCE GESTATIONAL WEIGHT GAIN AND PUERPERAL PSYCHOLOGICAL ADAPTATIONS?

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INTRODUCTION
This prospective, observational study analysed the association between gestational weight gain (GWG) and risk of post-partum depressive symptomatology in women who stopped following a Mediterranean diet.
METHODS
A cohort of 1,368 consecutive Italian mothers delivering at term a healthy baby at the Policlinico Abano Terme (Italy) from September 2014 to September 2016, completed the Edinburgh Postnatal Depression Scale (EPDS, Cox, 1987) and a questionnaire about their pregnancy diet and their gestational weight gain (GWG, according to 2009 IOM Guidelines), at the discharge. The hospital is located in a industrialized area of North-East Italy, characterized by low and late fertility and good cultural and economic level.
RESULTS
Among 1,368 puerperae, 50 (3.79%) stopped following a Mediterranean diet (vegetarian diet 28, 56%; vegan diet 2, 4%; other diet 20, 40%; respectively). Their GWG shifted across the BMI categories in 36 (72%) mothers, in the range defined by IOM 2009. Normal weight women category halved (17, 34%), and the number of both overweight (27, 54%), and obese women (6, 12%) increased tenfold. However, gestational obesity rate was significantly lower with respect to "Mediterranean diet Group" (12 vs 21.38%, p 0.014). Conversely, mean EPDS scores (7.75 ± 5.83 vs. 6.21 ± 3.29, p 0.008) and the factor analysis of EPDS (anhedonia: 0.42 ± 0.70 vs. 0.26 ± 0.43, p 0.009; anxiety: 1.27 ± 0.76 vs. 1.08 ± 0.61, p 0.034; depression: 0.50 ± 0.61 vs. 0.37 ± 0.42, p 0.033, respectively) were higher in mothers who stopped following a Mediterranean diet.
CONCLUSIONS
Stop of Mediterranean diet is associated with lower risk of gestational obesity but enhanced EPDS scores. This study provides important information about the quality of care implications of a stop of a Mediterranean diet in childbearing age women. Awareness of problematic diet is essential for humanization of patient care, a correct planning of the intervention, and the chance to support women developing maternal attitude and adjusting to motherhood.

ABS 35

LIFESTYLE INTERVENTION IN OVERWEIGHT/OBESE PREGNANT WOMEN AND ITS EFFECT ON LARGE FOR GESTATIONAL AGE (LGA) BABIES OCCURRENCE

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INTRODUCTION
Several studies of high-quality evidence indicate that diet and/or physical activity during pregnancy can limit the excessive gestational weight gain (GWG), without a clear evidence that lifestyle interventions have a substantial effect in reducing the incidence of other negative pregnancy outcomes, both for the mother and the fetus. With this study we aimed to determine whether the prescription of a detailed lifestyle program in overweight/obese pregnant women influences the large for gestational age (LGA) babies occurrence.
METHODS
The study was a randomized controlled trial, with open allocation in a 1:1 ratio, enrolling 300 women at 9-12 weeks with a BMI ≥ 25. The women assigned to the Intervention group (I) received a multidisciplinary counselling with a gynecologist and a dietitian. These women were advised to follow a hypocaloric, low-glycemic index, low-saturated fat diet (with an average intake of 1,800 kcal/day divided in 3 main meals + 3 snacks), and a specific physical activity was recommended (30 minutes/day). Those assigned to the Controls (C) received a booklet about a proper nutrition and exercise. Follow-up was planned at the 20th, 28th and 36th weeks. The Food Frequency Questionnaire was filled-in at enrollment and at the 36th week to evaluate the adherence to the prescribed diet.
RESULTS
The sociodemographic features were similar between groups: no differences in age at enrollment (C = 31.4 ± 5.4, I = 31.8 ± 4.9 years), ethnicity (Caucasian: C = 78.7%, I = 82.7%, Sub-Saharan African: C = 8%, I = 8%), education (low middle school: C = 35.3%, I = 40.7%), job (housewife: C = 38%, I = 30%, handiwork: C = 34.7%, I = 33.3%, sedentary work: C = 27.3%, I = 36.7%), nulliparity (C = 36%, I = 35.3%), family history of diabetes (C = 32.7%, I = 36.7%) and hypertension (C = 56%,

I = 58.7%). Pre-pregnancy BMI (C = 35.1 ± 4.7, I = 36.8 ± 7.7) and weight (C = 91.7 ± 15.2 I = 92.7 ± 18.6) as well as the obesity at enrollment (C = 78.7%, I = 69.3%) and BMI > 40 (C = 11.3%, I = 18.7%) were equally distributed. Sixty women were lost to follow-up, leaving 240 women (C = 114, I = 126, p = 0.08). The prevalence of gestational diabetes mellitus (GDM) (C = 37.7% vs. I = 27.8%, p = 0.12) and the adherence to the diets (C = 76.2% vs. I = 71.2%, p = 0.52) was similar between groups. LGA occurrence (n = 31, 12.9%) was lower in I group (10.3%) compared with C (21.1%, p = 0.021). Moreover, women affected by GDM (C = 24.4% vs. I = 11.1%, p = 0.008) and with a low adherence to the diet (C = 26.5% vs. I = 12.6%, p = 0.024) were more likely to give birth to LGA babies. Receiving the intervention was a protective factor for delivering LGA babies (RR 0.42, CI 95% 0.19; 0.91, p = 0.029). No correlations were found between LGA occurrence and obesity/BMI classes, GWG and adherence to Institute of Medicine (IOM) guidelines.

CONCLUSIONS

A multidisciplinary intervention on individual lifestyle change consisting of a personalized, hypocaloric, low glycemic, low saturated fat diet, followed by adherence to this diet, starting early in pregnancy appears to prevent LGA occurrence in women with BMI ≥ 25.

ABS 36

THYROID DISEASES AND PREGNANCY

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INTRODUCTION

Together with gestational diabetes, thyroid diseases are the most common endocrine disorders during pregnancy. In pregnancy there are factors that interfere with normal hypothalamic-pituitary-thyroid axis. Thyroid diseases have a significant influence on outcome of reproductive life. The objective of the study is to confirm this concept.

METHODS

The study sample included 4,296 pregnant women admitted to the Department of Obstetrics in Perugia. Study period: January 2015 - June 2016. The study was configured as an observational case-control study. Patients with thyroid diseases were enrolled in the cases group. Patients without thyroid disorders were enrolled in the control group. Data collected included: type, etiology and treatment of thyroid disease, age, obstetric history, gestational age, mode of delivery, obstetric complications, neonatal weight and APGAR score. The X^2 test to compare qualitative data, descriptive statistics of continuous variables and frequencies of qualitative variables with the corresponding rates were generated with SPSS®.

RESULTS

The thyroid disease group included 7% of the sample. Among these, 6.8% of cases had hypothyroidism and 0.2% hyperthyroidism. The subgroup of hypothyroidism cases consisted of 3.8% with pregestational disease and 3% with gestational disease. Starting with hypothyroid patients, obstetric history and therefore outcome of previous pregnancies were evaluated, making a comparison between patients with gestational hypothyroidism, pregestational hypothyroidism and controls; they resulted not statistically significant, as well as the outcome of pregnancy. On the contrary, in both groups of patients with gestational and pregestational hypothyroidism, the proportion of preterm deliveries was greater compared to controls. Also the number of cesarean section in such patients was demonstrated to be greater. Among the reported obstetric complications, gestational diabetes and threat of miscarriage/preterm labor were statistically significant. The weight of babies at birth as well as the Apgar score in the first minute did not get statistically significant results.

CONCLUSIONS

In conclusion we demonstrated that hypothyroid patients showed significantly higher number of threatened abortion, threatened preterm delivery, cesarean section, gestational diabetes and placental abnormalities. Among hypothyroid patients, those with gestational hypothyroidism developed these complications more frequently than patients with pregestational hypothyroidism. Given the significant influence of maternal thyroid diseases on the course of gestation and on its outcome, it is therefore clear that the assessment of thyroid function in the preconception period and during pregnancy has an important diagnostic significance.

ABS 37

GESTATIONAL WEIGHT GAIN (GWG) AS AN INDEPENDENT RISK FACTOR FOR ADVERSE

PREGNANCY OUTCOME IN WOMEN WITH GESTATIONAL DIABETES MELLITUS (GDM): A RETROSPECTIVE OBSERVATIONAL STUDY

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INTRODUCTION

The incidence of obesity and gestational diabetes mellitus (GDM) is rising worldwide. This study retrospectively evaluated the role of excessive gestational weight gain (eGWG) in women with gestational diabetes mellitus (GDM) and different pre-pregnant body mass index (BMI).

METHODS

Optimal glycemic control was defined when women achieved glucose target thresholds > 80% of measurements. According to this definition, 283 women with GDM were categorized according to WHO classification as underweight (BMI < 18.5), normal weight (BMI ≥ 18.5 and < 25.0), overweight (BMI ≥ 25.0 and < 30.0), and obese (BMI ≥ 30.0) women. Excessive GWG was defined as > 18.0 kg for underweight, > 15.8 kg for normal weight, > 11.3 kg for overweight and > 9.0 kg for obese. For the analysis, women were divided into two groups: normal and excessive GWG. Main outcomes measured were incidence of large/small for gestational age (LGA/SGA), macrosomia, preterm delivery, hypertensive disorders, cesarean sections (CS).

RESULTS

Excessive GWG was associated with higher birth weight and percentile ($p < 0.001$), and with higher incidence of LGA ($p < 0.001$), macrosomia ($p = 0.002$), and hypertensive disorders ($p = 0.036$). No statistically difference was found regarding week of delivery, incidence of CS and SGA. Pre-pregnant BMI and eGWG resulted both independent risk factors for LGA and macrosomia at the multivariate analysis. Women with a pre-pregnant BMI ≥ 25 and an eGWG have a 5.43-fold increased risk of developing LGA ($p = 0.005$).

CONCLUSIONS

When combined with an inadequate pre-pregnant BMI, eGWG plays as a "synergic risk factor" for a poor outcome. When obesity or GDM occurs, an optimal GWG can guarantee a better pregnancy outcome.

ABS 38

ACUTE RENAL FAILURE DUE TO MATERNAL EXPOSURE TO ANGIOTENSIN RECEPTOR ANTAGONISTS

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INTRODUCTION

Fetal renal structure and function can be altered by medications prescribed to pregnant women. Sartans are selective type 1 angiotensin II receptor antagonists that are used for treatment of hypertension. Valsartan blocks the effects of angiotensin II by preventing its binding to specific receptors. Exposure to sartans during gestation seems to be associated with high risk of congenital renal dysfunctions.

CASE REPORT

We report a case of a premature infant born at 27 weeks gestation to a 39-year-old pregnant woman with chronic hypertension treated with losartan before and throughout pregnancy. Ultrasound examination one week prior to delivery identified a fetus whit intrauterine growth restriction (IUGR), anhydramnios and empty bladder. A male infant (weight: 1,000 g) was delivered with Apgar scores of 5 and 8 at 1 and 5 minutes, respectively. Positive-pressure ventilation was administered. Because of increasing respiratory distress, he was intubated and received a dose of surfactant. Since his blood pressure was low, inotropic support was given. The neonatal course was complicated by oliguria and marked renal dysfunction. Initial serum creatinine on day 1 was 1.9 mg/dL but then rose to 3 mg/dL on day 4 and reached a maximum of 4.4 mg/dL on day 8. He gained weight and had a generalized edema. Renal Doppler and ultrasound examinations were normal. Treatment included ventilation, sympathomimetic agents, diuretics and fluid balance control. Furosemide continuous infusion did not increase urinary output so it was administered ethacrynic acid at a continuous infusion dose of 0.3 mg/kg/h. Normal urine production increased progressively on day 10. The patient was extubated after 15 days of ventilatory support. Serum creatinine decreased

progressively to reach a stable level of 1 mg/dL at 1 month.

DISCUSSION

Very few data concerning the effects of angiotensin II receptor antagonists on pregnancy are available for humans. Exposure to AT1 antagonists during the first months of pregnancy can lead to neonatal abnormalities which are strikingly similar to those produced by maternal treatment with angiotensin-converting enzyme inhibitors. An hypothesis is that this fetal abnormalities are probably related to extreme sensitivity of the fetus to the hypotensive action of these drugs during pregnancy. Thus, pharmacological suppression of the fetal renin-angiotensin system through AT1 receptor blockade seems to alter fetal vascular perfusion and renal function.

CONCLUSIONS

This case emphasizes the importance to have a high index of suspicion for potential pregnancy and considering serial testing for pregnancy when using such drugs. AT1 antagonists should be avoided throughout pregnancy; moreover, women who become pregnant while assuming one of these medications must change antihypertensive drug, choosing a different class of drugs.

ABS 39

ANTI-RH IMMUNOPROPHYLAXIS AT 28 WEEKS: WHAT EFFECTS ON THE FETUS?

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INTRODUCTION

Anti-RH immunoprophylaxis was introduced in 1970 with the purpose of reducing the maternal immunization risk in all Rh negative women from 1% to 0.2% at 28 weeks of pregnancy. Despite the fact that several studies have proven that such a procedure does not cause relevant side effects on the newborn, it is also documented that a small amount of immunoglobulin anti-D can cross the placenta, coat Rh-D positive fetal red blood cells, causing mild haemolysis and secondary positivization of the direct Coombs test at birth. The aim of this study was to evaluate any other minimal impact on RhD positive newborns who had received anti-Rh immunoprophylaxis at 28 weeks of pregnancy (at a dose of 1,500 IU, 300 μg).

METHODS

This comparative and retrospective study included a pool of 284 RhD positive babies born to RhD negative mothers who delivered at a tertiary hospital within a one-year period (from 1 January to 31 December 2015). The group was divided into two subgroups: 143 women who had received immunoprophylaxis at the gestational age of the 28 weeks, and 141 women who had not. For each subgroup the following neonatal variables were considered, taken from the umbilical cord by blood gas analysis at birth: hemoglobin, bilirubinemia, standard base excess and pH. The Apgar score at the first and fifth minutes, direct Coombs test, neonatal icterus, need for phototherapy and days of hospitalization were also reported. Statistical analysis: the Chi square test was used to analyze statistically significant relations between the distribution of categorical variables. Student's t test was used to compare significant differences in mean continuous variables between the two groups. A p value < 0.05 was considered statistically significant.

RESULTS

Besides the statistically significant difference between the two groups in the positivization of the direct Coombs' test at birth (p 0.0001), no other statistically significant differences for all the others parameters under examination were found.

CONCLUSIONS

Our findings indicate that placental passage of anti-D immunoglobulin at 28 weeks of gestation does not produce any hematological changes related to hemolysis in RhD positive newborns. As it has already been reported in literature, newborns who were exposed to anti-D immunoglobulines during intrauterine life had a more frequently positive direct Coombs test at birth. The tendency of a prolonged hospitalization in the group who received anti-D prophylaxys seems more related to the low Apgar score at the 1st minute than to the need for phototherapy. We may conclude that the prevention of Rh isoimmunization by the injection of anti-D immunoglobulin brings a benefit in the prevention of hemolytic disease of the fetus and does not have any other even minimal impact on the RhD positive newborns.

ABS 40

CORRELATION BETWEEN PLACENTAL HISTOLOGICAL PATTERNS AND ANGIOGENIC FACTORS IN PREGNANCIES COMPLICATED BY HYPERTENSIVE DISORDERS OF PREGNANCY

AND/OR INTRAUTERINE GROWTH RESTRICTION

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OBJECTIVE

The objective of our study was to correlate placental histological patterns with angiogenic factors in pregnancies complicated by different phenotypes of hypertensive disorders of pregnancy (HDP) and intrauterine growth restriction (IUGR).

METHOD

A dedicated pathologist performed histological examination of 85 placentas in blind, using Redline classification. In addition, maternal circulating concentrations of placental growth factor (PlGF) and soluble fms-like tyrosine kinase-1 (sFlt-1) were assayed. We included 20 HDP-IUGR, 10 HDP-AGA (appropriate for gestational age), 14 severe IUGR, 25 mild IUGR and 16 controls. The groups were defined on the basis of maternal hypertension and fetal growth.

RESULTS

HDP-IUGR and severe IUGR groups showed histological alterations on the maternal vascular side in all the cases and most of the lesions were developmental placental abnormalities. On the other hand HDP-AGA and mild IUGR groups frequently showed lesions on the fetal side, expecially immaturity and iper-ramification of villi. We observed a reduction of PlGF plasma levels and an increased sFlt-1/PlGF ratio in all groups respect to controls. Finally, we found an association between placental alterations on maternal side and an increased sFlt-1/PlGF ratio, expecially in the groups with a severe placental damage (HDP-IUGR and severe IUGR).

CONCLUSIONS

Placental pathology may identify different phenotypes of HDP and IUGR and correlates with angiogenic factors.

ABS 41

ULTRASOUND ASSESSMENT OF EMBRYONIC-FETAL DEVELOPMENT IN ASSISTED REPRODUCTIVE TECHNOLOGY PREGNANCIES

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INTRODUCTION

The wide use of frozen embryo transfer in assisted reproduction technology (ART) techniques has raised concerns about the negative effect of cryopreservation on the health of children. A number of observational studies suggested that both obstetric and perinatal outcomes after frozen embryo transfer are similar to those after fresh transfer, whereas other studies indicated that pregnancies obtained by frozen embryo transfer are associated with a decrease in small for gestational age and low birth weight births. The aim of this retrospective observational study was to investigate and compare embryonic-fetal growth trajectories and birth weight in singleton live births obtained from the transfer of fresh versus frozen blastocysts in ART treatment.

METHODS

Between 2011 and 2016, 100 women with singleton pregnancies conceived by ART received ultrasound evaluation during the entire pregnancy. Patients were divided into 2 groups: fresh blastocysts (n = 50) and frozen blastocysts (n = 50). Women underwent ultrasound examination at 6^{+1} to 10^{+0} week's gestation to assess fetal vitality and crown-rump length (CRL). The 11^{+0} to 13^{+6} weeks' screening ultrasound was performed in all women. Furthermore, they received a routine third trimester growth-monitoring scan at 29^{+1} to 33^{+6} week's gestation, which included measurement of fetal biometry and estimation of fetal weight (EFW). Birth weight (BW) was recorded at delivery.

RESULTS

The significant differences between fresh and frozen group included maternal BMI ($p < 0.05$), number of follicles picked-up ($p < 0.001$), estrogen peak ($p < 0.001$) and progesterone peak ($p < 0.001$) after controlled ovarian stimulation. No significant differences were recorded with respect to maternal age, smoking and parity. Frozen blastocysts' CRL was significantly higher with respect to fresh blastocysts' CRL after adjustment for gestational age (GA), both in early pregnancy ($p = 0.002$) and first trimester ($p = 0.04$). Frozen EFW was significantly higher compared to fresh EFW, after adjustment for GA, maternal BMI, number of follicles and hormonal peaks, at third-trimester growth monitoring scan ($p = 0.01$). Also,

frozen blastocysts' neonatal BW was significantly higher with respect to fresh blastocysts' BW, after adjustment for GA, maternal BMI, number of follicles and hormonal peaks, once recorded at delivery (p = 0.04).

CONCLUSIONS

This study demonstrates that embryonic growth trajectories, first trimester fetal growth trajectories, third trimester EWF and neonatal BW are significantly higher in ART pregnancies obtained from the transfer of frozen blastocyst-stage embryos compared to fresh blastocyst-stage embryos. Most likely the etiology of this developmental difference has to be identified in controlled ovarian stimulation (COS) with exogenous gonadotropins in fresh ART cycles, which is associated with altered endometrial development and aberrant placentation in early pregnancy.

ABS 42

UTERINE DOPPLER ASSESSMENT IN PREGNANCIES OBTAINED FROM FROZEN AND FRESH BLASTOCYSTS TRANSFER

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INTRODUCTION

Better obstetrical and perinatal outcomes have been reported in frozen blastocysts IVF compared to fresh transfer. This could be related to the natural uterine environment associated with the frozen replacement cycle that allows a normal early placentation. The most useful tool to evaluate placental implantation available is the uterine artery blood flow velocity assessed by Doppler ultrasonography. The aim of this retrospective observational study is to investigate and compare uterine artery pulsatility index (PI) in singleton live births obtained from the transfer of fresh versus frozen blastocyst-stage embryos in IVF treatment.

METHODS

Between 2011 and 2016, 97 women with singleton pregnancies conceived by assisted reproduction technology (ART) underwent ultrasound screening. All patients were divided into two groups: fresh blastocysts and frozen blastocysts. All women received measurement of uterine artery PI. The delta PI was then obtained as the difference between the observed mean PI and the mean expected PI for gestational age. Both univariate and multivariate statistical analysis were performed in order to correct the delta PI values for the variables that were significantly different between the two groups: maternal BMI, number of follicles, estrogen peak and progesterone peak.

RESULTS

The median first trimester mean PI was 1.43 ± 0.37 and 1.83 ± 0.58 in the frozen and fresh group, respectively. The median delta PI was -0.28 ± 0.38 and 0.18 ± 0.56, in the frozen and fresh group, respectively. In the univariate and multivariate analysis first trimester fresh and frozen delta PI values were compared, showing significantly higher PI values in the fresh blastocysts' group (95% CI, -1 / -0.16; p = 0.009). The median second trimester mean observed PI was 0.80 ± 0.22 and 1.12 ± 0.37 in the frozen and fresh group, respectively. The median delta PI was -0.32 ± 0.22 and -0.01 ± 0.38 in the frozen and fresh group, respectively. In the univariate and multivariate analysis second trimester fresh and frozen delta PI values were compared, showing significantly higher PI values in the fresh blastocysts' group (95% CI, -0.61 / -0.16; p = 0.001). The median third trimester mean PI was 0.66 ± 0.18 and 0.77 ± 0.41 in the frozen and fresh group, respectively. The median delta PI was -0.08 ± 0.18 and 0.05 ± 0.41 in the frozen and fresh group, respectively, but in this case the difference was not statistically significant (95% CI, -0.40 / 0.02; p > 0.05).

CONCLUSIONS

In our study, fresh blastocyst's uterine artery PI is significantly higher compared to frozen blastocysts' PI both in the first trimester and second trimester, therefore supporting the hypothesis of an altered placentation in fresh cycles.

ABS 43

THE DIFFERENCE BETWEEN THE SYSTOLIC AND DIASTOLIC FETAL ABDOMINAL AORTA DIAMETERS IN INTRAUTERINE GROWTH RESTRICTION AND CONTROL FETUSES: A CASE CONTROL STUDY

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INTRODUCTION

Human aorta stores strain energy in the distended wall during systole mainly through the extracellular matrix of the tunica media, that could be influenced by blood pressure, flow, or increased peripheral resistance. In intrauterine growth restricted (IUGR) fetuses the increased aorta intima media thickness (aIMT) could reflect a different extracellular matrix composition and therefore functionality. The aim of this study was to analyze the resistance to flow in fetal descending aorta and its relation to aIMT and systolic and diastolic fetal abdominal aorta diameters in IUGR and controls.

METHODS

This is a prospective case control study on single pregnancies collected on a tertiary center for feto-maternal medicine in Northeast Italy. We considered a group of IUGR as cases and a group of fetuses appropriate for gestational age (AGA) as controls. We collected ultrasound examination (fetal biometry, maternal-fetal Doppler, systolic and diastolic fetal abdominal aorta diameters, and fetal aIMT) and clinical data (age, BMI, parity, and pregnancy outcomes).

RESULTS

We found an increased pulsatility index (PI) of fetal abdominal aorta in IUGR (1.82, IQR 1.31-2.00) compared to AGA controls (1.21, IQR 0.95-1.44) ($p < 0.05$). The change between the systolic and diastolic fetal abdominal aorta diameters was significantly increased in IUGR fetuses (0.10 mm, IQR 0.07-0.28) than in AGA controls (0.04 mm, IQR 0.03-0.05) ($p < 0.05$). In IUGR fetuses a significant increase of aIMT was observed. In IUGR group, aIMT was significantly correlated with peak systolic velocity (PSV) and systolic-diastolic aorta diameters change, while these two correlations were not found in controls.

CONCLUSIONS

The change between the systolic and diastolic fetal abdominal aorta diameters during early third trimester of pregnancy was significantly increased in IUGR cases. aIMT was significantly correlated to systolic-diastolic diameter change and PSV in IUGRs, probably reflecting aorta wall adaptation to blood flow changes in IUGRs.

ABS 44

VESSELS OF THE UMBILICAL CORD: A MICROSCOPIC STUDY IN NORMAL AND PATHOLOGICAL NEWBORNS

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INTRODUCTION

Intrauterine growth restriction (IUGR) due to placental insufficiency is related to blood-flow redistribution to preserve brain perfusion. Placental insufficiency in late-onset IUGR often goes undetected by umbilical artery Doppler scan. Despite a broad general body of literature about placentas of IUGR pregnancies, there are no report on the structural characteristics of the vessels of the umbilical cord in IUGR. Thus, the aim of the present study was to compare the microscopic anatomy of the umbilical arteries and veins in normal, IUGR and small for gestational age (SGA) newborns.

METHODS

IUGR and SGA patients were enrolled at the Maternal Fetal Medicine Unit of a tertiary center. IUGR fetuses were defined by an estimated fetal weight (EFW) below the 10th percentile and umbilical artery (UA) pulsatility index (PI) up to standard deviations for gestational age or below the 3th percentile. SGA fetuses were defined by an EFW below the 10th percentile with normal UA PI. Controls were fetuses with an EFW between the 10th and 90th percentile and were enrolled during the routine third trimester ultrasound scan. At birth, a sample of umbilical cord was obtained and conserved in formalin.

RESULTS

Twenty-six umbilical cords were taken from 10 IUGR, 5 SGA, and 11 controls newborns. The histological and morphological examination was performed with H&E, Azan–Mallory, Sirius Red stains and morphometric evaluation was performed through a computer image analysis approach. In controls, the UA shows a muscular tunica, organized by two layers, an outer one with circularly arranged cells, and an inner one, with irregularly arranged cells. In IUGR, longitudinal muscular fibers were observed. In IUGR the tunica media of the UA shows a major thickness with respect of SGA and controls ($p < 0.05$). In IUGR the media tunica of the vein showed a minor thickness with respect to the SGA and controls. In IUGR the collagen I and III in the umbilical artery was diminished with respect of SGA and controls.

CONCLUSIONS
These data agree with those of intrauterine life, in which a major thickness of the abdominal aortic wall was observed in fetuses with abnormalities of Doppler flussimetry. The rearrangement of umbilical artery may affect the mechanical properties of these vessels and affect fetal blood circulation.

ABS 45

FETAL INTRAUTERINE GROWTH RESTRICTION (IUGR) AT TERM: OUTCOME OF INDUCTION OF LABOR FOR A CONSCIOUS PATIENT'S CHOICE

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INTRODUCTION
As recommended by the most important International Societies, induction of labor should be performed only in the presence of a clear medical indication and when the benefits outweigh the potential risks. If it is well established that one of the indications is fetal intrauterine growth restriction (IUGR) in the presence of concurrent conditions, evidence for induction versus expectant monitoring for the management of IUGR at term without other maternal-fetal complications are not strong enough. We have analysed the outcome regarding induction for IUGR at term at our Department.
METHODS
We analyzed data collected in our labor-ward database from June 2014 to September 2015. All the inductions ≥ 37 gestational weeks with IUGR as first indication without other comorbidities were included and compared with the other inductions at term. IUGR was defined as estimated fetal weight < 10th percentile. Obstetrical outcomes such as gestational age, method of induction and mode of delivery were considered and neonatal outcome was determined by weight at birth, Apgar score, fetal umbilical arterial emogasanalysis, need of neonatal resuscitation, and NICU admission. Fetal acidemia was defined by an umbilical arterial blood gas pH < 7.00 and base excess ≥ 12.
RESULTS
In the 16-months period we analysed, there were 564 inductions and 20 cases with IUGR as first indication. In the IUGR group, the average gestational age at birth was 39 gestational weeks. The methods of induction were endovaginal prostaglandins (19 cases: 95%) and oxytocin (only 1 case: 5%). We had a vaginal delivery in 16 cases, 1 operative delivery with ventouse and 2 cesarean sections (10% compared to a 16.1% cesarean section rate in induction at our Institution). IUGR accounts for the 3.5% of all our indications for induction at term. The impact of IUGR on the total cesarean section rate during induction is 0.4%. There was 1 case of fetal acidemia. The Apgar score at 5 minutes was always ≥ 7. We did not report necessity for neonatal reanimation nor intubation, but there were five NICU admissions. The mean neonatal weight at birth was 2,578 g.
CONCLUSIONS
Induction prior to 38 gestational weeks seems to be associated with a higher number of neonatal admissions. However none of the major International Societies provides conclusive recommendations for the management of IUGR at term. Induction of labor (after ≥ 37-38 gestational weeks) is an option and our data confirms a good neonatal and obstetrical outcome in terms of success of vaginal delivery and poor impact on the total amount of cesarean sections. Both strategies, induction and expectant monitoring are possible and management may be enhanced by an individualized and multidisciplinary approach, involving women in the choice through an adequate counselling including risks and benefits.

ABS 46

INTRAUTERINE GROWTH RESTRICTION: OBSTETRIC-NEONATAL RISK STRATIFICATION ACCORDING TO PLASMA PLACENTAL GROWTH FACTOR LEVELS

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INTRODUCTION
The aim of this study was to evaluate the clinical utility of placental growth factor (PlGF) in the management of pregnancies complicated by intrauterine growth restriction (IUGR).

METHODS
This prospective cohort study included women with a preconception or current risk of placental dysfunction. Blood samples were collected every 4-5 week or during hospitalization from early second trimester until delivery. Plasma levels of PlGF were considered pathological under the 5th centile for gestational age. Serum placenta growth factor levels were stratified in very low (12 pg/mL but < 5th centile) and analyzed according to pregnancy outcome. Statistical analysis: Fisher's test and ANOVA One Way.
RESULTS
A total of 75 women were included and 40 were complicated by IUGR: the ones with very low plasma levels (n = 20) had a significantly lower gestational age at delivery, lower birthweight and higher rate of emergency C-section outside labor.
CONCLUSION
Our data suggest that a decrease in PlGF is associated with worse outcomes. Therefore, PlGF may be useful for risk stratification of pregnancies that require an intensive monitoring or delivery. This single biomarker would simplify the clinical management and would reduce costs.

ABS 47

THE COMBINATION OF COMPUTERIZED CARDIOTOCOGRAPHY, AMNIOTIC FLUID INDEX AND DOPPLER ULTRASOUND IN THE EARLY AND LATE IUGR

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AIMS
The aim of the study was to evaluate a possible correlation between velocimetric indices (umbilical artery pulsatility index [UA PI] and ductus venosus [DV]), amniotic fluid index (AFI) and antenatal computerized cardiotocographic (cCTG) parameters (fetal heart rate [FHR], short term variability [STV], approximate entropy [ApEn]), in order to detect which one is associated to early and late onset IUGR.
METHODS
We evaluated 178 pregnancies assisted from 26th to 37th week of gestation and monitored through weekly Doppler ultrasounds, AFI and cCTG investigations. The antepartum cCTG monitoring was performed in a controlled clinical environment, the patient lying on an armchair for a time of 60 minutes. The fetuses were divided into three groups (low, medium and high risk) according to first antenatal investigation. Low risk was defined with UA PI > 95th centile, AFI > 2 cm and STV > 5th centile. Medium risk was defined with UA PI > 95th centile, AFI 5th centile. Finally, high risk was considered with UA PI > 95th centile, absent wave-A of the DV and/or STV < 5th centile. The clinician's decision about the time of delivery was assumed according to the group of risk and the gestational age.
RESULTS
We had 61 pregnancies complicated by early IUGR. Only three newborns with prenatal high risk had an umbilical artery pH 7.00. One newborn with prenatal high risk had an umbilical artery pH 6.8 and died after three days. We had 117 pregnancies complicated by late IUGR (> 32 weeks). In 78 pregnancies we obtained a low risk assessment, in 31 pregnancies a medium risk and in 8 pregnancies a high risk, respectively. 84% of women had a cesarean section. Only 1 newborn with prenatal low risk had pH 7.00, while 3 newborns with medium and high risk had pH 7.00. The ANOVA test evidenced a statistical significant difference between the two groups of study (32th gestational age) for each parameter except for ApEn: FHR ($p < 0.001$); STV($p < 0.001$); ApEn ($p = 0.42$); UA PI ($p < 0.001$); DV ($p = 0.002$).
CONCLUSIONS
Studies evaluating the monitoring of pregnancies complicated by IUGR are characterized by high heterogeneity, partly because our knowledge of its pathophysiology is actively progressing. Our study was driven by the need of a clear combined clinical evaluation, since the limitations of both cCTG and Doppler velocimetry as a stand-alone wellbeing test. IUGR fetuses with placental insufficiency require antenatal testing using multiple surveillance modalities to enhance prediction of neonatal outcome at birth.

ABS 48

LATE INTRAUTERINE GROWTH RESTRICTION AND FETAL CEREBRAL REDISTRIBUTION

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INTRODUCTION

The late intrauterine growth restriction (IUGR) is determined by third trimester placental insufficiency that entails fetal hypoxia. These fetuses present increased morbidity and mortality during the neonatal period, in comparison with appropriate-for-gestational-age (AGA) infants. Clinical evidence of underlying uteroplacental dysfunction may only emerge at a late stage in the disease process. The fetus hemodynamically adapts to this pathology (detected by an increase in the umbilical artery pulsatility index [UAPI]) through the vasodilation of cerebral circulation (detected by a decrease in the middle cerebral artery pulsatility index [MCAPI]). However, MCAPI and UAPI by themselves are less sensitive in predicting adverse perinatal outcomes than either their ratio (MCAPI/UAPI) or the cerebroplacental ratio (CPR). CPR is gaining much interest as a useful tool in differentiating the at risk fetus in both IUGR and AGA settings. In the present study we have evaluated CPR as an indicator of fetal cerebral redistribution (FCR) predicting adverse perinatal outcomes.

METHODS

A retrospective cohort study was performed. From December 2014 to July 2016 we enrolled 46 patients with fetal growth restriction after 32 weeks of gestation. The patients were classified according to CPR into two groups: A group (22 fetuses) presented abnormal CPR (95th percentile); B group (24 fetuses) with normal CPR (> 5th percentile), abnormal MCAPI, and normal UAPI (< 95th percentile). CPR was calculated as MCAPI/UAPI ratio. Various approaches have been taken to interpreting the cutoff for abnormal CPR, including a fixed value of < 1.08 or one of below the 5th percentile for gestational age. Adverse perinatal outcome was defined as a composite of intraventricular hemorrhage, periventricular leukomalacia, hypoxic ischemic encephalopathy, necrotizing enterocolitis, bronchopulmonary dysplasia, sepsis, and death.

RESULTS

Group A showed a greater number of babies admitted to NICU, lower gestational age more frequent and cesarean delivery own to suspected fetal distress. There were no differences in acidosis at birth (umbilical artery pH). None of the infants had a 5-min Apgar score < 7. The mean gestational age at delivery for fetuses with abnormal CPR was 34.2 weeks, while for those with normal CPR was 36.5 weeks. The fetuses of group B had a better neonatal outcome (5% vs 22%) than group A.

CONCLUSIONS

Our findings suggest that IUGR infants with an abnormal CPR are at increased risk of poor neonatal outcame. Therefore, FCR is a risk factor for these fetuses and CPR identifies those with poor outcomes and infants that could develop deficits in cognitive functioning in childhood.

ABS 49

PLACENTAL DISORDERS IN EARLY PRETERM PREMATURE RUPTURE OF MEMBRANES (pPROM). INFLAMMATORY OR VASCULAR DISEASE?

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INTRODUCTION

Disorders of deep placentation, characterized by failure in physiologic transformation of the spiral arteries, is associated with major obstetrical syndromes including preeclampsia, intrauterine growth restriction (IUGR) and abruptio. This lesion is observed also in sponteneous preterm birth and preterm premature rupture of membranes (pPROM), although the typical disorder of these conditions is inflammatory. We looked for a correlation between histological patterns and maternal and perinatal outcomes in a cohort of patients with early pPROM.

METHODS

We retrospectively studied 177 singleton pregnancies complicated by pPROM < 28.6 weeks managed conservatively from 01/2006 to 12/2015, with placental histopathological analysis available. Cases with persistent oligohydramnios before 25 weeks received serial amnioinfusions. IUGR was diagnosed if abdominal circumference was < 10th centile. Uterine malformations or fetal anomalies were excluded. Cases' classification was based on the histologic examination of placenta and cord, including inflammatory lesions: chorionamnionitis with or without funisitis; decidual vascular lesions, expression of disorder of deep placentation (one or more among atherosis, fibrinoid necrosis, thrombosis and myointimal hyperplasia).

RESULTS
177 patients were included: group 1 inflammatory (n = 125, 70.6%), group 2 vascular (n = 25, 14.1%), and group 3 with no abnormal findings (n = 27, 15.3%). Gestational age (GA) at delivery (25.2 ± 3.8 vs 27.2 ± 4.3 vs 27.2 ± 4.2 weeks, p = 0.009) and latency period between pPROM and delivery (26.9 ± 27.5 vs 50.6 ± 36.4 vs 35.7 ± 28.3 days, p = 0.001) were significantly lower in group 1. As expected, clinical chorionamnionitis occurred more frequently in cases with inflammatory lesions (14.4% in group 1 vs 0% in group 2 and 3.7% in group 3, p = 0.04). IUGR was associated with vascular lesions (36% in group 2 vs 11.9% in group 1 and 0% in group 3, p = 0.001). The overall survival was 51.4%, perinatal survival in cases delivered ≥ 24 weeks was 73.8%. Neonatal adverse outcome included neonatal sepsis (20%), moderate/severe bronchodysplasia (22.5%), intraventricular hemorrhage II-III-IV grade and periventricular leukomalacia (20%), necrotizing enterocolitis (13.3%), retinopathy of prematurity (25%), pulmonary hypoplasia (19.2%) and skeletal deformities (7.5%). Type of placental lesion did not influence perinatal outcomes. Long term follow up was available for 70/91 live born infants (76.9%); 14 of them had cerebral palsy (GA at pPROM 22.1 ± 3.6 vs 23.7 ± 2.9 weeks, p = 0.08 and GA at delivery 27.7 ± 2.9 vs 28.2 ± 2.3 weeks, p = 0.49 without CP), with no differences between groups.
CONCLUSIONS
Early pPROM may be classified according to placental histology into groups with different clinical characteristics. As expected the prevalent histological damage was inflammatory, however the determinism of pPROM was related to hypoxic-ischemic damage in 15% of cases. Type of placental damage did not influence perinatal or long-term outcomes.

ABS 50

EVALUATION OF THE QUANTITATIVE FETAL FIBRONECTIN TEST AND PARTOSURE™ (PLACENTAL ALPHA MICROGLOBULIN-1 [PAMG-1]) FOR THE PREDICTION OF SPONTANEOUS PRETERM BIRTH (SPTB) IN PATIENTS WITH SIGNS AND SYMPTOMS SUGGESTIVE OF PRETERM LABOR

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PURPOSE
To compare an established method with a novel method for assessing the risk of imminent spontaneous preterm birth (sPTB) in women with symptoms of preterm labor: (1) a test based on quantification of fetal fibronectin (qfFN) at four different cutoffs: 10 ng/ml, 50 ng/ml, 200 ng/ml, and 500 ng/ml; and (2) a qualitative test based on placental alpha microglobulin-1 detection (PartoSure™).
METHODS
Patients presenting with a singleton pregnancy, self-reported signs of preterm labor between 23.1 and 34.6 weeks of gestation, clinically intact membranes, no sexual intercourse within 24 hours, and cervical dilation ≤ 3 cm were recruited. qfFN was performed as a part of the standard of care at the hospital, while clinicians were blinded to the PAMG-1 test results. qfFN accuracy was evaluated at four thresholds of 10 ng/ml, 50 ng/ml, 200 ng/ml, and 500 ng/ml for its ability to predict imminent spontaneous preterm delivery within 7 and 14 days from the time of sample collection. The PAMG-1 test was evaluated based on its qualitative result for the same delivery endpoints.
RESULTS
72 patients met the inclusion/exclusion criteria. Median maternal and gestational age at presentation were 28 years and 31.5 days, respectively. 14% of patients (10/72) had a prior preterm birth; 58% (42/72) had active contractions at the time of presentation, with 4 contractions per hour on average. 57% of patients (41/72) had an fFN concentration of < 10 ng/ml fFN; 75% (52/72) < 50 ng/ml; 92% (66/72) < 200 ng/ml; 97% (70/72) < 500 ng/ml. The SN, SP, PPV, and NPV for fFN at each of the four cutoffs were calculated for both 7 and 14 days of delivery and are presented respectively: 10 ng/ml: 67%, 58%, 6%, 98% and 60%, 58%, 10%, 95%; 50 ng/ml: 67%, 77%, 11%, 98% and 60%, 78%, 17%, 96%; 200 ng/ml: 33%, 93%, 17%, 97% and 40%, 94%, 33%, 95%; 500 ng/ml: 0%, 97%, 0%, 96% and 0%, 97%, 0%, 93%. The PAMG-1 test was positive in 7% of patients (5/72). SN, SP, PPV and NPV for PAMG-1 were 67%, 96%, 40%, 99% and 40%, 96%, 40%, 96%, delivery ≤ 7 and ≤ 14 days respectively.
CONCLUSIONS
Compared to qfFN, the PAMG-1 test is a better predictor of spontaneous delivery within 7 and 14 days while maintaining a very high negative predictive value. The PAMG-1 test is an easy-to-use bedside test that provides rapid results, does

not require a speculum examination, and does not require specialized equipment to analyze results. As expected, compared to the conventional cutoff of fFN (50ng/ml), a higher fFN cutoff of 200 ng/ml does seem to increase the positive predictive value of the test. However this comes at a cost to the fFN test's sensitivity and negative predictive value, rendering it of little to no advantage in clinical practice.

ABS 51

THE ROLE OF PARTOSURE™ TEST IN PREDICTING IMMINENT PRETERM BIRTH

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INTRODUCTION

An accurate risk assessment of preterm birth is clinically important in pregnancies with threatened preterm labor. This is particulary true with respect to both the administration of corticosteroids, as well as the transfer of patients to a tertiary care center capable of caring for the birth of premature infants. Clinical evaluation alone, with the measurement of cervical length and dilatation, are not sufficiently predictive of imminent delivery. Currently available biomarker tests, such as the detection of fetal fibronectin, have extramely poor predictive value form imminent delivery. The PartoSure™ test is a rapid, qualitative immunochromatographic test for the *in vivo* detection of placental alpha microglobulin-1 (PAMG-1) in vaginal secretions of pregnant women. PAMG-1 is a protein found in high concentrations in the amniotic fluid.

METHODS

We conducted a prospective observational study from March to June 2016. We enrolled 20 symptomatic patients between 24-34 week of gestation with singleton pregnancy, irregular uterine activity and/or lower abdominal pain and pelvic pressure, intact membranes, cervical length < 20 mm and funneling. Patients were initially managed according to the internal protocol: prophylactic corticosteroid betamethasone i.m. 12 mg/day for 2 days and primary tocolysis for 48 hours. 7 days after the therapy, we evaluated all the patients: 2 patients had delivered and 3 patients were excluded for premature rupture of membranes. In the final analysis, we included 15 patients. The PartoSure™ test was performed for these patients. The result was interpreted once two lines were visible, or after 5 min elapsed since the insertion of the test strip into the sample vial. The patients were divided in two groups: the test was positive for two patients (Group A) and was negative for 13 patients (Group B). All patients had been revaluated after 7 and 14 days from the execution of the test.

RESULTS

In group A, a patient delivered within 7 days, while the others delivered within 14 days from presentation. In group B, a patient delivered within 7 days, while 12 patients were still pregnant after 14 days.

CONCLUSIONS

In our study, the positive and negative predictive value of the PartoSure™ test seems to be high within 7 and 14 days (PPV 100%, NPV 92%). However, our conclusions are based on a small sample, so further studies are needed. If our results will be confirmed, the device could be considered an excellent test to rapidly assess the risk of preterm delivery within 7 or 14 days from time of collection of cervicovaginal sample in pregnant women with signs and symptoms of early preterm delivery, intact membranes and minimal expansion. A positive PartoSure™ test in these patients indicates with a high degree of accuracy that spontaneous preterm delivery will occur within 7 days. A negative result indicates that spontaneous preterm delivery within 14 days is highly unlikely.

ABS 52

PRETERM BEHAVIORAL EPIGENETICS: *SLC6A4* METHYLATION AND SOCIO-EMOTIONAL STRESS REGULATION IN VERY PRETERM INFANTS

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INTRODUCTION

Recent research highlighted that procedural pain in Neonatal Intensive Care Unit (NICU) might be associate with altered DNA methylation of the gene encoding for serotonin transporter (*SLC6A4*) in very preterm (VPT) infants (Provenzi et al., 2015). These alterations have been shown to differ from full-term (FT) infants at birth and they have been further associated with differences in temperament at 3 months (Montirosso et al., in press) and internalizing behaviors at school age (Chau et al., 2014). Nonetheless, no previous study investigated the association between *SLC6A4* methylation status and response to socio-emotional stress in VPT. The main aim was to assess the relationship between *SLC6A4* methylation at birth and at NICU discharge with socio-emotional stress response in VPT infants.

METHODS

Fifty-nine infants (32 VPT; 27 FT) and their mothers took part to the study. Cord blood samples were obtained at birth for the two groups, while an additional peripheral blood sample was obtained from VPT infants at NICU discharge. *SLC6A4* methylation was assessed in VPT (at birth and at NICU discharge) and in FT (at birth) infants, at 20 CpG sites within the exon 1 CpG island (chr17:28562750-28562958) for both groups. This region showed specific associations with emotional-related amygdala activation in humans (Nikolova et al., 2014) and with variations in *SLC6A4* mRNA expression (Philibert et al., 2007). At 3-month-age, all infants and mothers underwent a 5-episode Still-Face Procedure (SFP; episodes: Play, Still-Face #1, Reunion #1, Still-Face #2, Reunion #2). Negative emotionality was 1-sec micro-analytically coded.

RESULTS

No differences emerged between VPT and FT birth for *SLC6A4* methylation at birth, $F(20,38) = 1.45$, $p = .158$, $\eta 2p = .43$. Methylation at NICU discharge in VPT infants significantly differred from methylation at birth in VPTs, $F(20,12) = 2.44$, $p = .008$, $\eta 2p = .88$ (CpG sites: 2, 5, 16, 20), and from FT methylation at birth, $F(20,38) = 5.76$, $p = .000$, $\eta 2p = .75$ (CpG sites: 2, 4, 5, 16, 18, 20). VPT infants had higher Negative emotionality throughout the SFP procedure compared to FT counterpart, $F(1,51) = 5.95$, $p = .018$, $\eta 2p = .10$. *SLC6A4* methylation at birth did not predict Negative emotionality in VPT and FT infants. Methylation at NICU discharge predicted Negative emotionality during Still-Face #1 ($R2 = .14$, $p = .035$, CpG16 $\beta = -.37$, $p = .035$), Still-Face #2 ($R2 = .25$, $p = .025$, CpG2 $\beta = .43$, $p = .025$), and Reunion #2 ($R2 = .32$, $p = .010$, CpG2 $\beta = .35$, $p = .049$).

DISCUSSION

These results confirm previous report suggesting that the methylation status of a specific stress-related gene (i.e., *SLC6A4*) might be affected by NICU stay in VPT infants. Moreover, the present contribution is unique in providing associations between NICU-related changes in *SLC6A4* methylation and the socio-emotional response of VPT infants to the SFP procedure.

ABS 53

SAFETY OF LUMBAR PUNCTURE IN EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS: INSIGHTS FROM A SINGLE ITALIAN NICU CENTER

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INTRODUCTION

Neonatal meningitis is a disease with substantial mortality and morbidity, with a higher incidence and severe consequences especially in preterm neonates. Lumbar puncture could have a crucial role during the diagnosis phase although different factors may interfere with this suggested good practice in the daily routine such as trauma, further risk of infection, spinal epidermoid tumor, brain stem herniation. The aim of this study is to determine the safety of lumbar puncture in extremely low birth weight (ELBW) neonates with clinical signs of sepsis.

METHODS

From January 2015 to June 2016 all lumbar punctures performed in preterm ELBW admitted to Neonatal Intensive Care Unit (NICU) at Istituto Giannina Gaslini (IGG), Genoa, Italy were collected retrospectively. For all procedures, we considered demographic data (sex, gestational age, birth weight, postnatal day of lumbar puncture) and cerebrospinal fluid (CSF) parameters (red

blood cells [RBCs], white blood cells [WBCs] counts, glucose and protein levels). Blood and CSF cultures were performed for diagnosis of sepsis and meningitis. A CSF leukocyte count ≥ 20/mm^3 was considered as suggestive of bacterial meningitis.

RESULTS

During the study period a total of 52 preterm ELBW neonates (29 males and 23 females) underwent lumbar puncture (unsuccessfully in eight of them). The CSF WBCs count was suggestive for meningitis in 17/44 (38%) (median WBCs count of 100 cells/mm^3, range 20-600). All CSF cultures were negative. A blood culture was always obtained and it was positive in 14 (32%) cases. *S. epidermidis* (4) and *S. agalactiae* (4) were the most commonly isolated pathogens.

CONCLUSIONS

We believe that performing lumbar puncture might help to reach a more appropriate antimicrobial stewardship in terms of duration and use of antibiotics consistent with improved therapeutic efficacy and reduced risk of resistance selections.

ABS 54

ANNULAR PANCREAS AS A RARE CAUSE OF DUODENAL ATRESIA

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INTRODUCTION

Annular pancreas (AP) is a rare congenital anomaly where the pancreas forms a full or incomplete ring around the second segment of the duodenum, causing various degrees of stenosis or atresia. The annual incidence is estimated at 1/50,000 births, representing 10% of all cases of stenosis of the duodenum; it has been associated with maternal polyhydramnios and congenital abnormalities such as Down syndrome, esophageal/duodenal atresia, imperforate anus, and Meckel's diverticulum. Antenatal diagnosis of upper intestinal obstruction is possible after the 20th week of gestation by ultrasound observation, considering duodenal atresia or duplication, endoluminal diverticulum and congenital Ladd's bands as differential diagnoses. AP may manifest itself in infancy, childhood or adult life. In the neonatal period, the main symptom is epigastric distension with non-bilious vomiting, since the obstruction is usually before the junction with the bile ducts. The diagnostic work-up soon after birth includes plain and contrast medium radiography. Surgical treatment is not an emergency but it is usually performed within the first 24-72 hours of life. The prognosis depends on the presence of any associated defects. We present a case of prenatal diagnosis of duodenal atresia diagnosed as AP after surgery.

CASE REPORT

A neonate (female) was delivered by cesarean section at 33^{+5} weeks of gestational age on suspicion of duodenal atresia. Mother's prenatal and pregnancy history were unknown and the first ultrasound examination, carried out one week before birth, showed intra-uterine growth retardation, severe polyhydramnios and "double bubble" image. At birth, the baby showed good adaptation to extrauterine life. Auxological data was within range except for weight < 3rd percentile. At about 8 hours of life the baby started developing gastric distension, so plain and contrast radiologic examination of the abdomen was performed, showing a "double bubble" image and no other gas shadow in the rest of the abdomen. On the 1st day of life, laparotomy revealed an annular pancreas. Reconstruction was made by duodeno-duodenotomy and anastomosis was done using Kimura's diamond-shaped technique, with a horizontal incision on the upper pouch and sagittal incision on the lower pouch. The postoperative course was uneventful and oral feeding was successfully started 9 days after surgery.

CONCLUSIONS

AP is a condition that can cause progressive upper intestinal obstruction. Differential diagnosis is important to exclude pathologies that require immediate surgical intervention. AP may be silent at birth so an early contrast radiograph is recommended in order to confirm diagnosis and allow optimal patient management. For these reasons a multidisciplinary management is necessary after a prenatal diagnosis of AP.

ABS 55

CONGENITAL HEPATIC ARTERIOVENOUS MALFORMATION BREAKING OUT PERSISTENT PULMONARY HYPERTENSION

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INTRODUCTION

Congenital hepatic arteriovenous malformations (HAVM) are rare anomalies, which typically present in infancy with congestive heart failure, anemia, and hepatomegaly. Morbidity and mortality is high if the condition is not recognized and treated promptly. Newborn with large peripheral HAVM may display persistent pulmonary hypertension (PPH). Although PPH has been reported in neonates with peripheral HAVM, there are very few reports of congenital HAVM in association with PPH. We report a case of a newborn that was referred for management of PPH and was subsequently diagnosed with a large HAVM.

CASE REPORT

A female term infant, who had been delivered vaginally, presented respiratory distress, heart murmur, mild hepatomegaly, small hemangiomas spread to the trunk and limbs on the 3rd day of life. Transthoracic echocardiography showed a dilated right ventricle with tricuspid regurgitation and an estimated systolic pulmonary artery pressure of 70 mmHg. Abdominal ultrasounds showed hepatomegaly echostructure diffusely inhomogeneous due to the presence of soft coarse hyperechoic areas and small nodular hypoechoic images, most evident under Glisson's capsule, of variable size between 5 and 10 mm. Maximum 3 mm caliber of the hepatic veins; minimum district biliary dilatation of some branches. MRI-abdomen showed hepatomegaly note and confirmed the presence of multiple nodules occupying almost the entire liver parenchyma, characterized by sharp margins. In the center of the larger lesions a vase, was recognized which course in some cases coincided with the sovraepatic venous drainage. The hypothesis of angiomatosis with hepatic arterio-venous shunt or portal-systemic was made. The baby underwent another abdominal ultrasonography-Doppler, which confirmed the findings already highlighted by the MRI-abdomen with the main portal vein branch caliber increased (about 11 mm) and hepatic veins (approximately 8 mm) in the main section; at this level the turbulent flow appeared with high vascular resistance, such as arteriovenous fistula. The framework was indicative of fistula at that level or coarse cavernous angioma affecting much of the right lobe. Cerebral MRI and ultrasounds were normal. The clinical features and imaging findings supported the diagnosis of HAVM. The dermatologist considered "microcephaly-capillary malformation syndrome" or hemangioendothelioma as differential diagnosis. The baby was transferred to another hospital to perform trans-arterial embolization of the HAVM.

CONCLUSIONS

Case reports of congenital HAVM are scarce, as a consequence of the rarity of the malformation itself. Congenital HAVM, while rare, has a 50% to 90% mortality rate, which emphasizes the importance of a high degree of suspicion in achieving early diagnosis and definitive treatment.

ABS 56

TRANSPORT OF HIGH RISK NEONATES IN THE SOUTH–EAST AREA OF TUSCANY

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INTRODUCTION

Transport of high risk neonates (THRN) of Siena, referral Neonatal Intensive Care Unit (NICU) for the South east Area of Tuscany Region, has been first established by Tuscan statute No. 281 on 30/07/1991, revised on 10/05/1994. THRN is carried out by medical and nursing team of Siena, a third-level Neonatal Intensive Care Unit, and it is activated through the emergency telephone number 118. The in-utero transport, when predictable, should always be preferred; where this is not possible, the THRN is required soon after birth if diagnosis and/or proper care cannot be performed at the place of delivery. The transferring hospital fills in a specific form (Form A) containing the clinical information of the newborn, procedures and therapies. The THRN team fills in a form (Form B) indicating the clinical and therapeutic information of the infant during transport. Our protocol provides the activation of a THRN team for all infants up to the age of one month of life, and each transported baby is registered in a regional online database. The Region draws up an annual report with task data, timing and clinical conditions of the transported infants.

METHODS

All data related to Siena THRN from 1st January 2012 to 31st October 2016 was collected. Data was compared with those of the regional THRN online database.

RESULTS

In the examined period 263 THRN were carried out. The reasons for the transfer were: 29% surgical pathology; 18% medical services (e.g. ROP, cardiac disorders); 17% prematurity; 13% respiratory distress and neonatal asphyxia; 11% lack of hospital bed; 8% back transport. From January 2012 to October 2016, 294 newborn < 32 weeks of gestational age (GA) have been admitted to NICU, but only 24% were admitted with THRN. The percentage of premature infants < 32 weeks of GA admitted to the NICU of Siena with THRN was stable over the five-year period while the number of admissions with THRN among 32-36 weeks GA was significantly reduced (6/34 in 2012, 21/72 in 2013, 22/61 in 2014, 14/43 in 2015; 5/53 in 2016). In addition, there has been an increasing trend of back transport (from 24% to 30%) to provide continuum of care near home for children living in South-East area, in other Tuscany areas and/or other Italian Regions since 2014 (when back transport started).

CONCLUSION

Data shows a pivotal importance of prenatal diagnosis and *in utero*-transport at third-level hospital. However, 24% of preterm infants < 32 weeks GA are born in first/second level centers and need neonatal transport at third level with high-risk outcome. Conversely, the transport of newborns between 32 and 36 weeks GA is significantly reduced due to an improvement of the quality care in the second level centers. Lastly, the gradual increase of back-transport when babies no longer need intensive care shows the effort to put the family at the center of our care.

ABS 57

α-LIPOIC ACID AS MAINTENANCE THERAPY IN PATIENTS TREATED FOR PRETERM BIRTH

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INTRODUCTION

Preterm birth is the leading cause of perinatal and neonatal morbidity and mortality in developed countries contributing to 60-80% of all neonatal deaths. However, despite the intense work done by researchers in recent decades, the incidence of preterm birth remained virtually unchanged over the past 40 years. The etiology of preterm birth is multifactorial. Preterm birth would represent an uterine inflammatory response characterized by the production of prostaglandins by the amnion-chorion membranes and the decidua, with subsequent triggering uterine contractions and cervical modifications. α-lipoic acid (ALA) has antioxidant, as well as anti-inflammatory and immunomodulatory activity and presents no toxicity even at doses much higher than the therapeutic dose. The use of ALA in pregnancy is spreading due to its safety, tolerability and documented anti-inflammatory action on the placenta. The vaginal administration of ALA is a new approach that can provide a direct effect on vaginal and uterine level, also in view of the low bioavailability after oral administration.

METHODS

The purpose of this study was to compare the therapeutic efficacy of ALA versus no treatment and versus progesterone (Pg) vaginally administered, in a selected group of patients with threatened preterm delivery after successful acute tocolytic therapy, considered for high risk due to cervical length < 20 mm. 125 patients were initially managed according to our clinical protocol after admission: Prophylactic corticosteroid betamethasone i.m. 12 mg/day for 2 days and primary tocolysis (Atosiban or beta-mimetics for 48 hours). Patients who responded successfully to tocolytic therapy were still considered at high risk for cervicometry values < 20 mm. The patients were divided into three groups based on treatment modalities after primary tocolysis: group A (n = 43), vaginal Pg; Group B (n = 42), ALA; Group C (n = 40), no treatment.

RESULTS

We observed a reduction in preterm births (Group A = 23%, Group B = 16% versus Group C = 50%), in recurrence of uterine contractile activity (Group A = 16%, Group B = 9% versus Group C = 32%), and in number of admissions to the Neonatal Intensive Care (Group A = 18%, Group B = 14% versus Group C = 42%), in groups A and B. We found no differences between the group of patients treated with Pg and the group treated with ALA, except for a greater compliance to local therapy with ALA due to a lower frequency of adverse reactions ($p < 0.05$).

CONCLUSIONS

The results of our study seem to support the role of progesterone as maintenance therapy, although in contrast to most of the scientific evidence. ALA appears to be a potential new treatment for the prevention of preterm delivery, allowing to prolong pregnancy in at risk patients, representing a valid

alternative to progesterone. As its ability in reaching its site of action, the vaginal route seems to be favourite. ALA is safe, well tolerated, and vaginal administration has a good compliance and therefore it can be considered a viable integration to support tocolysis, even considering that maintenance therapy with progesterone is not supported.

ABS 58

FACTORS RELATED TO PERINATAL AND NEONATAL OUTCOMES OF LATE PRETERM (LP) BABIES: A MULTICENTER PROSPECTIVE OBSERVATIONAL COHORT STUDY AND CLINICAL AUDIT

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INTRODUCTION

Several studies showed an increased risk of adverse perinatal and neonatal outcomes in late preterm (LP) (34^{+0}-36^{+6} weeks) vs term babies. The rate of LP in Europe is 5-7% of births and represents the 70% of preterm births overall. The obstetrics conditions related to LP birth are divided in: iatrogenic (on maternal/fetal conditions), premature and preterm rapture of membranes and spontaneous preterm delivery. The aims of the study were: 1) understanding if the association between LP and adverse outcomes is caused by maternal/fetal conditions that lead to anticipate the birth or from preterm birth itself, 2) to improve the management of LP highlighting the critical issues in obstetrics and neonatal care, 3) to improve the relation between Hub and Spokes.

METHODS

This multicenter prospective observational study was funded by Regione Emilia Romagna and included almost all birth centers (n = 21). The enrollment started on 1/12/2013 and finished on 20/12/2015. Data was collected from 6 fellows through 2 folders (obstetric and neonatal) and downloaded in a dataset. Mother's informed consent was obtained in advance. Obstetric and neonatal outcomes were analyzed and linked with the follow up visits performed by pediatricians.

RESULTS

1,894 woman were enrolled and 2,179 babies were born. 288 were twin pregnancies. The data analysis thus included 1,606 single pregnancies (16.3% 34 weeks, 28.8% 35 weeks, 54.9% 36 weeks). Risk factors for LP were: maternal age > 40 (OR 1.36, IC 95%1.3-1.5), low education (1.30; 1.2-1.4), foreign mother (1.13; 1.04-1.2), indian/sub-saharan african ethnicity (1.29; 1.12-1.48), smoking (1.22; 1.05-1.42), assisted medical procreation (2.38; 1.97-2.88) and male gender (1.20; 1.11-1.29). 19.4% of women were overweight and 10.3% obese. Smoking was associated with SGA (2.29; 1.38-3.77). 43.3% of LP were medical indicated, namely in Spoke > 1,000 deliveries (1.58; 1.10-2.28) but 36.6% of these were not appropriate (e.g. low proteinuria, mild colestasis, mild hypertension). 55.6% of fetuses identified as IUGR were born SGA, 43.8% were born AGA and 0.6% LGA. 40% of SGA was not identified as IUGR during pregnancy. Regarding neonatal outcomes, respiratory distress was significantly higher in diabetic women (3.75; 1.80-7.78), in LGA (1.97; 1.31-2.97) and in placental abruptio (6.80; 3.39-13.62). Moreover, hypoglycemia was higher in obese (2.41; 1.36-4.30) and diabetic women (4.52; 2.23-9.16). Neonatal-fetal distress and resuscitation were significantly higher in 34 LP (vs 35 and 36) and in LP born in Spoke > 1,000.

CONCLUSIONS

Data demonstrates a prenatal care in line with Western Countries, however, it shows a trend towards unjustified diagnosis and consequent inappropriate iatrogenic LP. With the exception of the (few) urgent/emergency cases, the management of these babies must be more careful. A dialogue/counseling between Spokes and Hub should be implemented.

ABS 59

A PROSPECTIVE STUDY ON THE USE OF FETAL INTELLIGENT NAVIGATION ECHOCARDIOGRAPHY (FINE)

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INTRODUCTION

The prenatal diagnosis of AtrioVentricular Septal Defects (AVSD) is usually performed by two-dimensional (2D) and three/four dimensional (3D/4D) fetal echocardiography. Through STIC function a volume dataset of the fetal heart is acquired, and displays a cine loop of a complete, single cardiac cycle in motion. The cardiac planes can be extracted and displayed in any orientation through analysis of three orthogonal planes in the multiplanar display mode. Different Authors have developed algorithms based upon STIC to automatize retrieval of cardiac diagnostic planes and reduce operator dependency. Recently, a method known as Fetal Intelligent Navigation Echocardiography (FINE) was developed to interrogate a STIC volume dataset. By applying "intelligent navigation" technology to STIC volume datasets, the nine standard fetal echocardiography views are automatically generated. The purpose of this case series is to report the performance of FINE in the prenatal diagnosis of AVSD.

METHODS

This was a prospective study of patients diagnosed to have a fetal AVSD at the Unit of Maternal Fetal Medicine, Department for Health of Women and Children, AOP, Padua, Italy between November 2013 and July 2016. Patients underwent 2D sonographic examination, as well as 4D sonography with spatiotemporal image correlation (STIC). STIC volumes were acquired and FINE was applied to these volumes.

RESULTS

In all five diagnosed cases, the AVSD was detected in the four-chamber view diagnostic plane and VIS-Assistance. In 100% of cases, the five-chamber view diagnostic plane appeared normal, however all cases showed the AVSD in the five-chamber VIS-Assistance. All other cardiac views (diagnostic planes and VIS-Assistance) demonstrated no abnormality. The diagnosis was confirmed in four cases by autopsy and in one case by neonatal echocardiography.

CONCLUSIONS

The prenatal diagnosis of AVSD has been reported with the use of 2D, 3D, and 4D sonography with STIC. We applied successfully the FINE method to fetuses with a complete AVSD at 20 weeks of gestation. This is the first report that recognizes the FINE method as an useful tool in the prenatal identification of AVSD, in association with 2D echocardiography.

ABS 60

CONTINUOUS GLUCOSE MONITORING IN VERY PRETERM INFANTS INCREASES THE TIME SPENT IN EUGLYCEMIA: A RANDOMIZED CONTROLLED TRIAL

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INTRODUCTION

Impaired glycemic control is associated with poor neurodevelopment outcomes and increased mortality in preterm infants, as both hypoglycemia and hyperglycemia in the first week of life are responsible for a worsening of sensorineural development and increased mortality and morbidity. Thus, the goal of glycemic control during the first days of life should be the maintenance of euglycemia by avoiding both hypoglycemia and hyperglycemia. Different strategies have been adopted to reduce hypoglycemia or hyperglycemia in this time span, but none has been able to increase time in euglycemia without a significant increase of hypoglycemic events and mortality. We aimed to assess whether the use of continuous glucose monitoring (CGM) during the first week of life, coupled with an algorithm for adjustment of glucose intakes, increases the percentage of time spent in euglycemic range in very preterm infants.

METHODS

We enrolled 50 newborns ≤ 32 weeks gestation and/or birthweight ≤ 1,500 g. For the first week of life they wore a CGM sensor and were randomized to two groups: A) unblinded-CGM (UB-CGM), with real time CGM operating, and B) blinded-CGM (B-CGM), with no alarms and the display darkened. The glucose intakes, calculated using the same algorithm in both groups, were continuously adapted in UB-CGM group according to CGM data an hypo-/hyper-glycemic alerts; while in B-CGM group they were based on a minimum of 3 daily capillary glucose tests. Primary outcome was the time spent in euglycemic range (4-8 mmol/L). Secondary outcomes were the time spent in hypoglycemic and hyperglycemic ranges and glucose variability.

RESULTS
Newborns in UB-CGM group showed an increase of time spent in euglycemic range compared to newborns in B-CGM group (84% [77%-89%] in UB-CGM vs 68% [65%-77%] in B-CGM, p = 0.0004) and significantly less time spent in severe hypoglycemia (0.2% [0%-0.7%] in UB-CGM vs 1.5% [0.2%-4.7%] in B-CGM, p = 0.007) and mild hypoglycemia (12.1% [5.1%-16.3%] in UB-CGM vs 16.9% [9.8%-26.0%] in B-CGM, p = 0.04). Moreover, in comparison to the B-CGM group, the UB-CGM group showed decreased glycemic variability (coefficient of variation 22.8 ± 4.3% in UB-CGM vs 27.9 ± 5.0% in B-CGM, p = 0.0004).
CONCLUSIONS
The use of CGM coupled with a glucose infusion algorithm increases the time spent in euglycemic range and reduces both the time spent in hypoglycemia and glycemic variability in very preterm infants during the first week of life.
REFERENCE
Clinicaltrials.gov, NCT02583776.

ABS 61

IS HYPERGLYCEMIA ASSOCIATED WITH CLINICAL AND/OR PROCEDURAL EVENTS IN VERY LOW BIRTH WEIGHT (VLBW) INFANTS?

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BACKGROUND
Disturbances in glucose homeostasis are prevalent disorders in very low birth weight (VLBW) infants. Hyperglycemia is the most common metabolic alteration in preterm infants with an estimated incidence of 80% of VLBW infants in the first week of life. Hyperglycemia in premature infants has been associated with increased mortality and morbidity including retinopathy of prematurity, sepsis, intraventricular hemorrhage and necrotizing enterocolitis. However, the determinants and the correct management of hyperglycemia remain poorly defined. The continuous glucose monitoring system (CGMS) could help to identify the clinic and/or procedural events associated with hyperglycemia in order to reduce this problem.
AIMS
The purpose of this study was to identify a possible association between episodes of severe hyperglycemia and clinical events and/or procedures. Moreover, assessment of the risk factors of hyperglycemia and of the characteristics of every single episode in term of duration, peak and rate of change was performed.
METHODS
We enrolled all the preterm infants ≤ 32-week gestation and/or expected birth weight ≤ 1,500 g admitted to our NICU. All the patients were monitored with CGMS for 7 days (device Dexcom G4 Platinum). Only severe episodes of hyperglycemia (> 180 mg/dl) were picked out for our analysis.
RESULTS
67 episodes of severe hyperglycemia were detected, with a median duration of 35 minutes (IQR 20-93). 45 episodes (67.3%) were associated with medical/nursing procedures (emogasanalysis, venous sampling, tracheal aspiration, cleaning, stimulation after bradiapnea), 18 episodes (26.9%) were not related to any event, 2 episodes were associated with IVH and 2 episodes with administration of adrenalin. The study revealed an average maximum value of each event of 194.48 (SD 14), while the average velocity of the increase of the glycemic values resulted 1.003 (SD 0.62). The perinatal risk factors related to the development of severe hyperglycemia are birth weight (p = 0.005) and gestational age (p = 0.04).
CONCLUSIONS
40% of VLBW infants experience at least one episode of severe hyperglycemia during their first week of life. The median duration and the maximum peak of these episodes are 35 minutes and 190 mg/dl respectively. Using CGMS we were able to prove, for the first time, a connection between most of the hyperglycemia episodes and nursing/medical procedures, although the features (duration and peak) did not seem to be affected. Further studies are required to understand if a decreased number and/or an increased attention to the procedures could reduce these episodes and their eventual consequences on short, medium and long term.

ABS 62

NASAL CPAP LESIONS AFTER TWO TREATMENT TECHNIQUES (BUBBLE NASAL CPAP VERSUS INFANT FLOW NASAL CPAP) IN NEONATAL RESPIRATORY DISTRESS SYNDROME

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INTRODUCTION
Nasal continuous positive airway pressure (Nasal CPAP) is noninvasive treatment of respiratory distress syndrome (RDS) widely used in Neonatal Intensive Care Units in developing countries. Aim of study was to assess the incidence of nasal lesions related to different nasal CPAP systems and length of stay in CPAP.
METHODS
We ran a prospective randomized study between January 2011 - December 2014. 200 inborn infants with gestational age (GA) 28-35 weeks treated for RDS were involved in the study. They were assigned to Bubble NCPAP (n = 100) and Biphasic NCPAP (Infant Flow) (n = 100), using short bi-nasal prongs. Data collected were the following: gender, way of delivery, gestational age, birth weight, Apgar score at 1st and 5th minute, need for resuscitation, antenatal corticosteroids and surfactant use. Length of CPAP stay, incidence of nasal lesions were outcomes measured. We analysed the severity of lesions according to CPAP systems and any factors associated with it. Categorical data were analyzed using the chi-square test, and numerical data were analyzed using the t-test.
RESULTS
The newborns in the 2 groups had similar characteristics (gender, way of delivery, gestational age, birth weight, Apgar score, corticosteroids, Surfactant use); $p > 0.05$. Nasal lesions in Bubble CPAP were significantly higher, 31/100 versus 7/100 with Infant Flow CPAP; $p < 0.001$. In Bubble CPAP we used Fisher-Paykel nasal prongs; the mean length of stay was 2.08 ± 1.58 days; nasal hyperemia was found in 18 infants and nasal septum necrosis in 13 infants. Infant flow nasal prongs were used with Infant Flow system, mean length of stay was 3.2 ± 2.9 days ($p = 0.001$); nasal hyperemia was found in 4 infants and nasal septum necrosis in 3 infants.
CONCLUSIONS
Nasal lesion is a frequent complication during CPAP use. In our study this was found to be more frequent using Bubble Nasal CPAP. It can be minimised using softer nasal prongs, improving their fixation technique and staff's familiarity with the device.

ABS 63

MODIFICATIONS OF THE PERCENTAGE OF BREASTFEEDING IN A COHORT OF PREMATURE BABIES ACCORDING TO THE UNICEF PROJECT – BABY FRIENDLY HOSPITAL (BFH)

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INTRODUCTION
Preterm babies, compared to term ones, usually present a lower breastfeeding adhesion rate at discharge (either if exclusively breastfed or complemented with formula milk). Breastfeeding percentages are still suboptimal to what would be expected. This phenomenon can be only partially attributed to the physiological increased morbidity of preterm babies, but it is often the result of a lacking support for the mother. Correct application of protocols suggested by UNICEF-BFH project can ensure that babies enjoy the benefits of breastfeeding.
METHODS
324 premature infants with gestational age between 32 and 36^{+6} weeks were born at L. Sacco Hospital Pediatric-Maternal Department, from 01/01/12 (first accession to BFH project) to 30/06/16. Among this cohort we evaluated the type of breastfeeding at discharge and the improvement of the trend for both exclusive and complemented breastfeeding, regardless of gestational age and the presence of maternal or neonatal comorbidities.
RESULTS
In 2012 and 2013 the rate of breastfeeding in preterm infants was 63-64%. In 2014 and 2015 it reached 77.62% and 77.78% respectively. In the first half of 2016 this rate reached 79.42%. During the entire period of observation only 87 premature babies were exclusively nursed with formula milk: 18 due to maternal expressed will and 15 due to maternal concomitant disease or medical treatment with specific nursing contraindication.

CONCLUSIONS

There has been a general increasing trend in favour of breastfeeding. A conscious application of the UNICEF Guidelines could achieve even higher breastfeeding rate in the delicate population of premature infants.

ABS 64

METABOLOMICS (NMR, GC-MS) AS A TOOL FOR INDIVIDUALIZED MEDICINE IN INFANTS WITH NEC: IS GLUCONIC ACID A NEW BIOMARKER?

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INTRODUCTION

In Necrotizing Enterocolitis (NEC), the poorly tolerant and, in some cases, already damaged immature intestinal mucosa of the preterm newborn, responds to the stimuli coming from diet, hypoxia and from the microbiota colonization, giving rise to a strong inflammatory state. This intense inflammatory response alters the balance between inflammation and proliferation. It causes an initial mucosal injury and could progress to the full-thickness of the wall, leading to perforation. The real cause of NEC is still not known; it seems to be a multifactorial disease with poorly understood pathogenesis. The only risk factors strongly associated to NEC occurrence are prematurity and enteral nutrition, together with dysbiosis [1]. Thus, the diagnosis and the treatment of this pathology are very demanding. There is a need for a better understanding of the NEC pathophysiological mechanisms, in order to prevent the illness, to improve the outcome and to increase the survival rate of NEC [2].

METHODS

This study was carried out on 120 urine samples collected from 12 neonates, born at gestational age < 32 weeks and admitted to the Neonatal Intensive Care Unit of the Hopital de la Croix Rousse (HCR) – Hospices Civils de Lyon, Lyon, France: healthy infants (n= 4); NEC infants (n = 4); intolerant infants (n = 4). The clinical data of each patient were recorded in the hospital registers. From September 2014 to July 2015 the urine of all children were collected weekly, from birth until 8 weeks of life. The temporal evolution of the urinary profiles was followed by a combined used of NMR spectroscopy, GC-MS and chemometrics tools.

RESULTS

Data indicated a progressive temporal change of the urine metabolome of control and intolerant infants. Differently, in the case of NEC, the dynamics of the metabolic profile was sensibly affected by the period of the disease onset. For newborns with NEC onset within 15 days of life, the time-dependent shift of scores follows the same behavior as control and intolerant groups, while the temporal change of metabolic profiles of infants with NEC onset after 40 days of life was characterized by a break point and a drawback toward the first days. The analysis of loadings plot evidenced high levels of gluconic acid in every group in the first two weeks of life; the concentration of this metabolite decreased during growth, except in NEC cases. Only in NEC patients there was an increase of gluconic acid concentration at the moment of the onset of the disease after 14 days of age. These results suggest that the microbiota could play a pivotal role in the pathology onset since the gluconic acid is a metabolite of bacterial origins. Several classes of bacteria including *S. faecalis*, *Pseudomonas spp.*, and particularly *E. coli* are able to produce and use the gluconic acid as an energy source, through an alternative metabolic pathway called Entner-Doudoroff. These results are preliminary, they could be considered a first step towards the development of a diagnostic kit that could be used in the clinical practice.

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ABS 65

THE DURATION OF UMBILICAL CORD PULSATILITY AFTER A VAGINAL DELIVERY IN WOMEN WITH A SINGLETON PREGNANCY AT TERM: AN OBSERVATIONAL STUDY

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INTRODUCTION

One of the peculiarities of the umbilical cord is its pulsatility, detectable by palpation, which has often been used to define the optimal timing for cord clamping. Despite being widely used, the exact duration of umbilical cord pulsatility and the possible variables that could significantly affected it are unknown. The primary outcome was the duration of umbilical cord pulsatility, defined as the period in seconds between birth and the end of spontaneous pulsation of the cord. The secondary outcome was the possible association between the duration of pulsatility with maternal, obstetric and neonatal variables.

METHODS

This is an observational study on women admitted to a tertiary care hospital between February and September 2016. Women with a singleton pregnancy at term who had a spontaneous vaginal delivery and cord clumping at the cessation of pulsations were included in the study. Exclusion criteria were the following: multiple gestation, gestational age at delivery < 37 weeks, cesarean delivery, umbilical cord milking. The collection of pulsatility duration was performed by the same operator through a stopwatch and by manual palpation of the umbilical cord. Based on the average time of pulsatility, the population was divided into two groups: a group with an increased cord pulsatility duration (long-term pulsatility group) and a group with a reduced cord pulsatility duration (short-term pulsatitlity group). The two groups were compared for maternal variables (maternal age, BMI, parity and hemoglobin antepartum), obstetric variables (gestational diseases, the gestational age at delivery, the induction of labor rate, the duration of the first and the second stage of labor, the post-partum blood loss and the umbilical cord length) and neonatal variables (birthweight, cord blood pH, Apgar score, hematocrit and hemoglobin values). Statistical analysis was performed with the Student's t-tests, Mann-Whitney test and Kruskall-Wallis test for continuous variables and Pearson's test and Fisher exact test for categorical variables where appropriate. SPSS® version 23 (SPSS Inc, Chicago, IL) was used for statistical analysis and a p-value < 0.05 was considered significant.

RESULTS

A total of 102 women with a spontaneous vaginal delivery at term were identified. The mean duration of umbilical cord pulsatility after birth was 308.6 ± 244.8 seconds with a range of 39-1,200 seconds. The long-term pulsatility group had similar maternal clinical characteristics compared with the short-term pulsatility group. The obstetrics variables were similar in both groups. The infants in the long-term pulsatility group had a significantly higher birth weight (3,457.8 ± 392.6 vs 3,279 ± 389.7) and a significantly lower cord blood pH (7.05 vs 7.27) compared with the infants in the short-term pulsatility group. No differences in the other neonatal outcomes were found.

CONCLUSIONS

The duration of umbilical cord pulsatility after a vaginal delivery in women with a singleton pregnancy at term was established. The timing of the cord pulsatility may be affected by the birth weight and the cord blood pH but additional studies are necessary to clarify this issue and to identify the potential determinants of the duration of umbilical cord pulsatility after birth.

ABS 66

MATERNAL AND PERINATAL OUTCOMES IN PREGNANCIES DERIVING FROM ASSISTED REPRODUCTIVE TECHNOLOGIES (ART)

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INTRODUCTION

Pregnancies deriving from assisted reproductive technology (ART) have more obstetrical and perinatal complications than spontaneous pregnancies. The reason for this discrepancy is not clear, but it could be related to the higher rate of multiple gestations, older maternal age, the use of fertility medications, or probably a combination of these factors. Previous studies have reported the incidence of these complications in different separate categories: complicated or uncomplicated term pregnancy, single or twins, or they have reported the influence of a single parameter: age, BMI, etc. In order to give preconception counseling

to couples that want to undergo ART, it is important to have data about the global incidence of adverse outcomes related to ART when compared to a population who did not receive ART and that was followed and delivered at the same hospital. The aim of this study was to evaluate the global obstetrical outcome of pregnancies obtained from ART, using the data from spontaneous pregnancies followed and delivered at the same hospital during the same period of time as matched controls.

METHODS

We retrospectively analyzed the clinical records of all the singleton pregnancies of patients admitted for delivery at a regional tertiary medical center between January and December 2014. We divided our study population into two groups: one related to pregnancies obtained by ART (ART group) and one related to pregnancies after spontaneous conception (control group). Maternal characteristics such as age, BMI, diabetes, hypertension and exposition to smoke were reported. Pregnancy and delivery outcomes such as gestational hypertension, gestational diabetes, gestational thyreopathy, cholestasis, postpartum haemorrhage, induction of labour, recurrence to episiotomy or Kristeller manoeuvre, mode and gestational age at delivery, premature rupture of membranes, IUGR, fetal malformations, birthweight and placenta location were also reported for each group. Statistical analysis. The Chi square test was used to analyze statistically significant relations between the distribution of categorical variables. Student's t test was used to compare significant differences in mean continuous variables between the two groups. A p value < 0.05 was considered statistically significant.

RESULTS

A total of 159 pregnancies obtained by ART and 3,144 spontaneous pregnancies were included in the study. Mothers who received ART had a higher risk of developing obstetrical complications such as placenta previa ($p < 0.005$) and postpartum hemorrhage ($p = 0.05$) compared to mothers with spontaneous pregnancies. In the ART group a higher rate of invasive maneuvers such as episiotomy ($p = 0.02$), Kristeller ($p < 0.005$) and caesarean section ($p < 0.005$) were reported. Pregnancies after ART had significantly increased risk of preterm birth ($p = 0.05$) and low birthweight ($p = 0.007$) compared to spontaneous pregnancies.

CONCLUSION

This study shows that ART itself represents a risk factor in the development of an adverse obstetrical outcome including placenta previa and postpartum hemorrhage. Our study population was homogeneous, as the two groups of cases and controls were comparable in terms of age, BMI and pre-gestational risk factors such as chronic hypertension, diabetes and exposition to smoke. ART seems to be related to an augmented rate of invasive maneuvers such as episiotomy, Kristeller and caesarean section and it is independent of maternal age, in contrast to what had been reported in previous studies. Finally, the newborns of women submitted to ART are often premature and with a low birth weight compared to newborns of women with a spontaneous conception.

ABS 67

REDUCED SHORT TERM VARIATION FOLLOWING ANTENATAL ADMINISTRATION OF BETHAMETASONE: ANY ASSOCIATION WITH FETAL SIZE?

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OBJECTIVES

The aim of this study was to assess the association between fetal size and the incidence of reduced short term variability following administration of betamethasone for fetal lung maturity.

METHODS

This is a retrospective, multicenter, cohort study. Singleton pregnancies admitted to hospital for threatened preterm labor between 26 and 34 weeks and submitted to bethametasone administration for fetal lung maturity were included in the study. Estimated fetal weight was sonographically calculated upon admission. Computerized cardiotocography (CTG) was carried out on a daily basis. Exclusion criteria were congenital anomalies, estimated fetal weight $< 10^{th}$ centile or intrauterine growth restriction, hypertensive disorders, abnormal CTG on admission or cases where delivery took place within 72 hours of bethametasone administration. A comparison of demographic and pregnancy characteristics was performed between cases with persistently reduced vs those with normal short term variability following bethametasone administration. Persistently reduced

short term variability was defined as a value < 5th centile for gestational age lasting for 72 hours after first dose.

RESULTS

Overall 405 women were included in the study population, among whom 33 (8.1%) had persistently reduced short term variability. Compared to women with normal short term variability, this latter group showed a significantly lower estimated fetal weight (1,462 ± 314 vs 1,712 ± 522 g, p = 0.04), birthweight (2,184 ± 421 vs 2,992 ± 603 g, p < 0.01), and gestational age at delivery (35.1 ± 4.2 vs 37.3 weeks ± 2.4, p < 0.01) whereas all the other variables including gestational age at admission were comparable.

CONCLUSIONS

Reduced short term variability following maternal bethametasone administration among appropriately grown fetuses seems to correlate with lower fetal size. Furthermore, fetuses with such abnormal response to steroids seem to carry a higher risk of perinatal complications, including lower birthweight and preterm birth.

ABS 68

COULD PREMATURITY STILL BE CONSIDERED A RISK FACTOR FOR THE EVOLUTIVE HIP DYSPLASIA (EHD)?

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INTRODUCTION

Evolutive hip dysplasia is a cartilaginous and capsule-ligamentary alteration of the coxo-femoral joint. It represents about 2/3 of all orthopedic pathologies, it is multifactorial and includes different anatomic-pathological and clinical pictures, starting from instability to dislocation. In clinical practice, preterm birth is often associated to EHD, although studies are not always concordant.

METHODS

Between 2008 and 2016, 5,914 infants (2,845 males, 3,069 females) underwent ultrasound examination of the hips. They were divided into two groups based on gestational age at the delivery (n = 5,492 at term and n = 422 preterm). Ultrasound scannings were performed according to the Graft technique taking into consideration the age of the patients, sonographic findings, the classification of the hips, the diagnostic conclusions and therapeutic indications. In particular, the clinical case of 2 preterm girls born via C-section at gestational age (GA) of 31^{+6} weeks on September 2015 at Policlinico of Monserrato was analyzed. The risk factors for the first twin were female, twin, breech position. The risk factors for the second twin were female and twin only. The clinical examination was negative in both cases. Ultrasound examination was performed after discharge at 6 weeks of life.

RESULTS

The diagnostic results for both of twins were the following: normal hips in transition type 1b bilateral according to Graft classification. The alpha and beta angles measures for the first twin were 73°/60° and 72°/62° for the left and right hips, respectively, and 70°/64° and 71°/62° for the hips of the second twin.

CONCLUSIONS

The two clinical cases confirmed that preterm birth is not a risk factor for EHD. In fact, as every other examined preterm, the two twins followed the same indications as at term newborns concerning EHD, with no necessity to correct GA. The therapeutic indications were postural and included the divarication of the inferior limbs, the use of bands or/and baby carriers, without the need of another sonographic control calculating the correct GA as for at term newborns.

ABS 69

WHITE MATTER DISEASE OF PREMATURE INFANTS: PERIVENTRICULAR LEUCOMALACIA OR PUNCTATE LESIONS?

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INTRODUCTION

In recent years, a progressive decline in the incidence of cystic periventricular leucomalacia (PVL) has occurred, but milder forms, like punctate white matter lesions (PWML) are largely present although they appear to be rather heterogenous. Advanced MRI techniques, such as susceptibility weighted imaging (SWI), sensitive in detecting blood products, can be used to evidence subgroups of PWML. The aim of this study was to investigate the incidence of different types of white matter lesions according to gestational age (GA) at birth

and their SWI appearance in a population of consecutively admitted preterm infants.

METHODS

All infants born ≤ 32 weeks of gestational age (GA) and admitted to our NICU between January 2012 and July 2016 who underwent routine brain MRI at term-equivalent age were included. Scanning was performed on a 1.5 Tesla system using "feed and wrap" technique and images were reviewed in order to identify cystic periventricular leucomalacia and PWML. PWML were divided into SWI+ and SWI- types based on the evidence of blood degradation products as visualized by SWI, and the prevalence of all findings was assessed in two groups: extremely (< 28 weeks) and very preterm (28-32 weeks) infants.

RESULTS

Out of 382 very preterm infants, 8 (2%) presented cystic PVL and 74 (19.4%) PWML. Nineteen out of 74 (25.6% or 5% of population) presented lesions visible on SWI as limited zones of lower signal in the periventricular zone, often following the distribution of deep medullary veins, and were defined SWI+. Considering the two subgroups, the incidence of punctate lesions was of 11.2% in the group < 28 week GA (116 infants), with 46% of the lesions positive on SWI. In 28-32 week group (266 infants) the total incidence of PWML was significantly higher (22.9%, $p < 0.05$), although the share of SWI+ abnormalities among these went down to 21.3%. Of interest, in the presence of intraventricular haemorrhage, SWI+ PWML were significantly more frequent than SWI- lesions. Incidence of PVL was slightly higher in the 28-32 weeks group (2.2% vs 1.7%).

CONCLUSIONS

Cystic PVL was confirmed to be quite rare (2%) in a population of premature infants, while about 1/5 of the population presented milder form of white matter damage. Incidence of PWML is not inversely related to gestational age: in the infants born between 28 and 32 weeks of gestation it was twice as high as in extremely premature (< 28 w), highlighting specific vulnerability of white matter in that developmental period. About 1/4 of PWML are SWI+, suggesting potential vascular haemorrhagic-transudative process, as opposed to activation of ischemic-inflammatory pathway in SWI-lesions.

ABS 70

MICROVESICLES FROM UMBILICAL CORD BLOOD OF PRETERM INFANTS: A MIRROR OF THEIR METABOLIC STATE

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INTRODUCTION

Microvesicles (MVs) are 200-1,000 nm membrane-enclosed bodies budding outward the cell plasma membrane. Here, we studied the proteome of MVs from umbilical cord blood from Term- or Preterm infants (≥ 37- or 28-30-week-old, respectively), and their metabolic capacity.

METHODS

MVs were collected by ultracentrifugation. Orbitrap mass spectrometry discovery approach was employed. Oxidative phosphorylation was assayed by oximetry and biochemical analyses.

RESULTS

3,253 proteins were identified. 78.3% matched among Preterm and Term. 396 proteins in Preterm and 311 in Term MVs were exclusive; 200 were significantly different. Statistical and bioinformatic analyses showed, respectively, that the Preterm and Term proteome cluster separately and that in both the top gene signatures clustered around the energetic metabolism. Preterm and Term MVs consume oxygen independently from cellular mitochondria, but only Preterm MVs synthesized ATP.

CONCLUSIONS

MVs from Preterm and Term have an identical composition, likely related to their biogenesis and they are specifically enriched in aerobic metabolism proteins. These proteins are operative with peculiarity interesting differences. These characteristics could allow to use MVs to assess the metabolic state of the newborn in a painless and minimally invasive way.

ABS 71

INVESTIGATION OF THE AMNIOTIC CAVITY BY HIGH RESOLUTION MASS SPECTOMETRY TO FIND THE ORIGINS OF PRETERM LABOUR

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INTRODUCTION
Preterm birth pathogenesis is not yet well understood. The multifactorial causes can be attributed to the inability of the immune system of the fetus to control infectious phenomena, inflammatory and hypoxic intrauterine processes, and structural defects of the placenta. During these pathological conditions both the amnion, the innermost structure facing amniotic cavity, and the amniotic fluid, which surrounds the embryo or fetus, are likely to be involved.
METHODS
In this study based on proteomics we evaluated changes in protein expression of amnion and amniotic fluid samples, collected at term from placentas or severe preterm births (before the 33th week of gestation) and as amniocentesis samples. Thanks to High Resolution Liquid Chromatography/ Mass Spectrometry system and the Label Free Quantification, that can provide robust and precise relative protein expression, we coud identify a large number of proteins to describe a protein profile of amnion and amniotic fluid. Data analysis was performed by specific bioinformatic tools.
RESULTS
The amnion samples derived from placentas of highly premature births were first histologically classified by clinical complications. Seventy samples were collected and processed in one year. We managed to identify 4,000 proteins, versus the 270 proteins reported in literature, with the possibility to characterize the specific biochemical phenotype of samples obtained at birth and to describe the characteristics of each pathological group. In particular, we characterized the inflammatory pathways that can alter the physiology of the placenta. Amniotic fluid samples were collected from caesarean sections at term, preterm and from amniocentesis. In these samples we identified 1,700 proteins, of which more than 700 proteins significantly distributed between the three groups. We were therefore able to characterize the peculiarities of amniotic fluids from preterm birth compared to those from elective caesarean sections at term, showing the pulmonary and immune system immaturity of the preterm newborn. We also observed the protein profiles occurring during fetal development compared to the proteins activities at birth.
CONCLUSIONS
An unexpectedly high number of proteins were identified. Some markers of inflammatory status were isolated in the amniotic cavity with the potential to be utilized as predictors of preterm birth.

ABS 72

A NEGLECTED PROBLEM OF PREMATURE BABIES: WHEN IS FULL ORAL FEEDING ACHIEVED ?

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INTRODUCTION
Difficulties in nutrition and feeding is an important phenomenon of prematurity, although it is not often discussed. Progress to full oral feeding is a complex process for many preterm infants, due to the combined influence of immaturity in functions and medical complications. Thus, we wish to investigate timing and variables influencing the achievement of full oral feeding (FOF) in preterm infants without major complications, in order to define appropriate behaviors and timing. The aim of this study is therefore to identify the age of introduction of oral feeding and the timing of FOF achievement, in other words, the length of time from first nutritive suctioning of the baby to FOF achievement, in preterm infants born below 32 week of GA.
METHODS
We conducted a retrospective review of 77 medical records of preterm infants born 2014-2016. Infants born below 32 weeks of gestation were recruited. Preterms with congenital anomalies, genetic diseases, bronchopulmonary dysplasia, necrotizing enterocholitis, surgery, severe neurological disorders and SGA infants, were excluded from the study. Variables such as sex, twins, weight and GA at birth, type and total duration of respiratory supports used (Mechanical Ventilation, Nasal Continuos Positive Airway Pressure, High Flow Oxygen Therapy, Oxygen Therapy), PMA at the introduction gavage were considered. All enrolled infants were discharged on full oral feeding.
RESULTS
The GA was 29.2 ± 1.8 weeks with a BW of 1,178 ± 291 g. Respiratory support was used in 97% of cases, for a median duration of 9 days (range 1-116). The

introduction of enteral feeding occurred at 29.3 ± 1.8 weeks and the continuous gavage at 32.3 ± 1.3 weeks. The mean postmenstrual age (PMA) for the introduction of oral feeding was 33.4 ± 1.0 weeks. Full oral feeding was reached at 35.0 ± 1.53 weeks of PMA. The transition time from gavage to oral was 9 days in median (range 0-60). Factors associated with both the time taken to commence and the time to attain full oral feeding were the duration of respiratory supports ($p = 0.02$ and $p = 0.004$ respectively) and the PMA at which respiratory supports were stopped ($p = 0.0001$ and 0.0001 respectively). The introduction of oral feeding was also influenced by the BW ($p = 0,0001$) and the PMA at the introduction of gavage ($p = 0.0001$). No statistical difference was observed for sex and in between twins and singletons.

CONCLUSIONS

Interestingly, BW appears to be more important than GA at birth in the achievement of FOF, suggesting that muscular strength is more important below certain GA. Children who used more respiratory supports and for longer time began to eat and reached FOF later. It appears crucial to invest on specific interventions (i.e. oral stimulation) to accelerate timing to achieve FOF.

ABS 73

PREMATURITY-RELATED BRAIN LESIONS (PRBL) AND PLACENTA CHARACTERISTICS IN SINGLETON AND TWIN VLBW INFANTS

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INTRODUCTION

The association between twin gestation and prematurity-related brain lesions (PRBL) is still uncertain. Lesions visible on cranial US have similar incidence in twins and singletons, but studies based on MRI are lacking, although MRI allows better identification of minimal brain alterations. Placental lesions may play a role in neonatal morbidity, and this work is a part of bigger ongoing study aimed at better identifying risk factors for PRBL originating from placental pathology. Aims of the current work were: 1. To evaluate the incidence of PRBL detectable on MRI in twins and singletons; 2. To evaluate the incidence of placental anomalies in twins and singletons.

METHODS

All VLBW admitted to the NICU of Gaslini Children's Hospital between January 2012 and December 2015 undergoing brain MRI at term-equivalent age (39-41 weeks of gestation) were studied. Perinatal clinical data and placental histology were collected and compared between twin and singleton groups. MRI scans were evaluated for the presence of brain lesions connected with prematurity (intraventricular haemorrhage, post-haemorrhagic ventricular dilatation, cerebellar haemorrhage, periventricular leukomalacia, punctate white matter lesions) and their incidence was assessed in twins and singleton groups.

RESULTS

A total of 270 patients were included: 106 twins and 164 singleton. Twins and singleton groups differed by a higher frequency in the twins group of artificial reproductive techniques (49% vs 6%, $p < 0.0001$), need for mechanical ventilation (82.1% vs 62.8%, $p < 0.001$), pneumothorax (6.6% vs 1.2%, $p < 0.05$), medical treatment of patent ductus arteriosus (78.3% vs 56.7% $p < 0.0001$); and higher presence in singleton group of IUGR (28% vs 15.1%, $p < 0.05$) and vaginal birth (29.4% vs 16%, $p < 0.05$). On histology, twin placentas presented more frequently velamentous cord insertion (22% vs 8.5%, $p < 0.001$), while singleton placentas presented more frequently inflammatory alterations (52.4% vs 27.9% $p < 0.005$), retroplacental hematomas (20% vs 4.4%, $p < 0.005$), placental infarctions (33.3% vs 11.8%, $p < 0.01$) and placental weight < 10th centile (40.4% vs 24.2, $p < 0.05$). Incidence of various cerebral lesions connected with prematurity did not differ significantly between groups.

CONCLUSIONS

Multiple gestation does not seem to act as a risk factor for PRBL, although morbidity was higher in this group. Chorioamnionitis seems to be more frequent in singletons.

ABS 74

TWIN PREGNANCY AND INTRAEPATHIC CHOLESTASIS OF PREGNANCY: A COHORT STUDY ON 441 PREGNANCIES

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INTRODUCTION

Intrahepatic cholestasis of pregnancy (ICP) is a complication of pregnancy resulting in elevation of serum bile acid levels. Elevations in bile acids are associated with adverse pregnancy outcomes, namely meconium staining of amniotic fluid, fetal asphyxial, preterm delivery, both spontaneous and iatrogenic, and sudden intrauterine fetal demise. An increased incidence of ICP has been also demonstrated among twin pregnancies, due to elevated hormone levels. The aim of the present work was to determine maternal and fetal outcomes of intrahepatic ICP in twin pregnancies.

METHODS

This was a retrospective single-hospital cohort study of twin pregnancies complicated by ICP. All twin pregnancies receiving care at a regional tertiary medical center, Italy, from January 2013 to October 2016 were included in the study. Inclusion criteria were: dichorionic diamniotic (DCDA) pregnancy or monochorionic diamniotic (MCDA) pregnancy and patients receiving both outpatient and inpatient care at the University Hospital. Exclusion criteria were monochorionic monoamniotic pregnancy or triplet, patients with pre-pregnancy liver disease. Data on maternal demographics and obstetric complications together with fetal outcomes were collected for all patients. The risks of adverse maternal and fetal outcomes were determined in relation to serum bile acid levels > 40 micromol/L. Subgroup analysis focused on the effect of assisted reproductive technology (ART) and on the mode of delivery in twin pregnancies complicated by ICP.

RESULTS

A total of 441 twin pregnancies were included, of which 32 (7.3%) had intrahepatic cholestasis. Among pregnancies complicated by cholestasis the mean maternal age was 37.7 years old (SD = 4.7), 21 (65.6%) pregnancies were conceived by ART, one through egg donation. ICP was significantly more frequent in DCBA comparing to MCDA (29 vs 3, $p < 0.001$). Moreover there were significantly more MCDA among patients without ICP than in patients with ICP (22% vs 9.4%, $p < 0.001$). Cesarean section was performed significantly more ($p < 0.001$) in the ICP group (93.7%), compared to patients without ICP (82.3%). All vaginal deliveries in ICP patients were induced and the mean gestational age at delivery was 35^{+6} weeks. Three fetuses (4.7%) were born with cord blood pH ≤ 7. Interestingly, all these three fetuses were conceived by ART, and one of them by egg donation, and from three different pregnancies with early onset ICP. Finally, in the ICP group there was neither fetal demise nor perinatal death.

CONCLUSIONS

Twin gestation is believed to be associated with a higher incidence of ICP. Compared to an incidence of 0.1-1.5% in singletons as reported in literature, we found that 7.3% of twin gestation were complicated by ICP. Subgroup analysis revealed higher incidences of adverse outcomes in severe and early onset ICP and ART. ICP was also associated with iatrogenic preterm delivery. Notably, no intrauterine demises were registered.