www.jpnim.com Open Access eISSN: 2281-0692
Journal of Pediatric and Neonatal Individualized Medicine 2019;8(2):e080224
doi: 10.7363/080224
Published online: 2019 Oct 23

Selected Abstracts of the 15th International Workshop on Neonatology and the 40th Congress UMEMPS (Union of Middle-Eastern and Mediterranean Pediatric Societies)

CHILDREN OF THE MIDDLE-EASTERN AND MEDITERRANEAN AREA: WE CAN DO BETTER!

CAGLIARI (ITALY) • OCTOBER 24TH-26TH, 2019

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How to cite

[Abstracts's authors]. [Abstracts's title]. In: Selected Abstracts of the 15th International Workshop on Neonatology and the 40th Congress UMEMPS (Union of Middle-Eastern and Mediterranean Pediatric Societies); Cagliari (Italy); October 24-26, 2019. J Pediatr Neonat Individual Med. 2019;8(2):e080224. doi: 10.7363/080224.

ABS 1

THE TUBULAR DAMAGE MARKERS – NETRIN-1 IN PRETERM NEWBORNS

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INTRODUCTION

Maturity and birth weight are very important factors determining the adaptation of the newborn. Premature babies are exposed to kidney damage because they are born before the nephrogenesis process begins, which lasts until the 34th-36th week. In the diagnosis of kidney damage in newborns and especially in those born prematurely, there is a lack of a good marker for early injury extraction, because the serum creatinine level used so far belongs to the so-called late markers of acute kidney injury. Netrin-1 is currently an increasingly widely studied biomarker. Compared with other new biomarkers, netrin-1 is excreted into the urine quickly, after kidney damage, and quickly returns to a normal level after perfusion. Therefore, netrin-1 can be used not only as a marker of kidney damage but also to assess the prognosis of the return of their normal function. Currently, there are only few papers in the literature regarding the study of netrin-1 concentration in newborns. The study aimed to analyze kidney function in neonates born prematurely through the assessment of netrin-1 concentration in urine.

MATERIAL AND METHOD

A prospective study involved 88 newborns (60 premature newborns, 28 healthy term newborns). All these newborns were appropriate for gestational age, without any damage to the kidneys, and their clinical condition were assessed as good or medium. Among premature babies, we identified two groups: 28 newborns born between 30-34 weeks of pregnancy and 32 newborns born between 35-36 weeks of pregnancy. Urine samples were collected on the first or second day of life. The commercially available enzyme immunoassay was used to determine the concentration of netrin-1 in the urine.

RESULTS

The urinary concentrations of netrin-1 in the urine of newborns born at 30-34, 35-36 and 37-41 weeks of pregnancy were similar: median (Q1-Q3) was 63.65 (56.57-79.92) pg/dl, 61.90 (58.84-67.17) pg/dl, 60.37 (53.77-68.75) pg/dl, respectively. However, after normalization of the urinary concentrations of netrin-1 with the urinary concentration of creatinine, the results for the same age groups were 547.9 (360.2-687.5) ng/mg creatinine, 163.64 (119.15-295.96) ng/mg creatinine, 81.37 (56.84-138.58) ng/mg creatinine, respectively. All differences were statistically significant ($p = 0.00$). We have not found a correlation between the value of netrin-1 and netrin-1/creatinine and delivery, gender, the percentile of birth weight.

CONCLUSIONS

The use of the values of netrin-1/creatinine may be useful in the diagnosis of subclinical kidney damage in premature newborns. It should be emphasized that premature babies who participated in the study were in good or medium condition, did not require mechanical ventilation or antibiotic therapy; nevertheless, the median value of netrin-1/creatinine was almost 7 times higher than in full-term newborns.

ABS 2

CYTOMEGALOVIRUS INFECTION IN THE FIRST DAYS OF LIFE: PREVALENCE IN THE SOUTH SARDINIA FROM 2016 TO 2019

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INTRODUCTION

Congenital cytomegalovirus (CMV) infection poses a significant health risk to women of childbearing age and pregnant women and their unborn babies. Screening for CMV represents a crucial objective for Public Health, since this virus is one of the leading causes of childhood disability. CMV belongs to

the Herpesviridae family and, once contracted the infection, it remains latent inside the organism for life, but it could be reactivated in case of weakening of the immune system. CMV infections are generally asymptomatic, but in immunocompromised patients, they can cause serious complications. CMV can be transmitted vertically from mother to child, as well as a primary, recurrent, or chronic infection. Maternal-fetal transmission of CMV can occur in the uterus (congenital infection), during labor or delivery (perinatal infection), or by lactation (postnatal infection) and it can cause miscarriage, intrauterine growth retardation, congenital anomalies and neonatal or postnatal pathologies of different severity. The aim of this study was to investigate the prevalence of CMV infection in a court of newborns clinically evaluated in the South Sardinia University Hospital.

METHODS/RESULTS

The postnatal diagnosis of CMV infection was carried out within the first 2-3 weeks of life of the newborn through the detection of the virus from urine, blood, and saliva. From September 2016 to July 2019, a total of 297 urine samples from the Department of Neonatology of Policlinico of University of Cagliari were analyzed, and proviral DNA was obtained by GeneProof Phatogen Kit. Our results showed a notable decrease in CMV infection cases in newborns, from 24% to 4% DNA positives, estimated in the South Sardinia.

CONCLUSIONS

The National Institute of Health underlines that, in Italy, the prevalence of infection is among the lowest in the literature. The results shown are in line with epidemiological data on the frequency of CMV infections. Our results suggest a low prevalence in comparison with the last years in the same region.

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ABS 3

THE EDUCATIONAL NEED FOR PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION AMONG NURSERY AND PRIMARY SCHOOL TEACHERS. A PRELIMINARY STUDY

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INTRODUCTION

Accidental foreign body inhalation is common in small children and represents a relevant public health issue. It happens suddenly and is usually caused by food, coins, and small toys. Its prevention, timely recognition, and treatment are paramount for a good outcome. This study investigates the knowledge of lifesaving maneuvers among nursery and primary school teachers in order to evaluate the need for educational interventions.

MATERIALS AND METHODS

An observational study held in nurseries and primary schools in Cagliari (Italy). In June 2019, teachers were administered a questionnaire including 17 items on previous education and knowledge about the management of the choking child.

RESULTS

Seventeen schools out of the 27 initially included took part in the study. 119 questionnaires were distributed, and 57 returned to the study group completely filled. Amongst the 57 teachers, 95% (54) are women, 1 man, 2 did not declare the gender. 63% (36) is older than 40 years old. 51% (29) has been teaching for more than 10 years; 10% (6) did not declare it. 30% (17) of respondents never participated to courses on the study subject. The remaining sample attended several courses: 22 subjects took part in a course on pediatric foreign body airway obstruction; 26 in a Basic Life Support and Defibrillation (BLSD) and/or a Pediatric Basic Life Support and Defibrillation (PBLSD) course. 14% (8) rescued a choking child. All participants deem a dedicated course very useful. 40% (23) of them judges their knowledge on the topic inadequate, 56% (32) sufficient or good, 2 did not answer. Analysis of specific knowledge: 30% (17) of the sample is unable to recognize partial obstruction of the airway; 17% (10) cannot answer. 75% (43) correctly associates the inability to vocalize to complete obstruction; 10% (6) was unable to answer; 2 did not answer. 33% (19) of respondents would encourage to cough a coughing child after a foreign body inhalation; 12% (7) ignores what to do. Back blows and abdominal thrusts are indicated as the adequate maneuvers for the conscious child unable to talk and to cough by 67% (38) of participants; 7 subjects do not know how to intervene. 60% (34) knows the maneuvers to correctly rescue the unconscious child with an obstructed airway; 21%

(12) does not know how to help. 14% (8) knows the recommended compression/ventilation ratio; 37% (21) is unable to answer. 88% (50) would correctly put the breathing child in the recovery position while waiting for the ambulance; 10% (6) does not know the answer. Among the nursery teachers (9), 33% (3) knows the airway clearing maneuvers for the conscious infant, whereas no one knows how to open the airway if the infant is unconscious.

CONCLUSIONS

This study investigated the training of school teachers on pediatric foreign body airway obstruction in Cagliari. It shows non-uniform education and incomplete knowledge in the study sample. Such a result suggests the need for more systematic education on the topic.

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ABS 4

DOES LEAD (Pb) CONTENT OF LIPSTICKS POSE A HEALTH RISK TO CHILDREN? AN EXPOSURE AND RISK ASSESSMENT IN TURKISH COSMETIC MARKET

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INTRODUCTION

Lead (Pb) was and still is an environmental factor that causes developmental disorders, increases neurologic and psychiatric morbidity. Thus, studies emphasize that there is no safe level of lead exposure. Lead content in lipsticks, with potential life-long exposure to consumers, is an important concern for the public. Even child may use the products to mimic adult activities. Continuous exposure in children produces neurobehavioral symptoms, such as decreased concentration, inability to follow instructions, difficulty to play games and low IQ. Assessing the safety of lipsticks is essential, to understand if they are increasing the blood Pb concentration and also have any effect on health for chronical usage.

MATERIALS AND METHODS

To assess any health risk arising from lead content of lipsticks. A total of 25 lipsticks (solid, gloss, and creamy type) from different brands are deployed from Turkish markets, which are also categorized in different price ranges.

RESULTS

The means of Pb concentration range from 0.95 mg/kg to 2.45 mg/kg with the type of lipstick, while the mean lead contents show a statistically significant difference between the high priced and low priced groups. US-EPA Adult Lead Model and Integrated Exposure Uptake Biokinetic Model were used to determine the blood Pb levels (BLLs) in children, and Pb exposure from lipstick did not significantly increase estimated BLLs. For assessing the health risk of chronic usage, calculated with the worst-case scenario for both children and adults, oral daily systemic exposure levels are compared with Maximum Allowable Dose Level (MADL) for lipsticks. For lifetime risk assessment, 4 different exposure scenario has deployed. Daily level and total risk for lifetime Pb exposure from deployed lipsticks are below the acceptable risk levels.

CONCLUSIONS

Routine monitoring of metal content is crucial, while a careful selection of the raw material can improve the quality and safety of these products.

ABS 5

PRENATAL DETECTION OF CENTRAL NERVOUS SYSTEM MALFORMATIONS: OUR MULTIDISCIPLINARY APPROACH

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INTRODUCTION

We evaluated a standardized diagnostic workout for the detection of Central Nervous System (CNS)

malformations and a proper patient-centered counselling.

METHODS

In our retrospective study, we have included suspicious cases of fetal CNS malformations, which underwent level II ultrasound for the period 2016-2019 (IRCCS Ospedale Policlinico San Martino). In some cases, functional magnetic resonance (MRI) has been performed for further specific investigations (IRCCS Istituto G. Gaslini). A post-mortem examination was executed after voluntary interruption of pregnancy or miscarriage following the standard institutional protocol.

RESULTS

22 cases with the following ultrasound abnormalities (some cases showed more than one of these alterations): ventriculomegaly (n = 8), microcephaly (n = 5), absence of septum pellucidum (n = 5), posterior cranial fossa abnormalities (n = 4), head shape malformation (n = 4), fusion of the left and right thalami (n = 4), corpus callosum agenesis (n = 2), myelomeningocele (n = 2), cerebellar hypoplasia (n = 1), cerebral cyst (n = 1), ocular agenesis (n = 1), frontal lobe hypoplasia (n = 1), holoprosencephaly (n = 1), interhemispheric line defects (n = 1). Nine cases have been deepened with functional MRI. Nine patients underwent amniocentesis, whereas in three cases villocentesis was performed. The karyotype analysis revealed Trisomy 21 (n = 2), Triploidy 69 XXY (n = 1), 7p14.1 deletion (n = 1). The autopsy showed malformations of the brain (n = 12) and spinal cord (n = 2). Five women followed genetic counseling to determine the risk of malformations in future pregnancies. Five definitive diagnoses were made, by integrating the results of imaging, autopsy and genetic counseling: Down syndrome (n = 2), Triploidy 69 XXY (n = 1), L1 syndrome (n = 1), RHD mutation (n = 1). In addition, 8 provisional diagnoses: Edwards syndrome (n = 1), Meckel syndrome (n = 1) and complex syndromes with multiple malformations (n = 6).

CONCLUSIONS

A prenatal ultrasound screening suspicious for CNS malformation needs a proper multi-disciplinary workout. A level II ultrasound is requested, eventually complemented by level III imaging (functional MRI). None of these tools are decisive alone. For a definitive diagnosis, the integration of imaging, pathological, and genetic data is needed.

ABS 6

EARLY DIAGNOSIS OF KLIPPEL-FEIL SYNDROME WITH EXTRA-SKELETAL ANOMALIES, A CASE REPORT

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INTRODUCTION

Klippel-Feil Syndrome (KFS) is a rare congenital anomaly characterized by the fusion of two or more cervical vertebrae. The etiopathogenesis seems to involve mutations of genes responsible for somite development during embryogenesis. KFS is defined by the triad of a short neck, low posterior hairline, and limited cervical range of motion. It is often associated with multisystemic anomalies (i.e., skeletal, urogenital, cardiac, ocular, craniofacial, and others) and the diagnosis can occur at different ages. We report the case of a KFS diagnosed during the first months of life.

CASE REPORT

Female infant, 46XX, born at term from cesarean section due to placental abruption. APGAR 2-5-8 at 1st, 5th and 10th minute. At birth, respiratory distress and microcephaly. Echocardiography showed ventricular septum defect and patent foramen ovale. At two months of age, a left scapula swelling with forced flection and abduction of the left arm was detected. Shoulder Magnetical Resonance Imaging revealed a Sprengel deformation with the left scapula connected to C5 and C6 by bone tissue. A spine MRI showed bone anomalies: C6 hypoplasia with posterior arc cleft, C7-T1 fusion, T2 right hemivertebra. A small tract of syringomyelia was also detected from T11 to T12. An evaluation of extra-skeletal systems also identified a right pyelectasis. At 12 months she showed no neurodevelopmental delay. She has been evaluated by neurologists, neurosurgeons, cardiologists, geneticists, and physiatrists during the follow up of the disease during her growth, with no surgical indications. Genetics studies are ongoing to define the etiology of this disease.

DISCUSSION AND CONCLUSION

Our case showed a single congenitally fused segment between C7 and T1. This condition defines a KFS type I according to Samartzis classification. Other cervical anomalies and the Sprengel deformation of the scapula are often associated with this condition in contrast to thoracic syringomyelia, which matches less frequently with KFS. The systemic disorders are also infrequent, and they could predict a negative prognosis. Therefore, the identification of spinal and scapular anomalies during the first months of life represents a useful tool to establish an early diagnosis of KFS, in order to start an effective multidisciplinary follow-up program.

ABS 7

SHOULD SOMATOSTATIN BE USED AS FIRST-LINE AGENT IN MANAGEMENT OF CONGENITAL CHYLOTHORAX?

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INTRODUCTION

Congenital chylothorax is defined as abnormal accumulation of lymphatic fluid in the pleural space and may be either congenital or an acquired condition. Although congenital chylous effusions are relatively rare in infancy, they have serious clinical consequences and can be potentially life-threatening disorder. To the best of our knowledge, there are no evidence-based guidelines to support the use of octreotide in chylothorax management as the first-line agent. In our case, the accumulation of chylothorax has been treated successfully after the administration of octreotide. We aim to provide guidance for the optimal management of congenital chylothorax in infancy.

CASE REPORT

Here, we report a case of a premature baby born at 30 weeks gestation, diagnosed antenatally with trisomy 21 syndrome and severe bilateral congenital pleural effusions which subsequently confirmed after birth as chylothorax. Bilateral thoracentesis was performed, and bilateral chest tubes were inserted soon after birth due to the size of the effusion, which compromised the respiratory system. Quantification of drainage was used to determine clinical improvement and also used as a guide to fluid imbalance and replacement of daily losses. Expressed brest milk and Medium-Chain Triglyceride (MCT) formula was introduced in the first week of life. However, chylothoraces re-accumulated which required another bilateral thoracentesis and bilateral chest tubes. Congenital chylothorax was treated successfully after administration of octreotide infusion along with intercostal decompression of the pleural effusion and total parenteral nutrition (TPN) as adjunctive therapy. In our case, there were no complications with the use of octreotide.

DISCUSSION

The MCT diets have met with variable success in the treatment of chylothorax. This is because any oral enteral feeding increases lymph flow. Octreotide is a synthetic, long-acting somatostatin analogue; it has been used in conjunction with other modalities (TPN, effusion drainage) in conservative management.

CONCLUSION

This case is of particular interest because it provides evidence for the efficacy of octreotide in the management of chylothorax. Therefore, octreotide may be used as the first-line agent along with adjunctive therapy of parenteral nutrition and intercostal decompression of the pleural effusion. The early administration of octreotide may allow the patient to avoid invasive procedures.

ABS 8

ENAMEL HYPOPLASIA IN COELIAC CHILDREN: AN EPIDEMIOLOGICAL STUDY

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INTRODUCTION

Coeliac disease is a systemic immune-mediated primary small bowel disease characterized by inflammation in the small intestine and is sometimes called gluten-sensitive enteropathy or celiac sprue. Patients could have malabsorption, which results in hypersensitivity to gluten found in cereal products. This pathology determines effects on the oral cavity, documented in scientific literature, including dental erosions, mouth ulcers, angular cheilitis, migratory glossitis. The purpose of this work is to observe the

prevalence of dental enamel hypoplasia in a sample of 212 coeliac patients.

MATERIALS AND METHODS

212 coeliac patients were included in this study, with a confirmed histological diagnosis, between the ages of 6 and 12 years. Patients underwent a dental examination, where it was recorded the possible presence of enamel hypoplasia, the severity of the hypoplasia (from the first to the fourth degree), and which elements were interesting.

RESULTS

162 out of 212 celiac patients had enamel hypoplasia. 60% of them had grade 1, 19% of them grade 2, 8% grade 3, 14% grade 4. The most frequently involved elements were incisors (52% of cases), and molars (26%).

DISCUSSION

Previous works have highlighted a close correlation between enamel hypoplasia and celiac disease. In a very recent study of 60 pediatric celiac patients, the authors pointed out that 20 had these type of enamel lesions. Another Brazilian study performed on 40 celiac patients and 40 controlled patients showed that in the first group 65% had enamel hypoplasia compared to 35% of non-celiac patients. Our data highlight, with a much larger sample of the population, that the correlation is even higher.

CONCLUSION

The recognition of these lesions by the dentist could be very useful in intercepting an unknown celiac disease, intervening promptly, and improving the patient's prognosis and systemic health.

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ABS 9

METABOLOMICS IN PATENT DUCTUS ARTERIOSUS: PROPOSAL FOR A PROSPECTIVE STUDY

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INTRODUCTION

In preterm newborns, a persistent patent ductus arteriosus (PDA) can determine severe short- and long-term complications. Despite years of research and clinical experience, controversies about PDA diagnosis and management persist, with a heterogeneity of closure's criteria, timing and modality. The most reasonable strategy seems to treat only hemodynamically significant PDA (hsPDA) and, currently, ibuprofen is the drug of choice (success rate 70-85%); paracetamol recently showed a comparable efficacy but fewer side effects [1]. From recent preliminary data, metabolomics seems promising in the diagnosis and optimization of PDA management [2, 3].

MATERIALS AND METHODS

We purpose a prospective, observational, longitudinal study enrolling 20 neonates (GA 23^{+0}-31^{+6} weeks), hospitalized in the Neonatal Intensive Care Unit of Cagliari. Intravenous ibuprofen will be 1st choice drug for PDA treatment, according to the validated therapeutic scheme [1]. If PDA persists after 2 courses of ibuprofen or in case of contraindications for this drug, paracetamol will be orally administered at the standard dosage of 15 mg/kg every 6 hours for 3-7 days. Thus, patients will be divided into five groups:

A. PDA spontaneous closure;
B. ibuprofen 1st choice;
C. paracetamol 1st choice due to an absolute ibuprofen contraindication;
D. ibuprofen 1st choice but development of contraindications during treatment (incomplete ibuprofen cycle, switch to paracetamol);
E. ibuprofen 1st choice but persistence of hsPDA after 2 cycles (complete ibuprofen cycle, paracetamol).

In all neonates, urine samples at birth and at successive time points will be non-invasively collected through the cotton-diaper validated technique, and urinary metabolome will be analyzed with GC-MS (gas cromatography) and ^{1}H-NMR (magnetic resonance mass spectrometry). Among these, newborns with an echocardiographically defined hsPDA (PDA diameter > 1.5 mm/Kg; LA/AO [Aortic Root Ratio] > 1.4; PDA/LPA Ratio > 0.8) after the 3rd day of life will start appropriate treatment. According to a detailed scheme, urine samplings, echocardiogram, laboratory, clinical and instrumental evaluations will be performed at six-time points, between birth and 36 weeks of corrected GA.

RESULTS

We will consider the following outcomes:

- PDA closure rate after the 1st course of therapy and after 2-3 cycles of therapy;
- global PDA closure;
- reopening rate and closure after reopening;
- days required for closure;
- incidence of side effects;
- urinary metabolomics.

CONCLUSIONS

With this study we hope to develop an innovative and unique metabolomic, non-invasive, predictive model to define, at birth, a PDA condition after the 3rd day of life; moreover, we investigate the role of metabolomics in the prediction of therapy response and drug toxicity.

Finally, we will evaluate the oral paracetamol efficacy and safety.

In the future, this approach could allow an individualized treatment, resulting in efficacious and safer management, avoiding overtreatment.

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ABS 10

LONG-TERM OUTCOMES AND VERY LOW BIRTH WEIGHT: A 16 YEARS EXPERIENCE IN THE NICU OF A.O.U FEDERICO II IN NAPLES

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INTRODUCTION

Very low birth weight (VLBW) infants represent approximately 1-1.5% of live births but contribute to 40-60% of neonatal and child mortality. In the last years' mortality has decreased even in extremely low birth weight infants (< 1,000 g). Although the survival rate of infants with lower gestational weight and age continues to increase, there is a greater rate of severe disability, related to lower gestational age (22-24 w), as well as minor disabilities. Recent international literature highlights the association between abnormalities and/or delay in neuromotor development and severe prematurity. Minor neurological signs have been identified in 23-60% of the VLBW and ELBW infants. These are alterations of the visual-motor coordination, dysfunctions in writing, difficulties in learning mathematics and logical analysis, behavioral performance, attention deficits, hyperactivity, language delay.

MATERIALS AND METHODS

Our study aimed to evaluate outcomes in premature infants with birth weight < 1,500 grams, admitted in the Neonatal Intensive Care Unit of the University "Federico II" of Naples from January 2001 to December 2016. All newborns with a birth weight < 1,500 g were recruited and were followed until 36 months of corrected age

RESULTS

In our study, 935 children were recruited for the follow-up to 36 months of the correct age, of which 850 (91%) returned. We observed an increased adherence to follow-up of 14% more in the period 2015-2016 compared to the years 2001-2004; in particular, in 2016, the adherence to follow-up was 98%. Data collected from these groups of children observation showed in 2005-2008 a statistically significant decrease in birth weight and gestational age compared to 2001-2004 that remains constant until 2014. In particular, the minimum weight recorded at birth has progressively fallen over the years, going from 690 g in the first four years to 490 g in the last one with a gestational age ranging from 23 to 35 weeks. 16% of the sample presented abnormalities in muscle tone abnormalities in the first year of life while this percentage reduced to 10% at 24 months, after an early program of rehabilitation. 90% of infants had a psychomotor development appropriate to the correct age. This result seems particularly interesting because it enhances the importance of early diagnosis and early rehabilitation therapy. 10% of infants presented serious handicaps: cerebral palsy in 4%, severe psychomotor delay in 3.2%, blindness in 1%, deafness in 0.6%, severe language delay in 1.2%. In about 24% of infants, we diagnosed minor abnormalities, predominantly language delay (8.3%), muscle tone abnormalities (3%),

and behavioral disorders (12%). In the context of behavioral disorders, we have diagnosed relationship disorder and communication (2.3%), hyperactivity and attention deficit (4%), eating disorders (3%), disturbance of conduct, intolerance to frustrations, with oppositional rules. For cognitive functions, no significant variations in outcomes were detected over the years. The frequency of infantile cerebral palsy has not changed over time. This can be explained by the increased survival of increasingly lower weight classes.

CONCLUSION

Following the growth processes of the premature baby is necessary to prevent the presence of disorders that may occur at different ages. The monitoring of the child's activities must be followed in close collaboration with the family, by a multi-specialist team, to offer the possibility of adequate support for a harmonious development of the child and family dynamics.

ABS 11

THE IMPORTANCE OF THE PRESENCE OF OLIGOSACCHARIDES IN MATERNAL MILK: METABOLOMIC RESULTS IN A CASE STUDY OF 80 SAMPLES

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INTRODUCTION

Maternal milk is the best food for the infant due to its nutritive and immunity composition. HMOs (Human Milk Oligosaccharides) are becoming increasingly important. They have an important prebiotic effect, they may modulate epithelial and immune cell responses, and they are signal molecules. The gestational age of the baby, the mother's origin population has been associated with a significant modification of milk composition. The milk compositional variability has been demonstrated among the lobules within the same breast and even during the same feed. However, it has not been clarified yet whether the milk is changed at birth by the anthropometric characteristics of the newborn. This study aimed to determine the metabolome of milk samples collected from a population of mothers who gave birth to Appropriate for Gestational Age (AGA), Large for Gestational Age (LGA) and Small for Gestational Age (SGA) newborns. Moreover, to identify any metabolic differences in the anthropometric groups and the metabolites characterizing those groups.

MATERIALS AND METHODS

A Hydrogen Nuclear Magnetic Resonance (^{1}H NMR) experiments have been performed. Milk samples have been collected (2-3 ml) by directly pressing the breast into a sterile container. Human milk samples have been obtained from 80 mothers of AGA, SGA, and LGA term infants at 7 ± 2 days post-partum. The NMR data sets have been analyzed by Principal Component Analysis (PCA) in order to be able to assess the presence of similarities, dissimilarities, or outliers within the set of the samples.

RESULTS

The result of PCA analysis does not suggest any differences in the spectral profiles of the sample in terms of the neonatal customized centile such as AGA, LGA, SGA. However, it has been possible to split them into two groups, secretor or non-secretor phenotypes, based on the presence of different HMOs. The fucosylation pattern mostly reflects the expression and activity of two genes: the secretor gene (Se) and the Lewis gene of blood groups (Le). The first one codes for the α1,2-fucosyltransferase, while the following codes for the α1,3-/α1,4-fucosyltransferase. The metabolic changes accompanying the different milk phenotypes have been further investigated through two Orthogonal Projections to Latent Structures Discriminant Analysis (OPLS-DA) pairwise comparisons: Se+ vs. Se- and Le+ vs. Le-. The first one provided a satisfactory model ($R^2Y = 0.894$, $Q^2 = 0.850$, $p < 0.0001$). Also, the second has produced valid results ($R^2Y = 0.843$, $Q^2 = 0.411$, $p < 0.001$) confirming the α1,4-fucosylated structures as the key metabolites in the discrimination between the two Lewis status.

CONCLUSION

The results of the present study lead to support that maternal milk does not change among newborns with AGA, LGA, SGA anthropometric differences during their first week of life. On the other hand, similarly to other studies in the literature, we have demonstrated that maternal milk is different according to the secretory phenotypes of mothers.

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ABS 12

IMPACT OF HTST PASTEURIZATION OF HUMAN MILK ON THE KINETIC OF DIGESTION OF MACRONUTRIENTS AFTER *IN VITRO* DYNAMIC DIGESTION

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INTRODUCTION

Donor human milk (DHM) represents the best alternative when mother's milk is not available, a common occurrence in Neonatal Intensive Care Units. Heat treatment of DHM is mandatory for safety reasons. Holder pasteurization (HoP, 62.5°C-30') is recommended by all human milk bank guidelines. Recent studies have demonstrated that HoP affects the digestion profile and behavior of several human milk components. High-temperature short-time pasteurization (HTST, 71°C-15'') is currently under evaluation as a promising alternative technology to limit the denaturation of some biological compounds of raw human milk. The present work aimed to assess whether the different types of pasteurization (HoP, HTST) impacted the digestive kinetics of human milk during *in vitro* dynamic digestion.

MATERIALS AND METHODS

Pooled raw HM (RHM) was collected and processed by using the two pasteurization techniques. The pasteurized samples and RHM were digested *in vitro* using preterm gastrointestinal conditions. Samples were collected at different digestion times. Undigested and digested milk samples were characterized for their particle size distribution (PSD), triglyceride content, protein, and amino acid (AA) profiles.

RESULTS

During gastric digestion, both pasteurization methods modified PSD, as compared to RHM. Caseins were rapidly hydrolyzed in the gastric phase, unlike that for the whey proteins. Lactoferrin was hydrolyzed faster in the pasteurized samples in comparison to RHM, in which lactoferrin was resistant to gastrointestinal digestion. Heat-treatments, consequently, affected the intestinal release of some AA, and a higher bioaccessibility of AA was found for HTST, as compared to HoP. Concerning lipolysis, at any time of the intestinal digestion phase, the lipolysis of HoP samples was significantly lower ($p < 0.05$) than in both RHM and HTST samples.

CONCLUSIONS

This work provides the first important evidence on the differential impact of HoP and HTST pasteurization techniques on bioaccessibility of DHM nutrients and biological compounds, for preterm newborns.

ABS 13

CHRONIC INTUSSUSCEPTION DUE TO INFLAMMATORY FIBROID POLYP IN CHILD: A CASE REPORT

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BACKGROUND

Chronic intussusception (CI) is defined as intussusception lasting for 14 days or more. Its clinical picture is different from acute intussusception, and its diagnosis is often delayed [1]. Here we report a case report of a boy with anemia and abdominal pain.

CASE REPORT

He is an eleven-year-old boy who came to the hospital for a lab test requested by the family pediatrician for pallor. Blood exams showed severe iron deficiency anemia: hemoglobin 6.2 g/dl, mean corpuscular volume 58 fl, ferritin 3 ng/ml. He was therefore immediately admitted to our Pediatric Ward, and a three-month history of abdominal pain, fatigue, and skin pallor were reported. Anti-transglutaminase, antineutrophil cytoplasmic, anti-myeloperoxidase, anti-saccharomyces cerevisiae antibodies, and fecal calprotectin were negative. Because of the anemia, a red blood cell transfusion was performed. Abdominal ultrasound showed an ominous image of jejunal-jejunal intussusception, 7 cm long, without signs of malrotation. The invaginated loop ended with a "cauliflower" image with the dimensions of

2.6 by 2.5 cm. Enteral Magnetic Resonance Imaging confirmed ultrasound description. He successfully underwent laparoscopic resection with a loop enterotomy and polyp removal. Histopathology of resected part is pending. An esophagus-gastro-duodenoscopy confirmed jejunal villi atrophy. An ancillary finding was left cryptorchidism.

CONCLUSION

The incidence of CI is about 3% of all cases of intussusception in children aged under one year, and approximately 10% of children over that age [2]. An underlying pathological cause of intussusception can be identified in 1.5-12.0% of cases [3]; these include Meckel's diverticulum, polyps, duplications, mesentery cysts, intestinal hematoma, and lymphoma [4]. Our case highlights the importance of considering CI, though rare, as a cause of faltering growth in young children with prolonged abdominal symptoms. Chronic intussusception is rare but should be in the list of causes of poor growth or weight loss in young children, especially those with prolonged vague abdominal symptoms.

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ABS 14

SUPRAVENTRICULAR TACHYCARDIA: IS IT A RISK FACTOR FOR NECROTIZING ENTERO-COLITIS?

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INTRODUCTION

Necrotizing enterocolitis (NEC) is a gastrointestinal emergency in Neonatal Intensive Care Units (NICUs). Its pathogenesis is incompletely understood, and it is considered a multifactorial disease. Supraventricular tachycardia (SVT) is the most common pathological tachycardia in newborns. Recent data in the literature suggest a possible association between these two entities.

CASE REPORT

We report a case of a 29^{+6}-week preterm infant delivered by cesarean section. Apgar score was 7 at 1 minute and 8 at 5 minutes. Birth weight was 1.38 kg, appropriate for gestational age (AGA). The pregnancy was marked by twin-to-twin transfusion treated by laser therapy *in utero* and complicated by the death of one twin before birth. At birth, he was admitted to NICU due to prematurity and received ventilation support for 21 days. On the day of life 16, he had a recurrent episode of SVT of 300-390 bpm, initially self-limited or responding to vagal maneuvers. Echocardiogram revealed a structurally normal heart with good function. He started a pharmacologic therapy with flecainide and remained hemodynamically stable with good perfusion and oxygen saturations throughout episodes of SVT. On day 17, bloody stools and abdominal distension were noticed. In the suspicious of an initial stage of NEC, antibiotics and parenteral nutrition were started. Therapy was switched to amiodarone since the oral assumption was not possible. An abdominal x-ray was performed, without evidence of intestinal pneumatosis. Surgical treatment was not necessary, and a conservative approach succeeded in control the progression of NEC to an advanced stage. He was dismissed after 59 days in good condition with antiarrhythmic therapy.

DISCUSSION

We presented a case of a preterm infant with recurrent episodes of SVT, who developed an initial stage of NEC on day of life 17. NEC is a devasting disease of newborns, especially if premature, with a high mortality rate. It is considered a multifactorial disease, but the exact etiology of NEC remains unclear. Prematurity, enteral feeding, intestinal hypoxia-ischemia, and bacterial colonization are considered significant risk factors. SVT is the most frequent tachyarrhythmia in children. The association between NEC and SVT had been previously described in six case reports in the literature. Recurrent episodes of the SVT can lead to insufficiency in mesenteric flow with subsequent intestinal ischemia and reperfusion injury. Authors suggest that NEC can occur in infants affected by TPSV also without evidence of a significant hemodynamic compromise.

CONCLUSION

Our case and recent reports in the literature suggest that SVT could be a risk factor for the development of NEC. Intestinal ischemia due to SVT could have a role in causing NEC. If SVT could have a

causative role in NEC or could be only associated is an issue which is currently being discussed.

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ABS 15

DRESS IN AN EPILEPTIC BOY

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INTRODUCTION

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) is a rare potentially life-threatening drug-induced reaction, often linked to anticonvulsants (carbamazepine, phenytoin) with a latency of 2 to 8 weeks from drug exposure. The clinical presentation involves: skin rash (morbilliform rash of face, trunk and extremities that progresses to a diffuse, confluent, infiltrated erythema with following exfoliative dermatitis); facial oedema; mucosal involvement (mouth or pharynx), systemic symptoms (asthenia, fever, lymphadenopathy), visceral involvement (liver, kidneys, lungs), laboratory abnormalities (eosinophilia, atypical lymphocytes). We present a case of a DRESS in an 8-year-old boy.

CLINICAL CASE

He has been treated for a Rolandic epilepsy with carbamazepine for 6 weeks. He came to ER for asthenia, an erythematous rash of face, neck, extremities with tongue disepithelization and facial edema. Laboratory tests showed: mild-moderate renal insufficiency (estimated glomerular filtration rate 55 ml/min) with non-nephrotic pathological proteinuria, C-reactive protein 2.67 mg/dL; ANA, ANCA, complement, immunoglobulins, microbiological tests were negative; liver function tests, ECG, renal ultrasound were normal. A staphylococcal infection complicated by *Staphylococcus* Scalded Skin Syndrome has been considered; therefore, amoxicillin-clavulanate was started, then shifted to clindamycin after twenty-four hours. Forty-eight hours later, he showed a worsening clinical status with confluent rash-erythema on the face, back, abdomen and lower limbs, worsening asthenia, and persistent renal failure. A DRESS was then considered: carbamazepine was stopped, and antihistamine drugs were started. After twenty-four hours, erythema improved with desquamation of previous skin lesions, general conditions, and renal function tests improved as well. EEG was negative for active epileptic abnormalities. The patient was discharged with midazolam as needed. After 3 weeks, rash and renal failure disappeared without epileptic seizures.

CONCLUSIONS

The large variability of clinical symptoms and signs makes a true diagnosis of DRESS difficult. It has to be suspected in case of: typical rash, hematologic abnormalities, and systemic symptoms in a patient treated with a high-risk medication in the previous 2 to 6 weeks. The diagnosis could even be made without one of the typical symptoms. Treatment consists of drug withdrawal and symptomatic therapy (antihistamines and corticosteroids). Aromatic antiepileptic drugs could be replaced with valproic acid.

ABS 16

PLACENTAL HISTOPATHOLOGY OF DICHORIONIC DIAMNIOTIC TWIN PREGNANCIES IN RELATION TO INTRAUTERINE GROWTH RESTRICTION AND PERINATAL OUTCOME

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INTRODUCTION

Dichorionic diamniotic twin pregnancy is known to be associated with increased risk of complications and with assisted reproduction technology (ART). The evaluation of placental histopathology could

explain the high incidence of intrauterine growth restriction (IUGR) and small for gestational age (SGA) babies, preterm delivery and placental ischemic lesions. We aimed to compare differences in placental histopathology lesions and perinatal outcome in dichorionic-diamniotic (DCDA) pregnancies.

METHODS

In our study, we compared all DCDA pregnancies (IRCCS Ospedale Policlinico San Martino) from December 2016 to April 2019. These pregnancies were followed-up until delivery, and all the placentas were examined following our standard checklist, analyzing macroscopic and microscopic characteristics of the disc, cord, and membranes.

RESULTS

28 pairs of twins were included in the study (MM: 8; FF: 12; MF: 8). Mean gestational age was high (35.1 ± 4.9; min: 25, max: 55). Almost half of the cases were due to ART (IVF: 3, ICSI: 6, IUI: 1, egg donation: 2). In each pair of twins, significant discordance was observed in weight (grams) (2,486.8 ± 427.6 vs. 2,206.4 ± 460.8; $p < 0.0001$) and in head circumference (centimeters) (32.8 ± 1.7 vs. 32 ± 1.9). No differences were appreciated for length, APGAR, or clinical outcome. Males showed a higher birth weight, but females were located in the upper centile for gestational age. Otherwise birth weight wasn't related with placental characteristics, such as thickness and weight of disc, length and diameter of umbilical cord, knots of umbilical cord, cord insertion and placental membranes (translucency, color, insertion), fetal placental surface, presence, severity and extent of acute inflammation of cord, membranes and/or fetal surface, villous development in relation to the stated gestation, villous ischemia and infarctions or chronic inflammation. The smaller twin placentas were strictly associated with cord velamentous insertion (4 vs. 1). Anthropometric data were the same for a different type of placentas (fused or separated).

CONCLUSIONS

Our population confirms an advanced maternal age and high incidence in ART pregnancies. Gestational age is low and weight is discordant between pairs of twins and single birth. There are differences in weight and head circumference with a weak correlation with sex. Placentas have not shown specific pathology pattern, but frequently adaptive-compensatory alterations. Cord velamentous insertion, an obstetric high-risk condition, is strictly associated with low weight birth and underscores the need for prenatal detection and increased surveillance in these pairs of twins.

ABS 17

RETROSPECTIVE STUDY INVESTIGATING THE MANAGEMENT OF PATENT DUCTUS ARTERIOSUS IN NEONATES BORN BEFORE 28 WEEKS OF GESTATIONAL AGE: THE CAGLIARI EXPERIENCE

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INTRODUCTION

We took part in a multicentric retrospective study involving 14 Italian third-level Neonatal Intensive Care Units; thus, we provide preliminary results regarding the Cagliari experience. The project aimed to investigate the management of hemodynamically significant Patent Ductus Arteriosus (hsPDA) comparing groups of premature belonging to different gestational ages (GA).

MATERIALS AND METHODS

We retrospectively enrolled n = 18 neonates (23^{+0}-28^{+6} w of GA), born from January 2014 to December 2017, and receiving ultrasound diagnosis of hsPDA (left-right shunt, left atrium/aortic root > 1.3, PDA diameter > 1.5 mm).

- N = 14 females (77.7%), n = 4 males (22.3%); n = 7 twins (38.89%).
- Average BW 769.67 g, average GA 26^{+2} w.
- N = 4 neonates GA < 25 w and n = 14 GA ≥ 25 w.

After birth, all newborns presented respiratory distress syndrome; 88.9% received surfactant, 11% nitric oxide, 50% steroids, 22.2% dopamine, 27.78% dobutamine. For each newborn, we collected all prenatal, perinatal and postnatal parameters, PDA treatment with ibuprofen (IBU), paracetamol (PARA) or indomethacin (INDO) and, for each drug, number of cycles, time of start, outcomes, time of closure, reopening or needs of surgical closure. Contraindications to IBU use were: bleeding, thrombocytopenia, renal failure. Each cycle of treatment was represented by: IBU 10 mg/kg followed by 5 mg/kg after 24 and 48 hours;

INDO 0.2 mg/kg/12 h for 3 total doses; PARA 15 mg/kg/6 h for 3 days.

RESULTS

- HsPDA diagnosis occurred at an average of 141.78 h of life.
- N = 10 neonates (55.56%) obtained PDA closure at an average age of 68.3 days.
- N = 8 patients did not achieve PDA closure (44.4%): n = 2 died (11.1%) at an average age of 12.5 days; n = 6 neonates maintained hsPDA (33.3%).
- No one required surgical ligation.

Treatment details:

- N = 8 patients could start IBU as the first choice: n = 1 died; n = 2 underwent PDA closure after the 1st cycle; n = 3 PDA closure after 2nd cycle; n = 3 maintained hsPDA.
- N = 10 patients could not start IBU due to contraindications: n = 6 with GA ≥ 25 w (42.86%), n = 4 with GA < 25 w (100%).

Therefore, n = 10 started treatment with PARA: n = 1 died; n = 1 PDA closure after 1st cycle; n = 2 closure after 3rd cycle.

N = 2 maintained PDA after 2-3 cycles of PARA and 1 cycle of IBU.

N = 2 PDA reopening after 3 cycles of PARA, closure after 1-2 cycles of IBU.

N = 1 required 1 cycle of IBU, 2 cycles of PARA, and 1 cycle of INDO.

Results according to GA:

- In GA< 25 w, n = 4 neonates (100%) started with PARA and underwent failure of the 1st cycle; n = 3 did not close PDA after the 2nd cycle (75%).
- In GA ≥ 25 w, failure rate after the 1st cycle of PARA (83 %) was higher than IBU (75%). Globally, 1st cycle (IBU or PARA) failed in 78.6% and 2nd in 50%.

CONCLUSIONS

Despite the small sample, our results highlight the higher tendency, for neonates with GA < 25 w, to show contraindications to the use of IBU and therapeutic failure.

In the future, we hope that PDA treatment will be adapted to neonatal features.

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ABS 18

PERSISTENT LEFT SUPERIOR VENA CAVA WITHOUT RIGHT SUPERIOR VENA CAVA IN A NEWBORN

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BACKGROUND

Persistent left superior vena cava (PLSVC) is the most common congenital abnormality of the thoracic systemic venous drainage. The majority of patients with PLSVC have an intact right superior vena cava (RSVC). In rare circumstances, the right anterior cardinal vein regresses during fetal development, resulting in absent RSVC associated with PLSVC; fewer than 100 cases have been reported in the world literature in patients with situs solitus. This rare variation can be associated with other cardiac malformations (atrial septal defects, endocardial cushion defects, and tetralogy of Fallot), but in most cases, it is observed in patients without other congenital heart diseases. Here we report a case of a newborn with PLSVC and absent RSVC.

CASE REPORT

F. is a newborn female of 38 weeks of gestational age, born by cesarean section due to a previous one. Pregnancy was characterized by maternal obesity, cystitis, and edema. At birth, she reported an Apgar score of 9-10 and cyanosis since the fourth minute of life that required oxygen with a mask for 15 seconds. Morphological ultrasonography in the second trimester showed the absence of RSVC associated with PLSVC. Ultrasonography during the third trimester did not show pathological cardiac findings. Echocardiography performed in the first day of life showed: absence of RSVC, presence of LSVC, and patent ductus arteriosus (PDA). Electrocardiography was normal. PDA closure occurred 2 days after birth. No other pathological findings were observed. F. maintained good peripherical saturation values and good growth, stable hemodynamic parameters. In the sixth day of life, echocardiography confirmed the heart anomaly.

DISCUSSION AND CONCLUSION

In patients with PLSVC without RSVC, all the blood from the upper part of the body drains via the LSVC, without any significant hemodynamic consequences. Surgical correction or other treatment are not required. However, it is still important to recognize this condition, particularly if a surgical procedure is planned. Placement of central venous catheters and pacemakers could be difficult in these patients together with a compromising performance of coronary artery bypass grafting and other cardiac surgeries.

ABS 19

TRAUMATIC OPEN GLOBE INJURY IN A CHILD: A CASE REPORT

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BACKGROUND

Ocular trauma (OT) in children remains a significant cause of visual morbidity. Its incidence varies from 8.85 [1] to 15.2 [2] per 100,000 per year. Globally, there are 3.9 million people with bilateral low vision or blindness from ocular trauma and more than 18 million with unilateral visual impairment. [3] Open globe injury (OGI) is the most severe type of OT. The main complications are amblyopia, endophthalmitis, retinal detachment, vitreous hemorrhage, corneal opacities, and sympathetic ophthalmia, a rare condition caused by an autoimmune response, which leads to granulomatous panuveitis [4]. We describe a case report of OGI in a five-year-old male.

CASE REPORT

He was admitted to our emergency department for OGI. At home, he was hit by a shard of a glass of a Prosecco bottle which fell to the ground and unfortunately burst against his face. The ophthalmologic evaluation showed: blind eye, markedly hypotonic bulb for a large corneal-scleral wound that extended posteriorly to the limbus up to the insertion of the medial rectum in the nasal sector. Iris was damaged with uvea prolapse. Surgical intervention was performed with corneal and scleral suture and repair of all of the right eyelid margin. After surgery, a Computerized Tomography of the globe was carried out without finding signs of foreign bodies. Intravascular antibiotic prophylaxis with vancomycin and cefazoline was started together with endovenous steroids. Five days after surgery, a globe ultrasound was performed: normal bulbar morphology and normal observable retina were shown. After one week, an initial resumption of color vision was reported by the child; an initial corneal opacity was shown. Future surgery interventions are needed. An ancillary anamnestic datum was the fact that his grandfather reported traumatic OGI and completely lost vision and globe.

CONCLUSION

The incidence of OGI counts for 2-3/100,000 and requires urgent primary globe repair to close the wound, remove intraocular foreign bodies, and reposition of prolapsed tissue [4]. Ocular anatomy maintenance and infection prevention are the two most important initial goals. In our patient, a prompt intervention was needed to preserve his vision as much as possible. A follow up is required to identify sympathetic ophthalmia.

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ABS 20

A QUALITY IMPROVEMENT INTERVENTION TO DECREASE HYPOTHERMIA IN PRETERM NEONATES

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INTRODUCTION

Neonatal hypothermia is an important risk factor for mortality and morbidity and is common even in temperate climates.

OBJECTIVE

To reduce the incidence of hypothermia (admission temperatures < 36°C) in very low birth weight

(VLBW) neonates using multi-intervention quality improvement (QI) initiative.

STUDY DESIGN

We conducted a multi-intervention QI initiative to reduce hypothermia (admission temperatures < 36°C) among preterm VLBW (< 1,500 g birth weight) neonates born at AOU Federico II of Naples. The QI project was conducted in three periods: period 1, traditional thermal care, including polyethylene wraps and wool cap or polyethylene cap at birth; period 2, during admission to the Neonatal Intensive Care Unit (NICU) by monitoring temperature; and period 3, after 1 h from the birth, by monitoring the temperature. Statistical analysis included t-student and logistic regression as appropriate.

RESULTS

In our cohort of 46 patients, baseline characteristics were comparable in the three periods. The temperature on admission to the NICU was significantly higher combining more thermal containment devices, such as plastic bag and cap, regardless of the material of the cap (wool or polyethylene cap). For neonates, especially preterm, plastic wraps combined with other environmental heat sources are effective in reducing hypothermia during stabilization and transfer within the hospital. There was no patient with a temperature of > or = 37.5°C.

CONCLUSION

A concerted QI approach improved admission temperature in VLBW neonates, 7-8 with more neonates in the euthermic range, without increasing the risk for hyperthermia. Such an approach could be associated with improved outcomes in this population.

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ABS 21

THE CURIOUS CASE OF AN UNPLANNED OUT-OF-HOSPITAL BIRTH OF A NEWBORN WHO WAS ABANDONED AFTERWARD IN A GRAVEYARD

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BACKGROUND

Unplanned out-of-hospital births count for 0.19-0.61% of all deliveries and are associated with increased perinatal morbidity and mortality. A higher risk of hypothermia, infection, hypoglycemia, and death is associated with them. We present the case of a newborn who was abandoned alive in a graveyard.

CASE REPORT

A male newly-born baby has been accidentally found crying in a bag near the wall of a graveyard in Rosolina town. He was undressed, covered with blankets, intact cord and placenta; an old lady called the emergency team. After 10 minutes or so, an emergency team with a doctor and a nurse came to rescue the infant; he was placed over the chest of the nurse and transferred to the near Adria Hospital. Vital signs and first medical examination were as follows: skin temperature 34°C, HR 132/min, RR 45/min, SpO_2 98%, glucose POC test 62 mg/dL, cyanotic extremities, good reactivity; cardiac, chest and abdomen physical examination were negative. BW was 2,700 g, L 46 cm, HC 33.5 cm. According to Ballard score gestational age was 37 weeks. He was placed in an incubator, and, gradually, his temperature became normal after 1 hour. Ampicillin, gentamicin, hemorrhagic and ocular prophylaxis, hepatitis B vaccine, and hepatitis B immunoglobulins were given. His hospital stay was remarkable for jaundice only, treated with phototherapy. Blood gas analysis, CRP, blood culture, and routine blood exams were within normal limits; TORCH, HIV, HCV, HBV, VDRL antibodies were negative. ECG showed transient myocardial ischemia, normal 5 days later; cardiac ultrasound normal. At 24 days of life, his weight was 3,610 g and he was given to a young couple.

DISCUSSION AND CONCLUSION

The management of out-of-hospital births mainly requires temperature and infection control, and a prompt and effective call for help. 118 needs to be called whenever birth takes place on an ambulance, on a ship, at home, or in the environment. Anesthesiologist, pediatrician/neonatologist, midwife and gynecologist need to be called whenever

birth takes place in a hospital (e.g., emergency room) but not in the delivery room! Whenever birth takes place outside the delivery room, hypothermia is very frequent. Therefore, drying the newborn, covering him with warm sheets, closing windows, and using incubator as soon as possible is very important. A glove filled with warm water and the bare chest of the mother is good initial transient solutions to keep the newborn warm. In our case report, a further issue to be discussed is the social one. Abandoned newborns in Italy count for 3,000 per year (1/1,000), 73% are children of Italian mothers, mainly between 20-40 years of age, 6% of adolescent mothers. Only 400 are born in the hospital. Three main actions need to be improved according to the Italian Society of Neonatology: 1) anonymous hospital delivery; 2) domicile assistance; 3) "haven baby boxes or baby hatch", i.e., a crib outside the hospital which can receive an unwanted baby.

ABS 22

IS RENAL SCINTIGRAPHY ACCURATE ENOUGH TO DIAGNOSE CONGENITAL SOLITARY KIDNEY? EVALUATION OF PRELIMINARY DATA

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INTRODUCTION

Congenital anomalies of the kidney and urinary tract (CAKUT) are the predominant cause of end-stage renal disease (ESRD) in childhood. One important condition in the spectrum of CAKUT is the solitary functioning kidney, which can be congenital (congenital solitary functioning kidney [CSFK]) or acquired after unilateral nephrectomy in childhood. Because of the implementation of routine fetal ultrasound screening in most developed countries, patients with a CSFK are increasingly identified before birth [1]. This identification does not only imply that clinicians will be more often confronted with questions regarding the prognosis of this specific condition, but also that these children can be clinically monitored from birth onward. We propose to obtain renal scintigraphy within 6 months of life and to repeat it in adolescence to compare renal function.

For a definitive diagnosis of a CSFK, renal scintigraphy is suggested as being the gold standard of ruling out ectopic functioning renal tissue, possibly missed by ultrasound [2]. The secondary aim is to detect the amount of functioning renal cortical tissue through images taken with a gamma camera approximately two hours after radiopharmaceutical injection, in order to obtain a baseline value.

A radionuclide scan is the most useful tool for the detection of focal renal parenchymal abnormalities and the differential assessment of renal function between the two kidneys. We use 99mTc-MAG3 as a radiotracer. Following intravenous (IV) injection, MAG3 is taken up by tubular cells with only a minimal amount excreted in the urine, so the tracer accumulates over several hours within the tubule, providing an image of functioning nephrons. The minimum age at which a MAG3 scan should be performed is one month since at this time a complete renal maturation is achieved. Renal scintigraphy with 99mTc-MAG3 can provide excellent image quality even in the presence of severely decreased renal function. However, the quality of both dynamic and static radionuclide scans improves with renal maturity; the radiation dose given to the patient is 0.5-0.6 mSv.

The purpose of this study was to evaluate renal scintigraphy precision in comparison with ultrasonography on a large cohort of a CSFK.

We conducted a retrospective study of our CSFK cohort, collecting laboratory and imaging data.

RESULTS

Our preliminary results showed that renal scintigraphy was performed at a mean age of 25.8 months. The mean value of Tubular Extraction Rate (TER) was 64 ml/min.

CONCLUSIONS

Further research is needed to assess the correlation of renal scintigraphy in comparison with ultrasonography renal length and kidney function test. So, waiting for our definitive data, we would recommend repeating renal scintigraphy if there is not an evenness between ultrasonography and laboratory results.

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ABS 23

OVERVIEW OF SOLITARY FUNCTIONING KIDNEY: ANALYSIS OF SARDINIAN POPULATION

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INTRODUCTION

Solitary functioning kidney (SFK) is the anatomical or functional absence of one kidney. The natural history of SFK has never been fully outlined: challenges remain in distinguishing patients with a higher risk for renal injury. Therefore, opinion-based recommendations for monitoring have been issued, but a consensus is lacking. The purpose of this study is to analyze the clinical characteristics of Sardinian patients with SFK. The secondary aim is to evaluate the presence of risks factors for renal injury, that were recently described in the literature [1-3] in order to establish a closer follow-up concerning the prognosis.

POPULATION STUDY

We performed a retrospective cohort study by collecting data from clinical charts. To be eligible for the study, patients had to have a US documenting SFK, then confirmed by 99mTc-MAG3 scintigraphy. Family history, demographic, clinical, imaging, and laboratory data were recorded at baseline and during follow-up.

RESULTS

We evaluated 180 children with SFK (congenital SFK 97.2%; acquired SFK 2.8%). Most of the patients had been diagnosed prenatally (52.2%, median gestational age 23.5 w) or postnatally within the sixth month of life. 13.8% of the children have ipsilateral CAKUT: this is associated with a higher possibility of UTI, ruled out to be a cause of secondary renal injury. 6.6% of these patients were administered antibiotic prophylaxis for a mean duration of 1.3 years. 13.9% of the patients had a history of UTI, a condition associated with end-stage renal disease (ESRD) as outlined before. 1.8% and 8.8% of the patients presented birth weight < 2,500 g and prematurity, respectively. Renal hypertrophy was present at birth in 42.7% of patients. Insufficient renal hypertrophy is considered an independent risk factor for renal injury. Mean values of creatinine and cystatin C were 0.55 mg/dl and 1.11 ng/dl at baseline (median age of 63.5 months) and 0.54 mg/dl and 0.88 ng/dl at follow-up. ($p < 0.5$), respectively. There was a concordance between serum creatinine, cystatin C, and TER scintigraphy. The mean duration of follow-up was 15 years, and the whole population was free from renal injury.

DISCUSSION

In literature, type of SFK and prenatal diagnosis were not shown to be independent risk factors for the development of renal injury. We want to emphasize the lifelong need for regular follow-up (laboratory tests for kidney function, urinary analysis, and blood pressure measurement) in patients with an SFK. The proposal is a semestral revaluation in children < 1 year and an annual examination in children > 1 year. The same regimen could be applied every 2 years for children > 5 years and in adulthood.

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ABS 24

USE OF VACUUM ASSISTED THERAPY IN LLA INFANT WITH ECTIMA: A CASE REPORT

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INTRODUCTION

Acute lymphoblastic leukemia (ALL) in infants younger than 1 year is biologically different from ALL in older children and is characterized by genetic rearrangements (MLL gene) and worst outcome. Serious infectious events during chemotherapy are frequent due to the relatively immune system's immaturity and drugs effects.

CASE REPORT

A 2-month-old male with fever, trilinear cytopenia, and blasts in peripheral blood smears was admitted

to our hospital. He was in a good clinical condition, no hepatosplenomegaly, no lymphadenomegaly. No ongoing infections. We diagnosed a pB ALL MLL germline, SNC2, no evidence of other genetic rearrangements, no evidence of extramedullary involvement. After placement of a central venous catheter, the child started the treatment with glucocorticoids pre-phase according to the Interfant-06 protocol. During this phase, he showed increasing irritability, refusal of eating, septic fever, associated with a phlegmon at the site of previous bone marrow aspiration puncture. Empirical antibiotic therapy with ceftazidime, amikacin, and fluconazole was immediately started after performing blood cultures and swabs. *E. coli* was isolated from blood and skin lesion. Next, the patient required admission for intensive care in NICU for bilateral pneumonia associated with coagulation disorders and hyperlipidemia related to chemotherapy. During the hospitalization, the lumbar wound increased in width and depth with necrosis and loss of tissue. We added local packs with Dalibour water + nadifloxacin + amikacin. After 10 days, the necrosis got worse. After performing an escharotomy, we placed a Vacuum-Assisted Closure (VAC) device for 5 weeks with the cooperation of dermatologist. The wound showed a progressively-good evolution, and it was necessary only to proceed with a late suture. Chemotherapy was modulated according to clinical conditions, and the child obtained complete remission at the end of induction. Now, after two years, the patient is completing maintenance treatment, we had a full recovery of skin and subcutaneous tissue of the presacral region without signs of the previous lesion.

CONCLUSIONS

VAC therapy is largely used in adults, and its application in children is less frequent and mainly post-surgical. In our patient, the combined use of VAC with systemic and local therapy allowed complete healing without scars. The multidisciplinary approach helped us to manage a useful device considering the limited experience of its application in pediatrics.

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ABS 25

CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT (CAKUT): POSTNATAL MANAGEMENT OF URINARY TRACT DILATION

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Congenital anomalies of the kidney and urinary tract (CAKUT) are a heterogenic group of malformations resulting from defects in the morphogenesis that occur at the level of the kidney (hypoplasia and dysplasia), collecting system (hydronephrosis, megaureter, double collecting system), bladder (ureterocele and vesicoureteral reflux) or urethra (posterior urethral valves). They are the most common kind of malformations at birth, involving 3-7 out of 1,000 live births, and the responsible of the majority of pediatric end-stage renal disease (ESRD) cases [1].

The pathogenesis of CAKUT is based on the disturbance of normal nephrogenesis, secondary to environmental and genetic causes. Often CAKUT is the first clinical manifestation of a complex systemic disease, so an early molecular diagnosis could help the physician to identify other subtle clinical manifestations, significantly affecting the management and prognosis of patients [2]. Prenatal diagnosis with ultrasound (US) of CAKUT has had an important role in improving the natural history of these diseases. Usually, the first evaluation of urinary tract dilation (UTD) is performed between 16-27 weeks of gestational age and at 28 weeks and, based on the findings. We stratify the patients into a low-risk group (UTD A1) and an increased risk group (UTD A2-3) (diagram 1) [3]. The management of UTD is medical more than surgical: in the increased risk group we start after birth antibiotic prophylaxis (amoxicillin 20-25 mg/kg/die in a single dose) to prevent urinary tract infections (UTIs), and we perform regular follow-up in nephro-urologic unit care. Further imaging is based on results of US: micturating cystourethrogram (MCUG) should be done to rule out the vesicoureteral reflux (VUR) if severe hydronephrosis is seen in the US. Diuretic renography with 99mTc-labelled mercaptoacetyltriglycine (MAG-3) or 99mTc-labelled diethylenetriamine pentaacetic acid (DTPA) should be performed to detect functional aspects of the kidneys [4]. Neonatal markers of

renal function that are used as prognostic indicators of post-natal progression of chronic kidney disease (CKD) included serum creatinine (SCr) cystatin C (CysC) and glomerular filtration rate (GFR) [5]. CysC values within first days of life: 1.64-2.59 mg/L; > 12 monts of life: 0.6-1 mg/L. Surgical intervention may be necessary for children with persistent VUR, renal scarring, or recurrent febrile UTIs. Surgical correction involves preferably endoscopic, laparoscopic, and robotic approach [6]. In children with CAKUT, a prolonged follow-up is essential as decades may pass between the first renal injuries and development of ESRD. An individualized approach is needed based on the severity of the disease with close follow-up of renal function in order to prevent and slow the progression of CKD. It is of the utmost importance to organize multidisciplinary management in the approach to the children with CAKUT and to follow them in the transition to adulthood [6].

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ABS 26

BAD PLACENTA, BAD BRAIN: MATERNAL CHORIOAMNIONITIS ASSOCIATED WITH PRE-TERM DELIVERY AND INTRAVENTRICULAR HEMORRHAGE

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INTRODUCTION

Chorioamnionitis (CA) is a perinatal condition characterized by the presence of inflammatory cells in the fetal membranes (chorion and amnion). The leading causes of CA are ascending bacterial infections from the maternal birth canal, while viruses and fungi are less involved. The relationship between maternal CA and neurodevelopmental outcomes in newborns has become a topic of growing interest in recent year. Several studies suggested that CA is associated with an increased incidence of brain injuries, including severe intraventricular hemorrhage (IVH), periventricular leukomalacia (PVL) and cerebral palsy (CP).

CASE REPORT

We report a case of a 27 weeks infant born prematurely due to premature rupture of membranes (PROM). Apgar score was 7 at 1 minute and 8 at 5 minutes, and birth weight was 1,000 g, appropriate for gestational age. The mother had severe CA with smelling amniotic fluid at birth. The baby was promptly admitted to the Neonatal Intensive Care Unit (NICU) due to prematurity and respiratory distress, and he received non-invasive ventilation support for 17 days. Then, he experienced sepsis requiring intubation and double antibiotics therapy (meropenem and teicoplanin) for 7 days. Infectious investigations in the mother during pregnancy (TORCH, HIV, HBV, HCV, VDRL, TPHA) and in the newborn at birth resulted negative. Abdomen and cardiac echography were normal. Echoencephalography showed a right intraventricular-hemorrhage (3rd grade) with signs of resorption, right ventricular dilatation, and a massive parietal-occipital periventricular venous infarction. Gradually, the newborn presented a tri-ventricular posthemorrhagic hydrocephalus, cystic leukomalacia, and intracranial hypertension. Therefore, on day of life 28, the infant was transferred to the Neurosurgery Department to receive ventricular drain. Histological analysis of placenta was also performed. Macroscopically, the fetal side of the chorionic plate of the placenta (2,338 g) was yellowish and opaque. The membranes also looked opaque. Histology of placenta samples showed the presence of severe CA associated with vasculitis and intravascular thrombosis in the umbilical cord vessels.

CONCLUSION

There is emerging evidence for a placental role in prenatal neurodevelopmental programming. Maternal insults will impair placenta micro-environment and disrupt fetal brain development resulting in the fetal programming of neuro-developmental disorders. Our case lays stress on the relevant role of placenta histological study for a better understanding of the adverse fetal outcome.

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ABS 27

USE OF ACID SUPPRESSIVE DRUGS IN CHILDREN AND ADOLESCENTS: A SINGLE CENTER EXPERIENCE

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INTRODUCTION

Acid suppressive drugs (ASDs) include histamine receptors antagonists (H2RAs) and proton pump inhibitors (PPIs), which have different pharmacological properties; accordingly, H2RAs are used to treat acute diseases, while PPIs are generally preferred for prolonged treatments. In childhood, ASDs' main indications are gastroesophageal reflux disease (GERD), gastritis, peptic ulcer, *H. pylori* infection, PPI-responsive esophageal eosinophilia, caustic and foreign body ingestion, prophylaxis of stress-induced and drug-induced gastropathy.

OBJECTIVE

To assess retrospectively ASD use in a population of hospitalized children and adolescents, and in particular, indications, dosage, duration of treatment, and side effects of these drugs.

METHODS

This observational study included subjects aged > 1 month and < 16 years, who were admitted to our Pediatric Clinic between 1st January 2016 and 31st December 2018, and treated with ASDs. Subjects admitted to hospital with an ongoing ASD therapy were excluded. Data were collected through clinical records and telephonic interviews. The study population was stratified based on the type of drug used (PPI or H2RA), and child age (< 2 years, 2-5 years, 6-11 years and ≥ 12 years).

RESULTS

Between 2016 and 2018, a total of 461 children were enrolled, of whom 396 (85.9%) were treated with H2RAs and 65 (14.1%) with PPIs. Median age (10 vs. 6 years, $p < 0.0001$), duration of treatment (16 vs. 2 days, $p < 0.0001$) and percentage of patients who continued taking ASDs after discharge (60% vs. 10.2%, $p < 0.0001$) were greater in the PPI-group. In all age groups, the percentage of subjects treated with H2RAs was higher than that of subjects treated with PPIs. Patients under 6 years old were treated almost exclusively with H2RAs (94.7% in < 2 years group, and 96.4% in 2-5 years group), while PPIs were used predominantly in older children (5.3% in < 2 years group, 3.6% in 2-5 years group, 21.3% in 6-11 years group, and 21.7% in ≥ 12 years group). In the treatment of GERD, gastritis, and prevention of drug gastropathy, PPI use was greater than that of the H2RAs (13.9% vs. 1.8%, $p < 0.0001$; 7.7 vs. 0.8, $p = 0.002$; 32.3% vs. 20%, $p = 0.03$, respectively). Unspecific gastrointestinal symptoms were the main indication for H2RA use (n = 264, 66.7%). Side effects occurred more frequently with PPIs than with H2RAs (40% vs. 15%), including constipation (7.6%), diarrhea (4.1%), abdominal pain (1.7%), headache (1.3%) and vomiting (1.3%).

CONCLUSIONS

In our study population, H2RAs were the most widely used ASDs, especially in children younger than 6 years, and had fewer side effects than PPIs. Indications and posology of ASDs were in accordance with international guidelines.

ABS 28

ROTAVIRUS ACUTE GASTROENTERITIS IN HOSPITALIZED CHILDREN: A SINGLE CENTER EXPERIENCE

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INTRODUCTION
Rotavirus (RV) is the most common cause of severe infectious diarrhea worldwide, affecting mainly children under the age of 5 years and causing about 215,000 deaths per year. In the current Italian national vaccination plan, RV vaccination is not mandatory. This study was aimed at examining retrospectively the characteristics of a cohort of children affected by acute rotavirus gastroenteritis (RV-AGE). The impact of breastfeeding and that of RV vaccination were also assessed.
METHODS
The study included all children admitted to our Pediatric Clinic and discharged with the diagnosis of RV-AGE, in the period 2014-2018. Data were collected by clinical records and telephonic interviews. Qualitative data were analyzed by the Chi-square and Fisher's exact tests, while quantitative data by the Student's t-test and Mann-Whitney test. P-values of less than 0.05 were considered statistically significant.
RESULTS
From January 2014 to December 2018, a total of 139 (74 males) children were included, of whom 106 (80.9%) were breastfed, and 4 (4.2%) had been previously vaccinated for RV. The median age was 20.5 months (14-31.5 months) for breastfed children, while it was 26 months (15-58 months) for the remaining children ($p = 0.07$). Vaccinated children had a milder clinical picture and a shorter duration of RV infection compared to those non-vaccinated. The highest number of cases ($n = 76$, 54.7%) was recorded in 2014, followed by 22 (15.8%) cases in 2018, 21 (15.1%) in 2015, 12 (8.6%) in 2017, and 8 (5.8%) in 2016. In 2014 and 2018, the peak of cases of RV-AGE occurred in spring, in 2015 it was recorded in summer, while, in 2016 and 2017, sporadic cases were observed throughout the year. Besides gastrointestinal symptoms, seizures were observed in 4 children, associated with fever in 3 cases. In our series, 19 (13.7%) cases of RV-AGE were nosocomial infections, which were characterized by a more extended period of hospitalization (7 days vs. 4 days, $p = 0.0001$), greater use of medications (antibiotics, corticosteroids, etc. depending on the underlying disease), and less frequent clinical dehydration.
CONCLUSIONS
Our data show the relevance and characteristics of nosocomial RV infections, against which prevention strategies are mandatory. The seasonal variability observed may be explained by climate changes and fluctuating trends of infectious diseases. The breastfeeding was found not to be a protective factor, while RV vaccination was shown to reduce the severity and duration of RV-AGE.

ABS 29

URINARY METABOLOMICS IN TERM NEWBORN RELATED TO NUTRITION AND BIRTH WEIGHT: CLINICAL RECORDS

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INTRODUCTION
Recently, more importance was given to the study of human milk oligosaccharides (HMOs), breast milk's bioactive molecules that are likely to exert several protective functions for newborn's health. A most important feature of HMOs is their production, that is genetically determined and capable to differentiate women according to their phenotype. The presence of 2'-FL in breast milk distinguishes between secretory and non-secretory phenotype and is related to positive outcomes for those who assume it. An exciting approach to understanding this complicated relationship between nutrition and health status of the neonate is the metabolomics analysis. Looking for peculiar metabolites, like HMOs, through metabolomics would help clinicians to predict health outcomes of newborns and tailor their nutrition to fit their needs and prevent the developing of disease.
MATERIALS AND METHODS
Our study aimed to characterize the urinary metabolome of a group of neonates and underline the differences arising from different birth weight and nutrition. We involved 80 term newborns (GA = 39^{+1} w), of which 50 AGA, 15 LGA, and 15 SGA, in these 42 were exclusive breastfed and 38 were partially breastfed, with a percentage of breast milk < 40%. We collected 80 urine sample, through a non-invasive way, and performed the metabolome analysis was by nuclear magnetic resonance spectroscopy (^{1}H-NMR).
RESULTS
Our study did not suggest any differences in urine metabolome corresponding to the different birth weight. However, according to the different diet, it

was possible to observe a separation in two groups: exclusive breastfed and partially breastfed infants with different increased metabolites. The peculiarity was that the most represented metabolites were the one related to the diet: maltodextrin, resulted from formula milk, for the partially breastfed group and 2'-FL for the exclusively breastfed group.

CONCLUSION

To the best of the Authors' knowledge, at present, few studies analyzed the presence of HMOs in the urine. With our study it is possible to determine that the exposure to HMOs is not enough for making them detectable in urine: mixed feeding, with a quantity of < 40% of breastmilk, according to us, is not sufficient. In conclusion, although the pathway that ends with the absorption of HMOs is still unclear, this study represents a significant step forward for the examination of secretory phenotype: performed not on breast milk but on newborn urine.

ABS 30

OCT-4 IS HIGHLY EXPRESSED IN STEM/ PROGENITOR CELLS AND PRIMORDIAL FOLLICLES OF THE HUMAN FETAL OVARY

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Oct-4 (octamer-binding transcription factor 4), also known as Oct-3 or POU5F1 (POU domain, class 5, transcription factor 1), is a transcription factor of the POU (Pit-Oct-Unc) family [1]. It is critically involved in self-renewal of undifferentiated embryonic stem cells [2]. The activity of Oct-4 is essential for the identity of the pluripotential founder cell population in mammalian embryos [3]. During development, Oct-4 is expressed in embryonic stem cells and germ cell precursors. Given the scarcity of studies on Oct-4 expression in the fetal ovary, this study was aimed at analyzing the expression of Oct-4 in the human ovaries during intrauterine development, at different stages of development, in order to identify the ovarian cells in which Oct-4 is mainly expressed during gestation.

In this study, we investigated the expression of Oct-4 in the ovaries of human fetuses during gestation. To this end, the ovaries of 14 human fetuses and newborns, ranging in gestational age from 12 up to 38 weeks of gestation, were formalin-fixed, routinely processed and paraffin-embedded. Paraffin sections were immunostained with an anti-Oct-4 commercial antibody. Oct-4 expression was demonstrated in all the ovaries analyzed. Immunoreactivity for Oct-4 was detected in multiple stem/progenitor cells, including oogonia.

Moreover, Oct-4 was expressed in oocytes, in primordial follicles. In ovarian stem/progenitor cells, Oct-4 was expressed in the nucleus, whereas in oocytes reactivity for Oct-4 was restricted to the cytoplasm. In the initial stages of gestation, the majority of Oct-4-positive precursor cells were detected in the outer cortex. These preliminary data indicate Oct-4 as major player in germ cell differentiation in the human ovary and a putative new useful marker for ovarian stem/progenitor cells. Given the ability of Oct-4 for the detection of ovarian stem/progenitor cells, further studies are needed in order to verify its ability to detect stem cells in adult ovaries.

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ABS 31

CDX2 EXPRESSION IN THE DEVELOPING HUMAN GUT: AN IMMUNOHISTOCHEMICAL STUDY

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INTRODUCTION

The caudal-type homeobox transcription factor 2 (CDX2), is a member of the caudal-related homeobox transcription factor gene family. CDX2 is considered to be a master regulator of intestinal identity: it is essential not only for specification but also for maintenance of intestinal identity during development. In mice, CDX2 expression has been reported to be organ-specific, being expressed throughout embryonic and postnatal life within the nuclei of enterocytes from the duodenum to the rectum. CDX2 also regulates multiple cellular processes, including cell proliferation, cell-cell adhesion, and the acquisition of columnar cell morphology. During embryo rotation, the nascent gut tube has different domains along the anterior-posterior axis. The foregut and hindgut domains of the endoderm are separated by expression of Sox2 and CDX2, respectively. The foregut, which gives rise to the esophagus and stomach in addition to lungs, liver, and pancreas, initially expresses Sox2, which sets up a sharp boundary at the pylorus. Adjacent to this Sox2 boundary is the hindgut, which will give rise to the small and large intestine, marked by CDX2 expression.

AIM

Given the scarcity of data on CDX2 expression in the human gastrointestinal tract, this work was aimed at evaluating CDX2 expression in the human fetal intestine during development.

PATIENTS AND METHODS

CDX2 was evaluated in gut samples from 10 human fetuses and newborns, ranging from 8th to 41st weeks of gestation. Samples were formalin-fixed and paraffin-embedded. Tissue sections were immunostained with anti-human CDX2 Rabbit monoclonal antibody (clone EPR2764Y, Ventana Medical Systems).

RESULTS

At 8 weeks of gestation, immunohistochemistry showed an intense and diffuse nuclear CDX2 staining in all enterocytes.

At 11 weeks, immunostaining for CDX2 showed an intense and diffuse immunoreactivity in all epithelial nuclei.

At 16 weeks, immunoreactivity for CDX2 was intense and diffuse in all epithelial nuclei.

At 41 weeks, immunohistochemistry showed an intense and diffuse CDX2 positivity in all epithelial nuclei.

CONCLUSIONS

In recent years, CDX2 has been introduced in clinical practice as a marker of enterocyte differentiation in the diagnosis of colorectal cancer. Previous data on mice had reported the early expression of CDX2 during gut development, suggesting a role for this transcription factor in the early phases of development, acting as a master regulator of intestinal identity. Our work confirms a major role for CDX2 in early intestinal development in humans, being detected in the nuclei of intestinal precursor, starting from the 8th week of gestation. As a consequence, caution should be taken in considering CDX2 expression simply as a marker of enterocytic differentiation. According to our data, CDX2 should be considered a marker of intestinal identity, expressed by gut epithelium starting from the earliest phases of development.

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ABS 32

PLACENTAL MESENCHYMAL DYSPLASIA IN BECKWITH-WIEDEMANN SYNDROME: A CASE REPORT

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BACKGROUND

Placental mesenchymal dysplasia (PMD) is a rare placental disorder first described by Moscoso et al. in 1991 [1]. Macroscopically, PMD shows placentomegaly, dilated, tortuous, sometimes thrombosed chorionic vessels and cystically enlarged villi admixed with normal villi. Histologic examination reveals a prevalent population of normal villi and interposed enlarged stem villi with varying degree of edema, loose, myxoid or fibromatous stroma, abnormally small, peripheral,

sometimes thrombosed thick-walled vessels and absent trophoblastic proliferation. PMD is frequently associated with Beckwith-Wiedemann syndrome (BWS), although it may be associated with other neonatal disorders, adverse pregnancy outcomes, and maternal complications [2]. BWS is a rare genomic imprinting disorder characterized by an overgrowth syndrome and predisposition to embryonal tumors in infancy. In 2018, the International Consensus Statement on BWS (ICS-BWS) defined cardinal and suggestive features of BWS. Cardinal features include, among others, exomphalos, lateralized overgrowth, and pathology findings such as PMD and adrenal cortex cytomegaly [3]. We report a case of PMD in a female newborn with BWS.

CASE REPORT

A 26-year-old woman, at her first pregnancy, had a preterm delivery of a 1,450 g female newborn at 27 weeks of gestation. Macroscopically, placental disk weighed 459 g and measured 19.5 x 15 x 3 cm. The chorionic vessels were dilated and tortuous. Histologic examination revealed thrombosis of some ectatic chorionic vessels and admixture of normal and pathologic stem villi. Pathologic stem villi were dilated with mild or absent edema, absent trophoblastic proliferation and few, small thick-walled vessels in the abundant fibromatous stroma. The vessels were located peripherally in the villous structure, with thrombosis and recanalization. The gross and histologic findings were consistent with PMD. The newborn died two days after birth. The autopsy showed asymmetric overgrowth of the right part of the body, exomphalos, and diffuse organomegaly. Histologic examination highlighted cytomegaly of the adrenal cortex in the adrenal glands.

CONCLUSIONS

The ICS-BWS establishes that PMD belongs to cardinal features of BWS and underlines the importance of gross and histologic examination of the placenta in the diagnostic work-up of BWS. A score of ≥ 4, based on cardinal and suggestive features, is sufficient to make a diagnosis of classical BWS and does not require molecular confirmation. Cardinal features are more specific than suggestive ones. Hence they weigh 2 points, whereas suggestive features weigh 1 point [3]. In our case, the four cardinal features (PMD, exomphalos, lateralized overgrowth, and adrenal cortex cytomegaly) with a score of 8 were consistent with the diagnosis of BWS, according to ICS-BWS diagnostic criteria.

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ABS 33

OVERVIEW OF FEDERATED FACILITY TO HARMONIZE AND ANALYZE DATA IN COHORTS

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BACKGROUND

Cohorts are instrumental for epidemiologically oriented observational studies. Cohort studies usually observe large groups of individuals for a specific period of time to identify factors contributing to a specific outcome (for instance an illness) and create associations between risk factors and the outcome under study.

OBJECTIVE & DATA COLLECTION IN COHORTS

Here we aimed at performing a narrative review of the literature-pertaining to "federated facility" approaches to harmonize and analyze data in cohorts. Several sets of data might be collected in the context of a cohort study. These might include clinical, biological and imaging data. Data from clinical assessments are comprised of physiological, cognitive, structured or semi-structured interviews

measures and/or computer-based questionnaires. Genetic, transcriptomic, proteomic, metabolomic, epigenetic, biochemical and environmental exposure data can be obtained from the analysis of biological samples [1].

METHODS

Quantitative techniques and specific methodological approaches have been established to build an aggregate knowledge base across multiple studies.

RESULTS

Federated facility is a meta-database system distributed across multiple locations that permits to harmonize data from different sources making them comparable and usable for meta-analyses. Variables can be harmonized using different procedures. The process of harmonization offers the prospect to upturn the statistical power of studies through maximization of sample size, allowing additional sophisticated statistical analyses, and ultimately leading to answer research questions that could not be addressed using a single study.

DISCUSSION

The current narrative review refers to the rationale, challenges faced, and solutions developed, to maximize the advantages obtained from the federated facility of cohort studies. Assembling individual-level data can be a useful venture, mainly when the results of interest are relevant. There are several benefits of federated facility and harmonizing cohorts: integrating harmonized data permits to increase sample sizes, improves the generalizability of results [2-4], ensures the validity of comparative research, provides opportunity to compare different population groups by filling the gaps in the distribution (different age groups, nationality, ethnicity, etc.), facilitates extra proficient secondary use of data, and offers opportunities for collaborative and consortium research.

ACKNOWLEDGMENTS

This work has received funding from the European Union's Horizon 2020 Research and Innovation Programme under the Marie Sklodowska-Curie CAPICE Project grant agreement number 721567.

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ABS 34

TUBULAR ADENOMA OF THE BREAST IN A 15-YEAR-OLD GIRL

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INTRODUCTION

Tubular adenoma (TA) of the breast is a rare epithelial benign tumor, accounting for 0.13-1.7% of all benign breast tumors. It has been mainly reported in young women in premenopausal age. It has no risk of recurrence if completely excised and no risk of progression to carcinoma. TAs are characterized by the proliferation of packed tubular structures, composed of epithelial and myoepithelial cells, surrounded by a small amount of fibrous stroma. Tubular lumina may contain proteinaceous material or mucus. Our study aims to report a case of a 15-year-old girl and to highlight the main differential diagnosis of this tumor.

CASE REPORT

The ultrasound examination revealed a solid oval well-circumscribed hypoechoic nodule of 47 x 24 x 46 mm. At macroscopy, it was firm, yellowish and well-circumscribed. At histology, it was composed by a proliferation of uniform, small, round tubules, without a haphazard distribution, lined by epithelial (CK5+) and myoepithelial (p63+) cells, in a small intervening stroma (CD34+). Eosinophilic material was observed inside tubules.

CONCLUSIONS

The differential diagnosis of a breast mass in a pediatric patient includes fibroadenoma (FA), phyllodes tumor (PT), microglandular adenosis (MGA), tubular carcinoma (TC), atypical hyperplasia (AH), ductal carcinoma in situ (DCIS) and TA. In our case, FA and PT could be excluded since there was only a small amount of stroma accompanying the epithelial proliferation, and the lesion did not show the characteristic leaf-like appearance of PT. The immunostaining for CK5 excluded the diagnosis of AH and DCIS. The presence of myoepithelial cells (p63+) and the absence of the haphazard distribution of tubular structures ruled out the diagnosis of TC and MGA.

Breast tumors in pediatric patients are uncommon. TA, typical of young girls, is very rare. Clinical and radiological evaluation is not able to distinguish TA form the more frequent FA and other benign and malignant entities. Therefore, the correct diagnosis, as shown in our case, relies only on the histopathological and immunohistochemical evaluation of tumor cells.

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ABS 35

PULMONARY CAPILLARY HEMANGIOMATOSIS IN A NEWBORN: A CASE REPORT

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INTRODUCTION

Primary capillary hemangiomatosis (PCH) is a rare disease usually associated with pulmonary hypertension and hemoptysis. It has an overall poor prognosis. PCH is extremely rare in children, and only a few cases with congenital presentation have been described. It has been associated with other congenital abnormalities and autoimmune diseases. PCH is characterized by an uncontrolled proliferation of capillaries into alveolar walls, intralobular septa, pleural and pulmonary interstitium. This study aims to report a case of a 5-day-old girl diagnosed at autopsy with PCH, altered glomerulogenesis, right ureteral agenesis, and left ureteral stenosis.

CASE REPORT

The patient was a female infant born by cesarean section at 36 weeks + 3 days of gestational age after the beginning of deceleration and fetal bradycardia. At birth, Apgar index was 1-7-7. Prenatal history was significant for anhydramnios and an ultrasound picture suggestive for polycystic kidney disease. After birth, the baby showed continuous desaturation, pulmonary hypertension, anuria, and diffuse edema. Despite the therapy, respiratory and renal functions were still unsatisfactory. The small amount of urine produced showed proteinuria, granular casts, erythrocytes, leukocytes, and bacteria. After the progressive worsening of general condition, the patient died. At autopsy, there was a splenization of lungs, which were reddish-brown and showed a higher consistency. Kidneys were enlarged, with no cyst inside. The right ureter was not found, and the left ureter was stenotic. At histology, lungs showed immaturity and a diffuse capillary proliferation inside alveolar walls and pulmonary interstitium. The histological examination of kidneys revealed altered glomerulogenesis and widely dilated tubules filled with hyaline casts.

CONCLUSIONS

Herein we report a case of a 5-day-old female infant with congenital PCH, altered glomerulogenesis, right ureteral agenesis and left ureteral stenosis. PCH is a rare disease, and a congenital presentation is unusual. To the best of our knowledge, only a few cases of congenital PCH have been described. These cases have been associated with heart defects, diaphragmatic hernia, renal, and bladder agenesia. Although the cause of PCH is still unclear, some authors propose hypoxia as a stimulus for capillary proliferation. Renal and pulmonary development are interconnected, and impairment of renal function may cause marked immaturity of the lungs and consequently hypoxia. Furthermore, this study suggests that when a newborn presents with proteinuria and diffuse edema, pediatricians must also consider the hypothesis of an altered glomerulogenesis.

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ABS 36

HYDROPS DUE TO FETAL TACHYCARDIA: A CLINICAL CASE

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INTRODUCTION

Narrow complex supraventricular tachycardia is the most commonly presenting pathological tachycardia in newborns. Often these infants have a circulatory compromise and need an ICU management. Some self-limiting cases have been described. Antiarrhythmic therapy can have good control of heart rate, although drug failure is frequent. A step-by-step approach is essential to diagnose and treat neonatal cardiac arrhythmias. The neonatologist has to know the basic approach for the initial treatment of such tachycardias, especially in tertiary centers.

CASE REPORT

We report a case of a 46,XX neonate, that was born at 35 weeks of GA, Apgar 1-5, by urgent cesarean section due to fetal tachycardia, cardiac failure, and hydrops. At birth, after some spontaneous breathings, there was a cardio-respiratory arrest with prompt endotracheal intubation. First bradycardia and then tachycardia (200-230 bpm) were seen. The newborn was hospitalized in ICU and required FiO_2 0.22. The electrocardiogram showed atrioventricular narrow complex tachycardia, temporarily reversible to sinus rhythm with the diving reflex maneuver. The ejection fraction (EF) was low, and mild abdominal and pericardial effusion was evidenced. Three trials of progressive IV adenosine administration were done with a return to a normal rhythm only for a few minutes. Diuretic therapy and a bolus of cordarone at the dose of 20 mg in twenty minutes and then a maintenance dose was administered. During the following hours, cordarone dose was adjusted because of the reduction of blood pressure and dopamine infusion was started. After about 12 hours, another cycle of adenosine was tried, and three electric shocks of cardioversion were done starting from 1J unsuccessfully. The introduction of digoxin at a dose of 7.5 µg/kg every 12 hours augmented the EF partially during the following hours, alternating period of sinus rhythm and tachyarrhythmia were present with discrete clinical conditions. At 2 days it was decided to transfer the newborn to a highly specialized cardiologic unit to adjust pharmacologic therapy and to effectuate transesophageal atrial stimulation (TAS) in order to control cardiac frequency rhythm and define the final diagnosis of Wolf-Parkinson-White reentrant tachycardia. After one year of pharmacologic washing-out, another TAS study was done to exclude the tachyarrhythmia inducibility, and antiarrhythmic drugs were stopped.

CONCLUSION

Although the majority of neonatal tachyarrhythmias can be resolved with simple maneuvers or antiarrhythmic drugs, sometimes invasive procedures such as TAS are needed. Persistence of tachyarrhythmias for many hours is a life-threatening condition, especially in newborns. Early referral of such clinical cases to a high cardiologic specialized unit can be a life-saving step. We presented this typical and teaching case because it is very useful for all neonatologists.

ABS 37

ADMISSION LABORATORY TESTING ON UMBILICAL CORD BLOOD HELPS TO REDUCE BLOOD TRANSFUSIONS IN VERY PREMATURE INFANTS

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BACKGROUND

Total circulation blood volume is small in extreme preterm neonates (between 40 ml for 500-gram infant to 90 mL to 1,200-gram infant), and opportunities to minimize blood loss in first days of life are more clinically significant. It is well known that phlebotomy loss is one of the major factors associated with increased red cell transfusions in premature and critically ill neonates. In the NICU, one of the largest blood loss usually happens on the first day due to admit laboratory testing (ALT). Opportunity to obtain admission laboratory tests from the otherwise discarded umbilical cord blood (UCB) may be one of the ways to prevent the development of early anemia, thereby avoiding blood transfusion in an otherwise healthy preterm neonate.

AIM

To draw initial laboratory blood tests except blood culture using fetal blood from the cord, thereby minimizing admit blood work volume in infants born at < 30 weeks of gestation.

OBJECTIVE

To compare the need for PRBC transfusions in infants born < 30 weeks of gestation with a similar cohort of neonates whose ALT were not done using UCB.

PDSA CYCLE

Cord blood collection initiated for infants born at < 30 weeks of gestation from January 1, 2019, to June 30, 2019. Complete blood count, differential, blood typing, and direct agglutination test (DAT) were collected simultaneously with cord blood gases collection.

MEASURES (PROCESS AND OUTCOMES INDICATORS)

The study timeline includes 6 months before and 6 months after implementation of the ALT UCB guidelines.

1. Pre-implementation (control) group: 30 infants born at < 30 weeks of gestation between January 1, 2018 and June 30, 2018.
2. Post-implementation (intervention) group: 30 infants born at < 30 weeks of gestation between January 1, 2019 and June 30, 2019.

Primary outcome: number of blood transfusions during NICU admission.

Secondary outcome: age of the first-time transfusion (days).

ANALYSIS/OUTCOMES/RESULTS

There was a significative difference between the intervention group and the controls in the number of transfusions: 1.2 (0.6) vs. 3.0 (0.8) as mean (SD) ($p < 0.001$); again, there was a significative difference between the intervention group and the controls in the day of the first transfusion: 12.2 (1.6) vs. 5.3 (3.6) ($p < 0.0001$).

DISCUSSION

Delay cord clamping, noninvasive bilirubin, and CO_2 monitoring, point-of-care testing are current recommendations of AAP and CPS aiming to minimize blood loss and the need for transfusions in very premature infants. We believe that the use of UCB for admission laboratory testing could be helpful in reducing the number of blood transfusions in this population.

ABS 38

COMPATIBILITY OF DEXMEDETOMIDINE AND TOTAL PARENTERAL NUTRITION AT NEONATAL INTENSIVE CARE UNIT: SINGLE CENTRE EXPERIENCE

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Dexmedetomidine (Precedex®) is a selective alpha2-adrenergic agonist that acts in the brainstem by inhibiting norepinephrine release. It has both sedative and anesthetic properties and causes minimal respiratory depression. Neuroprotective effects of Dexmedetomidine have been reported in various brain injury models. Animal studies showed that Dexmedetomidine provides protection against oxidative stress and inflammatory cytokines, as well as a positive effect on hippocampal neurogenesis, specifically on the maturation of neurons and neuronal plasticity. Data describing its effectiveness in neonatal patients continue to emerge, and simultaneous administration of Dexmedetomidine and total parenteral nutrition (TPN) may be required at Neonatal Intensive Care Unit (NICU).

In the available literature, we found reports of physiochemical compatibility of Dexmedetomidine and standard TPN solutions. However, there is no reported clinical data of their co-infusion in the NICUs. We share our experience of simultaneous infusions (co-infusion) of Dexmedetomidine and TPN in 6 neonates (2 term and 4 preterm infants). All infants were on mechanical ventilation, with minimal to absent oral intake; central lines were used for multiple intravenous medications including narcotics infusions. Dexmedetomidine was started after confirmed suboptimal response to high-dose intravenous narcotics (morphine, fentanyl, midazolam, and phenobarbital). Due to the limited number of central lines ports, Dexmedetomidine was co-infused with lipids-free TPN, with an infusion rate of 0.5-0.7 μg/kg/h, with a maximum rate of 1.2 μg/kg/h. Administration of Dexmedetomidine allowed tapering of other sedative medications and markedly decreased agitation and pain scores. There were no negative effects on the ventilation parameters. No adverse effects were noted during the co-infusion of Dexmedetomidine and TPN.

ABS 39

NOTCH ACTIVATION IN BILIARY ATRESIA

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INTRODUCTION

Biliary Atresia (BA) is a rare progressive cholangiopathy of infancy whose etiology is still unknown. The treatment is surgical by the Kasai operation, and the time of diagnosis is critical, affecting the survival rate with the native liver. Notch 1-2 are spanning transmembrane receptors involved in the formation of bile ducts. Defective Notch signaling pathway causes Alagille syndrome, a congenital intrahepatic ductopenia, while Notch activation has been suggested to promote biliary ductular reactions associated with biliary fibrosis in BA. Aim of the study was to analyze Notch 1-2 in BA infants at the diagnosis compared to controls.

METHODS

Notch 1-2 expression was analyzed by indirect immunofluorescence (IF) and by quantitative real-time PCR (qRT-PCR) in hepatic tissues from BA and non-BA liver biopsies. Serum Notch 1-2 levels were investigated in BA and age-matched controls using commercially available enzyme-linked-immunosorbent assay kits.

RESULTS

IF analysis showed Notch-2 but not Notch-1 increased fluorescence bile duct patterns in tissues from 10 BA compared to 4 non-BA cholestatic controls. Interestingly, Notch-2 fluorescence intensity was lower in 4/5 (80%) BA infants who showed clearance of jaundice after Kasai operation compared to 4/5 (80%) BA infants who required liver transplantation. The IF results were not associated with increased Notch 1-2 gene expression by qRT-PCR assay. Serum Notch-2 levels were not different in 16 BA infants compared to 17 age-matched controls (median value 2.4 vs 2.8 ng/ml, respectively; p = ns). Notch-1 serum levels correlated with age at the diagnosis (r = 0.66): BA infants diagnosed within 65 days of age (age range 39-64 days) had Notch-1 values similar to the controls (< 8 ng/ml), while BA infants diagnosed later than 65 days of age (age range 67-116 days) had Notch-1 values above 14.6 ng/ml ($p < 0.01$).

CONCLUSIONS

Notch signaling pathway is activated in BA livers, but further investigations are needed to clarify its role in BA etiopathogenesis, clinical outcome, and the chance of survival with the native liver. The results of this study suggest new lines of research aimed at exploring Notch signaling blockage as a potential pharmacological treatment for BA.

ABS 40

ACYL-COENZYME A BINDING PROTEIN (ACBP) EXPRESSION IN HUMAN FETUSES

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INTRODUCTION

Acyl-coenzyme A binding protein (ACBP), synonymous for Diazepam binding inhibitor (DBI), is a 10kDa endogenous polypeptide, first described in 1983, which plays a fundamental role in the long-chain fatty acid synthesis and the regulation of insulin release. In experimental animals, ACBP is expressed in all tissues and cell types, where it might act as an intracellular acyl-CoA transporter, with a major role in sphingolipid synthesis. Given the scarcity of immunohistochemical studies carried out in humans, this study aimed to analyze ACPB expression in human tissues during gestation, in order to shed light on the role played by ACBP during human development.

MATERIALS AND METHODS

Tissue samples were obtained from 7 human fetuses' autopsies, ranging in gestational age from 14 to 20 weeks, from salivary glands, liver, lungs, kidney, and heart. Immunohistochemistry for ACBP was performed on 5 micron-thick paraffin sections, utilizing a commercial anti-ACBP antibody.

RESULTS

ACBP immunostaining was detected in all fetal tissues analyzed, with differences from one organ to the next. In salivary glands, ACBP was mainly expressed in intercalated ducts and striate ducts cells; in kidneys, reactivity for ABCP was detected in collecting ducts cells; in the liver, immunostaining was observed in hepatocytes, but not in hematopoietic cells; in the lungs, ACBP was expressed in mesenchymal precursors surrounding branching tubules; in the heart, cardiomyocytes were strongly immunoreactive for ACBP.

CONCLUSIONS

Our preliminary data show that ACBP is highly expressed in human embryos and fetuses, suggesting a major role for this peptide in human development. Moreover, ACBP expression is characterized by a marked variability among the different tissues and the different cell types inside each organ. This finding suggests a previously unreported complexity of the role played by ACBP during human development in human cells.

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ABS 41

STEM/PROGENITOR CELLS IN THE DEVELOPMENT OF THE INTERVERTEBRAL DISC FROM THE HUMAN NOTOCHORD: AN IMMUNOHISTOCHEMICAL STUDY

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BACKGROUND/AIM

The intervertebral discs (IVDs) are moving joints derived from embryonic notochord located between the bony vertebrae. They are composed of the central nucleus pulposus (NP), surrounded by the annulus fibrosus and by the cartilaginous endplate (CEP). The aim of this study was the identification of the stem/progenitor cells involved in the origin of IVDs from human notochord.

MATERIAL AND METHODS

A tissue sample of notochords was obtained of an autopsy from ten human fetuses of gestational age ranging from ten to sixteen weeks. Samples were formalin-embedded 5 nm thick sections were stained with H&E for histology and immunostained for cytokeratins (CK) 8, 18, 19 and Galectin-3 (GAL-3) and CD24.

RESULTS

Immunoreactivity for CKs 8, 18, 19 and GAL-3 was observed in all ten cases studied. Cells immunoreactive for there notochordal markers were grouped in the intervertebral areas, probably representing the progenitors the intervertebral disc. Moreover, in three out of ten cases, few CD24 positive cells were detected in the center of the intervertebral zones, suggesting a role for CD24 positive progenitors in the development of the nucleus pulposus.

CONCLUSION

Our preliminary data indicated the ability of the notochordal immunohistochemical markers here utilized to identify stem/progenitor cells involved in the origin of human IVDs. With the hope that identification of notochordal stem cells in the adult might be useful for the development of effective therapies of back pain and for reversing the IVD degenerative processes.

ABS 42

FROM TWO-DIMENSIONAL TO THREE-DIMENSIONAL: OBSERVATION OF HISTOLOGICAL PREPARATIONS THROUGH SCANNING ELECTRON MICROSCOPY

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The preparation of a sample for light microscopy involves the cutting of the paraffin-embedded sample in slices with a thickness of 2 to 4 μm, a good compromise between the difficulty of managing a thin slice and the passage of light, in order to produce two-dimensional images. Unfortunately, important information is lost due to the need to focus on a specific level of specimen thickness. Our technique suggests using Scanning Electron Microscopy (SEM) to start an additive new approach to the sample, to observe three-dimensionally the same slices intended for light microscopy. Our approach allows analyzing, in the thickness of about 4 μm, the organization of stromal fibers, the cellular ultrastructure and the relationships between cells, taking advantage of the peculiar depth of field of this instrument. The paraffin-fixed specimens are placed on the specimen slide in the same manner

as provided by the light microscopy protocol. The specimen is then deparaffinized, washed and finally dehydrated, dried and coated with a conductive metal film. Another important advantage of this technique is the close correspondence of the sections destined for observation with light and with SEM, which allows easy comparison between the data obtained. Some examples of the application of our new technique on fetal cartilage and bone and adipose tissue are reported. On the base of our preliminary data, we suggest that this new simple application might introduce SEM in the clinical practice as an ancillary technique useful for diagnostic purposes.

ABS 43

ACYL COA BINDING PROTEIN IS HIGHLY EXPRESSED IN THE HUMAN FETAL BRAIN DURING DEVELOPMENT

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BACKGROUNDS/AIMS

Acyl CoA binding proteins (ACBP), also known as Diazepam-binding inhibitor (DBI), is a highly conserved 10-kDa polypeptide that is expressed in a wide variety of species ranging from yeast to mammals. It is found in various tissues and organs and was identified independently in different experimental settings. ACBP was first isolated from a rat brain based on its ability to displace Diazepam from the γ-aminobutyric acid A receptor [1]. In experimental animal, evidence has been provided that ACBP is expressed in stem cells in all neurogenic niches of the postnatal brain [2]. Given the shortage of data of ACBP expression in the human brain, this work was aimed at studying it is immunoreactivity in the human fetal brain.

MATERIALS AND METHODS

Brain samples from the frontal cortex were obtained at autopsy from three human fetal brains of 14 weeks of gestational ages. Tissues samples were formalin-fixed and paraffin-embedded. 5 micron-thick section where immunostained with commercial ACBP antibodies.

RESULTS

ACBP was highly expressed in the cortex of the 3 cases analyzed. Immunoreactivity was higher in the ventricular zone (VZ) and in the sub-ventricular zone (SVZ) in which pre-mitotic neurons showed diffused cytoplasmatic and focal nuclear immunostaining. In the intermediate zone (IZ), rare scattered migrating neurons showed strong nuclear reactivity for ACBP. No immunoreactivity was noted in the postmitotic neuron of the fetal cerebral cortex.

CONCLUSION

Our preliminary data show that ACBP is highly expressed in the neuronal precursors of the VZ and SVZ in the human fetal cortex. This finding suggests a major role for ACBP in the development of the human brain.

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ABS 44

PLACENTAL CHANGES DUE TO *KLEBSIELLA PNEUMONIAE* INFECTION: A CASE REPORT

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BACKGROUND

Klebsiella pneumoniae is a gram-negative bacterium that is found in the environment and typically colonizes human mucosal surfaces of the oropharynx and gastrointestinal tract. It causes a wide variety of clinical illnesses, including pneumonia, urinary tract infections, and chronic granulomatous disease of the upper airways. This organism may also be a possible etiologic agent of acute chorioamnionitis inducing a variety of pathologic changes in the placenta.

CASE REPORT

A 35-year-old pregnant woman, presented at the 28th week + 6 days of gestation with Preterm Premature

Rupture Of Membranes (P-PROM). Apgar index of the male newborn at birth was 2 at time 0, increasing to 6 after 5 minutes. The newborn weighed 1,265 g. No congenital malformations were noted, but he was affected by *Klebsiella* sepsis. He was admitted to the Neonatal Intensive Care Unit of our hospital. Placenta tissue samples were formalin-fixed and routinely processed. Tissue sections were stained with H&E.

PATHOLOGICAL FINDINGS

The placenta weighed 250 g and measured 14.5 x 14.5 cm. The fetal membranes were dull, and the fetal surface showed gray discoloration. The maternal surface showed intact and prominent cotyledons. On histologic examination, the umbilical cord was trivascular. There were umbilical panvasculitis and perivasculitis with hemorrhage of the umbilical artery wall, edema of Wharton Jelly and pseudocystic aspects, edema of funicular vessels. Fetal membranes showed acute chorioamnionitis (stage 2, grade 2) [1] with microabscesses and decidual necrosis. Sections of the placenta showed micro-abscesses into the intervillous space.

CONCLUSIONS

Our case is, at the best of our knowledge, the second case of placenta's *Klebsiella pneumoniae* infection reported in the literature. In the previous case, the fetus died in the womb [2] whereas, in our case, the newborn is alive. Histological finding in our case was comparable: we found numerous neutrophils in fetal membranes and the umbilical cord, micro-abscesses into the intervillous space and decidual necrosis. We did not find acute, suppurative villitis and bacterial presence in the lumen of the umbilical cord or blood vessels.

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ABS 45

MORNING FRACTIONAL EXHALED NITRIC OXIDE IN CHILDREN WITH RECURRENT DESATURATION IN SLEEP

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OBJECTIVE, DESIGN AND SETTING

The aim was to assess the relationship between morning fractional exhaled NO (FeNO) and nocturnal oxygen desaturation in children. Design: a prospective study. Setting: the study was conducted from January 2012 to January 2018, in the Division of Pediatrics at a tertiary-care hospital.

PATIENTS AND METHODS

Of the total of 112 children initially enrolled, 109 (case children; 65.1% males; age 7.0 ± 3.1 years) met the criteria of the oxygen desaturation index (≥ 1 desaturation measured by pulse oximetry). In addition 63 healthy children (controls; 60.3% males; age 7.9 ± 2.9 years) were enrolled as external controls. Only the case children underwent pulse oximetry, whereas all 172 were assessed for FeNO and inhalant allergens (skin prick test). Comorbidities were allergy and obesity.

Nocturnal at-home oximetry and morning FeNO levels were recorded.

RESULTS

FeNO levels were comparable between the case children without comorbidities and the controls ($p = 0.346$). FeNO levels were much higher in the case children with atopy compared to the controls ($p = 0.0011$) and in those with atopy plus overweight compared to the controls ($p < 0.0001$) but only mildly increased in the overweight children compared to the controls ($p = 0.0311$).

CONCLUSIONS

Atopy was the main determinant of elevated FeNO levels in children with nocturnal oxygen desaturation. A novel finding is that the FeNO levels were mildly increased in obese children as compared to the controls. Further studies are needed to compare FeNO levels in obese children with or without recurrent desaturation events during sleep.

ABS 46

SERUM VITAMIN D, AGE, AND PHYSICAL CHARACTERISTICS ARE PREDICTORS OF ACUTE BRONCHIOLITIS IN INFANTS

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BACKGROUND
Bronchiolitis is a viral infection of the lower respiratory tract. The maintenance of adequate serum 25(OH)D levels in infancy may be regarded as an effective prophylactic strategy against respiratory tract infections.
AIM
The aim of the present work was analyzing the serum 25(OH)D levels in a group of otherwise healthy infants with acute bronchiolitis and matched controls.
MATERIALS AND METHODS
103 infants (64 with bronchiolitis and 39 controls) were enrolled. Data on gestational age, birth season, gender, ethnicity, anthropometric data (weight), season of admission, and serum 25(OH)D level at hospitalization were collected. An initial statistical analysis was performed with SPSS® Statistics software for Windows®. The relationship between bronchiolitis and serum 25(OH)D levels were then explored with IBM® Modeler.
RESULTS
Using SPSS® analysis, a high rate of low serum vitamin D levels was found (22.2% infants was in the category of insufficient serum 25(OH)D levels), especially in infants with acute bronchiolitis ($p < 0.018$). Using IBM® Modeler, the significant predictors of bronchiolitis were low serum vitamin D levels and body weight (appropriate). Significant predictors of serum vitamin D levels were the birth season (winter), gestational age, and birth weight (near/at-term infants).
CONCLUSIONS
The results of our study show that low serum vitamin D, age, and physical characteristics of infants were significant predictors of bronchiolitis, while perinatal factors were significant predictors of serum vitamin D levels.

ABS 47

THE PANAYIOTOPOULOS SYNDROME

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INTRODUCTION
Chrysostomos Panayiotopoulos described this syndrome in the year 1975. The first publication included patients with EEG occipital paroxysm or occipital spikes, but later it became apparent that the same clinical manifestations and mainly ictal vomiting also occur in children with extra-occipital EEG spikes or with normal EEG. Panayiotopoulos observed more than 900 patients of all ages with epileptic seizures, and only in 24 children ictal vomiting was present.
EPIDEMIOLOGY
This syndrome affects 13% of children aged 3 to 6 years who have had one or more febrile seizures and 6% of children from the 1 to 15 years age groups. Panayiotopoulos syndrome is an idiopathic childhood-related seizure disorder that occurs exclusively in otherwise healthy children and manifests with epileptic autonomic seizures and autonomic epilepticus status. We can consider this syndrome as a idiopathic epilepsy. A consensus has defined it as a "benign age-related focal seizure disorder occurring in early and mid-childhood". The syndrome is characterized by seizures often prolonged, with many autonomic symptoms, and with EEG that shows shifting or multiple foci and often with occipital prevalence.
CAUSES AND PATHOPHYSIOLOGY
Panayiotopoulos syndrome is probably genetically determined. There is a high prevalence of febrile seizures, about 17%. In different cases, SCN1A mutation was reported. However, this mutation was not found in many other cases with the typical symptomatology of Panayiotopoulos syndrome. In this syndrome, there is a diffuse multifocal cortical hyperexcitability, which is age-maturation-related. The diffuse epileptogenicity may be unequally distributed, predominating in one area, often posterior. Epileptic discharges, irrespective of their location at the onset, activate emetic and autonomic centers before any other conventional neocortical seizure manifestation. An explanation for this is that children are susceptible to autonomic disorders as illustrated by the cyclic vomiting syndrome, which is a nonepileptic condition specific to childhood.
CLINICS
The syndrome exclusively occurs in healthy children and manifests with infrequent autonomic epileptic seizures and autonomic epilepticus status. The seizures are present from age 1 to 14 years, with 76%

starting between 3-6 years. The autonomic seizures consist of episodes of disturbed autonomic functions with vomiting, retching, and nausea. Other manifestations are pallor or flushing or cyanosis, mydriasis or miosis, thermoregulatory and cardiorespiratory alterations, incontinence of urine and feces, intestinal motility modifications and hypersalivation. More typical seizure symptoms often appear after the onset of autonomic manifestations. Initially, the child is fully conscious, after she becomes confused and unresponsive. The eyes turn to one side or gaze widely open. Only half of the seizures end with brief hemiconvulsions or generalized convulsions. The emetic triad (nausea, retching, vomiting) culminates in vomiting in 74% of the seizures; in other cases, only nausea or retching occur. Most of the seizures are prolonged. Half of them last more than 30 minutes, thus constituting autonomous epileptic status, which is the more common nonconvulsive epileptic status in normal children. Seizures are more common during sleep. The EEG usually shows multiple spikes in various brain locations. There is a marked variability of interictal EEG findings from average to multifocal spikes that also change significantly in serial EEGs. Occipital spikes are frequent but not necessary for diagnosis. Frontal or centrotemporal spikes may be the only abnormality. Generalized discharges may happen alone or together with focal spikes. A few children have consistently normal EEG, including sleep EEG. EEG abnormalities may persist for many years after clinical manifestations.

The Panayiotopoulos syndrome is remarkably benign in terms of evolution. The risk of developing epilepsy in adult life is probably no more than the general population. Formal neuropsychological assessment of children with the syndrome showed that these children have normal IQ, and they are not at any significant risk of developing cognitive and behavioral aberrations.

CONCLUSIONS

The distinctive clinical features, particularly lengthy seizures and ictus emeticus, means that the diagnosis of the syndrome is easy. However, these are frequently mistaken as nonepileptic conditions such as acute encephalitis, syncope, migraine, cyclic vomiting syndrome, sleep disorders, motion sickness, gastroenteritis. The consequence is high morbidity, avoidable misdiagnosis, costly mismanagement.

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ABS 48

THE ENGEL'S LEGACY, A GENTLE REVOLUTION IN MEDICINE: FROM THE BIOMEDICAL MODEL TO THE PRECISION MEDICINE

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George Libman Engel became the precursor of the modern concept of personalized and holistic medicine. He published an article challenging biomedicine, proposing a new model for medical assistance. The reductionist approach in which the individuals and their needs are erased and caused the deterioration of the relationships and cultural degradation was outdated and needed to be changed. This new model, known as the "gentle revolution", had a high impact on the medical community. Indeed, 25 years later, F. Bonell-Cariò reaffirmed its indisputable importance and significance. The term revolution is not about mere medical science or its possible new applications, but it combines the medical practice with the individual psycho-social needs. This led the WHO to rewrite the concept of health state. It is not the absence of diseases but is a broader concept that includes psychological, physical, and social wellness. Indeed, these concepts were revisited in Alma Ata in 1978 and Ottawa in 1986. They could be summarized in the right of individuals to be the best version of themselves. The way to reach this aim is paved by the right to understand their aspirations, needs, and possibly improve their surrounding environment as a whole. The authors discussed the limits of the authoritarian

and paternalistic approach and analyzed the many small steps and the new tools that are leading to the humanization of care.

This is of particular importance in today's medicine and especially in pediatrics. Pediatricians must switch their attitude towards their profession and take care of all the needs of the suffering little human beings and their family. Children are not their diseases. Pediatricians must share both their medical knowledge and their empathy in order to make them reach a full health status.

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ABS 49

PERINATAL OUTCOMES AMONG REFUGEES IN A TERTIARY HOSPITAL IN GREECE

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INTRODUCTION

Pregnant female refugees who have immigrated to Greece as a result of civil war in Middle Eastern countries are giving birth mostly in public hospitals. In the context of family medicine, they should be screened in scheduled appointments in the prenatal period; however, they do not attend official screening registries and health management in camps and community health units. As in most cases the fetal monitoring has been disrupted, the risk of delivery complications and neonatal morbidities still remains high.

AIM

Descriptive study in neonatal refugee population for purpose of evaluating the delivery complications and neonatal morbidity and mortality.

METHODS

In this prospective study, data were obtained for refugee live births that occurred in our hospital, between September 1, 2016 and December 31, 2018. Data for 137 neonates were analysed for gestational age, delivery type, prematurity, somatometric features. Furthermore, for refugee neonates hospitalised in NICU, analysis for maternal morbidities, neonatal morbidity and mortality rates as well as for simple correlations was conducted.

RESULTS

Overall, 137 refugees with median gestational age 39 weeks (2 IQR) were included and 34 neonates (24.8%) with median postmenstrual age 259 days (21 IQR) were admitted to NICU, out of which 22 (64.7%) were premature (< 37 w pma). Cesarean section was undertaken for 47 (34.1%) of all refugee live births and for 13 (38.2%) of the hospitalised in NICU neonates, while the median for hospitalization was 4 days (2.5 IQR). Median neonatal birth weight was higher among non-hospitalised (3,140 g, 610 IQR) than among hospitalised refugees (2,533.27 g, 729.87 SD), while from the latter 4 (11.8%) were IUGR. Gestational hypertension was recorded for 3 (8.8%), gestational diabetes for 5 (14.7%), pre-eclampsia for 2 (5.9%), chorioamnionitis for 2 (5.9%), PROM for 7 (20.6%) neonates admitted in the NICU. Neonatal morbidity in NICU was recorded as RDS for 8 (23.5%) neonates, from which prenatal steroid administration performed for 5 (14.7%), as jaundice for 20 (58.8%) and infection for 15 (44.1%). Maternal morbidity in an overall percentage of 29.4% was correlated with prematurity in 70% (CI 95%, 1.3-68.2, p 0.01, OR 8.17), RDS in 40% (CI 95%, 0.45-23.5, p 0.19, OR 3.2, no statistical significance) and infection (suspected and confirmed sepsis) in 60% (CI 95%, 0.43-15.2, p 0.27, OR 2.4, no statistical significance) of the hospitalised neonates. The neonatal mortality was recorded as a percentage of 2.9% (one death due to major complications).

CONCLUSION

Maternal and neonatal morbidities remain in high proportion for refugees. Caesarean rates are fairly higher than those reported in USA (32.8%) and in Europe (25%). Prematurity and IUGR constitute the main reason for admission to NICU and in association with maternal morbidity we approximately assume that these correlations could be the impact of nutritional inadequacies and poor prenatal care among pregnant refugee women in Greece. The low neonatal mortality rate could be attributed to the high quality health care that was achieved in the NICU.

ABS 50

NECROTIZING ENTEROCOLITIS IN VERY LOW BIRTH WEIGHT INFANTS (VLBWI): A CASE CONTROL STUDY

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INTRODUCTION

Necrotizing enterocolitis (NEC) is one of the most common emergencies in very low birth weight infants (VLBWI) (birth weight [BW] < 1,500 g), which often leads to surgical management.

OBJECTIVE

This study aimed to determine the incidence of NEC in VLBWI and compare the risk factors for outcomes in VLBWI with surgical NEC (sNEC) with those who did not develop NEC.

SUBJECTS/METHODS

We reviewed the records of VLBWI with NEC who underwent a surgical procedure and VLBW controls, who did not develop any stage of NEC, matched for gestational age (GA) and BW between January 2009 and December 2018. Data collected include: mode of conception, gestational hypertension, placenta abruption, chorioamnionitis, preterm/premature rupture of membranes (PPROM), uterus contractions (UC), use of tocolysis, mode of delivery, GA, BW, gender, intrauterine growth retardation (IUGR), respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), patent ductus arteriosus (PDA), sepsis, periventricular leucomalacia (PVL), retinopathy of prematurity (ROP), bronchopulmonary dysplasia (BPD) and length of hospital stay (LHS).

RESULTS

During the study period, 5,750 neonates were admitted to our hospital, and 639 (11.1%) of them were VLBWI. Among these 639, twenty-six (4.1%) had developed NEC and underwent surgical treatment. Those infants had BW 916 ± 274 g and GA 27.6 ± 2.7 w. Eight among them died. The majority of the deceased neonates were male. IVH, PDA, and sepsis appear to be the most important contributors to the development of sNEC between VLBWI. In addition, ROP, as an outcome, was more frequent in sNEC group compared to the control group. LHS and the mortality rate were also significantly higher in the sNEC group of patients. No difference was documented among the rest of the factors.

CONCLUSIONS

Although the incidence of sNEC in VLBWI in our NICU was low and the survival rate was high and similar to that of other multicenter studies, sNEC remains a major cause of morbidity and mortality among VLBWI.

ABS 51

CHORIOAMNIONITIS ASSOCIATED WITH IMMATURITY OF THE LUNG, KIDNEY, AND ABORTION. A CASE REPORT

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BACKGROUND

Acute chorioamnionitis is an infection of the placenta and amniotic fluid. This inflammation causes changes in the placenta, umbilical cord, and membranes in response to microorganisms in the amniotic fluid. There is diffuse infiltration of the chorionic plate and membranous chorioamnion by maternal neutrophils derived from intervillous space and the venules of the decidua capsularis, respectively [1]. Although the mechanisms are not clear, chorioamnionitis is associated with premature birth, neonatal sepsis, and other adverse outcomes. The relationship between chorioamnionitis and neonatal pulmonary morbility is conflicting. Various studies have evaluated the risk of respiratory distress syndrome and bronchopulmonary dysplasia after chorioamnionitis [2].

CASE REPORT

A 40-year-old pregnant woman, at third pregnancy, presented spontaneous abortion at the 21st week + 6 days of gestation. The male fetus and the placenta tissue samples were formalin-fixed and routinely processed. Tissue sections were stained with H&E and examined.

PATHOLOGICAL FINDINGS

The placenta weighed 128 g (normal placental weight for 21 weeks of gestation is around 126). The fetal membranes were dull, and the fetal surface

was greyish, smooth and shiny. The maternal side of the chorionic plate of the placenta showed intact and prominent cotyledons. Histology of placenta showed the presence of chorioamnionitis stage 3 and grade 2 because the inflammatory infiltrate reaches the amnios. The fetus was a male, weighed 449 g (normal fetal weight for gestational age is around 320 g). On the right fronto-temporo-occipital portion, there was the presence of an erythematous area extended to the right eye. The fetus also showed highly brownish areas in the upper and lower limbs. On histologic examination, the fetus showed severe pulmonary immaturity (canalicular stage) with an important persistence of the alveolar epithelium within the developing alveolar spaces and focal renal alterations, in particular, altered glomerular form and marked congestion of the glomeruli.

DISCUSSION

Previous studies showed a possible correlation between chorioamnionitis and pulmonary alterations in live births. Instead, this work aims to study the correlation between chorioamnionitis and the developmental alterations of lung and kidney in the stillborn fetus, opening new perspectives to future studies.

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ABS 52

^{1}H-NMR METABOLOMICS ANALYSIS OF CONVENTIONAL AND ORGANIC FORMULA MILK: PRELIMINARY RESULTS

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INTRODUCTION

Metabolomics is a discipline that for a couple of years has been making its way in the agro-food industry for the investigation of foods mainly in terms of quality, authenticity, and traceability. It is finalized to the quantitative and qualitative analysis of the metabolome, meaning the set of the low molecular weight metabolites (< 1.5 KDa) of a biological system (plant, animal, human), that derive from the biochemical transformation of the substrates in the different biological processes and thus represent the final result of cellular function. It is considered to be the closest "omics" science to the phenotype expression. The present work has aimed to use a metabolomics approach on NMR platform to analyze the metabolome of several formula milks available in the market in Italy, some organic, other conventional.

MATERIALS AND METHODS

A total of 15 types of formula milk have been analyzed: 2 0-12 formulas; 9 types 1 formula; 4 types 2 formulas. Among them, 6 formulas derived from organic stock farming (each indicated by the -bio suffix). One of these was enriched with prebiotics. Before the nuclear magnetic resonance spectroscopy analysis (NMR), milk samples were filtered with Amicon Ultra 0.5 ml 10 KDa (Millipore, USA) centrifuge filters, to remove proteins and lipids, then centrifuged at 10,000 g for 30 minutes at 4°C. An aliquot of phosphate buffer (0.1 M pH 7.4) has been added to the filtered milk, containing trimethilisylpropanoic acid (TSP) used as internal baseline (δ = 0.00 ppm). Finally, an aliquot of 650 µl of the final solution was transferred in an NMR tube NMR (5 mm O.D). The ^{1}H-NMR experiments have been acquired at 300 K using a VARIAN UNITY 500 spectrometer, operating at the 499.83 MHz frequency. The monodimensional spectra have been registered by a 1D-NOESY experiment. Before proceeding to the multivariate, the ^{1}H-NMR spectra were processed using the MestReNova program (version 10.0.2, Mestrelab Research SL, Santiago de Compostela, Spain). Data were then analyzed using the PCA (Principal Component Analysis) technique.

RESULTS

In the present study, 15 commercial samples of formula milk were analyzed (6 produced with organic ingredients), along with 15 breast milk samples collected at 7 ± 3 postpartum days from women who delivered at term. Lactose and maltodextrin were the most discriminant metabolites among the different commercial formulas and between formulas and breast milk. Lactose is naturally the significant component of all analyzed samples, but it resulted in being on average more abundant in breast milk samples compared to formulas and in some samples of formulas compared to other commercial milk. Maltodextrin are present in variable quantity in the analyzed formula milk, while they are absent in breast

milk. For what concerns the differences among the different types of commercial milk analyzed, these are attributable for the most part to the different ingredients, or their various quantities, used for the production of formulas. Some metabolites found in the formulas in variable quantities are citrate and choline, lactate and phenylalanine. The only discriminant metabolite was methionine; its signals were on average more intense in organic milk samples than those conventional.

DISCUSSION AND CONCLUSIONS

Breast milk is considered the adequate food in the first period of life since it guarantees the neonates to reach their nutritional need and the supply of functional bioactive substances, such as human milk oligosaccharides. The study presents several limitations: samples pool is small and heterogeneous, and there is no mature milk sample for further comparison. Thus, the results need to be analyzed further in the future.

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ABS 53

CAN NATURE HELP US IN THE AUTISM SPECTRUM DISORDERS?

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INTRODUCTION

Autism spectrum disorders include neurodevelopmental abnormalities and are characterized by impaired ability to communicate and interact socially and by restricted and repetitive patterns of behavior, interests, and activities. The prevalence in the United States is about 1 in 68 children, with marked male preponderance. There are not efficient treatments for ASD symptoms, and the physicians often prescribe atypical antipsychotics to treat irritability and aggression in children with autism. The only two medications currently approved in the USA, by the FDA, are risperidone and aripiprazole. The unpleasant effects of these drugs include extrapyramidal symptoms and considerable risks: dyskinesias, gynecomastia, fatigue, increased appetite, obesity, and the risk of diabetes.

NATURAL THERAPEUTIC MEDICINE?

The sulforaphane, 4-methyl-sulfinyl butyl isothiocyanate seems to give us a new way for our patients. In the year 1992, at the John Hopkins University School of Medicine, the doctors Paul Talalay and Yuesheng Zhang isolated the sulforaphane. The sulforaphane develops different therapeutic actions: chemoprotective, phytochemical, anti-inflammatory. That substance is prepared from "broccoli" sprouts and has been successfully administered in various clinical studies: cancer prevention, asthma, alcohol toxicity, cognitive functions, and ASD. The sulforaphane is rich in glucoraphanin, the biogenic precursor of SF, or in myrosinase, the enzyme responsible for converting the precursor to an active moiety. A mechanism of connection between ASD symptoms and the SF was identified by observation of families in the improvement of ADS symptoms. In particular, an essential reduction of the symptomatology in children affected by ADS and with febrile seizures was observed.

CLINICAL CASES

We are taking care of three children affected by autism spectrum disorders: two females of four and three years and a male of two years. We are conducting a small clinical study designed to assess whether sulforaphane would reduce or ameliorate the typical symptoms of children with ASD. We have, at the moment, a little experience of three months with the SF therapy. Indeed, we have observed an improvement of communication and social

integration with more evidence in the language. These observations may contribute to understand ADS and treat or alleviate some of its symptoms. We believe that nutrition and supplements, such as cruciferous vegetables or the sulforaphane and the glucoraphanin supplements, can play a significant role in the lives of patients with ASD.

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ABS 54

PERSISTENCE AND COARCTATION OF THE V AORTIC ARCH, ATRESIA OF THE IV ARCH

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INTRODUCTION

The persistence of the V aortic arch is a rare congenital cardiovascular anomaly. Such fetal structure usually undergoes involution before birth, and the IV arch persists as true arch. It becomes clinically relevant when associated with coarctation or interruption of the true aortic arch [1, 2]. The gold standard exam to detect this condition is a cardiac color-Doppler ultrasound (US). It can be treated both with surgery or interventional treatment, according to the stenosis degree and the age at diagnosis [1-3].

CASE REPORT

C. was born full-term by spontaneous vaginal delivery; Apgar 6-8, BW 3,175 g. During the 3rd day of life, a systolic murmur (2/6) with interscapular-vertebral irradiation occurred; thus, a cardiac color-Doppler US was performed showing a severe aortic coarctation. With PGE1 infusion, at the dose of 100 ng/kg/min, the ductal reopening was not obtained. An urgent transfer to the 3rd level center of San Donato Milanese Hospital was organized. At the admission, the systolic pressure gradient between the right superior and inferior limb was 30 mmHg, and femoral pulses were absent. The cardiac color-Doppler US showed interruption of the left aortic arch, the persistence of the V aortic arch with severe isthmic coarctation (diam. 2 mm), diastolic run-off, absent pulsation in the abdominal aorta. Thus, C. underwent corrective cardiac surgery at 4 days of life, through the resection of the stenotic tract of the V arch and end-to-end anastomosis, without extracorporeal circulation.

After an uncomplicated postoperative course, C. was discharged at 12 days of life in good conditions (and in therapy with furosemide), valid femoral pulses and normal AP at the right superior and inferior limb. The cardiac US evidenced good biventricular contractility; at the level of the end-to-end (isthmic) anastomosis, flow turbulence with a slight acceleration and a maximum pressure gradient of 30 mmHg was detected, without a diastolic run-off. The abdominal aorta was well pulsating.

During clinical follow-up, a progressive increase in the isthmic gradient was detected. At 36 days of life, a severe aortic recoarctation was diagnosed (hyposphigmic and delayed femoral and absent tibial pulses, isthmic gradient and hypopulsating abdominal aorta with demodulated flow and diastolic run-off; right arm pressure 129/60 mmHg and right leg 63/40 mmHg) and a second intervention was organized.

At San Donato Hospital, a severe recoarctation at anastomosis level was confirmed (diam. 2 mm) through cardiac catheterization. Through an interventional procedure, a progressive dilatation of the restricted tract was performed (with Tyshak Mini balloon 5 x 20 mm and 6 x 20 mm); the subsequent implantation of 6 x 18 mm Valeo Stent allowed a gradient reduction from 70 to 10 mmHg. In the post-intervention, therapy with ASA (5 mg/kg/day) was started. Propranolol and captopril were added due to arterial hypertension. C. showed a good outcome. At the stent level, mild flow turbulence was reported with a little diastolic run-off. Abdominal aorta showed pulsatile flow, and femoral pulses were valid.

C. was discharged at 6 weeks of life; she is currently in follow-up in the Pediatric Cardiology Department of Policlinico Monserrato. At 6 months,

C. suspended therapy. At 8 months, signs of arterial hypertension are absent. Percutaneous angioplasty with stent implantation gave excellent result.

CONCLUSIONS

We described a very rare case of coarctation, showing peculiar anatomy not detectable in the prenatal US. After corrective surgery, the recoarctation (maybe due to fibrous tissue formation) required the application of an endovascular stent, rarely performed in a neonate.

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ABS 55

OVERVIEW OF CAPICE – CHILDHOOD AND ADOLESCENCE PSYCHOPATHOLOGY: UNRAVELING THE COMPLEX ETIOLOGY BY A BROAD INTERDISCIPLINARY COLLABORATION IN EUROPE – AN EU MARIE SKŁODOWSKA-CURIE INTERNATIONAL TRAINING NETWORK

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INTRODUCTION

In the Roadmap for Mental Health and Wellbeing Research in Europe (ROAMER) [1], priority was given to research into child and adolescent mental health symptoms. The Marie-Curie training network CAPICE (Childhood and Adolescence Psychopathology: unraveling the complex etiology by a broad Interdisciplinary Collaboration in Europe) focuses on this priority. This European Union (EU) funded network brings together eight population-based birth and childhood (including some twin) cohorts to investigate the causes of individual differences in childhood and adolescence psychopathology, in close collaboration with the EArly Genetics and Life-course Epidemiology (EAGLE) behavior and cognition group [2]. The cohorts have unique longitudinal information on lifestyle, family environment, health, and emotional and behavioral problems as well as (epi)genome-wide genotypic data, sometimes even for the parents.

METHODS

Polygenic approaches, based on Mendelian randomization, were developed to study causality as an explanation for the association between traits [3]. When parental (SNP) data are also available, maternal genome-wide complex trait analysis (M-GCTA) can be used to calculate whether the association between parent and offspring psychopathology is explained by an environmental effect on top of the effect of the genetic transmission [4]. Recently, the Mendelian randomization approach has been extended to support the exploration of DNA methylation as a causal pathway between exposures (such as tobacco use) and downstream health and mental health outcomes. Meanwhile, currently available data in the cohorts but also in the population-based registers in Sweden are already used to predict outcomes of psychiatric symptoms in childhood and adolescence, focusing not only on mental disorders but also on somatic medical outcomes. As part of

these analyses, different methods for prediction models, for example, regression trees and artificial neural networks, are compared to see which model works best.

RESULTS

The focus is on the etiology of common psychiatric symptoms in childhood and adolescence, including depression, anxiety, and attention deficit hyperactivity disorder (ADHD). Besides the identification of (epi)genetic variants associated with these phenotypes, analyses will be performed to shed light on genetic factors and the interplay with the environment in influencing the persistence of symptoms. Further, it will be investigated to what extent the association with early life and familial circumstances is explained by genetic and by environmental factors. Twin and polygenic risk score analyses have been performed, aiming to explain the correlation between symptoms as well as the stability in symptoms over time and the transition into adulthood disorders. Focusing on the environmental effects, M-GCTA has been performed investigating direct environmental effects from parents on internalizing problems. Mendelian randomization analyses attempting to explain the association between childhood psychiatric symptoms and prenatal risk factors, such as maternal smoking, are also ongoing. Results will also be disseminated to non-academic parties, in close collaboration with the Global Alliance of Mental Illness Advocacy Networks-Europe (GAMIAN-Europe).

DISCUSSION

Genetic research, including psychiatric genetics, has substantially advanced due to large-scale collaborations in consortia, with meta-analyses being the rule rather than the exception. Due to developments in methodology, it is also possible to use the genome-wide genotypic data for purposes other than the identification of genetic risk variants. Many of these analyses still need large sample sizes to have adequate statistical power. The cohorts brought together in CAPICE and the close collaboration with the EAGLE behavior and cognition group (https://www.wikigenes.org/e/art/e/348.html) provide the opportunity to perform these analyses and progress the field of child psychiatry by addressing essential questions like "Which genetic variants/biological pathways underlie the continuity of symptoms from childhood into adulthood?", "What does it explain the associations with early life and familial risk factors?", "What is the role of epigenetic factors?", "Can we predict which children are at higher risk for a poorer outcome?" Ultimately, the results may be translated into the clinic by informing personalized medicine and by supporting the identification of novel targets of pharmacological agents. In conclusion, CAPICE provides a coherent package of training in the field of psychiatric genetics, going from harmonizing the phenotypes, the creation of facilities for analyses across cohorts and the actual state-of-the-art analyses, to the translation of the results for drug target validation or prediction models that can be used in the clinic for targeted interventions.

ACKNOWLEDGMENTS

This work has received funding from the European Union's Horizon 2020 Research and Innovation Programme under the Marie Sklodowska-Curie CAPICE Project grant agreement number 721567.

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ABS 56

SARDINIAN MUTATION T338I: A "MILD" FORM OF CYSTIC FIBROSIS

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Cystic Fibrosis (CF) is the most frequent hereditary disease in the Caucasian population. The incidence is 1 per 3,000 live births and healthy carriers 1 per 25 people. To date the prognosis is unfavorable, life expectancy is 30-40 years. In our study, 68

patients with the Sardinian mutation T338I of the CF were examined from July 1983 to June 2019; 27 patients (39.71%) had genotype T338I/F508del, 20 patients (29.41%) genotype T338I/T338I and 21 patients (30.88%) genotype T338I associated with other mutations. Analyzing the epidemiology, 38 (55.88%) patients were males aged between 1.12 and 54.21 years, while 30 (44.12%) females aged between 2.24 and 62.33 years. The age of patients at diagnosis was between 0.11 and 44.12 years in males and between 0 and 62.06 years in females. Analyzing symptoms at onset, 30 patients (44.12%) experienced metabolic alkalosis with salts loss syndrome, 4 of them complicated with acute renal insufficiency, 4 patients (5.88%) acute pancreatitis, while 16 patients (23.53%) were diagnosed during screening for couple infertility. In the remaining 18 patients (26.47%), the diagnosis was made due to familiarity or non-specific symptoms. We compared the population affected by Sardinian mutation T338I and those affected by F508del/F508del mutation: there were no statistically significant differences between these populations in the height-weight increase and recurrent pancreatitis. Pancreatic sufficiency was 100% in T338I/T338I ($p = 0.031$), 96.30% in T338I/F508del ($p = 0.020$), 100% in T338I/other ($p = 0.024$) compared to 14.28% in F508del/F508del. Respiratory function assessed in the standard if FEV 1 > 70% was 100% in T338I/T338I ($p = 0.044$), 100% in T338I/F508del ($p = 0.027$), 94.44% in T338I/other ($p = 0.042$) compared to 15.38% in F508del/F508del. The chest radiograph was normal in 100% of T338I/T338I ($p = 0.020$), 96.30% in T338I/F508del ($p = 0.014$), 95% in T338I/other ($p = 0.020$) compared to 13.13% in F508del/F508del. Lung colonization appeared negative in 85.71% in T338I/T338I ($p = 0.0231$), 70.37% in T338I/F508del ($p = 0.030$), 73.68% in T338I/other ($p = 0.032$) compared to 7.14% in F508del/F508del. Sardinian mutation T338I is widely represented in Sardinian patients with CF (50.37%). After 36 years of observational study, we can say that, from the phenotypic point of view, it is configured as a "mild" mutation, even in compound heterozygosis with severe mutations. The typical symptomatology is metabolic alkalosis with salts loss syndrome, recurrent pancreatitis, and male infertility. The course is favorable with pancreatic sufficiency, normal liver function, modest or even absent respiratory involvement, negative microbiology in most patients. The prescribed therapy is oral rehydration therapy, and life expectancy is similar to the general population. During the observation period (36 years), no deaths were recorded for patients affected by Sardinian CF mutation, contrary to what happened in patients with severe forms of CF.

ABS 57

ANALYSIS OF CARDIOTOCOGRAPHIC PATTERNS AND NEONATAL OUTCOMES IN VACUUM DELIVERY AND EMERGENCY CESAREAN SECTION

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INTRODUCTION

Cardiotocography (CTG) is a valid device that allows the fetal heart rate monitoring, the well-being or distress of the fetus through the analysis of validated patterns. A pathological CTG is an indication of stress or fetal distress associated with reduced oxygenation. This could represent an alarm signal for midwife and doctor with subsequent implementation of emergency maneuvers to accelerate labor and delivery. The aim of this study was firstly to evaluate the effectiveness and validity of cardiotocographic monitoring in case of emergency delivery (vacuum delivery and cesarean section) and secondly to focus on a possible improvement on CTG interpretation in order to better understand obstetric-neonatal outcomes.

MATERIAL AND METHODS

The present study was conducted in the Division of Obstetrics and Gynecology of the University of Cagliari. Between December 2015 and October 2016, 65 women who underwent vacuum delivery or emergency cesarean section due to pathological cardiotocography were selected for the study. Neonatal outcomes were evaluated, such as the Apgar score at 1-5-10 minute after birth, fetal cord pH, base excess (BE) and admission to the Neonatal Intensive Care Unit (NICU).

RESULTS

In only two cases (3.08%) a condition of fetal acidosis was evidenced, reporting a pathological fetal cord pH (pH < 7 and BE < -12 mmol/L); 53 cases (81.54%) reported borderline parameters (pH 7-7.350 and BE > -12 mmol/L); 7 cases

(10.77%) had normal conditions (pH > 7.350 and BE > 4 mmol/L); in the remaining 4.61% the pH assessment at birth was not performed. Apgar's score at the 1st minute was low (0-4) in 7.69% of cases, medium (4-7) in 15.38% and good (7-10) in 76.93% of cases; at the 5th minute Apgar's score was low (0-4) in 3.08% of cases, medium (4-7) in 12.31% and good (7-10) in 84.61%; at the 10th minute was low (0-4) in 1.54% of cases, medium (4-7) in 7.69% and good (7-10) in 90.77% of cases. Considering the fetal hospitalization after birth, 8 babies (12.31%) were admitted to the NICU, 7 cases (10.77%) were admitted to the Neonatal Pathology Unit, and the remaining 49 babies (75.38%) were taken to the nursery; only one patient died after birth.

CONCLUSION

The study showed that cardiotocographic monitoring is a useful device for the identification of fetal distress and, in most cases, allows early intervention before important pathological conditions that could occur in the fetus. Nevertheless, our study confirms that CTG evaluation has a very high rate of false-positive results and a low sensitivity.

ABS 58

INCIDENCE AND INDICATION FOR SURGERY IN RELATION WITH ROBSON'S CLASSIFICATION IN A SINGLE TERTIARY HEALTH CARE CENTER: A PROSPECTIVE COHORT STUDY

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INTRODUCTION

Cesarean section (CS) is the most commonly performed major abdominal surgery in women. The World Health Organization (WHO) suggests that the ideal CS rate is 10-15%. However, this reference range was determined for populations rather than for individual health care facilities. Rising CS rate in developing countries is alarming as it increases maternal morbidity owing to fever, bleeding, anesthesia complications, postoperative thromboembolism and long-term risk of having morbidly adherent placenta leading to obstetrical hysterectomy or uterine rupture with a progressive number of scars. In 2001, Dr. Michael Robson proposed a system of 10 groups that classifies all women admitted for delivery (and not indications) according to five obstetric characteristics that are generally routinely collected in most maternities. The WHO Statement chose The Robson-10 Group Classification System (TGCS) as the global standard for assessing, monitoring, and comparing CS rates within healthcare facilities over time, and between facilities in 2011. The current study was planned to analyze the incidence, the different indications of primary or repeated CS in relation with the TGCS to reduce the CS rate by adopting multifaceted strategies in a single tertiary health care center.

MATERIAL AND METHODS

This prospective study assessed all CSs performed between 1st July 2015 and 30th June 2016 at the Division of Obstetrics and Gynecology of the University of Cagliari. Indication, type of CS (primary or repeated), TGCS, demographic features of patients were recorded on a designated diagram. Data analysis was done using Excel®.

RESULTS

A total of 585 CSs were performed, corresponding to an average overall CS rate of 35.4%. Considering the TGCS the most represented classes were V e II with the 27.6% and 26.6%, respectively. The main indications for surgery were repeated CS and the previous scar in labor (30.8%), followed by obstructed labors (29.8%). When we have correlated the indication for surgery with the TGCS, we have found that the dystocia is most represented indication in I, II, VI, VII, and IX class whereas all previous uterus scars appeared more in V and X class. Moreover, we have found that urgent CSs out of labor have been more performed in I, II and III class, while urgent CSs during labor have been more performed in IV and X class.

CONCLUSION

Rates of CS in our center is higher than that recommended by WHO. Renewed efforts are needed to reduce the number of unnecessary cesarean births. Audit and feedback are the best way to judge clinical practice and to reduce the frequency of CS in any tertiary setup.

ABS 59

IS SPORTOMICS USEFUL TO EVALUATE METABOLIC RESPONSES AND TO PREVENT INJURIES IN PROFESSIONAL SOCCER

PLAYERS? POTENTIAL INTEREST IN PEDIATRICS

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INTRODUCTION

Sportomics is non-hypothesis-driven research on an individual's metabolite changes during sports and exercise. It is the application of metabolomics, one of the omics sciences that provide a snapshot of the metabolome of an individual in both physiological and pathological conditions such as sports practice and musculoskeletal diseases or injuries through the analysis of biological fluids such as blood, urine or saliva.

METHODS

In this study we performed a ^{1}H-NMR analysis of urine metabolome of 21 professional soccer players, playing in Italian Serie-A league, at 3 different times: the first day (T1), after five days (T2) and at the end (T3) of the pre-season period 2016-17. We used this approach to investigate cellular and metabolic responses due to chronic physical exercise and to study the usefulness of sportomics to prevent injuries.

RESULTS

A clear separation was obtained between samples collected at time T1, T2, and T3. The metabolites responsible for the separation were: TMAO, DMA, N-methylhistidine, 3 OH-butyric acid and hippuric acid which levels were increased. Some of these compounds may be related both to the diet or the training since, for instance, N-methylhistidine is an indicator of proteins turnover that could correlate to the assumption of proteins, while the influence of microbiota is highlighted by hippuric acid.

CONCLUSIONS

To the Authors' knowledge, this was the first sportomics study in professional soccer players; preliminary results show significant changes in urine metabolites such as TMAO, DMA, N-methylhistidine, 3 OH-butyric acid, and hippuric acid, attesting sportomics as an exciting approach to advance in the understanding of global response to a programmed exercise and diet. Since it is the first study ever made on professional soccer players, it has several limitations, and the experimental setting could be improved in order to have more precise results. Further research is needed to determine whether sportomics could be employed to prevent, diagnose, and manage injuries induced by exercise. These results could be a preliminary step to start to assess the wellbeing of adolescent and children playing soccer.

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ABS 60

AN EARLY DIAGNOSIS OF CLASSIC CONGENITAL ADRENAL HYPERPLASIA

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INTRODUCTION

Congenital adrenal hyperplasia (CAH) is an inherited endocrine disorder caused by a steroidogenic enzyme deficiency. Depending on the type and severity of steroid block, patients can have various alterations in glucocorticoid, mineralocorticoid, and sex steroid production that require hormone replacement therapy. Presentations vary from neonatal salt wasting and atypical genitalia to the adult presentation of hirsutism and irregular menses. The most frequent mutation causing salt-wasting congenital adrenal hyperplasia is a 21-hydroxylase deficiency. We describe the case of a newborn with a classical form of congenital adrenal hyperplasia.

CASE REPORT

Our patient is a term newborn, 41 weeks, female, born to unrelated parents; BW 3,350; finding at the birth of atypical genitalia, with large scrutinized lips and phallic-like structure (2.4 x 1.2 cm). Given the suspect of a disorder of sexual development, we practiced I level investigations:

- karyotype: 46,XX;
- FISH SRY and molecular analysis of the gene CYP21A2: in progress;
- serum and urinary electrolytes: in the range;
- abdominal and pelvic ultrasound: normal internal female genital organs;
- hormonal profile: 17OHP 152.2 ng/ml (0.31-4.62), ACTH 780 pg/ml (10-130), cortisol 60 ng/ml (50-200), androstenedione > 10 ng/ml (1.0-4.5), DHEA-S 35 mcg/dl (35-430) and renin 1,065 pg/ml (2.52-35.82), LH < 0.10 mU/ml (5.0-60), FSH 0.1 mU/ml (5.0-30), testosterone 528 ng/dl (20-120).

The association of atypical genitalia with virilization, an elevated level of 17OHP and Renin, are suggestive of CAH, so we started replacement therapy with hydrocortisone 35 mg/m^2/die, fludrocortisone 0.5 mg/m^2/die, and NaCl 8 mEq/kg/die, in order to avoid salt-wasting (a potentially fatal condition associated with the classical form of CAH). During the hospitalization, we have monitored the newborn's clinical condition through serial checks of the blood pressure and water balances, in addition to repeated checks of serum electrolytes and glucose. The clinical course has been optimal with an adequated weight gain; the newborn has not shown any signs of adrenal crisis.

CONCLUSIONS

Excess fetal adrenal androgen exposure results in virilization of the external genitalia of 46,XX patients. This case highlights the importance of an accurate physical examination of the external genitalia at birth to recognize precociously potentially fatal conditions as the classical form of CAH. In male newborns, it is more difficult to recognize this kind of conditions. An early beginning of the replacement therapy with hydrocortisone and fludrocortisone is necessary to improve the newborn's outcome.

ABS 61

EFFECT OF NONINVASIVE RESPIRATORY SUPPORT ON FEEDING TOLERANCE IN PRETERM VLBW INFANTS

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BACKGROUND

Many studies in the literature on noninvasive respiratory support (NRS) focused on respiratory outcomes of preterm neonates, but their impact on the gastrointestinal tract is still under investigation.

OBJECTIVE

To evaluate the effects of different NRS techniques (NCPAP, BiPAP, NIPPV) on feeding tolerance in preterm infants VLBW infants (< 1,500 g).

METHODS

This is a retrospective study. A total of 56 infants met inclusion criteria (neonates included in Vermont Oxford Database beginning NRS in the first 5 days of life and enteral feeding in the first 7 days of life). Infants born between January 2018 and June 2019 were divided based on noninvasive respiratory support in three groups: nCPAP = 34; BiPAP = 13; NIPPV = 9. The time to achieve Full Enteral Feeding (FEF) was the primary outcome. It was measured in days from birth and defined by discontinuation of parenteral supplementation and achievement of 130-150 mL/kg/d of enteral feedings. Interruptions of enteral feeding (episodes/day), bilious gastric residual (episodes/day), enteral intake at 0, 7, 15 days old, total duration of respiratory support need (days), clinical events and complications (NEC, bowel perforation, ROP, IVH, PVL) were considered as secondary outcomes.

RESULTS

There was no statistical difference in time to reach full enteral feedings between the 3 groups. There was also no difference to the enteral intake to 0, 7, 15 days old. The number of bilious gastric residual was significantly higher in NIPPV group (vs BiPAP group) (2.14 ± 2.19 vs 0.36 ± 1.20; p = 0.040). BiPAP group (vs CPAP group) underwent longer respiratory support (9.44 ± 13.14 vs 23.9 ± 13.76; p = 0.002.). The use of any method was associated with a higher risk of complications.

CONCLUSION

There was no statistical difference in time to achieve full enteral feedings between nCPAP, BiPAP, and NIPPV. Further studies are needed to confirm our dates and clinical relevance of these observations.

ABS 62

TISSUE OXYGENATION AND SPONTANEOUS CLOSURE OF PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECTS

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INTRODUCTION

From 10% to 30% of perimembranous VSD close itself, thus avoiding the need for surgery or transcatheter occluding devices [1]. Anemia is quite common in children suffering from CHD [2]. It often results from a lack of enough iron for the synthesis of hemoglobin (Hb), while iron-deficiency is related to certain aspects of its metabolism or malnutrition. This study aimed at evaluating the impact of a few laboratory parameters on perimembranous VSD spontaneous healing: Hb, hematocrit (Ht), fetal hemoglobin (HbF), peripheral oxygen saturation (SaO_2), iron, transferrin, ferritin, and albumin.

METHODS

One hundred and seven patients were enrolled (57% males; mean age 2.1 ± 0.4 years). Criteria of inclusion were: presence of a perimembranous VSD not associated with CHD other than a transient patent ductus arteriosus and/or a small atrial septal defect and/or single/multiple trivial muscular VSD; need for surgical/interventional closure in presence of large volume left to right shunt (Qp/Qs > 2:1) and/or significant pulmonary arterial hypertension (PAH > 50% systemic) and/or clinical symptoms of congestive heart failure and/or banding of the pulmonary artery and/or when in the opinion of the treating investigator closure of the perimembranous VSD was clinically warranted. Conversely, criteria of exclusion were as follows: VSD size major than 10 mm and/or ratio VSD size/aortic diameter > 2/3 (as in these cases a spontaneous closure is unlikely); subjects with associated multiple significant muscular VSD and/or complex CHD; partial VSD spontaneous closure; active bacterial infections/sepsis; hematic diseases (mainly hemolytic disease of the newborn); incomplete laboratory data. They were subdivided into self-healing group (SHG, n = 36) and needing intervention group (NIG, n = 71). SHG was defined based on no residual shunts at colorDoppler across the previous perimembranous VSD.

FINDINGS

No statistically significant differences were reported in VSD size between the two groups (p = ns). Conversely, the prevalence of anemia was significantly higher in NIG than in SHG (p < 0.03), while the content in Hb, iron, ferritin, and albumin was lower (p < 0.001, p < 0.05, p < 0.02, p < 0.007, respectively). At multivariable linear regression analysis, only Hb and albumin were associated with spontaneous closure of perimembranous VSD (p < 0.005 and p < 0.02, respectively). In multiple logistic regression analysis, Hb independently increased the probability of VSD self-healing (p = 0.03). Below a Hb cut off of 10.4 g/dL a spontaneous perimembranous VSD closure is very unlikely.

CONCLUSIONS

Regarding the factors influencing VSD spontaneous healing, many anatomical parameters were proposed as potential independent predictors, but more in-depth knowledge is still lacking, and the biological mechanisms involved are still far from being fully understood [3]. In this respect, in our research, many hematic factors potentially responsible for perimembranous VSD spontaneous resolution were examined.

Perimembranous VSD self-resolution seems to rely on many factors, tissue level of oxygenation included, which is likely to promote cells proliferation as well as tissue regeneration. Hb blood concentration influences VSD natural history and improving anemia by means of iron intake implementation may be a simple and reliable method to promote perimembranous VSD self-healing.

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ABS 63

FROM TRIALS TO RESEARCH BASED ON BIOBANKING. THE PATH LAUNCHED IN ASL LECCE

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BACKGROUND

The Biobank is a non-profit service unit, aimed at collecting, processing, storing and distributing human biological samples and data connected to them, according to proven quality standards, for research and diagnosis, guaranteeing the rights of the subjects involved. The collections of pediatric biological samples are of great importance due to their particularity and rarity. In the ASL Lecce, the Proteomics Laboratory unit, in agreement with UniSalento, has cataloged a collection, surveyed by the Department of Health of the Regione Puglia, of biological samples coming from clinical trials and diagnostic analyses of patients, especially oncological, neurological and pediatric. With the Conference "The Role of Biobanks in Research and in the Clinic" of 10 June 2019 in Lecce, a process was started for the establishment of a Biobank in the ASL Lecce, in particular for the collection of pediatric biological samples.

METHODS AND ACTIONS

A clinical study of UniSalento is currently being carried out in collaboration with ASL Lecce, for the search for new markers on peripheral blood and CSF for pre-diagnosis and follow-up on patients with suspected neurodegenerative diseases, in particular on pediatric patients. The biological samples that are so important as they come from highly invasive samples, as per protocol, will be cataloged and stored for subsequent studies, also available to other research centers. In the organization of the Conference on Biobanks in Lecce, in the Round-Table and the drafting of the Final Document, in addition to the expert speakers for each discipline, there were patient associations, health professionals, the BBMRI-ERIC (the European Biobanking and BioMolecular Resources Research Infrastructure) network and UniSalento researchers. A Technical Scientific Committee was set up, composed of experts from the various medical and research disciplines, along with a Promoting Committee composed of representatives of the various patient associations and health professionals.

CONCLUSIONS

Providing, among hospital activities, a biobanking activity means including the constant search for increasingly refined models of treatment and diagnosis, as well as providing access to a variety of clinical information. It also means having the possibility of keeping, following standardized rules and procedures, samples of individual patients, usable for subsequent possible investigations that could improve the diagnosis of disease. Priority in the establishment of Biobank in ASL Lecce is the start of the collection of pediatric biological samples. Salento is a land rich in resources. However, scientific evidence shows an increase in oncological and neurodegenerative diseases with an increasingly significant incidence in the pediatric and adolescent age group. The biobanking activity will allow us to study and monitor this preoccupying phenomenon.

ABS 64

FROM THE US TO THE MEDITERRANEAN REGION, THROUGH THE UK: BORN TO READ AND LOW-VOICE READING

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Born to Read is a national program of reading promotion addressed to the families with children in pre-scholar age (0-6 years), promoted by the Associazione Culturale Pediatri, by the Associazione Italiana Biblioteche and CSB

(Centro per la Salute del Bambino Onlus). The program is active all over the country with around 800 local projects, that involve more than 2,000 Italian municipalities. Local projects are promoted by librarians, pediatricians, educators, public bodies, cultural and voluntary associations. From 1999, Born to Read aims to promote reading in the family since birth, because reading with certain continuity to the kids exerts a positive effect on their intellectual, linguistic, emotive and rational development, with significant effect for the whole adult life. The voice of a reading parent creates a solid and safe bond with the listening kid. Through the words of books, the relationship grows, they make contact and connect thanks to the invisible wire of the stories and the magic of the voice, and the physical contact. This is the heart of Born to Read, to provide the tools for the parents in order to consolidate an unbreakable bond with their kids. Low-voice reading has a positive effect on the development of language and literacy, and is overall promoted as a support for parenting, as a loving gesture to reinforce the child-parent relationship. Especially today, when the society is dealing with several social and cultural changes, in which more and more educated parents feel incapable of facing the relationship with their children, inadequate in the approach with the newborn. It is also promoted as mediation between children and parents of other ethnicities, religions, and community of this "in progress" world. After 20 years of implementation of this project, imported from the US and then from the UK, we have numerous scientific evidences, published in national and international literature. In Italy, the project began in Secondigliano and other at-risk neighborhoods and then was implemented in Intensive Care Units of Mayer Hospital and other hospitals, known as reference centers not only from a scientific point of view but also for Medical Humanities. There is scientific evidence that reading cuddling one's own kids since early age produces oxytocin, which is the tenderness and well-being hormone with positive effects on the children and on the performance anxiety, in particular in case of preterms, on the maternal and paternal depression, on the bonding and on the future relationship of the couple that is becoming a family. It is essential to point out to the parents that if it is important to feed the baby with milk, it is also essential to feed the mind: "Love reading through a gesture of love: read a book to your kid" (Rita Valentino Merletti).

ABS 65

A CASE REPORT OF PANS AND *MYCOPLASMA PNEUMONIAE* INFECTION: A METABOLOMICS APPROACH

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Pediatric Acute-onset Neuropsychiatric Disorder (PANS) is a clinical condition characterized by sudden and dramatic obsessive-compulsive disorder with a suggested post-infectious immune-mediated etiology. This condition is accompanied by an extensive series of relatively neuropsychiatric severe symptoms. The diagnosis of PANS is made by "exclusion", as the individual PANS symptoms overlap with a multiplicity of psychiatric disorders with onset in childhood. Several researchers accumulated evidence to support the hypothesis that PANS was closely associated with a variety of infections. In the last decade, metabolomics played an essential role in improving the knowledge of complex biological systems and identifying potential new biomarkers, as indicators of pathological progressions, or pharmacologic responses to therapy. The metabolome is considered the most predictive phenotype, capable of catching epigenetic differences, reflecting more closely the clinical reality at any given moment and thus providing extremely dynamic data. In the present work, we review the most recent hypothesis and suggested mechanisms of this condition and describe the case of a 10-year-old girl with PANS, before and after clarithromycin treatment. The main results of this case report are discussed from a metabolomics point of view. The alteration of several metabolic pathways concerning the microbial activity highlights the possible role of the microbiome in the development of PANS. Furthermore, different metabolic perturbations at the level of the protein biosynthesis, energy, and amino acid metabolisms were observed.

ABS 66

METABOLOMICS AND VITAMIN D IN PRETERM NEWBORNS: CLINICAL RECORDS

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INTRODUCTION

Vitamin D was initially described as a substance capable of treating rickets. Several studies have examined the potential extra-skeletal actions of vitamin D: it is implicated in various cardiovascular, autoimmune, neurological, infectious, tumoral diseases as well as in complications of pregnancy. The ESPGHAN (European Society for Paediatric Gastroenterology Hepatology and Nutrition) has recently described the nutritional recommendations for preterm newborns: it recommends 800-1,000 IU/day of vitamin D. The importance of this vitamin in preterm infants is far from being understood.

MATERIALS AND METHODS

The objective of our work was to compare the metabolomic profile of preterm newborns before the integration of the combined vitamin D + DHA (docosahexaenoic acid) and following its integration into their diet. In the present study, 66 urine samples were collected from 22 preterm babies (gestational age = 30 ± 9 weeks), whose diet was supplemented with vitamin D and DHA. The samples were collected in three stages: at the time of discharge (T0), after 1 month (T1), after 2 months (T2) from the intake of vitamin D and DHA. We investigated the metabolome of these urine samples by performing nuclear magnetic resonance spectroscopy (^{1}H-NMR).

RESULTS

The levels of betaine, N,N-dimethylglycine (N,N-DMG), creatine, and citrate increased significantly. The levels of myo-inositol and lactate progressively reduced.

CONCLUSIONS

The data emerging from this study show that vitamin D can reprogram the metabolism of the preterm infant.

They provide a starting point for further investigation, in particular on the potential advantageous role of this vitamin in common preterm diseases.

In the debate on the composition of the formulas for preterm infants, the integration of vitamin D and DHA deserves to be taken into consideration.

ABS 67

DISSEMINATION OF THE MUSICAL CULTURE DEDICATED TO THE NEONATES ACCORDING TO THE MUSIC LEARNING THEORY

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INTRODUCTION

The Music Learning Theory, meaning the theory of the musical learning concerning neonates and children below 6 years of age, was ideated by Professor Edwin E. Gordon (South Carolina University, USA) and is science-based taking advantage of studies performed for almost 50 years by teams of experts in neuroscience, psychology, psychomotricity, physics and pedagogy.

His theory aimed to discover and describe the modalities of musical learning of the child starting from the neonatal period, by relying on the presumption that music can be assimilated by processes analogous to those by which the language is learned. Immersing the neonate in a world of musical sounds allow the neonate to develop the musical thought, defined as Audiation by Professor Gordon (similar to an "inner ear"), indicating both the ability to listen and to understand the music in their mind as a process independent of the mental conditioning.

The musical attitude is innate in each individual, and it is best at birth. Thus, if newborns are placed in an environment full of significant musical stimuli, we can drive them in a pathway of polyhedric growth until 5 years of age. As highlighted by Stefano Giorini at the Roman conference of the AIGAM in 2009, among the main functions performed by the music, the cognitive and affective functions emerge: "the music takes part in the development of the child: the enforcement of the affective bond through a shared musical experience, the influence of music on the cognitive development of the child and the contribution provided by it for a more complete growth of the person, […] the early musical experience allow developing a cultural attitude and maturing a conscious ethical sense". Furthermore, as we know, music as a form of art always represented a precious opportunity of artistic and communicative expression of the individual in every age and culture.

The basis for a deep alphabetization of the musical repertoire both on the melodic and the rhythmic level mentioned by the American researcher, is, on the one hand, acknowledged in the validity of the chosen musical pieces concerning the established criteria. On the other hand, the execution of different tonal and rhythmic patterns are just as crucial in the learning process.

According to Edwin E. Gordon, there are 3 main phases of musical learning in children only partially due to their age: acculturation, imitation, and assimilation.

The musician offers active and comfortable listening, by breaking down the language limits of rigid settings linked to the space and the practice with a musical instrument. Indeed, the informal guide sings without words but with neutral syllables, is dedicated to the child keeping the visual contact performing a continuous flow type of movement, and welcomes the moments of silence and spontaneous responses of the children that, thanks to scientific research, are interpreted as an authentic demonstration of their participation. Edwin E. Gordon acknowledged and recognized a scientific value to anharmonic learning concerning both parts: the musician must perform music for the children, and music is made together, as an orchestral dialogue where proposals and answers, notes and silences coexist: "[...] the execution of vocal and rhythmic tracks will be performed for a child only or groups of children. The pieces will be sung musically and communicatively making the educational experience of the child complete since emotional aspects that facilitate the learning integrates it".

The project of collaboration between the Neonatology Ward of the Policlinico di Monserrato with a musician formed with this theory of musical learning allows giving new perspectives to the neonatal and pediatric scientific research, and in the meantime to offer an extraordinary cultural experience from the first days of life to the newborns and the new parents.

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ABS 68

THE FIRST 1,000 DAYS: A UNIQUE OPPORTUNITY TO UNDERLINE THE ROLE AS A PREVENTION OF UNCOMMUNICABLE DISEASES

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Growth and development are key characteristics of childhood and sensitive markers of health status and adequate nutrition [1]. The first 1,000 days of life – the period from conception to age of two – is the most important period of the body and brain development [2] Infants with restricted intrauterine growth are more likely to have poor cognition development during childhood, and they are also at increased risk of cardiovascular, pulmonary, and kidney disease in later life [3]. There are many growth drivers during this complex phase of life, among them nutrition, genetic and epigenetic factors, and hormonal regulation [4]. There is strong evidence [1-4] for risk factors during pregnancy (i.e., high maternal body mass index, excess gestational weight gain particularly in the third trimester of pregnancy, gestational diabetes), and infancy (i.e., high infant birth weight, accelerated infant weight gain), as well as other factors (i.e., parent-infant relationship, infant sleep, introduction of solid food before four months of life).

As a result, tools have been developed to identify and monitor infants and children growth. Epidemiological data indicate that early life nutrition plays a powerful role in influencing later susceptibility to certain chronic diseases. An increased understanding of developmental plasticity (defined as the ability of an organism to develop in various ways, depending on the particular environment or setting) provides a conceptual basis for these observations.

Identification of effective early-life intervention targeting these modifiable factors is critical for pediatric as well as adult obesity prevention. The

first 1,000 days of life is the unique window of opportunity, and we will discuss several approaches, according to the literature, to minimize obesity, taking into account growth and function of different tissues in the human body.

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ABS 69

SYSTEMIC PERSPECTIVE FOR THE FRAMING OF THE NEURODEVELOPMENTAL DISORDERS: GLIA (GRUPPO DI LAVORO INTERDISCIPLINARE PER L'AUTISMO, MEANING "THE INTERDISCIPLINARY GROUP FOR AUTISM")

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Neurodevelopmental disorders, neuropsychiatric and neurodegenerative diseases are the most significant chapters of the epidemiological transition of the XX-XXI century, characterized by the progressive reduction of the incidence of the infective diseases and by an equal rapid increment of the prevalence of chronic-degenerative, inflammatory and neoplastic pathologies, with a concerning anticipation of the age of onset [1]. This phenomenon makes a common pathogenetic paradigm and requires the adoption of a systemic perspective, able to rebuild the picture provided by super-specialized research and assistance.

The autism spectrum disorder (ASD) can be assumed as an emblematic condition to think about the necessity of a perspective change and about the urgency of effective strategies (1 case out of 59 in the US; 1 out of 77 in Italy, ISS 2019) [2].

The recent rapid increase of the prevalence and the complex clinical picture of the people with ASD require understanding the perturbation of the construction of the neuronal network inside a complex paradigm. The epigenetic modifications of the embryo-fetal period provide the most plausible explanation, precondition of the pathogenetic model proposed by the DOHaD Theory (Developmental Origins of Health and Disease) [3, 4]. According to this theory, the origin of several pathologies – neuropsychiatric and neurodevelopmental disorders – could be due to a lacking or imperfect correspondence between epigenetic programming in the uterus and the postnatal reality, often with effects not only on the nervous system. Several environmental factors that reach the fetus through the mother can induce reactive-adaptive and predictive epigenetic changes (fetal programming), in the tissues and cellular differentiation processes, with a long-term impact not only on the individual but on the next generations as well [5]. The neuroplasticity in the First One Thousand Days (embryo-fetal period and first two years of age) makes the vulnerability maximum (thus the opportunities as well) in this temporal window.

The interpretation of the ASD according to the pathogenetic key of DOHaD is the precondition for the building of GLIA (Gruppo di Lavoro Interdisciplinary per l'Autismo, meaning "the interdisciplinary workgroup for autism") in the SIPO. Among the main objectives, there is the beginning of effective strategies of primary prevention and the individuation of biomarkers for early diagnosis.

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ABS 70

A STRANGE DROWSINESS IN A 20-MONTH-OLD CHILD

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We describe the case of 20-month-old child who came to our hospital for growing drowsiness started the day before. Episodes of seizures, traumas or sleep disorders were excluded; parents also denied chronic or infectious diseases, allergies, or drug intake for their child. His perinatal history was also normal. At the time of his arrival to our hospital, physical examination showed good general conditions with stable vital signs (body temperature 36.4°C, heart rate 110 bpm, saturation O_2 98%, blood pressure 110/60 mmHg, refill < 2 sec). Neurological examination was also normal, Glasgow Coma Scale 15/15: the child usually responded to verbal and painful stimulations, muscle reflexes and strength were found not pathological, there were no injuries to the cranial nerves, no alterations were noted in speech or deambulation, no evidence of neck stiffness or signs of meningeal involvement. Pupils were isochoric and isocyclic. The patient was only somnolent without a specific cause. First step blood tests were performed such as blood counts, electrolytes, glucose, biochemical tests for liver, pancreatic and kidney functionality, inflammatory indices; all of these tests were normal. Before proceeding with instrumental examinations (TAC, NMR) and other blood samples for metabolic or autoimmune diseases, immunochemical screening of urine was performed, and the results were negative for amphetamines, barbiturates, benzodiazepines, cocaine, methadone, tricyclic anti-depressants. We found, unexpectedly, the presence of cannabinoids in the urine of this baby (80 ng/ml with normal values < 50). Most cases of cannabis intoxication involve young children (of toddler age) because of the unintentional ingestion of high-potency edible products. In these instances, kids mistake "edible" cannabis for regular food – like gummy bears, brownies, lollipops, etc. – and eat it unknowingly. The acidic forms of cannabinoids, THC-A (tetrahydrocannabinolic acid) and CBD-A (cannabidiol acid) are naturally present in cannabis plants and preparations and are generally decarboxylated to the active compounds before the use. Hence, the identification of the acidic compounds in urine could be evidence of cannabis ingestion rather than passive exposure to smoke. Symptoms of cannabis intoxication can range from loss of coordination to any degree of sleepiness (from mild drowsiness to being unable to "wake up"), to poor respiratory effort (trouble breathing). Less commonly, children have developed a coma and need a breathing tube and ventilator. Tachycardia, ataxia, mydriasis, and hypotonia were also commonly observed. In our case, this child did not develop respiratory or cardiac symptoms but only engraving drowsiness. This case shows that we always have to look for drug intake when the symptoms are unclear and when the anamnesis is not very significant. Also, parents do not always report the truth, or they can omit much essential information during the medical interview, so that they risk delaying the correct diagnosis. Cannabis intoxication in children should be reported to child protection services with the aim of prevention, to detect situations of neglect and at-risk families. Legal action against the parents may be considered. Accidental intoxication and caring parents should be no exception to this rule.

ABS 71

AN UNUSUAL CASE OF PERSISTENT HYPER-TRANSAMINASEMIA IN AN INFANT

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We report a case of hypertransaminasemia in a 40-day-old infant, who came in the emergency room for recent evidence of rash and anorexia.

He was born after an unremarkable 39 weeks gestation pregnancy, which included both a normal integrated prenatal screen and anatomical ultrasound scan. Her birth weight was 3.08 kg, and Apgar scores were 9 at 1 minute and 9 at 5 minutes. No drugs ingestion, and no fever were reported.

Physical examination revealed a pink-colored morbilliform rash and 3/6 pansystolic murmur heard at the left lower sternal border without signs

of heart failure. There were good peripheral pulses with capillary refill less than 2 seconds.
Abnormal laboratory findings included Hb 9.3 g/dl, lactate dehydrogenase (1,554 IU/l), proBNP (1,104 pg/ml) and hypertransaminasemia (aspartate aminotransferase 657 U/L, alanine aminotransferase 573 U/L).
The levels of CPK, troponin, C-reactive protein, GGT, total bilirubin (1.3 mg/dl), prothrombin time were normal.
Cardiac investigations were performed. Echocardiography showed patency of the oval foramen with left-right shunt and interatrial septum aneurysm, but both were not significant.
Abdominal ultrasound was unremarkable.
No antibodies against Human Immunodeficiency Virus (HIV), Hepatitis C Virus (HCV), Hepatitis B Virus (HBV), Parvovirus, Cytomegalovirus (CMV), Epstein Barr Virus (EBV) were detected.
However, the anti-HHV-6 infection was revealed from blood PCR examination. Intravenous hydration was started with a decrease of transaminases.
In conclusion, we underline that in the case of hypertransaminasemia also extrahepatic causes should be investigated. In addition, our case is particularly curious due to the absence of fever and the very young age of the child.
Human herpesvirus 6 (HHV-6) has been identified as the etiologic agent of exanthema subitum or sixth disease in infants and acute febrile illness in young children.
The peak age of primary HHV-6 infection is 6-9 month of life. It is characterized by abrupt onset of high fever and fussiness that usually resolves after 72 hours in coincidence with the appearance of faint pink or rose-colored, morbilliform rash on the trunk. The sixth disease is generally a self-limited illness associated with complete recovery.

ABS 72

NEVER FORGET PERTUSSIS

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A 12-year-old female patient presented to a Pediatric Emergency Room for anorexia, weight loss, and persistent cough with nocturnal paroxysms for the previous 4 weeks.
She also reported occasional wheezing and chest tightness. She denied other symptoms. The patient presented to her primary care physician two weeks prior and was treated with amoxicillin and bronchodilator therapy without improvement.
The cough became more frequent, sometimes emetizing and with an end-inspiratory whoop. She was vaccinated according to our national vaccine program.
On physical examination, the patient was in good general conditions, she had no fever, and the oxygen saturation was 97% on room air. The pharynx was slightly injected without exudates. No mass or adenopathy presented on examination of the neck. The lungs presented diffuse crackles and expiratory wheezes. The rest of the physical examination was unremarkable.
The blood analysis revealed an increased peripheral white blood cell count with lymphocytosis and normal biochemistry, including standard C-reactive protein. The chest radiograph showed a reinforcement of the perihilar bonchovascular reticulum and heterogeneous infiltrates on the inferior third of the right lung.
Tuberculin skin test was performed and read 72 hours later and was negative (0 mm). A sample of blood and a pharyngeal swab were sent to our laboratories for detection of principal respiratory viruses and *Bordetella pertussis* by polymerase chain reaction (PCR) assays. The PCR analysis was reported to be positive for *Bordetella pertussis* DNA.
The patient received a prescription of clarithromycin (15 mg/kg/day for 14 days). The patient's symptoms resolved after two weeks.
In the past, pertussis affected children under 6 years of age, mainly, but recent trends show that there is a shift toward the older age group. In Western countries, approximately 10% to 12% of all pertussis cases occurred in persons over 15 years of age.
Cough is one of the most common complaints among children, and its causes are multiple. The anticipation and early diagnosis of these cases are important because the affected adolescents and adults act as reservoirs of the disease to the vulnerable population of infants, for whom the disease can be life-threatening.
The clinical presentation can be atypical in the adolescent age group, and the disease is often misdiagnosed. Immunization and early diagnosis are crucial in the management of pertussis.