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THE REVOLUTION OF MICROBIOMICS

NUTRITION, BACTERIA AND PROBIOTICS IN PERINATAL AND PEDIATRIC HEALTH

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ABS 1

AWARENESS ABOUT LABIA MINORA FUSION AMONG LEBANESE PEDIATRICIANS

M. Amm[1], M.C. Fadous Khalife[1], V. Modica[1], H. Feghali[1], J. Mardini[1], M. AlOjaimi[2]

[1]Holy Spirit University of Kaslik, Kaslik, UH-Notre Dame Des Secours, Jbeil, Lebanon

[2]Balamand University, Koura, Lebanon

INTRODUCTION

Our three main objectives are to assess knowledge about the coalescence of labial minora among Lebanese pediatricians, evaluate the number of pediatricians who perform a systematic gynecological examination in young girls and describe the pediatric gynecologic pathology in Lebanon including a literature review.

MATERIAL AND METHODS

This is a cross-sectional descriptive study conducted in 2014 through a questionnaire that was answered by 117 pediatricians practicing in the different Lebanese regions, and the data were analyzed on "Microsoft® Excel® 2013" in order to meet the three pre-described objectives.

RESULTS

41% of the 117 pediatricians included in the study knew about labia coalescence. The lowest rates of knowledge are reported in the South (6.7%) and Bekaa (13.3%) and Baalbek (0%). 80.3% of pediatricians routinely examine the female's genitals. Male pediatricians who do not constitute 26% compared to 7.5% female pediatricians ($p = 0.02$). Regarding the incidence, the general average per year is 0.12%. 73% of pediatricians report that the diagnosis is made on a routine, systematic physical examination. The coalescence of the labia minora is associated in 23% of the cases with a urinary infection and in 16.65% with genitourinary symptoms. 10.4% of pediatricians made the diagnosis following the discovery by the mother. 83.3% of the doctors handled the case without pediatric gynecology consult and then referred the patient to a pediatric surgeon in 82% of the cases. 17% initially adopt a conservative attitude; 75% apply creams with a recurrence rate of 15.9%. This rate is highest in the case of a manual separation (21%).

CONCLUSION

The coalescence of the labia minora is a common, benign, commonly asymptomatic, poorly known and underestimated condition in Lebanon with an incidence of 0.12% per year. 1/5 of pediatricians do not examine the genital area of girls mainly male pediatricians. 75% of the pediatricians use estrogenic creams or corticosteroids, and 17% are conservative. The clinical presentation is similar to that found in the literature.

ABS 2

SUCCESSFUL CONSERVATIVE MANAGEMENT OF A GIANT UNILATERAL PNEUMATOCELE IN AN EXTREMELY LOW BIRTH WEIGHT INFANT

F. Bissolo, C. Forcellini, R. Beghini, S. Lauriola, M. Ventola, B. Ficial, E. Bonafiglia, L. Chini, L. Pecoraro, I. Sibona, R. Frassoldati, P. Biban

Neonatal Intensive Care Unit, Department of Pediatrics and Neonatal Critical Care, Verona University Hospital, Verona, Italy

INTRODUCTION

Pneumatocele is an air-filled, thin wall cavity within the lung parenchyma. It may be a consequence of protracted mechanical ventilation or a complication of *S. aureus* pneumonia, even in the neonatal age. In the latter case, affected neonates may appear septic and empyema or pneumothorax may occur. Differential diagnosis is with Congenital Cystic Adenomatoid Malformation (CCAM), pulmonary sequestration, and congenital pulmonary emphysema. Treatment is still controversial, and no specific guidelines are presently available. Several strategies are adopted in different centers, including early surgery, selective bronchial ventilation or a conservative approach while waiting for spontaneous resolution. Early surgery is not always effective and may be associated with postoperative complications and worse prognosis. However, surgery may be eventually necessary in prolonged unresolved cases.

CASE REPORT

An extremely preterm infant (GA = 26 weeks, BW = 670 g), was born by C-section for uncontrolled maternal hypertension and altered cardiotocography. Antenatal steroids were provided. At birth, the baby

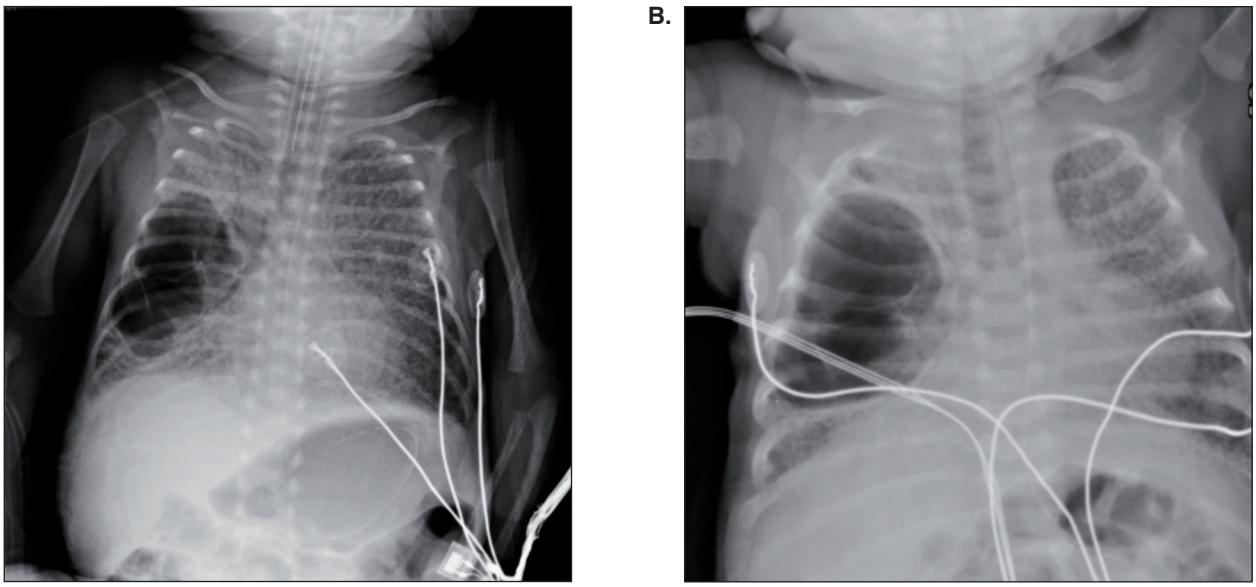


Figure 1 (ABS 2). Thorax X-ray of the case report.

did need cardiopulmonary resuscitation, intubation, and 100% oxygen. Apgar score was 1, 3 and 5 at 1, 5 and 10 minutes, respectively. Exogenous surfactant and prolonged mechanical ventilation were needed. At 2 weeks of life, a septic episode was treated with vancomycin and gentamicin. One week later, a chest X-ray (CXR) showed a large radiolucent area within the right lung. Lung ultrasound (US) revealed a loculated area suggestive of a pseudocystic lesion, compatible with a pneumatocele. Tracheal aspirate yielded positive for *S. aureus*, blood culture for *S. warneri*. Rifampicin and cefotaxime were given for 3 weeks. A CT scan confirmed the diagnosis of pneumatocele (large cystic loculated lesion, impronting the remaining parenchyma). Progression was monitored by weekly US and CXR (**Fig. 1**). We adopted a conservative approach based on residual lung recruitment, righ-sided positioning, and appropriate analgesia. Moderate hypercapnia was tolerated with pH values > 7.22. To facilitate weaning from invasive ventilation, low dose dexamethasone was also administered. Mechanical ventilation was discontinued after 7 weeks, followed by noninvasive support and supplemental O_2 for an additional 2 weeks. After 9 weeks since the diagnosis, we observed a spontaneous, full resolution of pneumatocele, with no obvious radiological signs of residual lung damage.

CONCLUSIONS

Management of pneumatocele in preterm newborns remains a very complex task. Early surgery could be particularly risky in extremely premature infants. In our case, despite the massive size of the lesion, which was markedly compressing the rest of the ipsilateral lung, we decided a conservative approach allowing a complete spontaneous resolution, at the same time preserving parenchymal tissue and avoiding invasive procedures. Further studies in larger populations will have to confirm the benefit of the wait-and-see attitude in these vulnerable patients.

REFERENCES

- Arora P, Kalra VK, Natarajan G. Pneumatoceles in infants in the neonatal intensive care unit: clinical characteristics and outcomes. Am J Perinatol. 2013;30:689-94.
- de Bie HM, van Toledo-Eppinga L, Verbeke JI, van Elburg RM. Neonatal pneumatocele as a complication of nasal continuous positive airway pressure. Arch Dis Fetal Neonatal Ed. 2002;86:F202-3.
- Hussain N, Noce T, Sharma P, Jagjivan, B, P. Hegde P, M. Pappagallo M, Bhandari A. Pneumatoceles in preterm infants: incidence and outcome in the post-surfactant era. J Perinatology. 2010;30:330-6.

ABS 3

METABOLOMICS IN NEWBORNS WITH INTRA-UTERINE GROWTH RESTRICTION: EFFECTS OF MATERNAL SMOKING

L. Corona, F. Cesare Marincola, S. Corbu, R. Pintus, V. Fanos, A. Dessì

Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

Maternal smoking during pregnancy is considered to be one of the leading modifiable determinants of adverse outcomes in the offspring, leading

to complications such as Intrauterine Growth Restriction (IUGR). Despite remarkable progress in understanding the metabolic profile of newborns with IUGR, to our knowledge, this is the first study carried out to investigate the metabolomic effects of maternal smoking on these particular patients. This work aimed to compare urine metabolome of IUGR newborns exposed to maternal smoking with that of non-exposed IUGR newborns.

MATERIAL AND METHODS

For this purpose, 32 neonates with an echographic diagnosis of IUGR were recruited: 11 of them were born to mothers who smoked during pregnancy, while 21 were born to non-smoking mothers. Smoking was self-reported by mothers, and average consumption was 7 cigarettes per day. Urine samples were collected non-invasively from each newborn during the first week of life and then frozen at -80°C until the metabolomic analysis was carried out by 1H-Nuclear Magnetic Resonance (NMR). Statistical analysis was performed using the Principal Components Analysis (PCA) and the Orthogonal Partial Least Squares-Discriminant Analysis (OPLS-DA).

RESULTS

From the loading plots of OPLS-DA, we were first able to visualize a separation between exposed and non-exposed IUGR newborns. The univariate analysis then allowed us to identify N,N-Dimethylglycine (N,N-DMG) as responsible metabolite for the separation between the two groups: box-and-whisker plot showed that signal intensity of N,N-DMG was significantly higher in exposed newborns compared with non-exposed ones ($p < 0.05$).

CONCLUSION

Considering its protective effects against oxidative stress, higher concentrations of N,N-DMG in neonates born to smoking mothers might be interpreted as evidence of exposure to reactive compounds due to maternal smoking.

ABS 4

THE C.O.R.E. STUDY: IMPACT ON HOSPITAL READMISSION RATES OF A NEW PROTOCOL FOR THE ANALYSIS OF CARDIORESPIRATORY STABILITY IN PRETERM INFANTS BEFORE NICU DISCHARGE

F. Cresi, E. Cocchi, A. Pirra, F. Logrippo, C. Plazzotta, D. Enrietti, R. Bagna, E. Maggiora, V.A. Dell'Anna, E. Bertino

Neonatal Intensive Care Unit, City of Health and Science, University of Turin, Turin, Italy

BACKGROUND

Detection of stable cardiorespiratory stability is essential for safe discharge of preterm infants. Management practices surrounding discharge decisions for infants with cardiorespiratory (CR) events vary widely among neonatologists [1-3].

AIM

Our study aims to assess the effectiveness of a new protocol for pre-discharge CR monitoring in preterm infants on hospital readmission rates.

METHODS

Preterm infants ready for discharge, born ≤ 34 weeks' gestational GA, were subjected to pre-discharge clinical evaluation and monitoring to detect cardiorespiratory stability. High-risk infants (GA ≤ 28 weeks and/or need for mechanical ventilation for more than 24 hours and/or need for oxygen for at least 28 days and after 36 weeks' postmenstrual age and/or evidence of severe CR events in the last two weeks) also underwent instrumental monitoring (IM). We evaluated the impact of our protocol on hospital readmission rates and length of stay by comparing study population with the control group (infants born in the same period and matched by GA and weight at birth).

RESULTS

We compared 110 preterm infants (median GA 30.64 weeks) with 213 matched infants (median GA 30.86 weeks). The study population included 47 high-risk infants who underwent IM, 13 of whom needed to repeat the IM one or two times before it improved enough for safe discharge. We observed lower hospital readmission rate within 3 months of discharge in study population compared to control group (10 [9.09%] versus 46 [21.6%], $p = 0.004$) without a concurrent extension of hospital length of stay (median: 39 [26-58] versus 43 [26-68], $p = 0.16$).

CONCLUSIONS

Our protocol significantly reduced hospital re-admission rates in the study population without lengthening hospital stay; therefore, it could help neonatologists to define the best timing for NICU discharge and reduce hospital readmission rates.

REFERENCES

[1] American Academy of Pediatrics Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. Pediatrics. 2008;122: 1119.

[2] Darnall RA, Kattwinkel J, Nattie C, Robinson M. Margin of safety for discharge after apnea in preterm infants. Pediatrics. 1997;100(5):795-801.

[3] Jefferies AL. Canadian Paediatric Society, Fetus and Newborn Committee. Going home: Facilitating discharge of the preterm infant. Paediatr Child Health. 2014;19(1):31-42.

ABS 5

FOLINIC ACID TREATMENT IN KEARNS-SAYRE SYNDROME (KSS): CURRENT APPROACH

M. Limone[1], M. Rossano[1], F. Guerra[1], E. Flore[2], M. Balzarini[3], L. Boccone[3], M. Marica[3], P. Moi[3]

[1]School of Pediatrics, University of Cagliari, Cagliari, Italy

[2]School of Medical Genetics, University of Cagliari, Cagliari, Italy

[3]Clinica Pediatrica e Malattie Rare, Ospedale Pediatrico Microcitemico "A. Cao", University of Cagliari, Cagliari, Italy

CASE REPORT

At 6 yo, MR showed intention tremor, dys-diadochokinesia and left ptosis. Ophthalmic evaluation diagnosed pigmentary retinopathy and weakness of superior and lateral rectus muscle. Lab tests revealed slightly high lactate levels, normal Amino Acid Chromatography (AAC), Organic Acid Chromatography (OAC), C26 and phytanic acid. Brain MRI showed T2 hyperintense signal from pons and midbrain, an altered signal on DWI in the pyramid tract, reduced thalamus, and a thinned corpus callosum. Molecular diagnostics excluded spinocerebellar ataxia (SCA) type 1-2-3-6-7 and Friederich ataxia. A muscular biopsy, performed for the suspect of a mitochondrial disorder, showed red ragged-like fibers. Besta Institute analyzed mtDNA finding a 7,500 bp microdeletion in 40% of mtGenome. These findings were consistent with Kearns-Sayre syndrome (KSS). Since diagnosis, progressive worsening of cerebellar symptoms has been noticeable. The patient developed DM in 2014. Today MR is 16 yo, and he is taking folinic acid, riboflavin, and coenzyme Q10. KSS is a multisystem disorder with onset before the age of 20 years, characterized by pigmentary retinopathy and progressive external ophthalmoplegia (PEO). Affected individuals may have CNS involvement (especially cerebellar dysfunction) with cerebrospinal fluid protein (CSF) concentration greater than 100 mg/dl, heart block, skeletal muscle myopathy, endocrine disorders, and renal failure. Treatment is supportive and preventive for known secondary complications of the disease. KSS has been associated with high CSF protein concentration and HVA values with a severe cerebral folate deficiency, but their clinical consequences and the mechanisms involved have not been fully enlightened [1]. Other mitochondrial disorders showed a reduction in cerebral folate, but in patients affected by KSS, the deficit is more severe. Choroid plexus is a target organ in KSS. Its impaired function caused by the accumulation of mutated mitochondria could lead to failure of absorption and secretion of substances with very low 5-MTHF and high protein concentrations in CSF. Literature suggests that folinic acid may improve neuroimaging damage and neurological outcome, suggesting that folate is important in white matter maintenance and stability and that CSF 5-MTHF determination in mtDNA deletion syndromes could be performed to select patients for folinic acid therapy [2, 3]. MR never performed a CSF 5-MTHF determination, but he started folinic acid supplementation. A benefit on neurological symptoms was appreciated.

CONCLUSION

Considering KSS rarity and mtDNA deletions, heterogeneous between patients and variably distributed in tissues with different clinical pictures, evaluating the efficacy of folinic acid treatment on a large scale is challenging. CSF 5-MTHF determination is an invasive procedure, and we suggest not to perform CSF collection to select a patient for treatment. Given its safety profile, starting folinic acid and evaluating neurological outcome during follow-up seems reasonable.

REFERENCES

[1] Batllori M, Molero-Luis M, Ormazabal A, Montero R, Sierra C, Ribes A, Montoya J, Ruiz-Pesini E, O'Callaghan M, Pias L, Nascimento A, Palau F, Armstrong J, Yubero D, Ortigoza-Escobar JD, García-Cazorla A, Artuch R. Cerebrospinal fluid monoamines, pterins, and folate in patients with mitochondrial diseases: systematic review and hospital experience. J Inherit Metab Dis. 2018 Jul 4. [Epub ahead of print]

[2] Pineda M, Ormazabal A, López-Gallardo E, Nascimento A, Solano A, Herrero MD, Vilaseca MA, Briones P, Ibáñez L, Montoya J, Artuch R. Cerebral folate deficiency and leukoencephalopathy caused by a mitochondrial DNA deletion. Ann Neurol. 2006;59(2):394-8.

[3] Serrano M, García-Silva MT, Martin-Hernandez E, O'Callaghan Mdel M, Quijada P, Martinez-Aragón A, Ormazábal A, Blázquez A, Martín MA, Briones P, López-Gallardo E, Ruiz-Pesini E, Montoya J, Artuch R, Pineda M. Kearns-Sayre syndrome: cerebral folate deficiency, MRI findings and new cerebrospinal fluid biochemical features. Mitochondrion. 2010;10(5):429-32.

ABS 6

SIBLING CLUSTERING OF VITAMIN D STATUS IN CHILDREN FROM NORTHERN SARDINIA

M.G. Clemente, D. Argiolas, L. Argiolas, G. Sotgiu, R. Antonucci

Pediatric Clinic, Department of Medical, Surgical and Experimental Sciences, University of Sassari, Sassari, Italy

INTRODUCTION

Several studies have revealed that hypovitaminosis D is a public health issue also in children and adults in industrialized countries like Italy. The study aimed to investigate vitamin D status in children from Northern Sardinia.

METHODS

A cross-sectional study was performed in June 2018 in a cohort of children aged more than one year from the north-west coast of Sardinia island, Italy. The study assessed auxologic data, findings from a questionnaire targeting family lifestyles and serum 25-hydroxyvitamin D (25[OH]D) concentration values, measured by commercially available chemiluminescence immunoassays assay, and expressed as ng/mL (kit limit concentration range = 4-130 ng/ml).

RESULTS

Total 68 children (M = 34; age, range = 1-16 years old) were enrolled, among whom 27 were siblings from 13 different families. Eleven of 68 children (17.65%) were 1-4 years old, 39 (57.35%) were 4.1-10 years old, and 17 (25%) were 10.1-16 years old. According to the body mass index (BMI) percentiles, the majority (85%) of children had normal BMI, while 10.5% were overweight and 4.5% obese. Considering the ESPGHAN's "sufficiency" cut-off value of 20 ng/mL, serum 25(OH)D concentration was found to be > 20 ng/mL in 46 (68%) children, between 20 and 10 ng/mL (insufficiency) in 20 (29%) children, and < 10 ng/mL (deficiency) in 2 (3%). Interestingly, a high degree of sibling clustering of vitamin D status was found, regardless of the family's lifestyles.

CONCLUSIONS

Hypovitaminosis D is present in approximately one-third of children living in the sunny Sardinian coast. Besides environmental and epigenetic factors, our results provide indirect evidence that genes play a significant pathogenic role. The vitamin D status of close family members seems to be a strong predictor of vitamin D status in children.

ABS 7

COMPARISON EFFECTS OF HOLDER PASTEURIZATION AND HIGH-TEMPERATURE SHORT-TIME PASTEURIZATION ON ANTIVIRAL ACTIVITY OF HUMAN MILK

M. Donalisio[1], M. Rittà[1], R. Francese[1], A. Civra[1], P. Tonetto[2], A. Coscia[2], M. Giribaldi[3,4], L. Cavallarin[3], G.E. Moro[5], S. Sottemano[2], D. Lembo[1], E. Bertino[2]

[1]Laboratory of Molecular Virology, Department of Clinical and Biological Sciences, University of Turin, Turin, Italy

[2]Neonatal Intensive Care Unit, Department of Public Health and Pediatrics, University of Turin, Turin, Italy

[3]Consiglio Nazionale delle Ricerche-Istituto di Scienze delle Produzioni Alimentari, Grugliasco (TO), Italy

[4]Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria, Centro di Ricerca in Ingegneria e Trasformazioni agroalimentari, Turin, Italy

[5]Italian Association of Human Milk Banks, Milan, Italy

INTRODUCTION

To date all international guidelines recommend the use of Holder Pasteurization (HoP), which provides a temperature of 62.5°C for 15 minutes, to avoid potential infections transmitted by human donor milk. A drawback of pasteurization is that it affects some human milk bioactive and nutritive components [1]. Recently, High-Temperature Short-Time (HTST) pasteurization has been reported to be a valuable alternative technology to increase the retention of some biological features of human milk [2]. However, to date, scarce data are available about the impact of pasteurization methods other than HoP on the antiviral activity of human milk.

AIM

The aim of our study was the evaluation of the antiviral activity of human milk against a panel of viral pathogens causing diseases in newborns and children (i.e., HSV 1 and 2, CMV, RSV, HRoV, and HRhV), and the assessment of the effects of HoP and HTST pasteurization on milk's antiviral properties.

RESULTS

Results demonstrate an antiviral activity of human raw milk against all viruses tested. Unlike the Holder pasteurization, HTST preserved the inhibitory activity against CMV, HRhV, HRoV and HSV 2. By contrast, both methods reduced the antiviral activities significantly against HRhV and HSV 1. Unexpectedly, HoP improved milk's anti-rotavirus activity. In conclusion, our study contributes to the definition of the pasteurization method that allows the best compromise between microbiological safety and biological quality of donated human milk: HTST pasteurization preserved milk's anti-viral activity better than HoP.

REFERENCES

[1] Peila C, Moro GE, Bertino E, Cavallarin L, Giribaldi M, Giuliani F, Cresi F, Coscia A. The Effect of Holder Pasteurization on Nutrients and

Biologically-Active Components in Donor Human Milk: A Review. Nutrients. 2016;8(8):E477.

[2] Giribaldi M, Coscia A, Peila C, Antoniazzi S, Lamberti C, Ortoffi M, Moro GE, BertinoE, Civera T, Cavallarin L. Pasteurization of human milk by a benchtop High-Temperature Short-Time device. Innov Food Sci Emerg Technol. 2016;36:228-33.

ABS 8

ULTRASOUND-GUIDED PERCUTANEOUS CENTRAL VEIN CANNULATION IN NEONATES

F. Piersigilli, I. Savarese, F. Campi, I. Bersani, S. Sgrò, A. Dotta

Department of Medical and Surgical Neonatology, Bambino Gesù Children's Hospital, Rome, Italy

INTRODUCTION

Advances in neonatal intensive care techniques have increased the survival of premature ELBW and VLBW infants, enhancing the need for central venous access in these small patients. Jugular access is not the first choice for vascular access in newborns because it is traditionally considered a problematic procedure. The use of ultrasound-guided (UG) approach to CVC placement is reported in adults and children to be a safe and effective technique, but it is still not well documented among neonates. Retrospective data collection of prospectively registered data on catheter insertion in infants.

METHODS

A retrospective review of data collected in a 36 month-period among neonates who underwent a central catheterization. All data regarding catheter placement were registered prospectively and then retrospectively analyzed.

RESULTS

Data were collected from January 2015 till December 2017. Overall, 560 CVC were positioned during the study period. Among these, 321 were 1 Fr or 2 Fr peripherally inserted central catheters while 239 were ultrasound guided catheters (42.6%). The internal jugular vein was the most used approach with no side preference. UG CVC placement was performed in the neonatal intensive care unit, at the bedside. For the UG approach, the SonoSite M-Turbo® portable ultrasound was used. Only patients requiring ventilatory support were intubated; otherwise, sedation was performed in all patients. Three trained neonatologists compose the catheter team. No intraprocedural complications were recorded. We had 5 long-term complications (3 pleural effusions, 2 pericardial effusions) involving both peripherally inserted central catheters and ultrasound-guided catheters.

CONCLUSIONS

Ultrasound-guided CVC placement has proved to be a safe and efficient procedure to central venous access in infants. This approach avoids the need for surgical cut-down and can be considered therefore less invasive, because it can be performed at bedside, with no need of intubation or neuromuscular block. The appropriate training of the medical staff is a crucial point for the success and safety of the procedure.

ABS 9

BECKWITH WIEDEMANN SYNDROME: AN INTERESTING CASE REPORT

A. Satta[1], R. Murru[1], G. Senes[1], V. Fanos[2], G. Faa[1], M.L. Lai[1]

[1]Division of Pathology, University of Cagliari, AOU Cagliari, Cagliari, Italy
[2]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

Beckwith Wiedemann syndrome (BWS) is a rare genetic disorder characterized by a marked phenotypic variability. Cardinal features of BWS include macroglossia, exomphalos, lateralized overgrowth, hyperinsulinism, adrenal-cortex cytomegaly and pancreatic adenomatosis [1]. The objective of this study is to describe a case of BWS occurring in a preterm newborn died in the perinatal period.

PATIENT AND METHODS

A 26-year-old pregnant woman presented with pre-eclampsia, leading to preterm labor at the 27th week of gestation. Apgar index of the female newborn at birth was 5, with the insurgence of a respiratory distress syndrome. The newborn was admitted to the neonatal intensive care unit of our hospital. Laboratory tests revealed hypoglycemia. The newborn died 44 hours after birth and autopsy were performed. Tissue samples were formalin-fixed and routinely processed. Tissue sections were stained with H&E, and pancreas specimens were immunostained with anti-synaptophysin and anti-Chromogranin antibodies.

RESULTS

At autopsy, the newborn showed anasarca, and a birth weight 2 SDS above the mean values.

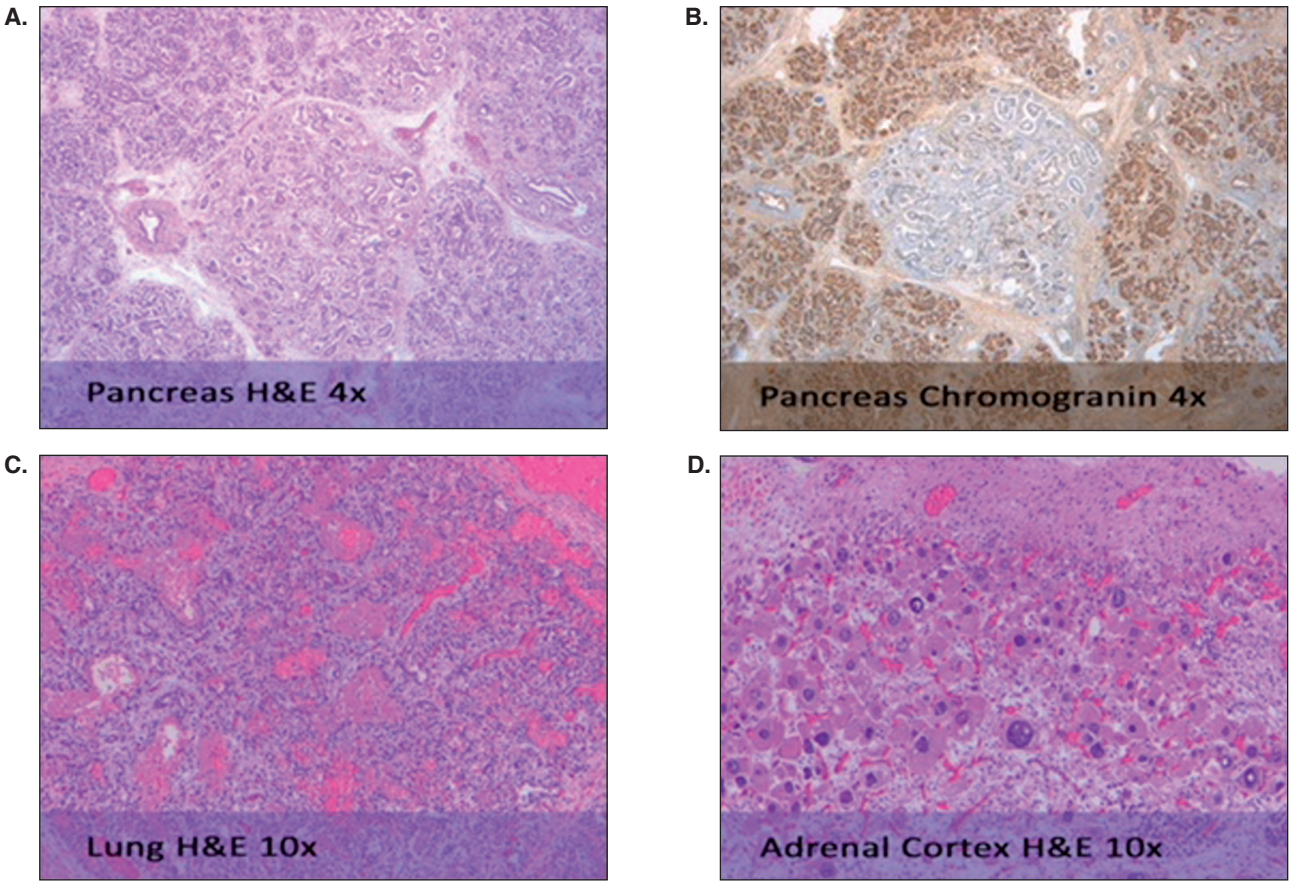


Figure 1 (ABS 9). At histology: cytomegaly of the adrenal cortex, hyaline membrane disease of the immature lungs, marked hyperplasia of the Langerhans islands of the pancreas, and increased hepatic hematopoiesis.

Macroglossia was observed, associated with generalized visceromegaly, including lung, heart, liver, pancreas, and kidney. An ectopic adrenal gland was found, in a para ovarian site. Exomphalos, with incarcerated and ischemic intestinal loops, was also detected. At histology (**Fig. 1**), we observed cytomegaly of the adrenal cortex, hyaline membrane disease of the immature lungs, marked hyperplasia of the Langerhans islands of the pancreas, and increased hepatic hematopoiesis.

CONCLUSIONS

The case of BWS here reported is characterized by a dramatic clinical course, leading to death within the first 48 hours after birth, despite the immediate recovery in a NICU. The histological study of the newborn organs and tissues, revealed the association of hyaline membrane disease, occurring in immature lungs, with marked hyperplasia of Langerhans islands, putatively responsible for hyperinsulinism and hypoglycemia. Our case shows that, in neonates affected by BWS, the finding of hyperinsulinism should be considered a sign of poor prognosis, mainly when associated with preterm birth and immaturity. The marked hyperplasia of the endocrine pancreas, here reported, confirms that in BWS infants affected with marked hyperinsulinism, surgery with partial pancreatectomy should be considered [2].

REFERENCES

[1] Brioude F, Kalish JM, Mussa A, Foster AC, Bliek J, Ferrero GB, Boonen SE, Cole T, Baker R, Bertoletti M, Cocchi G, Coze C, De Pellegrin M, Hussain K, Ibrahim A, Kilby MD, Krajewska-Walasek M, Kratz CP, Ladusans EJ, Lapunzina P, Le Bouc Y, Maas SM, Macdonald F, Õunap K, Peruzzi L, Rossignol S, Russo S, Shipster C, Skórka A, Tatton-Brown K, Tenorio J, Tortora C, Grønskov K, Netchine I, Hennekam RC, Prawitt D, Tümer Z, Eggermann T, Mackay DJG, Riccio A, Maher ER. Expert consensus document: Clinical and molecular diagnosis, screening and management of Beckwith-Wiedemann syndrome: an international consensus statement. Nat Rev Endocrinol. 2018;14(4):229-49.

[2] Laje P, Palladino AA, Bhatti TR, States LJ, Stanley CA, Adzick NS. Pancreatic surgery in infants with Beckwith–Wiedemann Syndrome and Hyperinsulinism. J Ped Sur. 2013;48(12):2511-6.

ABS 10

SPINAL MUSCULAR ATROPHY: A NEW COMPASSIONATE OR THERAPEUTIC PERSPECTIVE?

S. Vendemmia[1], G. Parisi[2], N. Vendemmia[3], M. Vendemmia[4]

[1]Head Emeritus of Pediatrics and Neonatology, Aversa, Italy
[2]Head Emeritus of Pediatrics and Neonatology, Vasto, Italy
[3]Orthopedics and Orthopedic Surgery, Policlinique Medipole Centre Hopitalier Cabestany, Perpignan, France
[4]Neonatal Intensive Care Unit, University Federico II, Naples, Italy

INTRODUCTION

The spinal muscular atrophy (SMA) is a severe neuromuscular disorder due to a defect in the gene 1 for the survival of the motor neuron (SMN1). Its incidence is about 1/11,000 live births; in 95% of patients, the SMA is caused by the absence of homozygosity of exons 7 and 8 of the SMN1 gene. In some cases, only of the exon 7 is reported. Most of the patients inherit the deletion of SMN1 from their parents, and in 2% there is a new deletion in one of the two alleles. In 3-4% we can find other mutations in SMN1, typically an SMN1 deletion on the other allele. The SMN locus is part of a genomic inverted duplication region of human chromosome 5, which contains a paralogue gene SMN2. The SMN2 is intact in all patients with SMA. The copy numbers of SMN2 gene, however, can vary between 0 and 4 for chromosome 5 in the general population. The SMA patients always carry at least one SMN2 copy.

DIAGNOSIS

The SMA diagnosis is based on molecular genetic testing. Genetic testing of SMN1/SMN2 is highly reliable, and it is the first line of investigation when we have a clinical suspicion. The gold standard genetic test for SMA is the quantitative analysis of both SMN1 and SMN2, via multiplex ligation-dependent probe amplification, quantitative polymerase chain reaction, next-generation sequencing.

INCIDENCE OF SMA

The incidence and prevalence vary according to the type of SMA. Type 1 has the highest incidence (3.2-7.1/100,000) and represents about half of the patients diagnosed. However, the extreme gravity of this typically translates into a low prevalence (0.1-0.15/100,000). Approximately 1/50 individuals are healthy carriers of SMA. In Europe, it is estimated that there are about 12/18 million healthy carriers. SMA lacks an essential protein for the functioning of motor neurons that control the muscles used to breathe, crawl, walk, swallow, control the movements of the head and neck. The lack of this protein, defined as survival of the motor neuron (SMN), causes the degeneration of the spinal cord motor neurons. For this reason, the size of the muscle cells is reduced causing muscle weakness. Deletions cause SMA in homozygosity or mutations involving the SMN1 gene that produces the SMN protein, highly expressed in the spinal cord and essential for the survival of motor neurons.

WHAT ARE THERAPIES USED UNTIL TODAY AND WHICH THE PERSPECTIVES FOR THE FUTURE?

Currently, SMA is managed with supportive therapies, including palliative interventions and/or proactive interventions. Palliative care is used to improve the quality of life and alleviate discomfort and stress. Non-invasive ventilation helps to avoid hospitalization and the need to practice a tracheostomy. The proactive treatment aims to improve the quality of life and its extension with the medical interventions. The pulmonary and nutritional interventions can include the positioning of a nasogastric tube for feeding, intensive respiratory support, and tracheostomy.

Muscle weakness in SMA can cause several complications:

- respiratory insufficiency (SMA type 1 and 2);
- gastrointestinal complications: gastroesophageal reflux and constipation:
- ortopedical complications: scoliosis, fractures.

A multidisciplinary approach is also envisaged for the care and treatment of a patient with SMA: child neuropsychiatrist, pulmonologist, and respiratory therapist, physiotherapist, speech therapist, nutritionist, genetic counselor, orthopedist, social worker, pediatrician, nurse specialist. Currently, in Italy, we are using a new product, the nusinersen, also in the context of scientific data currently available (studies ENDEAR and CHERISH). Interesting is the ENDEAR project, a multicenter, randomized, double-blind study that involved 120 patients with SMA1 and younger than 7 months of life. The interim results of this study enabled the activation of an extended access program in 20 countries.

NUSINERSEN

Nusinersen is an active ingredient that is part of a group of drugs known as oligonucleotides antisense. This drug was published in the Italian *Gazette* on 27-09-2017 with reimbursement for the types of SMA type 1, 2, 3. In Italy, 130 patients with SMA1 were enrolled in compassionate use, and it was a world record for the number of patients treated. It is still premature to draw positive and conclusive data on the efficiency and effectiveness of this new therapy, but from the first data acquired and from the ENDEAR and CHERISH studies, one gets the impression that this drug can act by helping the body to produce a greater quantity of SMN protein for which SMA is lacking. Besides, the endorachid

administration appears to reduce nerve cell loss and improve muscle strength.

CASES REPORT

We follow, from the first months of life, two patients who, currently, have about 22 months.

They are a little lady and a little boy who has periodically practiced, following the prescribed protocol, the endorachid therapy with nusinersen. Therapeutic scheme: day 0, day 14, day 28, day 63, then one administration every 4 months. The little ones have practiced this therapy in a hospital environment and have not presented any side effects. In both patients, the diagnosis of SMA1 was certain, obtained by extracting DNA from the leucocytes of the same subjects. DNA examination showed homozygous variations in the SMN1 gene on chromosome 5q13: SMN1 exon 7, exon 8, homozygous. The female has practiced the first endorachid dose at about 4 months of life (body weight 4.600 kg), continuing, then, according to the protocol. Her condition has dramatically improved with subsequent administrations. At about 22 months she follows with interest every movement, she smiles at the examiner and sends him a kiss with her little hands, interacts producing modulated vocalizations, the cranial nerves are unscathed. M.O. conjugates. Muscle tone is improving, holds the head very well and maintains the sitting position correctly. She was fed via a gastric nose, eating almost everything, and according to the mother, takes orally small amounts of homogenized foods or smoothies. She has not practiced PEG, but she is assisted, if necessary, with the coughing machine, Ambu ball for respiratory gymnastics, mechanical aspirator. The current weight is 10.300 kg, the length 74 cm. The male patient practices the same therapy is in discrete general condition feed himself through PEG. Currently weighs more than 8 kg. This second patient came to our observation at 15 months of age and had already suffered the intervention for PEG.

In truth in this second case, there is not good family compliance, and it is much more difficult to follow the patient optimally.

CONCLUSIONS

It seems that the use of nusinersen extends the life of these young patients by offering even better quality in the absence of unpleasant side effects. Considering how seriously is the prevalence (0.1-0.15/100,000) of SMA1 compared to a higher incidence (3.2-7.1/100,000) we believe that these first results can encourage us to continue this therapy, with the hope that, as soon as possible, gene transplantation can definitively solve the problem.

REFERENCES

- Finkel RS, McDermott MP, Kaufmann P, Darras BT, Chung WK, Sproule DM, Kang PB, Foley AR, Yang ML, Martens WB, Oskoui M, Glanzman AM, Flickinger J, Montes J, Dunaway S, O'Hagen J, Quigley J, Riley S, Benton M, Ryan PA, Montgomery M, Marra J, Gooch C, De Vivo DC. Observational study of spinal muscular atrophy type I and implications for clinical trials. Neurology. 2014;83(9):810-7.
- Finkel RS, Chiriboga CA, Vajsar J, Day JW, Montes J, De Vivo DC, Yamashita M, Rigo F, Hung G, Schneider E, Norris DA, Xia S, Bennett CF, Bishop KM. Treatment of infantile-onset spinal muscular atrophy with nusinersen: a phase 2, open-label, dose-escalation study. Lancet. 2016;388(10063):3017-26.
- Passini MA, Bu J, Richards AM, Kinnecom C, Sardi SP, Stanek LM, Hua Y, Rigo F, Matson J, Hung G, Kaye EM, Shihabuddin LS, Krainer AR, Bennett CF, Cheng SH. Antisense oligonucleotides delivered to the mouse CNS ameliorate symptoms of severe spinal muscular atrophy. Sci Transl Med. 2011;3(72):72ra18.
- Rigo F, Chun SJ, Norris DA, Hung G, Lee S, Matson J, Fey RA, Gaus H, Hua Y, Grundy JS, Krainer AR, Henry SP, Bennett CF. Pharmacology of a central nervous system delivered 2'-O-methoxyethyl-modified survival of motor neuron splicing oligonucleotide in mice and nonhuman primates. J Pharmacol Exp Ther. 2014;350(1):46-55.

ABS 11

MOTHERS AND ADDICTION: AN EXPLORATIVE STUDY IN NEONATOLOGY

G.M. Rossi, C. Cacciatore, R. Pintus, A. Dessì

Neonatal Intensive Care Unit, Neonatal Pathology, and Neonatology, University of Cagliari, Cagliari, Italy

INTRODUCTION

Substance abuse is becoming more and more widespread in pregnant women or mothers. The persistent and continuous use of neuro-psychotropic substances such as alcohol, opioids, cannabis, sedatives, tobacco, and stimulants during perinatal experience creates a high-risk situation to fetal development. Among the most common consequences of early exposure to substance abuse, there are spontaneous abortion, low birth-weight, preterm delivery, placental abruption, IUGR, congenital anomalies, and fetal alterations. Addicted mothers perpetrate the so-called perinatal abuse, in which the embryo of the fetus are exposed to risk conditions and biological, psychological and social damage.

AIM OF THE STUDY

We wanted to detect the psychosocial risk and the level of social support in addicted mothers, the presence of comorbid psychiatric illnesses and the

presence of past stressful events or if they occurred during pregnancy.

PATIENTS AND METHODS

To collect data, the psychosocial risk questionnaire was administered to 6 mothers whose newborn was admitted to the Neonatal Pathology ward due to substance exposition *in uterus*.

RESULTS

All 6 mothers presented a high psychosocial risk. There was an average social support for 2 mothers, while for the remaining mothers it was high. Comorbid psychiatric illnesses were major depression (4 mothers out of 5), anxiety disorder (2 mothers out of 5) and eating disorders (2 mothers out of 5). Then, 4 mothers out of 5 stated that they experienced a stressful period in the past, while only one mother stated that she experienced a stressful period during pregnancy.

DISCUSSION

From data analysis, it emerges that all mothers that abused substances during pregnancy had a high psychosocial risk. The variables of psychosocial risk and social support did not result to be dependent since when there are high levels of psychosocial risk, there are medium-high levels of social support. All the mothers presented a comorbid psychiatric disorder and the presence of high-intensity stressors mainly experienced in the past.

CONCLUSIONS

Against this background, it can be hypothesized that the high level of psychosocial risk in women with substance abuse in pregnancy is imputable to the presence of correlated psychiatric disorders and not only to the external social factors responsible for the perceived levels of social support.

ABS 12

OLFACTORY PERCEPTION AND OLFACTORY EVENT-RELATED POTENTIALS IN NEWBORNS WITH 3M SYNDROME

S. Invitto[1,2], A. Grasso[1], V. de Pascalis[3], R. Marulli[4], G. Trianni[4], A. Paladini[5], P. Paladini[6]

[1]*Human Anatomy and Neuroscience Laboratory, University of Salento, Lecce, Italy*

[2]*CNR Institute of Microelectronics and Microsystems, Lecce, Italy*

[3]*Department of Psychology, La Sapienza University, Rome, Italy*

[4]*Neurology Unit, Vito Fazzi Hospital, Lecce, Italy*

[5]*Policlinico Gemelli, Rome, Italy*

[6]*Intensive Therapy Neonatal Unit (UTIN), Vito Fazzi Hospital, Lecce, Italy*

INTRODUCTION

3M syndrome is a rare autosomal recessive dwarfism syndrome. The distinctive features of this syndrome are related to a limitation of fetal growth, facial dysmorphism, the absence of microcephaly and absence of mental impairment. The subjects affected by this form of disorder often have respiratory problems and present different facial morphology (i.e., fleshy nose, antero-verse nostrils) [1]. This research aimed to investigate how the 3M syndrome could have implications in the olfactory system. No study has so far been conducted on 3M to evaluate the use of olfactory event-related potentials (OERP) as tools for investigating the functional response to chemical stimulation.

MATERIALS AND METHODS

3 male siblings, diagnosed with 3M syndrome, (2 newborns twins of 4 months old [3M-N] and a 3M 18 months old [3M-O]), were compared with two controls couple of twins (HS), matched by age and sex. The subjects performed an olfactory recognition task. The scent was administered through the device US2017127971 (A1) [2], with 20 µL of Eucalyptus. The paradigm of presentation corresponds to the stimulation of OERP. The analysis considered the olfactory components N1 and LPC [3], the wavelet and the connectivity values.

RESULTS

The subject 3M-O shows, on N1, greater amplitudes (average amplitude 3M mV -45 vs. HS mV -25) e delayed latencies (average latency 3M 440 ms vs. HS 200 ms) and on LPC greater amplitudes (3M-O mV +17.5 vs. HS mV +5) and faster latencies (3M-O 260 ms vs. HS 380 ms). The LPC data concern the response obtained in the right front-lateral area. Through the brain mapping, it appears that the 3M-O subject shows a greater left lateralization. The 3M-N twins show, on both N1 and LPC, smaller amplitudes (N1: 3M-N mV -17.5 vs. HS mV 18.5; LPC: 3M-N mV 10 vs. HS mV 22.50) and delayed latencies (N1: 3M-N 350 ms vs. HS 225 ms; LPC: 3M-N 220 ms vs. HS 340 ms). Within the range between 70 ms and 250 ms, there is almost minimal activation of the parietal area in the case of 3M-N twins. In the range between 250 ms and 420 ms, 3M-N and 3M-O subjects showed an activation of part of the left hemisphere, of the parietal and of the left occipital area; while the showed an activation of parietal, left frontotemporal and right occipital areas. The wavelet analysis shows greater connectivity in alpha and delta in the case of the subject 3M-O and 3M-N vs. HS.

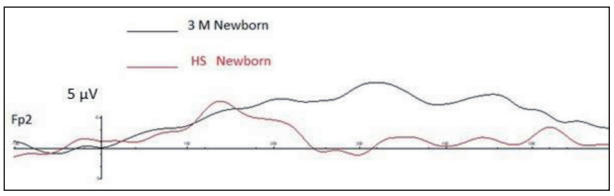


Figure 1 (ABS 12). Matching olfactory event-related potentials (OERP) in Fp2 electrode (frontoparietal right localization) in 3M (black line) and HS (red line) newborns.

CONCLUSIONS

In 3M syndrome, the olfactory processing seems to be diversified (see **Fig. 1**). In particular, the differences in the N1 and LPC components indicate substantial differences in 3M syndrome that can modify the pattern of olfactory processing. Moreover, the 3M subjects, in addition to greater connectivity, show different localizations of arousal due to olfactory stimulation, highlighting the implication of much larger areas ranging from the left hemisphere to the right hemisphere including occipital localizations.

REFERENCES

[1] Huber C, Dias-Santagata D, Glaser A, O'Sullivan J, Brauner R, Wu K, Xu X, Pearce K, Wang R, Uzielli ML, Dagoneau N, Chemaitilly W, Superti-Furga A, Dos Santos H, Mégarbané A, Morin G, Gillessen-Kaesbach G, Hennekam R, Van der Burgt I, Black GC, Clayton PE, Read A, Le Merrer M, Scambler PJ, Munnich A, Pan ZQ, Winter R, Cormier-Daire V. Identification of mutations in CUL7 in 3-M syndrome. Nat Genet. 2005;37(10):1119-24.

[2] Invitto S, Capone S, Montagna G, Siciliano PA. MI2014A001344. Method and system for measuring physiological parameters of a subject undergoing an olfactory stimulation. U.S. Patent No. 20170127971A1. Rome: Università del Salento, 2014.

[3] Pause BM, Sojka B, Krauel K, Fehm-Wolfsdorf G, Ferstl R. Olfactory information processing during the course of the menstrual cycle. Biol Psychol. 1996;44(1):31-54.

ABS 13

MYCOSIS FUNGOIDES IN A 9-YEAR-OLD GIRL. A CASE REPORT

V. Aimola[1], G. Cerrone[1], E. Robustelli[2], C. Ferreli[2], F. Rongioletti[2], G. Faa[1], L. Pilloni[1]

[1]Division of Pathology, University of Cagliari, AOU of Cagliari, Cagliari, Italy

[2]Dermatologic Clinic, Department of Medical Science and Public Health, University of Cagliari, AOU of Cagliari, Cagliari, Italy

INTRODUCTION

Mycosis fungoides (MF) is the most common T-cell lymphoma of the skin. It occurs mainly in middle-aged patients and only in 0.5-7% it arises in children [1]. It can present in different clinical forms. In its classical variant, it develops into three stages: patches, plaques, and tumor. Clinically and histologically, MF diagnosis could be missed in its early stages, since it mimics benign inflammatory dermatoses, including psoriasis, eczema, pityriasis versicolor, and tinea. At histology, MF is characterized by an epidermotrophic infiltrate of atypical lymphocytes. In 95% of MF cases neoplastic cells are CD4+, in the remaining 5%, they are CD8+ [2]. This last form prevails in children. Young patients with MF have an increased risk of other tumors, especially lymphoma and melanoma. In recent literature, it is described an overall favorable prognosis in young patients with MF [3].

CASE REPORT

We report a case of a 9-year-old girl presenting with a 3-year history of two erythematous annular itchy patches localized on the left hypochondrium (**Fig. 1A**) that slowly increased in dimensions. Recently, a similar lesion on the left iliac region appeared. The size of the lesions ranged from 1 cm (on the hypochondrium) to 4 cm (on the iliac region). A biopsy from the left hypochondrium lesion was taken. Histological examination revealed an epidermotrophic infiltrate of atypical lymphocytes with hyperchromatic and irregular nuclei, interstitial/lichenoid lymphocytic infiltrate, vacuolar interface dermatitis, papillary dermal fibrosis and scattered Pautrier's microabscesses (**Fig. 1B**). At immunohistochemistry, tumor cells were CD2+, CD3+, CD5+, CD7+, CD8+ and CD4-. On these bases, MF CD8+ was diagnosed (**Fig. 1C**). The patient was treated with superpotent steroid ointment and referred to the phototherapy outpatient clinic for UV therapy.

CONCLUSIONS

MF is an uncommon disease in childhood and, when it occurs, it presents with atypical CD8+ lymphocytes. Here we report a case of MF CD8+ in a 9-year-old girl. We aim to remind that, even if it is very uncommon, mycosis fungoides may also occur in children. Therefore, pediatricians, dermatologists, and pathologists should consider this disease in the differential diagnosis of compatible lesions in childhood.

REFERENCES

[1] Kempf W, Kazakov DV, Belousova IE, Mitteldorf C, Kerl K. Paediatric cutaneous lymphomas: a review and comparison with adult counterparts. J Eur Acad Dermatol Venereol. 2015;29(9):1696-709.

[2] Ceppi F, Pope E, Ngan B, Abla O. Primary Cutaneous Lymphomas in Children and Adolescents. Pediatr Blood Cancer. 2016;63(11): 1886-94.

[3] Virmani P, Levin L, Myskowski PL, Flores E, Marchetti MA, Lucas AS, Pulitzer M, Horwitz S, Trippett T, Moskowitz A, Querfeld C. Clinical Outcome and Prognosis of Young Patients with Mycosis Fungoides. Pediatr Dermatol. 2017;34(5):547.

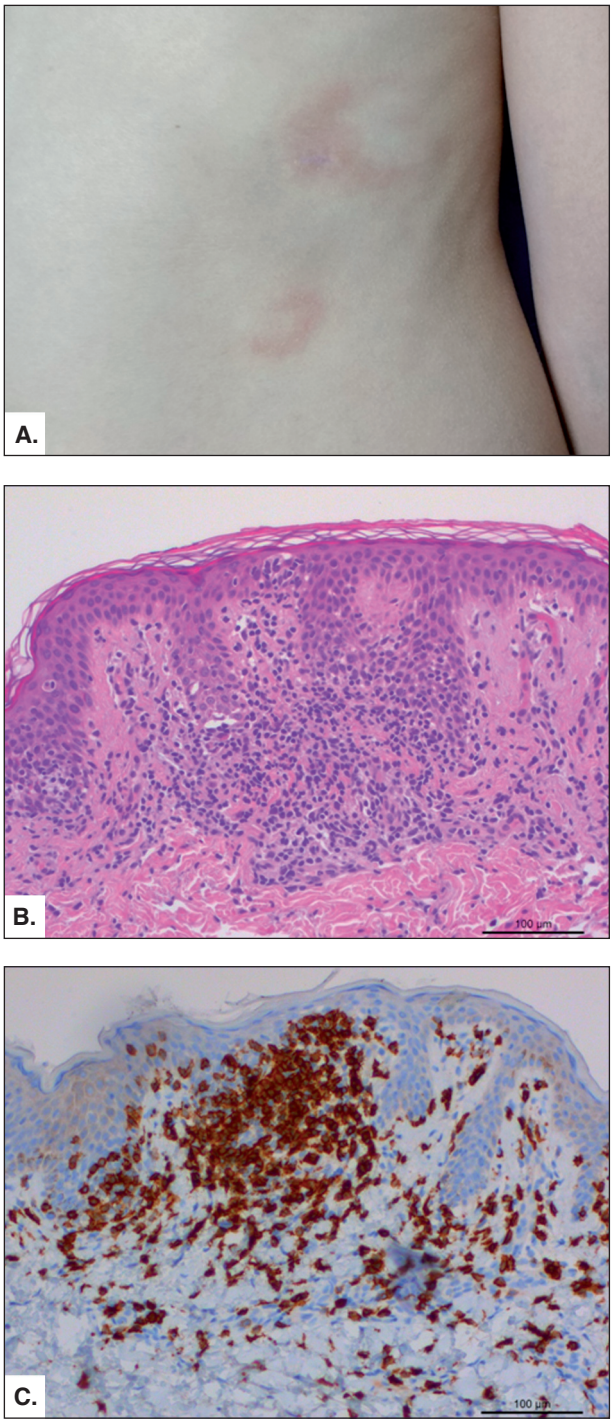


Figure 1 (ABS 13). A. Two erythematous annular itchy patches localized on the left hypochondrium. **B.** Superficial dermal and perivascular lymphocytic infiltrate with marked epidermotropism of atypical lymphocytes within the epidermidis as single cells and in Pautrier's microabscesses (hematoxylin and eosin staining; magnification x20). **C.** Anti-CD8 antibody: superficial dermal and perivascular lymphocytic infiltrate with marked epidermotropism of T-lymphocytes CD8+.

ABS 14

EXPLORING NEW INSIGHTS INTO AUTOIMMUNE HEPATITIS PATHOGENESIS: DESCRIPTION OF TWO CASES

R. Frassetto, A. Cambiganu, N. Vacca, R. Antonucci, M.G. Clemente

Pediatric Clinic, Department of Medical, Surgical and Experimental Sciences, University of Sassari, Sassari, Italy

INTRODUCTION

Autoimmune hepatitis (AIH) is a rare progressive inflammatory liver disease, leading to cirrhosis, liver failure and death, if untreated. The pathogenesis is multifactorial, likely raising from the complex interaction of still largely unknown genetic, epigenetic and environmental factors. Multiple cases within the same family are rare, but the association with other autoimmune disorders is possible in AIH patients and their relatives. AIH is associated to HLA DR3 and HLA DR4 genes and it has been reported with primary immunodeficiency diseases. Hepatitis B virus (HBV) and hepatitis A virus (HAV) vaccines are important as hepatic viral infections increase the risk of relapse and progression to end stage liver disease. Here we report on same type of AIH, occurring at the same time in two (first) cousins.

DESCRIPTION OF THE TWO CASES

The first case is a 5 years old boy who presented hypertransaminasemia, hypergammaglobulinemia and elevated titer of liver cytosol-1 (LC1) autoantibodies. At liver biopsy, the histologic picture of moderate-degree of periportal inflammation and advanced fibrosis confirmed AIH diagnosis. It turned out to be HLA DR3-DR4. Anti-HBs titer was negative despite vaccination during infancy. It is interesting to note that the serum transaminases values returned within the normal range before starting the immunosuppressive therapy with prednisone and azathioprine. Under therapy, LC1 autoantibody progressively reduced until testing negative. The second case is the boy first cousin, a 7 years old girl, in whom the diagnosis of LC1 positive AIH was made at the same time because her parents asked a check-up for chronic fatigue. Blood tests revealed hypertransaminasemia and high LC1 autoantibody titer, without hypergammaglobulinemia. The liver biopsy confirmed the diagnosis, showing mild portal inflammation and fibrosis. Her HLA genes typed DR3-DR5. Her anti-HBs titer was negative

too, despite vaccination during infancy. Also, her serum transaminases levels returned within the normal limits before starting immunosuppression by prednisone therapy only, which progressively reduced, until testing negative, the serum LC1 autoantibody. Their family history is positive for other autoimmune diseases, namely type 1 diabetes and Hashimoto's thyroiditis.

CONCLUSIONS

The same type of LC1 positive AIH is described for the first time in 2 first cousins. A gene dosage effect can be hypothesized in determining the early onset and clinical severity in the youngest one, as double heterozygous for the two HLA predisposition genes. The parallel fluctuation pattern of serum transaminases values would suggest a seasonal trend, with normalization in both cases in spring, before starting the immunosuppression. Clarifying whether the negative anti-HBs titer observed in both cases is due to antibody titer decline after primary immunization or to a primary vaccine unresponsiveness might reveal new insights into AIH pathogenesis.

REFERENCES

• Mieli-Vergani G, Vergani D, Baumann U, Czubkowski P, Debray D, Dezsofi A, Fischler B, Gupte G, Hierro L, Indolfi G, Jahnel J, Smets F, Verkade HJ, Hadžić N. Diagnosis and Management of Pediatric Autoimmune Liver Disease: ESPGHAN Hepatology Committee Position Statement. J Pediatr Gastroenterol Nutr. 2018;66(2):345-60.

• Parkkola A, Laine AP, Karhunen M, Härkönen T, Ryhänen SJ, Ilonen J, Knip M; Finnish Pediatric Diabetes Register. HLA and non-HLA genes and familial predisposition to autoimmune diseases in families with a child affected by type 1 diabetes. PLoS One. 2017;12(11):e0188402.

• Queirós PO, Sousa Martín JM. Autoimmune hepatitis as a complication of common variable immunodeficiency. Rev Esp Enferm Dig. 2018;110(3): 212-3.

ABS 15

BREASTFEEDING AND THE USE OF LATCH SCORE: FIRST DATA FROM A GROUP OF 50 MOTHERS

G. Corongiu, R. Pintus, M. Zonza, A. Dessì

Neonatal Intensive Care Unit, Neonatal Pathology, and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

BACKGROUND

Breastfeeding is natural but it cannot be easy or immediate. From the literature, it is clear that for a good start of breastfeeding, adequate information and a psychological/emotional support are needed from healthcare workers. This study aims to evaluate the maternal perception concerning breastfeeding, confronting the data present in literature and quantifying the success of breastfeeding through the LATCH score.

PATIENTS AND METHODS

The study was performed at the Policlinico Universitario di Monserrato between December 2016 and October 2017. The sample is constituted by 50 healthy mothers who took a breastfeeding consultation. The suckling was observed, and the LATCH score was filled. After that, the mothers completed a questionnaire about their perception of breastfeeding.

RESULTS

The majority of women had already been informed about the importance of breastfeeding during pregnancy. The thought of the majority of mothers was to exclusively breastfeed, nevertheless the 76% of the sample attached the baby 2 hours after delivery. This could be due to logistical problems of the maternity ward. The 52% of mothers had a LATCH scored ≥ 7, thus, according to the cut-offs indicated in literature, a scored that indicates a reduced risk of non-exclusive breastfeeding. Nevertheless, the 80% wanted a health care professional to help them during breastfeeding. This could mean that the mothers were not sure about their skills and they wanted to be supported. The study demonstrated that the majority of mothers believed that breastfeeding and psychological support are important. Breastfeeding in public is embarrassing for the majority of women. The father that is recently playing a relevant role in breastfeeding is an important figure. Indeed, the study confirms that the 82% of the mothers has her partner close during breastfeeding.

CONCLUSIONS

From this study, it seems clear that mothers are aware of the importance of breastfeeding since it is considered important even if they experienced some difficulties. Furthermore, mothers believe that psychological support during breastfeeding is important, as well as being informed about the difficulties that they may face during this experience. For these reasons it would be advisable to increase the psychological support in maternity wards and after the discharge since it results to be a necessity of the mothers.

ABS 16

HYPERGLYCEMIA IN A NEWBORN: BERARDINELLI-SEIP CONGENITAL LIPODYSTROPHY

G. Nicolas, V. Modica, J. Sakkal, M.C. Khalife

Department of Pediatrics, Holy Spirit University of Kaslik/NDS University Hospital, Jbeil, Lebanon

BACKGROUND

Berardinelli-Seip syndrome is complicated to diagnose directly at birth. It can be easily suspected later on during infancy by its associated clinical features such as growth failure, very muscular appearance, hepatomegaly, and mental retardation. In our case, a newborn was diagnosed only after a laboratory workup for jaundice and persistent hyperglycemia.

CASE PRESENTATION

A 7 days old boy, born at term from a second degree consanguineous marriage with a 3,110 g birthweight, was admitted to a peripheral hospital for jaundice and hypotonia. He was treated as having a neonatal infection with a 10 days course of antibiotics. His blood tests showed a slight hyperglycemia that was first considered secondary to the infection. However, due to its persistence in addition to a weight loss, the baby was referred to a pediatric endocrinologist in our hospital at 21 days of age. At presentation, the boy weighed 2,900 g, was hypotonic, with enlarged feet, distended abdomen, and prominent deltoid muscles. In addition to hyperglycemia (246 mg/dL) with glycosuria, further laboratory workup showed hypertriglyceridemia (1,720 mg/dL), hypercholesterolemia (111.8 mg/dL), hypoHDL (7 mg/dL), a slightly elevated GGT (250 U/L) with otherwise normal hepatic tests, renal profile, electrolytes, coagulation pattern, cortisol and insulin levels. Imagery revealed a homogenous hepatomegaly on abdominal US, with normal cardiac US and cerebral MRI. Since the baby was not breastfed, he was put on a high MCT formula, which led to a progressive increase in weight and an amelioration of glycemia and triglyceride levels and was discharged 18 days later. A genetic test identified the presence of a homozygote mutation (p.Y106CfsX111) that confirmed the diagnosis of Berardinelli-Seip syndrome.

CONCLUSION

Although it is a very rare disease, a high index of suspicion should be kept for Berardinelli-Seip syndrome even if the clinical presentation is not relevant, especially in countries where a higher incidence has been demonstrated (Lebanon 1/200,000). In addition, full investigations for hyperglycemia should be performed especially if we have clinical evidences supporting the presence of an associated syndrome.

ABS 17

PLACENTA IN DOWN'S SYNDROME: DIFFERENCES IN CYTOTROPHOBLAST AND SYNCYTIOTROPHOBLAST MATURATION

V. Vallascas, D. Fanni, G. Senes, R. Murru, F. Cau, G. Gerosa

Division of Pathology, University of Cagliari, AOU Cagliari, Cagliari, Italy

INTRODUCTION

Down syndrome is a congenital disorder arising from a defect involving chromosome 21, usually trisomy 21. It is characterized by complex clinical profile and including brain, heart and kidney disease. Recently, placental changes have been reported to be associated with Down syndrome, mainly due to defects in villous cytotrophoblast differentiation [1]. This work aimed to verify, by morphology and immunohistochemistry, the presence of villous differentiation in placentas from fetuses carrying Down syndrome.

MATERIAL AND METHODS

To this end, six placentas from fetuses with Down syndrome, ranging in gestational age from 14 to 15 weeks, were accurately sampled and routinely processed. Paraffin sections were stained with H&E for histology and immune-stained for placental alkaline phosphatase (PLAP), a marker of syncytiotrophoblast, and p57, a marker of cytotrophoblast. Six normal placentas of similar gestational age were used as the control group.

RESULTS

Whereas histology did not evidence any significant change in the placenta of Down syndrome, immunohistochemistry for p57 revealed marked differences. Immunostaining for p57 was much higher in Down syndrome (**Fig. 1**), evidencing a higher number of cytotrophoblasts in terminal villi, both on the villous surface and in the stroma.

CONCLUSIONS

Our preliminary data confirm, at the immunohistochemical level, the presence of a defect on terminal villi differentiation in Down syndrome. Our findings clearly indicate villous cytotrophoblasts as the most involved cells. The presence of a higher number of cytotrophoblasts both on the villous surface and on the villous stroma

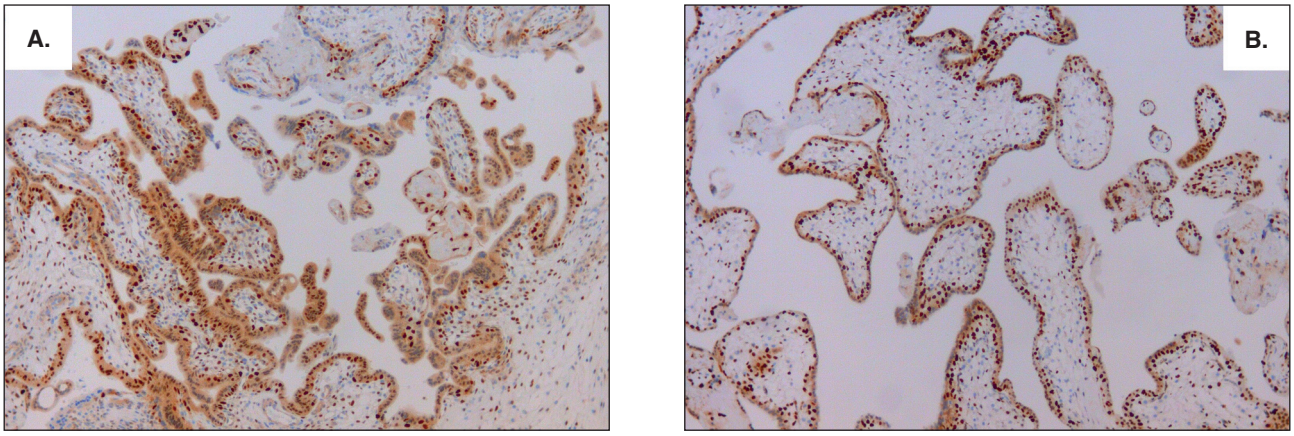


Figure 1 (ABS 17). Immunostaining for p57 reveals a higher number of villous cytotrophoblasts in a Down syndrome placenta (**A**) as compared to a control placenta (**B**), both of them at 15 weeks of gestational age.

in Down syndrome may suggest a defect in its differentiation to the syncytiotrophoblasts.

REFERENCE

[1] Frendo J-L, Vidaud M, Guibourdenche J, Luton D, Muller F, Bellet D, Giovangrandi Y, Tarrade A, Porquet D, Blot P, Evain-Brion D. Defect of villous cytotrophoblast differentiation into syncytiotrophoblast in Down syndrome. J Clin Endocrinol Metab. 2000;85:3700-7.

ABS 18

METABOLOMICS, IRON, AND PREVENTION OF THE ANAEMIA OF PREMATURITY

G. Ledda, M. Puddu, F. Cesare Marincola, S. Corbu, R. Pintus, E. Coni, V. Fanos, A. Dessì

Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

BACKGROUND

Iron deficiency is a common condition during infancy, particularly in preterm and very preterm infants; therefore, iron supplementation is recommended. The health impact is significant. The role of iron is fundamental in many body functions and biochemical processes, among others the oxidative and the lipid metabolisms, protein synthesis and the strong but not completely understood the role in the brain biochemistry.

METHODS

Urine samples from 19 preterm infants were collected non-invasively with cotton balls at three-time points: at discharge (T0), at one (T1) and two (T2) months after the iron treatments. To analyze the urinary metabolic profile was used ^{1}H-NMR spectroscopy and multivariate statistical analysis. The samples were collected from preterm infants admitted to the Neonatal Intensive Care Unit, the Neonatal Pathology and the Neonatal Section of the Azienda Ospedaliera Universitaria, University of Cagliari, Italy. To prevent anemia of prematurity, infants received prophylaxis with iron pidolate 3 mg/kg/day. The gestational age of the children was between 28^{+3} and 36^{+6} weeks, the birth weight between 790 and 1,890 g.

RESULTS

We observed a significant decrease of di-methylglycine from T1 to T2. This reduction probably reflects the maturation of the cellular and mitochondrial metabolism, conceivably influenced by the iron supplementation. We also observed the decrease of glycine, which is most likely due to a general increase of the metabolic activity, being this amino acid involved in numerous biochemical pathways, including haemoglobinization process. Glycine also has a role in the production of glutathione. We observed an increase in time of choline and its principal metabolite, betaine, both being growth metabolites. Choline in animal models seems to prevent anemia-related neurodevelopmental deficits. Creatine is also a growth metabolite and increases in time. Recent studies have shown an antioxidant effect mediate by creatine, selectively on the erythrocyte's membrane. Following what already described in literature we observed a decrease of myoinositol.

CONCLUSION

To the best of our knowledge, this is the first metabolomics study on children, which investigated the role of the iron treatment on the metabolism of preterm infants. We observed changes in the concentration of metabolites as a function of time, from the start of the iron treatment to the second month with regular therapy. These changes

can potentially link to pathways related to the erythrocytes metabolism that include, among others: haemoglobinization, glutathione production, choline, and betaine catabolism and cysteine synthesis. Further studies are needed in order to confirm these hypotheses.

ABS 19

VALIDATION OF HEEL STICK MICROSAMPLING TO OPTIMIZE MICAFUNGIN DOSES IN NEONATES

I. Bersani[1], C. Auriti[1], M.P. Ronchetti[1], B.M. Goffredo[2], F. Piersigilli[1], S. Cairoli[2], A. Dotta[1], M.P. Pai[3]

[1]Neonatal Intensive Care Unit, Bambino Gesù Children's Hospital, Rome, Italy

[2]Biochemistry Laboratory, Department of Specialist Pediatrics, Bambino Gesù Children's Hospital, Rome, Italy

[3]Department of Clinical Pharmacy, College of Pharmacy, University of Michigan, Ann Arbor, Michigan, USA

BACKGROUND

Sepsis due to invasive candidiasis (IC) is a major cause of mortality in pre-term neonates that requires effective antifungal therapy, vasoactive and inotropic agents, and intravenous fluids [1]. Major gaps exist in our knowledge of antimicrobial and antifungal pharmacokinetics in critically ill neonates that require validated micro-sampling and bioanalysis methods to support therapeutic drug monitoring. Our current therapeutic approach often relies on drug dose extrapolation from adults and adolescents that are scaled to the neonatal body size, which does not sufficiently account for this between and within-subject variability [2]. Improved bioanalytical approaches can support precision dosing in this unique population. However, gaining actionable insights into the neonatal pharmacologic phenotype requires measurement of antifungal plasma concentrations that are difficult to obtain due to competing biomarker assay needs from the limited volume blood samples that are collected. Several microsampling techniques have been developed such as dried blood spot, capillary tube, and volumetric absorptive microsampling; however, validation of these methods is critical to ensure that the results are true [3].

AIMS

To ascertain if heel-stick capillary (HSC) samples could be a valid alternative for intravenous blood sampling in neonates for micafungin dose optimization.

METHODS

During a phase 2 study on the pharmacokinetics of micafungin, administered at high doses in infants affected by invasive candidiasis, we compared four serial plasma levels of micafungin measured in blood samples, collected simultaneously via central venous catheter and heel-stick, in eight at term and pre-term infants.

RESULTS

The individual micafungin concentration-time plots showed near superimposable profiles by HSC compared to venous samples. The mean coefficient for the slope and constant was 1.06 [95% IC 0.94, 1.18] and 0.13 [-1.68, 1.95] with an $R^2 = 0.92$, demonstrating a strong linear correlation and proportional measurement between sampling methods. The mean (SD), micafungin AUCinf, was 316 (65.0) h • mg/L and 291 (79.5) h • mg/L for data generated by HSC compared to venous samples with a geometric mean ratio [90% CI] of 1.10 [0.99, 1.22]. No significant ($p > 0.05$) correlation was observed between micafungin AUCinf and any individual concentration-time measurement from either the HSC or venous sample.

CONCLUSIONS

According to our experience, HSC is a valid tool to assay micafungin when used to treat neonatal patients with invasive candidiasis.

DECLARATION OF INTEREST

This study was sponsored and funded by Astellas Pharma, Inc.

REFERENCES

[1] Benjamin DK Jr, Stoll BJ, Fanaroff AA, McDonald SA, Oh W, Higgins RD, Duara S, Poole K, Laptook A, Goldberg R; National Institute of Child Health and Human Development Neonatal Research Network. Neonatal candidiasis among extremely low birth weight infants: risk factors, mortality rates, and neurodevelopmental outcomes at 18 to 22 months. Pediatrics. 2006;117(1):84-92.

[2] Mian P, Flint RB, Tibboel D, van den Anker JN, Allegaert K, Koch BCP. Therapeutic Drug Monitoring in Neonates: What Makes them Unique? Curr Pharm Des. 2017;23(38):5790-800.

[3] Dorofaeff T, Bandini RM, Lipman J, Ballot DE, Roberts JA, Parker SL. Uncertainty in Antibiotic Dosing in Critically Ill Neonate and Pediatric Patients: Can Microsampling Provide the Answers? Clin Ther. 2016;38(9):1961-75.

ABS 20

HEPATOCYTES IN WILSON'S DISEASE: A SCANNING ELECTRON MICROSCOPY INVESTIGATION

T. Congiu[1], C. Gerosa[1], D. Fanni[1], F. Cau[1,2], M. Piras[1], G. Faa[1]

[1]*Department of Surgical Sciences, Division of Pathology, University of Cagliari, Cagliari, Italy*

[2]*Division of Pathology, San Gavino Hospital, ATS, San Gavino, Italy*

INTRODUCTION

Copper overload in Wilson's disease drives to multiple hepatic stress that needs a better comprehension. Often, we have to compare the alterations that weigh on cytoplasmic organelles and the whole cell with those that weigh on the stroma, to better explain the clinical data. The purpose of this study is a Scanning Electron Microscopy (SEM) approachable to examine the samples in a way that put together a panoramic view of the ultrastructural sight.

METHODS AND RESULTS

Wilson's disease liver samples were treated following the Osmium Maceration technique. The needle biopsies, fixed in aldehydes and 1% osmium tetroxide -1.25% potassium ferrocyanide, were immersed in 0.1% osmium tetroxide for two days in order to denature the protein components and remove them, thus exposing the intercellular spaces (space of Disse, space of Mall and bile ducts) and the organelles within hepatocytes. In this way, it is possible to analyze the alterations of hepatic lobule architecture (fibrosis) and the cellular ultrastructure, such as the expansion of mitochondria and the reduction of their crests (**Fig. 1**).

CONCLUSION

Histologic and cytological alterations have yet an interest in Wilson's disease diagnosis and give an essential contribution in understanding the processes that lead to hepatic sufferance. The wide range of enlargements and the resolution power give to the SEM an essential role not only as a diagnostic contribution but above all to the ability to analyze and help in the interpretation of structural alterations.

REFERENCES

• Fanni D, Fanos V, Gerosa C, Piras M, Dessi A, Atzei A, Van EP, Gibo Y, Faa G. Effects of iron and copper overload on the human liver: an ultrastructural study. Curr Med Chem. 2014;21(33):3768-74.

• Pazzaglia UE, Congiu T, Marchese M, Dell'Orbo C. The shape modulation of osteoblast-osteocyte transformation and its correlation with the fibrillar organization in secondary osteons: a SEM study employing the graded osmic maceration technique. Cell Tissue Res. 2010;340(3): 533-40.

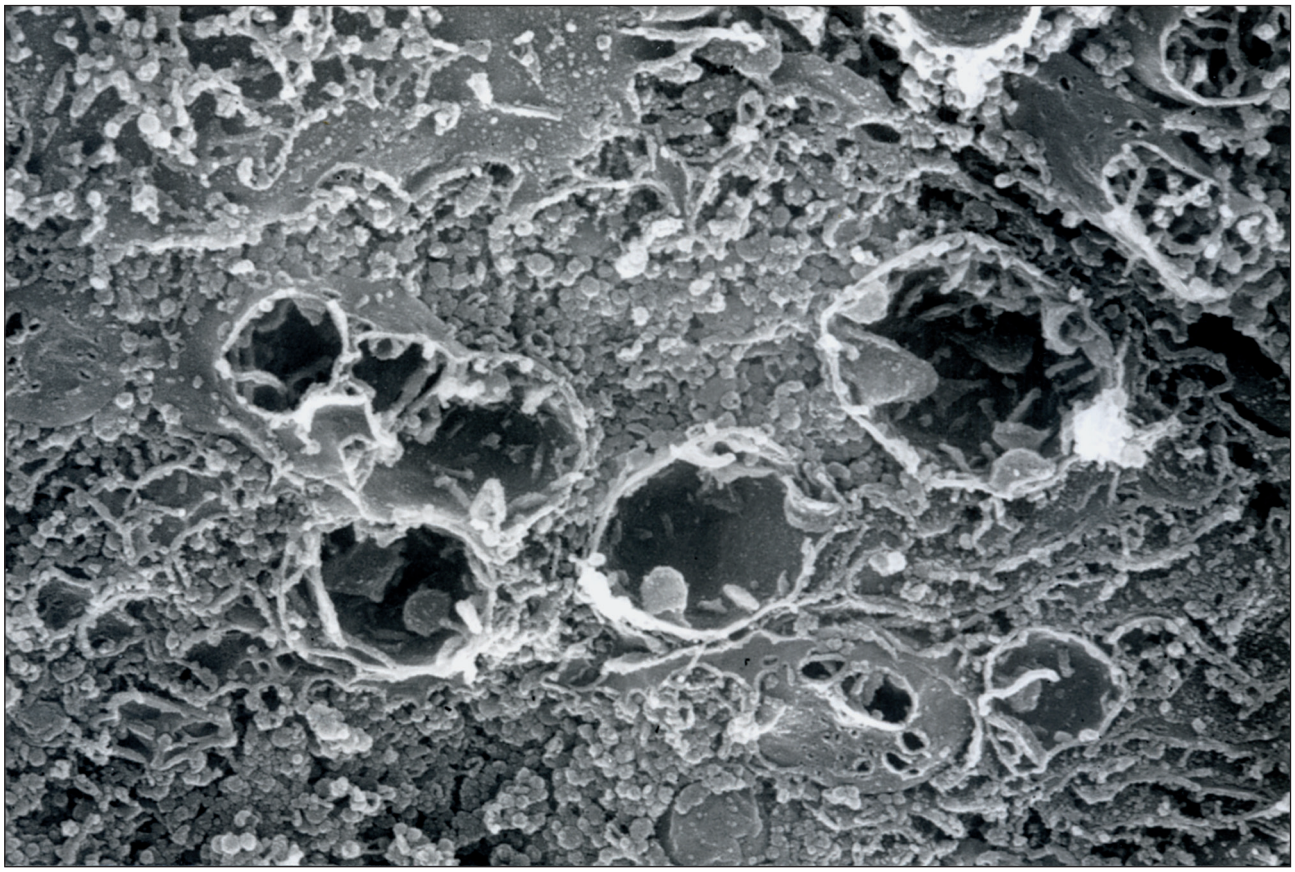


Figure 1 (ABS 20). Altered mitochondrial cristae in Wilson's Disease (enlargement 10,000 X).

ABS 21

FUSOBACTERIUM NUCLEATUM IN CHILDREN'S ORAL CAVITY. A COMMENSAL-TURNED PATHOGEN THAT INCREASED RADICALLY IN 5,000 YEARS

M.P. Contu[1], E. Casula[1], O. Fonzo[2], G. Paglietti[2], E. Usai[3], G. Denotti[4], V. Garau[4], R. Martorelli[5], F. Coghe[6], G. Orrù[1,6]

[1]*Molecular Biological Service (MBS), Department of Surgical Sciences, University of Cagliari, Cagliari, Italy*

[2]*Archaeological Museum Genna Maria Villanovaforru, South-Sardinia, Italy*

[3]*Private practice, Department of Life and Environmental Science, University of Cagliari, Cagliari, Italy*

[4]*Session of Pedodontics and Interceptive Orthodontics, Department of Surgical Science, University of Cagliari, Cagliari, Italy*

[5]*Department of History, Cultural and Territorial Heritage, University of Cagliari, Cagliari, Italy*

[6]*University Hospital Laboratory Services, AOU-Cagliari, Cagliari, Italy*

INTRODUCTION

The Gram-negative bacterium *Fusobacterium nucleatum* (Fn), is part of normal placental and oral microbiome, in particular tongue and dental plaque. In the same way, it is strictly associated with a set of diseases that increased in recent years: preterm birth, colorectal cancer, inflammatory bowel disease, periodontitis [1]. In the oral cavity, Fn concentration/growth results strictly related to human habits, such as alimentation and smoke. This research aims to determine the rate of this pathogen in oral biological samples (dental calculi) from 5,000 years ago to nowadays.

MATERIALS AND METHODS

Fn and total microbiome genomes were enumerated, by real-time PCR procedure, in DNA extracts from dental calculi of Sardinian pediatric subjects from age 4 to 12 years. PCR oligos were designed on the 16S rRNA gene [2]. The 89 samples were recruited from sites of different historical eras. The most ancient cohort (14 samples) comes from the hypogeal tomb of Scab's Arriu in Siddi (CA) and dated to the Copper Age (3300-2200 BC); 1 sample come from the Late Antiquity catacombs of Sant'Antioco (4th-7th century AD); 24 samples from the charnel house in Villaputzu (CA) are dated to the 19th century AD; 50 samples are dated to the 21st century. The Fn titer % was normalized to total plaque's bacteria by using the following formula:

% Fn = [Fn genomes/Total genomes] * 100.

The age of ancient subjects was estimated by using anthropological analysis and with Cameriere's age estimation method [3].

RESULTS

Fig. 1 shows the relationship between the samples era and the Fn titer %. The results show a significative

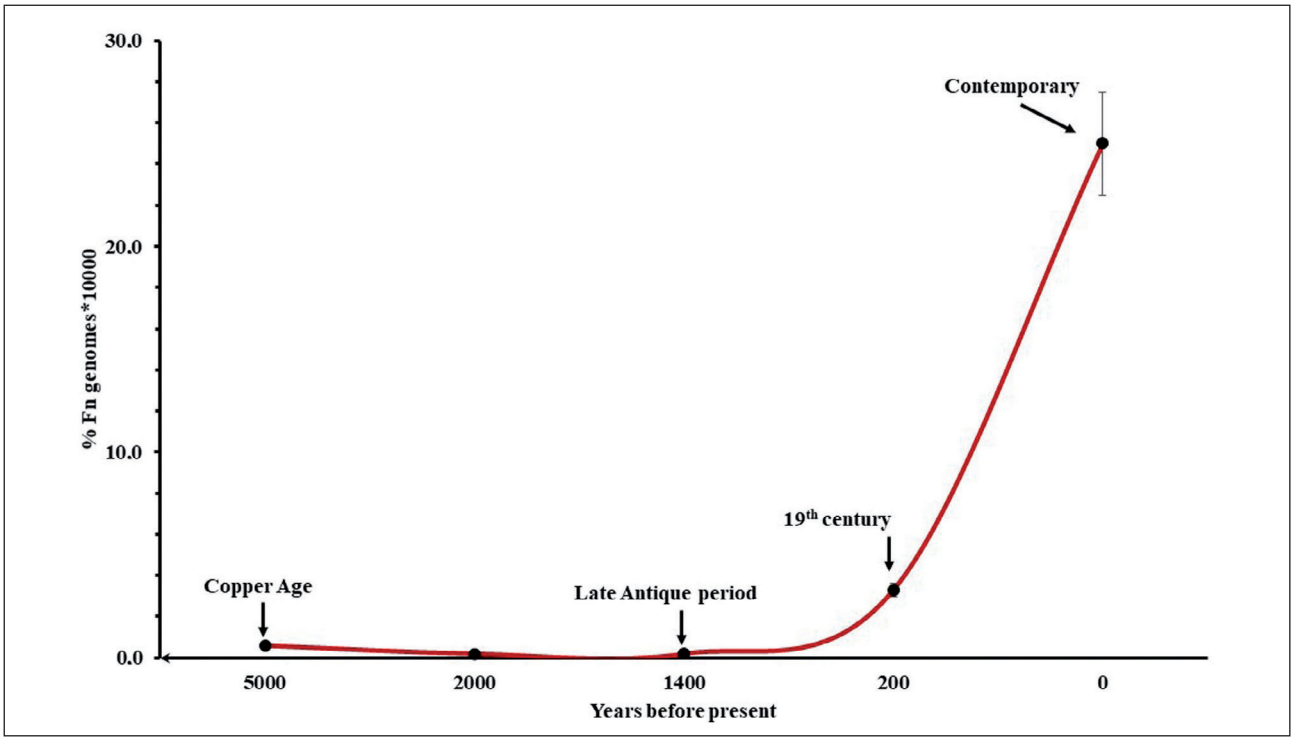


Figure 1 (ABS 21). Relationship between sampling period and Fn titer %, a significant increase is observable from the 19th century to the recent period.

increase of 40 folds of the Fn % ($p < 0.01$) from the Copper Age to the 21st century. The curve until the Late Antique period appears constant, without any increase of pathogen's titer in the plaque biofilm.

DISCUSSION

The relation between the commensal-pathogen Fn and the diseases of the modern era was increasingly recognized in the last decade. This bacterium is already present in placenta tissue and oral cavity after few days from birth. According to recent studies, it appears crucial in some tissues functions, such as the food taste in the tongue. In the last 200 years, a dramatic change in alimentary habits might have led to the increase of the % mass of this bacteria in the oral microbiome, and to the consequent change of its role from commensal to the silent long-term pathogen.

REFERENCES

[1] Han YW. Fusobacterium nucleatum: a commensal-turned pathogen. Curr Opin Microbiol. 2015;23:141-7.

[2] Orrù G, Marini MF, Ciusa ML, Isola D, Cotti M, Baldoni M, Piras V, Pisano E, Montaldo C. Usefulness of real time PCR for the differentiation and quantification of 652 and JP2 Actinobacillus actinomycetemcomitans genotypes in dental plaque and saliva. BMC Infect Dis. 2006;6:98.

[3] Cameriere R, Ferrante L, Mirtella D, Cingolani M. Carpals and epiphyses of radius and ulna as age indicators. Int J Legal Med. 2006;120(3):143-6.

ABS 22

EFFECTS OF A PSYCHOLOGICAL FOLLOW-UP ON CARE OF CHILDREN AND ADOLESCENTS FURTHER TO ACCESS TO PEDIATRIC EMERGENCY ROOM FOR PSYCHOLOGICAL PROBLEMS

A. Carollo[1], C. Polizzi[2], G. Perricone[2]

[1]"Villa Sofia – Cervello" Gathered Hospitals, Hospital and University Pediatric Multipurpose Interinstitutional Experimental Center (Ce.S.I.P.P.U.O'), Palermo, Italy

[2]University of Palermo, Hospital and University Pediatric Multipurpose Interinstitutional Experimental Center (Ce.S.I.P.P.U.O'), Palermo, Italy

INTRODUCTION

This paper presents a study on effectiveness of a psychological follow-up (psy f-up) path towards children and adolescents (c/a) who have been admitted to Pediatric Emergency Room (P.E.R.) for psychological problems, that in some cases were appeared as specific conditions of somatization/ organic alterations (functional pain for example). This psy f-up, activated during the discharge phase as an integrated model between pediatrician and pediatric psychologist, is divided into 4 meetings, based on interventions to promote in the child storytelling about himself, which is functional to strengthen personal resources and reduce risk factors [1-3]. So, this psy f-up is a path of prevention, promotion to change and development [1, 2]. This path aims to reduce improper access in P.E.R.

AIMS

1. Evaluate the effects of psy f-up in the c/a, as increasing levels of awareness of the discomfort experienced, management of emotions, motivation to change, and reduction/ disappearance of symptoms;
2. Evaluate the impact of psy f-up as a reduction of improper access to P.E.R.;
3. Evaluate parents' satisfaction.

TOOLS AND METHODS

This research involved 43 c/a (mean age = 10.3 years; SD = 2.6) taken into care in psy f-up during the discharge phase from the P.E.R. of "Villa Sofia – Cervello" Gathered Hospitals: 11 with anxiety disorder with somatization and 32 without somatization. The tools used to evaluate effects of psy f-up on children are: an evaluation sheet (on a 4-point Likert scale) on the level of awareness of the problem experienced, management of emotions and motivation to change, applied by the psychologist before and after follow-up; the letters written by children at the end of psy f-up; a telephone interview to families 2 months after the conclusion of psy f-up. The access flows in P.E.R. were monitored to evaluate the reduction of access to the P.E.R. A questionnaire of Human Satisfaction was used to evaluate parents' satisfaction. Data were submitted to descriptive and parametric statistics.

RESULTS

Remission of symptoms is in 85.4% of the sample. They have not returned to the P.E.R. for the same reasons following the psy f-up. The comparison between the attributed scores with the evaluation form before and after this path, through the "t-test for paired data", showed in children a significant increase in the levels of awareness of the problem experienced ($p = .001$), emotional self-regulation ($p = .001$), willingness to change ($p = .001$). 98% of c/a wrote in their letters about a high level of satisfaction for the support received and the desire to change. Even parents expressed high satisfaction.

CONCLUSIONS

Results confirm the value of prevention of the psy f-up, as a useful path for a reduction of the persistence of symptoms in conditions of the psychological suffering of c/a, a reduction of medical care (often

pharmacological), a reduction in healthcare costs linked to improper access.

REFERENCES

[1] Perricone G, Briulotta G. Psicologia Pediatrica. Dalla teoria alla pratica evolutivo-clinica. Milan: McGraw-Hill, 2012.

[2] Perricone G, Polizzi C, Morales MR. Corso di psicologia dello sviluppo e dell'educazione con elementi di psicologia pediatrica. Milan: McGraw-Hill, 2015.

[3] Rutter M. Psychosocial resilience and protective mechanisms. Am J Orthopsychiatry. 1987;57(3):316-31.

ABS 23

METABOLOMIC ANALYSIS IN PATIENTS WITH BICUSPID ARTIC VALVE DISEASE, WITH OR WITHOUT AORTIC DILATION: TOWARDS A TAILORED TREATMENT

M. Meli[1], A. Dessì[2], F. Cesare Marincola[2], E. Conforti[1], R. Pintus[2], S. Corbu[2], V. Fanos[2], M. Chessa[1]

[1]Pediatric Cardiology and Cardiosurgery, Policlinico San Donato, Milan, Italy
[2]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

BACKGROUND

Bicuspid aortic valve disease (BAV) is a common congenital cardiac defect with a prevalence of 0.5-2% in world population. Sometimes it is asymptomatic and often associated with valve dysfunction that may lead to aortic root and ascending aorta dilation. This condition, also known as aortopathy, is very concerning because of the possible evolution of an aortic aneurysm and dissection. The pathophysiological mechanism of BAV and its possible evolution in an aortic aneurysm are still unknown.

OBJECTIVE

This study aimed to analyze urinary metabolomics profiles of patients with BAV compared to controls and compare the metabolomics profiles of a patient with BAV associated with aortic dilation and patient with BAV without aortic dilation.

PATIENTS AND METHODS

Between January and September 2016 we collected a sample of 21 patients with BAV (cases) and 10 healthy patients (controls). Among cases, 15 patients (48.39%) were carriers of BAV without aortic dilation (group "BAV"), and 6 patients (19.35%) were a carrier of BAV with aortic dilation (group BAV + DIL). Urinary samples have been collected from each patient with the non-invasive method and stored at -80°C until the analysis. Analysis of samples has been performed through Nuclear Magnetic Resonance spectroscopy (^{1}H-NMR).

RESULTS

From data analysis, cases and controls have shown significant differences in seven metabolites levels. Levels of creatinine, urea, malonate, TMAO/betaine, choline and another metabolite with a singlet at 3.29 ppm are significantly increased in patients with the bicuspid aortic valve (group BAV and BAV + DIL), while hippurate and citrate are significantly decreased. Patients with BAV + DIL compared with controls have shown increased levels of malonate and choline and lower levels of citrate and hippurate. No statistically significant metabolomics differences have been found between BAV and BAV + DIL group.

DISCUSSION

These data may have different interpretations. First, even if a metabolomic difference between BAV and BAV + DIL group may exist, the presence of a malformation (bicuspid aortic valve) in both groups of patients probably influences metabolomics profile much more than any related complications (e.g., aortic dilation). While, the similar metabolomics profile between the two groups may confirm literature's data concerning the presence of molecular, histologic and functional alterations even in aortas of patients carriers of BAV without aortic dilation, thus leading to the hypothesis that BAV has to be considered more as a valvuloaortopathy than just a valvulopathy, with an intrinsic involvement of aortic wall.

CONCLUSIONS

Our study is the first that has approached metabolomics investigation of BAV through ^{1}H-NMR spectroscopy analysis of urine samples.
Metabolomics approach promises to be in the future a useful tool, which may allow revealing a sub-clinic aortopathy and support clinicians in therapy, follow-up, and decision for surgical rather than conservative treatment.

ABS 24

ROLE OF ELECTRON MICROSCOPY IN THE STUDY OF HEPATIC IRON OVERLOAD

M. Piras[1], T. Congiu[1], D. Fanni[1], C. Gerosa[1], F. Cau[2], G. Faa[1]

[1]Division Pathology, University of Cagliari AOU Cagliari, Cagliari, Italy
[2]Division Pathology, San Gavino Hospital, ATS, San Gavino, Italy

INTRODUCTION

The current research was conducted to study and above all to compare the morphological data concerning hepatic injury using transmission and scanning electron microscopy. These results have been studied in the beta-thalassemia patients in which iron overload disrupts the normal architecture of the liver, resulting in pathophysiological damage to the organ. Scanning and transmission electron microscopy play the not only diagnostic role, but also highlighting initial lesions from iron overload, but above all, they can give an essential contribution to analysis and interpretation of particular structural alterations.

METHODS AND RESULTS

We present some pictures obtained by scanning and transmission electron microscopy techniques. Needle liver biopsies were obtained from eight patients affected of beta-thalassemia major. The samples for transmission electron microscopy studies were cut into small pieces and immediately fixed in TEM buffer, a mixture of cacodylate 0.15 M, paraformaldehyde 1%, glutaraldehyde 1.25% for 2 h and then washed in cacodylate-sucrose buffer. Samples were post-fixed in osmium tetroxide OSO_4 and then left overnight in uranyl acetate. Specimens were dehydrated and embedded in epoxy resin. Subsequently ultrathin sections (60-90 nm) and observed. For scanning study, we have used osmic maceration (with 1% osmium tetroxide – 1.25% potassium ferrocyanide) were treated in 0.1% osmium tetroxide for two days to remove protein components, thus exposing the intracellular spaces. In this way is possible to identify even the smallest changes in the typical liver architecture. Hemosiderin storage was detected in all patients both hepatocytes and Kupffer cell (**Fig. 1**). Moreover, we found severe mitochondrial changes, characterized by disarrangement of cristae.

CONCLUSION

Histopathologic and ultrastructural examination of the liver revealed an extensive area of inflammation and focal accumulation of hemosiderin. Thanks to this more thorough investigation we can describe and try to understand specific mechanisms and the pathological consequences of iron overload. Our findings point to the presence of irregular deposits in the Kupffer cell cytoplasm and large bundles

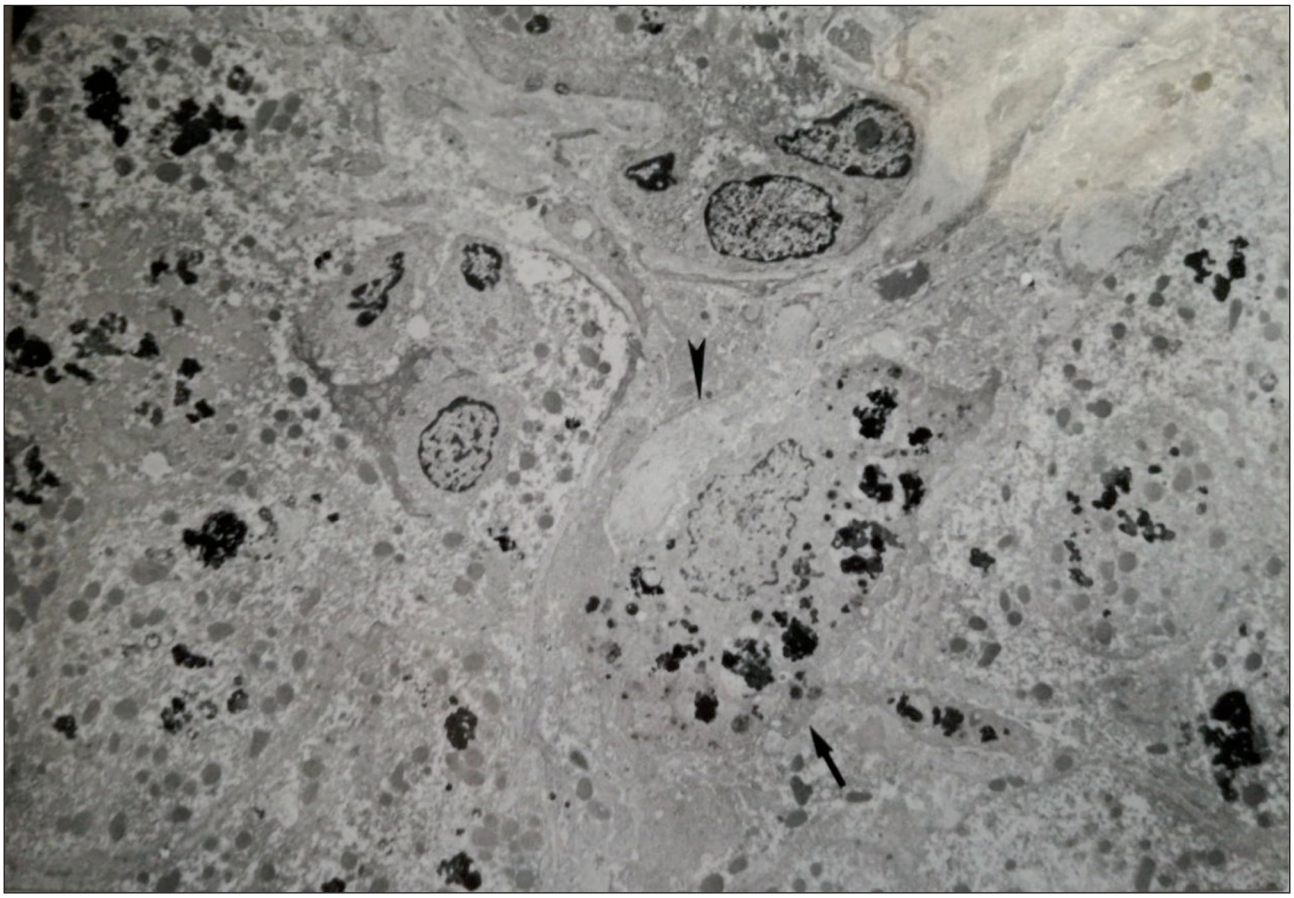


Figure 1 (ABS 24). Accumulation of hemosiderin in hepatocytes and mostly in Kupffer cells (arrow). Severe fibrosis of the spaces of Disse (arrowed).

of collagen fibers. Moreover, the mitochondrial damage was observed in all patients.
Understanding better the multiple morphological defects we hope to improve the therapeutic care of liver diseases due to storage in the liver of these essential minerals but also so harmful.

ABS 25

ATOPIC DERMATITIS: GOOD NEWS BY SKIN MICROBIOME

N. Maiello[1], S. Vendemmia[2], A.M. Basilicata[3]

[1]Dipartimento della Donna, del Bambino e di Chirurgia Generale e Specialistica, Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy

[2]Primario Emerito di Pediatria, Aversa, Italy

[3]Family Pediatrician, ASLCE, Italy

INTRODUCTION

The loss of diversity in a healthy skin microbiome known as dysbiosis is observed in most patients with atopic dermatitis (AD). In particular, staphylococcal colonization is correlated with the severity of AD, and it is thought to be a possible trigger for AD. However, the questions of whether staphylococcal colonization precedes the development of AD, and whether the colonization of commensal microbiota is protective against the occurrence of eczema have been controversial. In addition to the genetic skin barrier dysfunctions, virulence factors generated by *Staphylococcus* species may enhance the impairment of barrier functions, and they may induce allergic inflammation via innate and adaptive immunity. The Authors present the clinical case of an infant (3 months of age) with severe AD not responsive to the standard treatments with topical corticosteroids. The infant was then subjected to elimination diet by formula with amino acids, but without clinical improvement, however, gE mediated sensitization was not detected for milk and eggs. Targeted examinations detected no immunodeficiency (White Blood Cell Count, Ig serum dosage, Lymphocyte Subsets). A cutaneous and nasal swab showed the presence of *Staphylococcus aureus* (SA). For this reason, systemic therapy with antibiotic was undertaken active on the SA and topical therapy with corticosteroids of adequate power to the seriousness. After attack therapy, we started proactive therapy with low potency topical steroid for 4 weeks. Emollients were enriched with the prebiotic (*Vitreoscilla filiformis* killed with heat). The control of the AD reached after therapy and the control of flare reverte with antibiotics, and topical corticosteroids correct dysbiosis. The traditional AD treatment with anti-inflammatory and antimicrobial medications, even if intermittent, has been linked to greater microbial diversity, specifically increases in the populations of *Streptococcus*, *Corynebacterium* and *Propionibacterium* [1]. *Vitreoscilla filiformis* extracts in mouse modulate cutaneous inflammatory responses induces interleukin-10 production in dendritic cells and priming of regulatory T cells. A lack of natural microbial skin diversity combined with an overabundance of staphylococcal species in patients with AD further leads to disruption of skin-barrier homeostasis. Understanding the breadth of the skin microbiome and its protective role offers novel insights into the relationship between the microbiome and AD disease progression [2].

REFERENCES

[1] Powers CE, Powers CE, McShane DB, Gilligan PH. Microbiome and pediatric atopic dermatitis. Dermatol. 2015;42(12):1137-42.

[2] Nakatsuji T, Gallo RL. Dermatological therapy by topical application of non-pathogenic bacteria. J Invest Dermatol. 2014;134(1):11-4.

ABS 26

TEMPORAL VARIABILITY OF URINARY METABOLOME IN PRETERM NEWBORNS WITH NECROTIZING ENTEROCOLITIS

F. Giardina[1], A. Dessì[1], A. De Magistris[1], F. Cesare Marincola[1], S. Corbu[1], R. Pintus[1], V. Fanos[1], J-C. Picaud[2]

[1]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

[2]Neonatal Intensive Care of the Hopital de la Croix Rousse, Lyon, France

INTRODUCTION

Necrotizing Enterocolitis (NEC) is one of the most devastating pathologies of neonatal intestine characterized by inflammation and necrosis, with a mortality rate from 15% to 40% of cases. The etiopathogenesis is still unknown, an object of debate but the high prevalence in premature babies suggests the involvement of several factors such as intestinal immaturity, excessive immune system response and alteration of intestinal bacterial flora, which in patients with NEC appears to be strongly altered with the prevalence of potentially pathogenic bacteria. Metabolomics is one of the

newest "omics" sciences that provide a snapshot of the metabolites present and the metabolite variations in several biological fluids of an individual, such as blood, urine, feces, in different pathophysiological situations, during drugs assumption and different nutritional regimens. In this context, this technique may exert a role in understanding the causes of NEC, in order to provide an early diagnosis, a tailored treatment and to ameliorate the outcomes of these little patients.

AIM OF THE STUDY

Our study aimed to analyze the urinary metabolic profiles and their variations over time of preterm newborns, before, during and after the onset of NEC, through metabolomics.

PATIENT AND METHODS

The study group includes 18 premature newborns (9 males and 9 females) of gestational age less than 32 weeks admitted to the Neonatal Intensive Care of the Hopital de la Croix Rousse in Lyon. 6 cases developed NEC, 6 cases presented food intolerance in the absence of NEC, and the other 6 cases showed good food tolerance without any complications. Urine samples were collected within the first eight weeks of life in a non-invasive manner, subsequently analyzed by Nuclear Magnetic Resonance spectroscopy (^{1}H-NMR).

RESULTS

From data analysis, the urinary metabolomics profiles of these newborns changed over time. Nevertheless, in the urine samples of late onset NEC cases, after the occurence of the pathology, the metabolic pattern regresses to values that are similar to those observed in the first few days of the newborn's life. There was an increase of choline, betaine, N,N-dimethylglycine, citrate, succinate and α-ketoglutarate in the group of good food tolerance and minimal variations of the levels of these metabolites in cases with food intolerance. Gluconic acid seems to have a particular relationship with the development of the NEC late onset. Its variation corresponds to the presence of potentially pathogenic bacteria with higher virulence and proliferative capacity that can trigger an excessive inflammatory reaction in the intestine.

CONCLUSIONS

Despite this high variability of metabolic profiles related to NEC, gluconic acid could be proposed as a useful biomarker in the detection of NEC late onset.

Since metabolomics proved to be a useful tool in NEC investigation, it can allow, in the future, to clarify its causes and permit early diagnosis and treatment.

REFERENCES

- De Magistris A, Marcialis MA, Puddu M, Dessì A, Irmesi R, Coni E, Fanos V. Embryological development of the intestine and necrotizing enterocolitis. J Pediatr Neonat Individual Med. 2016;5(2):e050213.
- Dessì A, Pintus R, Marras S, Cesare Marincola F, De Magistris A, Fanos V. Metabolomics in necrotizing enterocolitis: the state of the art. Expert Rev Mol Diagn. 2016;16(10):1053-8.
- Puddu M, Marcialis MA, De Magistris A, Irmesi R, Coni E, Mascia L, Fanos V. From the "old NEC" to the "new NECs". J Pediatr Neonat Individual Med. 2014;3(2):e030245.

ABS 27

AN INNOVATIVE INTEGRATED WORKING MODEL FOR THE ACCOMPANIMENT AND PSYCHOLOGICAL SUPPORT TO WOMEN/COUPLES WITH AT RISK PREGNANCY OR BIRTH IN THE MATERNAL INFANT DEPARTMENT

M.V. Rizzo[1], S. Marotta[1], V. Cavarretta[1], G. Perricone[1,2]

[1]S.I.P.Ped. – Società Italiana di Psicologia Pediatrica

[2]Department of Psychology and Educational Sciences, University of Palermo, Palermo, Italy

INTRODUCTION

The contribution suggests an innovative working model for the accompaniment and psychological support from prenatal to neonatal period for women/couples with at pregnancy or birth. This model has been developping during an University-Hospital Trial named Ce.S.I.P.P.U.Ò., in the Maternal Infant Department of the Azienda Ospedaliera Ospedali Riuniti "Villa Sofia-Cervello" of Palermo. It is a model of intervention that involves a complex integration between doctors and pediatric psychologists that becomes part of the team of Units of the maternal area, to take charge of complex cases together, that has enabled fruitful management of particular risk conditions. Among all cases, we intend to focus attention on those already emerged in Prenatal Diagnosis and that lead to the birth of pre-term children with neonatal syndromes or pathologies, admitted to NICU, with the obvious passage in Obstetrics Unit. This is because they better express the continuity and complexity of integrated work and because they are high-risk conditions for the quality of the parent-child relationship and the latter's development.

AIMS

To present an integrated model of psychological support and accompaniment in the Maternal Infant Department.

PROCEDURE AND METHOD

The presented model provides an integrated management of couples with pregnancy at risk between Prenatal Diagnosis-Obstetrics and Neonatology Units: all the cases taken over due in Prenatal Diagnosis to the suspicion or detection of fetal pathologies or problems are managed until the immediate post-discharge with joint actions between psychologists and doctors of the Services/ Unites involved. This happens through specific procedural steps:

- Passage of information and reflections between psychologists and doctors before the admission of the user;
- Planning of the methods of taken care jointly;
- Co-presence of psychologists in particular moments like the communication to woman/ couple of the need to proceed with premature birth due to fetal distress;
- Continuous exchange of information between operators while the user "moves" between the different Units of the Department;
- Joint planning of possible post-discharge support pathways: when the woman is discharged, if the psychologist and the physician agree that psychological problem taken in charge is not resolved, they prescribe a brief sequence of psychological follow-ups. This can lead to solve the problem or send to local services.

CONCLUSIONS

Users' appreciation, also detected through Human Satisfaction Questionnaires, notes that this model of work makes couples feel supported by a network not limited only to the Hospital Unit but perceived as a welcoming continuity of care in the Maternal-Infant Department.

Last but not least, this type of intervention plays an important preventive function because it facilitates the early detection of risk predictors of Child Neglect and promotes a healthier parental competence.

ABS 28

HYPOTHERMIC TREATMENT IN NEONATES WITH HYPOXIC-ISCHEMIC ENCEPHALOPATHY: A 5 YEARS EXPERIENCE STUDY

S. Salomè, M. Morelli, G. Mansi, A. Romano, M. Vendemmia, F. Raimondi

Neonatal Intensive Care Unit, University of Naples Federico II, Naples, Italy

INTRODUCTION

Hypoxic-ischemic encephalopathy (HIE) is a condition affecting about 1‰ births. Despite a significant improvement in the management of this condition in the last ten years, HIE remains associated with high rates of death and severe neurological disability. Therapeutic hypothermia reduces cerebral injury and improves neurological outcome secondary to hypoxic ischemic encephalopathy in newborns and is currently considered the gold-standard treatment for newborns with HIE. This study analyzed the characteristics of term neonates with hypoxic-ischemic encephalopathy treated or not with hypothermia in our Neonatal Intensive Care Unit of the University of Naples Federico II.

MATERIALS AND METHODS

We performed a retrospective cohort analysis from 2013 to 2018, selecting all newborns with acceptance diagnosis of HIE according to the Italian recommendations (Italian Society of Neonatology [SIN] 2012). We selected 11 neonates who received hypothermia treatment (cases) and 11 newborns who have at least one of the two criteria of SIN recommendations and performed an amplitude integrated EEG but not received hypothermia (controls).

RESULTS

The two groups were homogenous for gestational age and birth weight. There were not statistically significant differences for type of delivery, obstetric risk factors, Apgar score (at 1, 5 e 10 minutes), pH e BE and resuscitation need. On the contrary we found significant differences between the two groups for neurological examination in the first hour of life, presence or absence of seizures, aEEG patterns ($p < 0.05$). Correlation studies showed: Apgar score at 1' minute was statistically related to neurological examination in the first hour of life (correlation coefficient Rho of Spearman rs 0.572) and aEEG (rs 0.56). Hypothermia was statistically related to neurological examination (rs -0.895) and aEEG before treatment (rs -0.756). The outcome and neurological development were statistically related to neurological examination (rs 0.648), aEEG (rs 0.558) and Apgar score at 1' minute (rs 0.596) and 5' minute (rs 0.454). Moreover, in our study, we found a significant correlation between aEEG normalization and outcome (rs 0.900, $p < 0.05$).

CONCLUSION

Our study confirms that the neurological examination is, together with aEEG, the best marker for HIE and outcome. The presence of seizures was confirmed to be strongly indicative of EII, and it is itself an indication of treatment. No antepartum and

peripartum factors seem to have a predictive value of severity for neurological damage, even if they remain essential risks factor for asphyxia. In our case studies, only Apgar score at 1' is statistically correlated to neurological examination and therefore indirectly to the outcome, probably because it better reflects the infant's initial situation and is less affected by the effects of resuscitation maneuvers.

ABS 29

AUTOIMMUNE HEPATITIS AND AUTOIMMUNE CHOLANGITIS WITH FULMINANT CLINICAL COURSE IN A YOUNG GIRL: A CASE REPORT

C. Rossi[1], D. Fanni[1], G. Cerrone[1], C. Gerosa[1], A. Ravarino[1], F. Coghe[2], Y. Gibo[3], G. Faa[1]

[1]Department of Surgical Sciences, Division of Pathology, University of Cagliari, Cagliari, Italy

[2]Department of Clinical Chemistry, Laboratory Medicine Service, AOU-Cagliari, Cagliari, Italy

[3]Hepatology Clinic, Matsumoto, Japan

INTRODUCTION

Autoimmune hepatitis (AIH) and autoimmune cholangitis (AIC) are included in the spectrum of autoimmune liver diseases (AILDs). In this spectrum, the identification of both hepatocytes and biliary cells, as target cells of autoimmunity, suggests an overlap syndrome [1]. AIH is a chronic liver disease with a higher incidence among girls. An acute severe (fulminant) presentation of AIH is possible and more frequent in children and young adults [2]. AIC does not have a consolidated niche in the spectrum of AILDs. Indeed, it is still debated whether AIC is a variant of primary biliary cirrhosis (PBC) with negative antimitochondrial antibodies (AMA) or a separate pathological entity in the spectrum of AILDs [3]. This report aims to describe a case of overlap syndrome between AIH and AIC characterized by an acute severe clinical course.

PATIENT AND METHODS

A 17-year-old female patient presented with jaundice and rapid onset of hepatic encephalopathy, for which she underwent emergency liver transplantation. Laboratory tests evidenced high serum levels of AST (4,061 U/L), ALT (2,220 U/L), total bilirubin (22.94 mmol/L) and conjugated bilirubin (15.63 mmol/L). Serologic analysis for hepatotropic viruses was negative, and drug-toxic etiologies were excluded. Anti-nuclear autoantibodies (ANA) were positive, while others serum circulating autoantibodies were negative.

RESULTS

Histological examination of the explanted liver showed submassive necrosis, with prevalent centrilobular necrosis, collapse of the lobular architecture and severe centrilobular and portal inflammation (lymphocytes, plasma cells, and neutrophils) with interface hepatitis. Residual hepatocytes, with aspects of ballooning degeneration, and sometimes, multinucleated giant hepatocytes were present in the periportal zone. Portal tracts showed lymphocytic cholangitis and periductal lymphocytic aggregates, suggesting a destructive autoimmune process of the bile ducts. Immunoreactivity for "biliary" cytokeratins (CK7 and CK19) helped us identify biliary interface activity and ductular metaplasia of periportal hepatocytes. Immunoreactivity for CD38 highlighted plasma cell clusters in the centrilobular zone and portal tracts (**Fig. 1**).

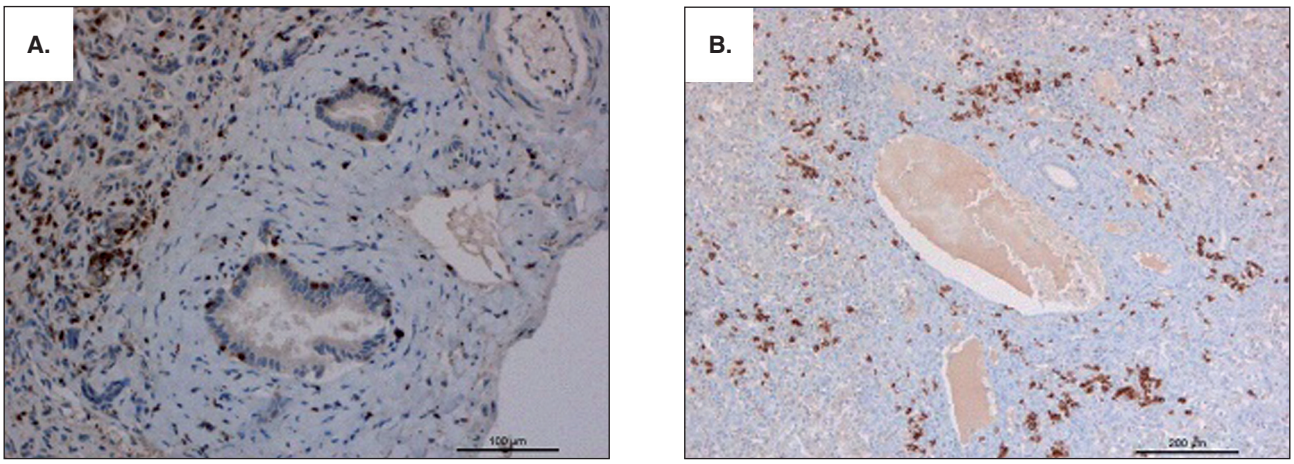


Figure 1 (ABS 29). A. Immunohistochemistry for CD3 helps in identifying small T lymphocytes on the inner side of the basal membrane encircling bile ducts (lymphocytic cholangitis). **B.** Immunostaining for CD38 highlights plasma cell cluters in the portal tract.

DISCUSSION

AIH may have a fulminant presentation with acute liver failure, hepatic encephalopathy and massive necrosis at histology, especially in children and young adults, as shown in our patient. In this case, we found not only typical elementary lesions associated with AIH but also lymphocytic cholangitis and aspects of vanishing bile duct disease, thus suggesting the diagnosis of an overlap syndrome.

REFERENCES

[1] Gerosa C, Fanos V, Fanni D, Van Eyken P, Ambu R, Nemolato S, Floris G, Iacovidou N, Gibo Y, Nurchi AM, Faa G. Liver biopsy interpretation in the differential diagnosis of autoimmune liver disease in children. J Pediatr Neonat Individual Med. 2013;2(2):e020229.

[2] Mieli-Vergani G, Vergani D. Autoimmune liver diseases in children – what is different from adulthood? Best Pract Res Clin Gastroenterol. 2011;25(6):783-95.

[3] Czaja AJ, Carpenter HA, Santrach PJ, Moore SB. Autoimmune cholangitis within the spectrum of autoimmune liver disease. Hepatology. 2000;31(6):1231-8.

ABS 30

PULMONARY HYPERTENSION IN A LATE PRETERM: A CASE REPORT

G. Cerrone[1], V. Aimola[1], C. Loddo[2], F. Cau[3], G. Faa[1], C. Gerosa[1]

[1]Division of Pathology, University of Cagliari, AOU of Cagliari, Cagliari, Italy

[2]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

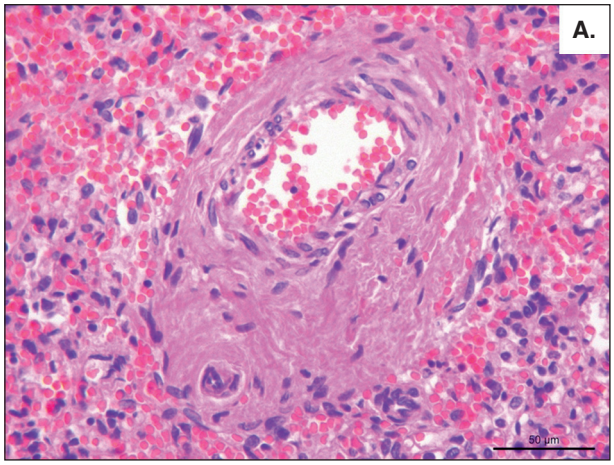
[3]Division of Pathology, San Gavino Hospital, ATS, San Gavino, Italy

BACKGROUND

Before birth, pulmonary vascular resistance (PVR) is elevated, whereas at birth it rapidly falls because of the normal circulatory transition. Persistent pulmonary hypertension of the newborn (PPHN) arises when PVR remains abnormally increased after birth, resulting in right-to-left shunting of blood at the ductus arteriosus or foramen ovale. Three main pathophysiological categories related to PPHN have been described: i) abnormal lung vascular constriction, caused by lung diseases (e.g., sepsis, respiratory distress syndrome [RDS], meconium aspiration syndrome); ii) lung vascular hypoplasia; iii) idiopathic PPHN caused by remodeling of the pulmonary vasculature. This is not a strict distinction, as these pathophysiological categories may overlap. The idiopathic PPHN represents the cause of 10-20% of all PPHN. The other two forms are the leading causes of the most severe cases [1]. At histology, PPHN presents with medial thickening in the smaller and peripheral arterioles both in muscular arterioles and in normally non-muscularized vessels [2]. Here we present an autopsy case of RDS and PPHN in a late-preterm infant.

CASE REPORT

Male preterm born at the 36th week of gestation was admitted to the neonatal intensive care unit of the University Hospital of Cagliari. After 8 hours, despite the nitric oxide therapy, the newborn died. Pulmonary hypertension refractory to therapy was clinically diagnosed. At autopsy, patent ductus arteriosus and foramen ovale enlarged right atrium, the rapid sinking of small lung specimens in water, no crepitance and liver-like consistency of the lungs were observed. Samples from both lungs were formalin-fixed and paraffin embedded. H&E was used to stain tissue sections. The microscopic evaluation revealed bilateral lung immaturity with hyaline membranes, composed of necrotic alveolar lining cells, fibrin and amniotic fluid along the surface of the alveolar ducts. Thickening of the muscular layer of the smaller and more peripheral arterioles was also observed (**Fig. 1**). PPHN caused by RDS was diagnosed.



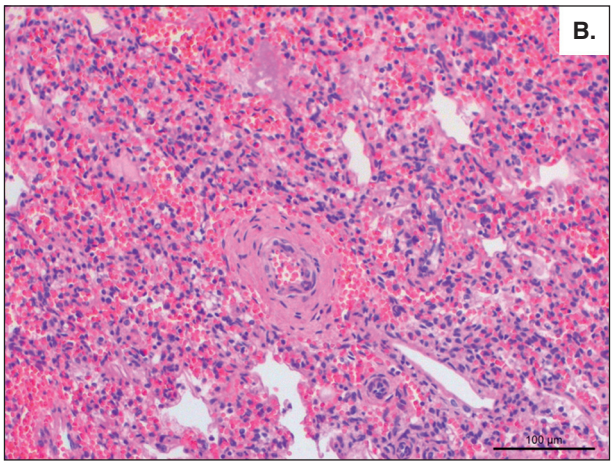


Figure 1 (ABS 30). Thickening of the muscular layer of the smaller and more peripheral arterioles, pulmonary hemorrhage and hyaline membranes lining alveolar duct surface (H&E).

CONCLUSIONS

Herein, we present an autopsy case of a late-preterm infant with PPHN and RDS. At gross examination, right-to-left shunt caused by ductus arteriosus and foramen ovale patency and, at histological evaluation, medial thickening of peripheral and smaller arterioles of the lungs confirmed the diagnosis of PPHN. In this case, the main cause of PPHN may be attributed to the presence of hyaline membranes over alveolar ducts surface [1].

REFERENCES

[1] Steinhorn RH. Neonatal pulmonary hypertension. Pediatr Crit Care Med. 2010;11(2 Suppl):S79-84.

[2] Ohara T, Ogata H, Tezuka F. Histological study of pulmonar vasculature in fatal cases of persistent pulmonary hypertension of the newborn. Tohoku J Exp Med. 1991;164:59-66.

ABS 31

AUDITING PEDIATRIC EMERGENCIES IN LEBANON

M. Amm[1], Z. Ghorayeb[1], V. Modica[1], G. Nicolas[1], H. Feghali[1], M. AlOjaimi[2], M.C. Fadous Khalife[1]

[1]Holy Spirit University of Kaslik, UUH-Note Dame des Secours, Byblos, Lebanon

[2]Balamand University, Koura, Lebanon

INTRODUCTION

Accreditation of hospitals began to emerge in Lebanon a few years ago and concerns the majority of hospitals where it operates via an audit system based on standards established in a reference manual. The goal is to improve the quality of care and safety in a dangerous environment that is the health environment. Because the current manual confuses pediatric emergencies in adult emergencies, we proposed 27 specific standards for Lebanese pediatric emergencies based on the reference standards and other international standards. These standards require the formation of a children's emergency department with its internal functioning, specialized staff and equipment appropriately chosen for this age group.

RESULTS

This study deals with accreditation and auditing as real health management tools with some clarifications made by reviewing the literature on the subject. 65 pediatricians opinions were collected by questionnaires distributed over the country concerning their emergencies work and utility. The questions were widened to their proposals. In addition, complaints were collected regarding the practice of pediatric emergencies.

CONCLUSION

In conclusion, Ministry of Health, private and public hospitals, and insurance companies must help to establish independent units for urgent pediatric cases in Lebanon.

ABS 32

OCT-4 EXPRESSION IN THE HUMAN FETAL OVARY DURING GESTATION

F. Cau[1], C. Gerosa[2], M.L. Pinna[1], G. Senes[2], F. Ronchi[3], C. Botta[1]

[1]Division of Pathology, Ospedale N. Signora di Bonaria, ATS-ASSL, San Gavino, Italy

[2]Division of Pathology, University Hospital San Giovanni di Dio, AOU of Cagliari, Cagliari, Italy

[3]Clinical Pathology, Ospedale N. Signora di Bonaria, ATS-ASSL, San Gavino, Italy

INTRODUCTION

Oct-4 (octamer-binding transcription factor 4), also known as POU5F1 (POU domain, class 5, transcription factor 1), is a transcription factor of the POU family, encoded by the POU5F1 gene [1]. Oct-4 is critically involved in self-renewal of undifferentiated embryonic stem cells. As such, it is frequently used as a marker for undifferentiated stem/progenitor cells. Oct-4 is initially acting as a protective factor in the oocyte [2] and remains active in embryos throughout the preimplantation period. Gene knockdown of Oct-4 promotes differentiation, demonstrating a role for this transcription factor in self-renewal of human embryonic stem cells [3]. The purpose of this study was to analyze the expression of OCT-4 in the human fetal ovary during gestation, at different gestational ages.

MATERIALS AND METHODS

Our study was based on the analysis of 10 fetal ovaries, ranging in gestational age from 12 to 38 weeks. Five-micron-thick tissue sections were stained with H&E and immunostained with a commercial antibody against Oct-4.

RESULTS

In the ovaries of the fetus aged 19 weeks, Oct-4 was expressed in the nuclei of oogonia. In ovaries from older fetuses, immunoreactivity for Oct-4 was mainly localized in the follicles and, in particular, in oocytes. Oct-4 was expressed in the cytoplasm of oocytes, appearing as granular immunostaining

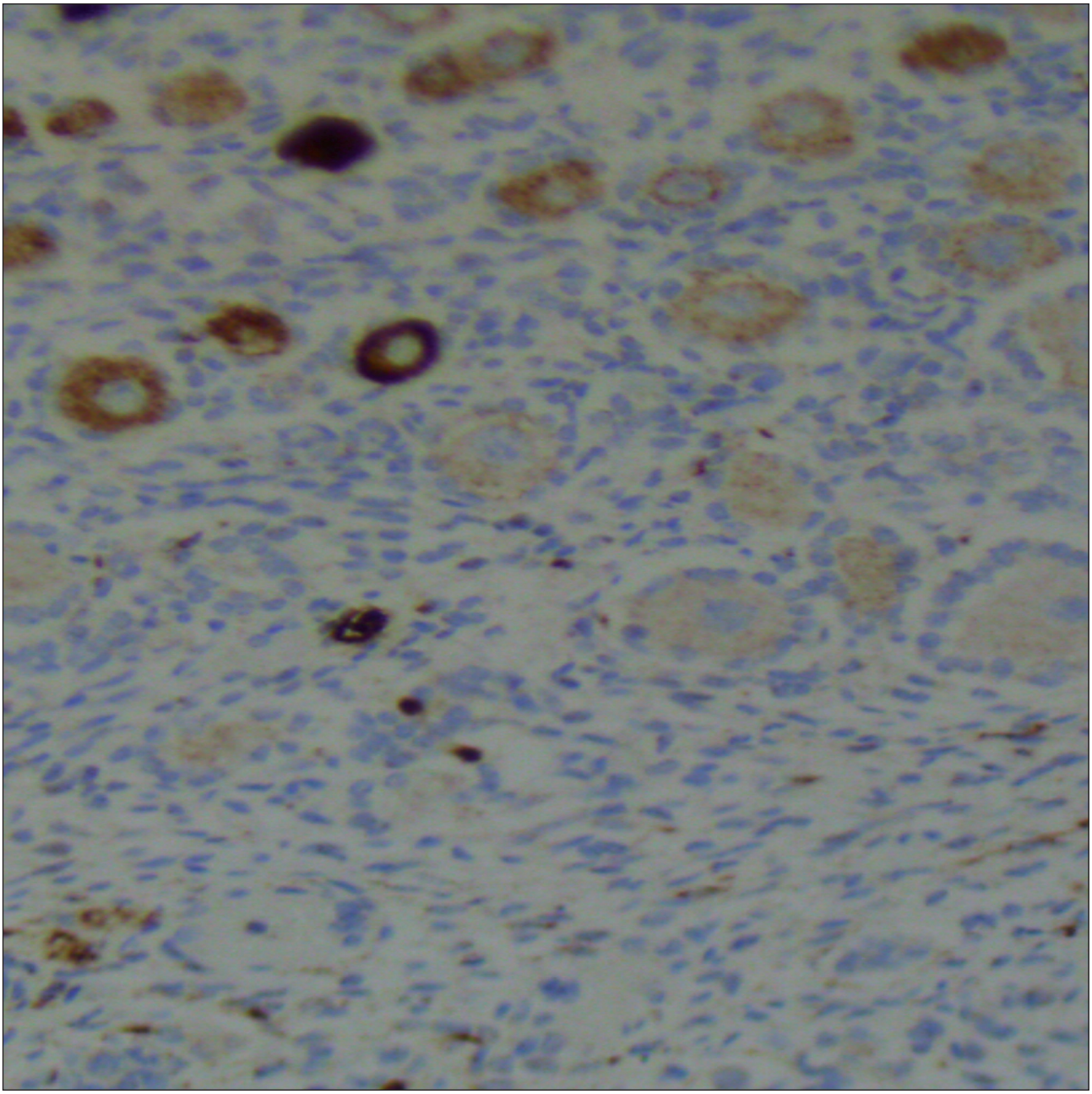


Figure 1 (ABS 32). Oct-4, 34 week, 63x.

(**Fig. 1**). The intensity of reactivity for Oct-4 changed significantly from one oocyte to the next, ranging from strong to mild. Oct-4 was expressed both in primordial, primary and in secondary follicles, its expression is higher in the former. The majority of larger secondary follicles did not show any reactivity for Oct-4.

DISCUSSION

Our study shows that Oct-4 is highly expressed in the human ovary during fetal life. Oogonia and oocytes are the ovarian cells that mainly express Oct-4. Differences were seen during maturation from oogonia towards secondary follicles, Oct-4 being mainly expressed in the initial phases of oocyte development, ending with its low immunoreactivity or absence in more mature oocytes. This finding confirms a major role for Oct-4 in human folliculogenesis and, in particular, in the initial steps of follicular maturation. Our preliminary data indicate Oct-4 as a key regulator in embryonic development of the human ovary. Further studies are needed in order to verify if the expression of Oct-4 persists in stem/progenitor cells in the adult ovary

REFERENCES

[1] Scholer HR, Ruppert S, Suzuki N, Chowdlhury K, Gruss P. New type of POU domain in germ line-specific protein Oct-4. Nature. 1990;344(6265):435-9.

[2] Varras M, Griva T, Kalles V, Akrivis C, Paparisteidis N. Markers of stem cells in human ovarian granulosa cells: is there a clinical significance in ART? J Ovarian Res. 2012;5(1):36.
[3] Bukovsky A. Ovarian stem cell niche and follicular renewal in mammals. Anat Rec (Hoboken). 2011;294(8):1284-306.

ABS 33

VERY LOW BIRTH WEIGHT AND LONG-TERM OUTCOMES: A 14 YEARS EXPERIENCE IN THE NICU OF A.O.U. FEDERICO II IN NAPLES

M. Vendemmia[1], G. Mansi[1], A. Romano[1], S. Salomè[1], A. Romano[2], F. Diana[1], F. Raimondi[1]

[1]Neonatal Intensive Care Unit, University of Naples Federico II, Naples, Italy
[2]Pediatric Neurologist, University of Naples Federico II, Naples, Italy

INTRODUCTION

In developed countries, very low birth weight (VLBW) infants represent approximately 1-1.5% of live births but contribute to 40-60% of neonatal and child mortality. Since the 1990s in all neonatal intensive care units, a survival rate of more than 90% has been achieved for infants with a birth weight exceeding 1,000 g. Compared to the previous decade 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 higher rate of severe disability, related to lower gestational age (22-24 w), as well as minor disabilities. The recent international literature highlights the association between abnormalities and/or delay in neuromotor development and severe prematurity. In addition to major neurological problems, 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 g, admitted in the Neonatal Intensive Care Unit of the University "Federico II" of Naples from January 2001 to December 2014. All newborns with a birth weight < 1,500 g were recruited and were followed until 36 months of corrected age.

RESULTS

In our study, 855 children were recruited for the follow-up to 36 months of correct age, of which 765 (89.5%) returned. We observed an increased adherence to follow-up of 14% more in the period 2013-2014 compared to the years 2001-2004; in particular, in 2014 the adherence to follow-up is 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 494 g in the last one with a 28% birth weight reduction. 20% of the sample presented abnormalities in neuromotor development in the first year of life while this percentage reduced to 9% at 24 months. The increased abnormalities of the muscular tone are inversely proportional to the reduction of the abnormalities at 24 months of correct age. This result seems particularly interesting because it enhances the importance of early diagnosis and early rehabilitation therapy. In 2005-2008 there was a worsening in motor outcomes, compared to 2001-2004; however, in the following years, the motor outcomes improved progressively. Regarding the verbal outcomes, in 2005-2008 there was a worsening but, unlike the neurological ones, they remained stable in later years. 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. Results are showed in **Tab. 1**.

Table 1 (ABS 33). Very low birth weight and long-term outcomes.

Outcome	2001-2004	2005-2008	2009-2012	2013-2014
Motor	96% normal	90% normal	92% normal	94% normal
	2% suspected	5% suspected	3% suspected	2% suspected
	2% abnormal	5% abnormal	5% abnormal	4% abnormal
Verbal	89% normal	83% normal	86% normal	80% normal
	7% suspected	10% suspected	8% suspected	9% suspected
	4% abnormal	6% abnormal	6% abnormal	10% abnormal
Cognitive	92% normal	90% normal	94% normal	91% normal
	6% suspected	5% suspected	2% suspected	3% suspected
	2% abnormal	5% abnormal	4% abnormal	6% abnormal

CONCLUSION

The possibility of following the growth processes of the premature baby is necessary to prevent the presence of disorders that may occur over time and 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 34

IF IT IS NOT A COMMON HEADACHE? ARACHNOID CYST WITH CRONIC SUBDURAL HEMATOMA POST MINOR HEAD TRAUMA IN CHILD

F. Mecarini[1], M. Tiddia[1], G. Cherchi[1], M.L. Giua Marassi[1], B. Biancu[2], P.F. Cappai[3], A. Medda[3], A. Canetto[1]

[1]Department of Pediatric Emergency Medicine, Azienda Ospedaliera Brotzu, Cagliari, Italy

[2]Department of Surgical and Biomedical Sciences, University of Cagliari, Cagliari, Italy

[3]Department of Neurosurgery, Azienda Ospedaliera Brotzu, Cagliari, Italy

INTRODUCTION

Arachnoid cyst (AC) is a common congenital intracranial lesion in children. Although most ACs are asymptomatic, they may be complicated by a subdural hematoma (SDH) or intracystic hemorrhage (ICH) after minor head trauma or spontaneously.

CASE REPORT

We describe the case of an 11-year-old boy who experienced a 2-month intermittent headache without nausea and vomiting. At admission, the patient sustained that this symptom started after minor frontal head trauma. We obtained a full ophthalmic evaluation with evidence of bilateral papilledema. Head computed tomography (CT) revealed an iso-hypodensity mass located in the right middle cranial fossa with a contiguous subdural collection (**Fig. 1**) and middle line shifted slightly to the left. This data suggested an AC with a chronical subdural hematoma (CSDH). The patient received medical treatment, no surgical intervention was needed, and after seven days the child was discharged.

DISCUSSION

AC is a common benign intracranial lesion. The reported incidence in the general population is less than 2.6%. ACs are usually asymptomatic, but SDH or ICH may complicate them in 8% to 27% of cases. Typical symptoms of complicated ACs are a headache, nausea, and vomiting due to intracranial hypertension. A rapid diagnosis can be made with a head CT-scan, that shows cystic content or subdural collection of various density depending on the bleeding time. MRI is especially useful during follow up and leads to determine the bleeding time valuing different methemoglobin signals. The pathogenesis is uncertain. AC has been implicated

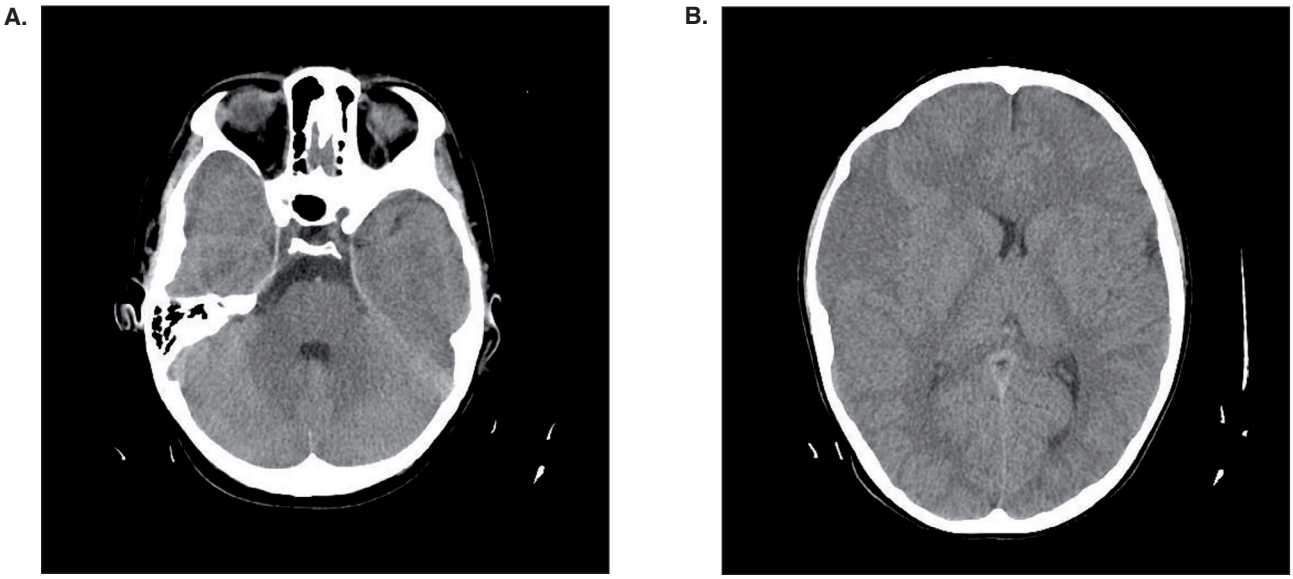


Figure 1 (ABS 34). Head CT scans at admission showing an iso-ipodense arachnoid cyst (AC) in the right middle cranial fossa with an omolateral chronical subdural hematoma (CSDH).
Note the thinning of overlying bone.

in both traumatic and spontaneous SDH. Hematoma could be caused by rupture of bridging veins or blood vessels after trauma because AC is less compliant than the healthy brain. Alternatively, it was assumed that AC rupture on the wall could form subdural effusion after trauma. In non-traumatic cases, the wall of AC secretes liquid increasing intracystic pressure leading to the rupture of the cyst. Treatment of complicated ACs is controversial. Spontaneous resolution is possible and conservative management could be selected for patients with known or mild symptom and slight space occupying effect. Burr hole drainage is the first-choice surgical procedure in symptomatic patients. In case of recurrence, craniotomy and standard cyst fenestration or membrane removal can be performed.

CONCLUSION

Headache is one of the leading causes of accessing pediatric emergency department (PED). This case highlights the important role of PED in identifying insidious diseases and starting a rapid diagnostic work up with a multidisciplinary team.

REFERENCES

- Liu Z, Xu P, Li Q, Liu H, Chen N, Xu J. Arachnoid cysts with subdural hematoma or intracystic hemorrhage in children. Pediatr Emerg Care. 2014;30(5):345-51.
- Wu X, Li G, Zhao J, Zhu X, Zhang Y, Hou K. Arachnoid Cyst-Associated Chronic Subdural Hematoma: Report of 14 Cases and a Systematic Literature Review. World Neurosurg. 2018;109:e118-30.
- Kode S, Hegde A, Menon G. Chronic Subdural Hematoma Associated with Congenital Arachnoid Cysts: Management Dilemmas. Cureus. 2018;10(4):e2550.

ABS 35

ADVANCED MAGNETIC RESONANCE IMAGING IN PEDIATRIC MUSCLE DISEASES

M. Marras[1], G. Vivanet[2], A. Lai[3]

[1]Radiology Unit, Microcitemico A. Cao Children's Hospital, Azienda Ospedaliera Brotzu, Cagliari, Italy

[2]Medical School, University of Cagliari, Cagliari, Italy

[3]Pediatric Anesthesia Unit, Microcitemico A. Cao Children's Hospital, Azienda Ospedaliera Brotzu, Cagliari, Italy

INTRODUCTION

Skeletal muscle disorders have a great variety of causes, and the diagnosis has traditionally been based on clinical examination and histological analysis. The clinical evaluation of the integrity and performance of skeletal muscle can be problematic; advanced MRI and conventional morphological MRI allow to define the qualitative, quantitative and functional characteristics of the muscle, with excellent resolution of soft tissue contrast and multiplanar tomographic visualization, also with specific imaging patterns in some case. Furthermore, magnetic resonance imaging can highlight a selective abnormality within individual muscles in unaffected synergistic muscles.

METHOD AND MATERIALS

The DWI, DIXON, T2 map, DTI, MRs (H), MRs (P) and MR elastography sequences (with 1.5T e 3T scanners) are quantitative and functional advanced MR imaging techniques, used as complementary sequences to conventional MR imaging in evaluation and follow-up of muscular pathologies, both in adult and pediatric age.

RESULTS

The recent development of advanced MR imaging and post-processing software has made it possible to extend the use of conventional morphological MR imaging to functional and quantitative evaluations of the muscular apparatus, to define the architecture, composition and muscular mechanical and functional characteristics with high sensibility and specificity.

CONCLUSION

Advanced MRI imaging techniques have recently been used in the evaluation of normal muscle and muscular pathologies; as reported by some authors, quantitative and functional MR imaging can help to understand the pathophysiology of various muscular disorders in children, define their diagnosis and to monitor the therapy.

REFERENCES

- Diaz-Manera J, Fernandez-Torron R, LLauger J, James MK, Mayhew A, Smith FE, Moore UR, Blamire AM, Carlier PG, Rufibach L, Mittal P, Eagle M, Jacobs M, Hodgson T, Wallace D, Ward L, Smith M, Stramare R, Rampado A, Sato N, Tamaru T, Harwick B, Rico Gala S, Turk S, Coppenrath EM, Foster G, Bendahan D, Le Fur Y, Fricke ST, Otero H, Foster SL, Peduto A, Sawyer AM, Hilsden H, Lochmuller H, Grieben U, Spuler S, Tesi Rocha C, Day JW, Jones KJ, Bharucha-Goebel DX, Salort-Campana E, Harms M, Pestronk A, Krause S, Schreiber-Katz O, Walter MC, Paradas C, Hogrel JY, Stojkovic T, Takeda S, Mori-Yoshimura M, Bravver E, Sparks S, Bello L, Semplicini C, Pegoraro E, Mendell JR, Bushby K, Straub V; Jain COS Consortium. Muscle MRI in patients with dysferlinopathy: pattern recognition and implications for clinical trials. J Neurol Neurosurg Psychiatry. 2018;89(10):1071-81.
- Theodorou DJ, Theodorou SJ, Kakitsubata Y. Skeletal muscle disease: patterns of MRI appearances. Br J Radiol. 2012;85(1020):e1298-308.

ABS 36

ACTION – AGGRESSION IN CHILDREN: UNRAVELING GENE-ENVIRONMENT INTER-

PLAY TO INFORM TREATMENT AND INTERVENTION STRATEGIES

M. Mauri[1]; ACTION CONSORTIUM[2]

[1]University of Cagliari, Cagliari, Italy

[2]VU University Amsterdam (1, The Netherlands); Leiden University Medical Center (2, The Netherlands); Queensland Institute of Medical Research (3, Australia); Karolinska Institutet (4, Sweden); University of Helsinki (5, Finland); King's College London (6, UK); Erasmus University Medical Centre (7, The Netherlands); University of Notre Dame du Lac (8, US); University of Cagliari (9, Italy); Diagenode SA (10, Belgium); Good Biomarker Sciences (11, The Netherlands); Leiden University (12, The Netherlands)

GOALS OF THE PROJECT

ACTION aims to improve the understanding of the causes of individual differences in aggression among children in order to better inform the development of prevention and treatment strategies. The project investigates current and diagnostic problems in pediatric aggression, including the differential expression of aggression as a function of gender, developmental stage, and patterns of comorbidity.

ACTION is trying to reveal the predictive outcome of childhood aggression by examining longitudinal trajectories in large-scale longitudinal data.

GENETIC AND METABOLOMIC APPROACHES

ACTION quantifies the influences of genes and environment as a function of gender, age, birth cohort, and environmental modifiers; it identifies genomic regions of interest for aggression using a genome-wide association (GWA) studies. ACTION develops new methods to study gene-environment correlation and interaction by including measured genes and measured environment; it selects informative groups of children for inclusion in epigenetic and metabolomic biomarkers studies of aggression. The ACTION Newsletters: http://www.action-euproject.eu/content/action-newsletters.

COMORBIDITY OF CHILD AGGRESSION: AN INTERACTIVE TOOL

The ACTION consortium released an interactive tool showing the comorbidities of child aggression with other childhood psychopathologies. The interactive tool can be browsed by questionnaire (ATAC – CBCL – DCB – SDQ – MSNI) or by psychopathology (http://www.action-euproject.eu/ComorbidityChildAggression).

PROJECT ARCHITECTURE

WP1: Management; WP2: Clinical epidemiology; WP3: Genetic epidemiology; WP4: Gene-environment; WP5: Metabolomics; WP6: Prevention and treatment; WP7: Dissemination.

CONSORTIUM

The project relies on a large body of competences, since it comprises 12 partners and members of the Scientific Advisory Board (SAB), from several world countries: VU University Amsterdam (1, The Netherlands); Leiden University Medical Center (2, The Netherlands); Queensland Institute of Medical Research (3, Australia); Karolinska Institutet (4, Sweden); University of Helsinki (5, Finland); King's College London (6, UK); Erasmus University Medical Centre (7, The Netherlands); University of Notre Dame du Lac (8, US); University of Cagliari (9, Italy); Diagenode SA (10, Belgium); Good Biomarker Sciences (11, The Netherlands); Leiden University (12, The Netherlands).

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ABS 37

INTUSSUSCEPTION IN A PREMATURE NEONATE: A RARE AND OFTEN MISDIAGNOSED CLINICAL ENTITY

L. Giua Marassi[1], D. Panico[1], F. Puddu[1], L. Mascia[2], M. Puddu[1]

[1]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

[2]Pediatric Surgery, Brotzu Hospital, Cagliari, Italy

INTRODUCTION

Intussusception typically presents between 6 and 36 months of age and is the most common cause of intestinal obstruction in this age group. It is an extremely rare clinical entity in neonates, especially among premature neonates. It accounts for only 3% of intestinal obstruction in neonates and only 0.3% (0-2.7%) of all cases of intussusceptions [1]. Its presentation closely mimics NEC, and this often leads to an initial misdiagnosis causing a significant delay between the onset of symptoms and the establishment of definitive treatment. Majority of the reported cases of intussusception are diagnosed intraoperatively and this increase the mortality [2, 3]. The etiology of neonatal intussusceptions in premature infants remains unclear. In only about 8% of cases, there are recognizable anatomical leading points, such as diverticulum, polyps, or cysts [4]. Common perinatal risk factors resulting in intestinal hypoperfusion, hypoxia, dysmotility and stricture formation may act as a lead point for intussusceptions [5].

CASE REPORT

A 2.290 kg female neonate was delivered by cesarean section of 36 weeks because of a bigeminal monochorionic diamniotic gestation with an Apgar score of 9 at 1 minute and 10 at 5 minutes. After 5 days after birth, she was admitted to our hospital for poor feeding. On day 8 after birth, the feeding was progressively reduced, and the neonate presented bilious secretions from the nasogastric tube that became fecaloid after few hours and bleeding stool. The baby remained hemodynamically stable, did not have any abdominal distension or a palpable mass.

The X-ray showed only a little gas-fluid level in the lower abdomen. Ultrasonography revealed fixed small bowel loops. The baby was taken for urgent surgery for suspected intestinal obstruction. The ileocolic intussusception was reduced. The post-operative period was uneventful. The baby was discharged 2 weeks later.

CONCLUSION

Successful management of intussusception in preterms requires a timely and accurate diagnosis.

Intussusception is a rare clinical entity often confused with other causes of intestinal obstruction. From all these conditions, it is essential to dissociate NEC, a condition which can be cured conservatively in most of the cases. It is, therefore, imperative for neonatologists, pediatricians and pediatric surgeons to be aware of the possibility of intussusception in association with NEC or as an alternative diagnosis, especially in a baby who has a more stable course that would normally be expected.

REFERENCES

[1] Wang NL, Yeh ML, Chang PY, Sheu JC, Chen CC, Lee HC, Hung HY, Hsu CH. Prenatal and neonatal intussusception. Pediatr Surg Int. 1998;13(4):232-6.

[2] Avansino JR, Bjerke S, Hendrickson M, Stelzner M, Sawin R. Clinical features and treatment outcome of intussusception in premature neonates. J Pediatr Surg. 2003;38:1818-21.

[3] Mooney DP, Steinthorsson G, Shorter NA. Perinatal intussusception in premature infants. J Pediatr Surg. 1996;31:695-7.

[4] Loukas I, Baltogiannis N, Plataras C, Skiathitou AV, Siahanidou S, Geroulanos G. Intussusception in a premature neonate: A rare often misdiagnosed cause of intestinal obstruction. Case Rep Med. 2009;2009:607989.

[5] Slam KD, Teitelbaum DH. Multiple sequential intussusceptions causing bowel obstruction in a preterm neonate. J Pediatr Surg. 2007;42:1279-81.

ABS 38

EPSTEIN-BARR VIRUS IN 5 PEDIATRIC PATIENTS WITH HODGKIN'S LYMPHOMA

J.A. Zanda[1], C. Gerosa[1], G. Senes[1], R. Murru[2], G. La Nasa[2], G. Faa[1], D. Fanni[1]

[1]Division of Pathology, University of Cagliari, AOU Cagliari, Cagliari, Italy
[2]Hematology Unit, Department of Medical Sciences and Public Health, University of Cagliari, Cagliari, Italy

INTRODUCTION

Hodgkin Lymphoma (HL) is a heterogeneous disease consisting of many etiological factors. Two major type of HL, classic (CHL) and nodular lymphocyte predominant (NLPHL), have been identified [1]. The Epstein Barr virus (EBV) has been recognized to have a role even though the pathogenetic mechanisms are still not completely clarified. EBV is more often observed in CHL then in NLPHL [2]. CHL with mixed cellularity (MCCHL) is the predominant histological subtype in pediatric patients while nodular sclerosis (NSCHL) in the adult. EBV was found to be higher in pediatric patients than in adults; thus MCCHL is more frequently associated with the virus. The gold-standard for evaluating the presence of EBV in tissues' samples is the research of Epstein-Barr encoding RNA by *in situ* hybridization (EBER-ISH). Our study aimed to investigate the presence of EBV in 5 pediatric patients with the diagnosis of HL.

PATIENTS AND METHODS

Five patients between 16 and 19 at the time of diagnosis, including 3 females and 2 males, were enrolled. The histotypes were: 3 CHL (2 of which NSCHL, 1 MCCHL) and 2 NLPHL. One patient had a documented acute EBV infection eight months before the diagnosis of MCCHL. EBER-ISH assessed the presence of the EBV in paraffin-embedded tissue's block.

RESULTS

The EBER-ISH determination was positive in all CHL. MCCHL was the histotype characterized by the higher number of positive cells. EBER-ISH found in rare small lymphocytes of the background (**Fig. 1**), while the cellular diagnostic elements (Hodgkin's and Reed-Sternberg cells) were mainly negative. The 2 cases of NLPHL were completely negative.

DISCUSSION

EBV is considered a trigger of lymphomagenesis [3]. Even with the positivity was observed only in the small lymphocytes and not in the Hodgkin's and Reed-Sternberg cells in our CHL cases, our data demonstrated the presence of EBV in the background of the 3 cases of CHL. Interestingly

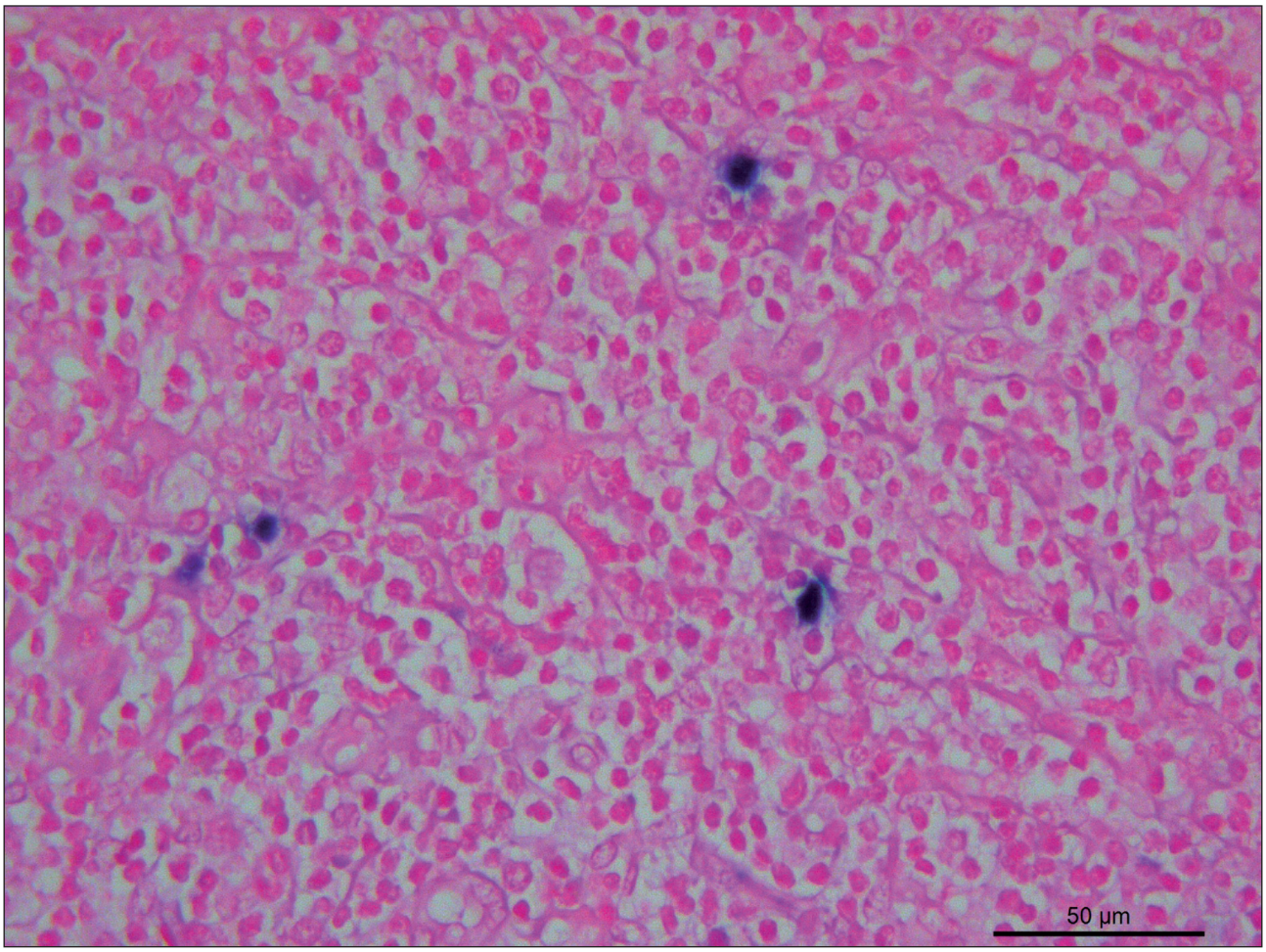

Figure 1 (ABS 38). EBER-ISH in Mixed Cells Classi Hodgkin Lymphoma (MCCHL).

the increased positivity was detected in a patient who had an EBV infection eight months before the diagnosis of MCCHL. A possible relationship could be explained by the theory of "hit-and-run" even though some authors are still controversial and not entirely accepted concerning the relationship between EBV and HL. Despite the limitations due to the reduced number of case that we studied, our results are consistent with the literature in which the presence of EBV is uncommon less than 5% in NLPHL cases.

REFERENCES

[1] Swerdlow SH, Campo E, Pileri SA, Harris NL, Stein H, Siebert R, Advani R, Ghielmini M, Salles GA, Zelenetz AD, Jaffe ES. The 2016 revision of the World Health Organization (WHO) classification of lymphoid neoplasms. Blood. 2016;127(20):2375-90.

[2] Huppmann AR, Nicolae A, Slack GW, Pittaluga S, Davies-Hill T, Ferry JA, Harris NL, Jaffe ES, Hasserjian RP. EBV may be expressed in the LP cells of nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) in both children and adults. Am J Surg Pathol. 2014;38(3):316-24.

[3] Vockerodt M, ZumlaCader F, Shannon-Lowe C, Murray P. Epstein-Barr virus and the origin of Hodgkin lymphoma. Chin J Cancer. 2014;33(12): 591-7.

ABS 39

UBALDO DIMITA AND THE HUMANIZATION OF CURES IN NEONATOLOGY

L. Cataldi

Study Group on the History of Paediatrics of the Italian Paediatrics Society

Ubaldo Dimita was born in Santeramo in Colle September 20th, 1948, graduated in Medicine and Surgery at Catholic University Medical School in Rome, February 1975, having Luigi Cataldi as a tutor. He was able to obtain the fellowship in Pediatrics (1978), then in Neonatology with professor Giovanni Bucci (1979) at the "Sapienza" University in Rome. In 1977 he moved to Naples working in the Neonatology and UTIN service with professor Marcello Orzalesi and then to Palermo obtaining a fellowship in Perinatal Medicine with professor Ettore Cittadini in 1978. In May 1988 he moved to the Buccheri La Ferla Fatebenefratelli Hospital in

Figure 1 (ABS 39). Ubaldo Dimita, 1997.

Palermo. There on behalf of Father Elia Tripaldi, before, and then of Fra' Alberto Angeletti, doctor Dimita was able to open a new road in the world of the neonatal and mother care, opening a new Neonatal Intensive Care Unit of a very high level. He enrolled in the staff young distinguished neonatologist from the best General Hospital and Neonatal Units of Italy, giving to each one of those a goal in the cure. Of course, he also organized the nursing staff increasing the number and the level of quality of nurses. At the end of the 80ties doctor Dimita was able to organize a department for Mother and Infant Global Care. First of all the rooming-in started. The Neonatal Unit was very close to the maternal one, where, so Mothers were able to remain strictly connected with their newborn infant, including those taken in care in the NICU. This Unit was "open" to the parents 24/24 h, 7/7 days, in order to obtain: a) the best mother-infant bonding; b) an important increase in breastfeeding; c) facilities in the medical and nursing staff and parents relation in order to improve the communication. At that time in the Buccheri La Ferla Pediatric and Neonatal Unit doctor Dimita began a way of humanization of all the medical care facilitating the Global Care. So he organized some Master courses in order to obtain experts in Global Medical care. I would like to remind the last meeting that Ubaldo celebrated in the May 1998. He invited all the best friends in Caserta, in an exceptional venue, the Palatine Chapel of the Royal Palace, only some weeks before's death, killed by an enemy against them he fought strenuously. However, the bad enemy subtracted it from his wife and sons and the Italian Neonatology, a few weeks before he turned fifty. The Family and the Friends of Ubaldo wanted to remember him by setting up a Study Award to its memory that has been attributed over the last 20 years, also supported by SIN and by the AISERNUI Association. Such a prize which still lives, on the occasion of the International Workshop of Neonatology of Cagliari, organized by Professor Vassilios Fanos, and this year at the 14th edition.

ABS 40

CAN DIFFERENT VENTILATORY APPROACH REDUCE ATELECTASIS ANESTHESIA-INDUCED IN CHILDREN UNDERGOING GENERAL ANESTHESIA DURING MAGNETIC RESONANCE IMAGING?

M. Marras[1], A. Bullegas[2], A. Lai[2]

[1]Radiology Unit, Children Hospital Microcitemico A. Cao, Azienda Ospedaliera Brotzu, Cagliari, Italy

[2]Pediatric Anesthesia SSD, Children Hospital Microcitemico A. Cao, Azienda Ospedaliera Brotzu, Cagliari, Italy

AIM

To show the incidence of pulmonary atelectasis in different ventilatory assistance in pediatric patients undergoing to general anesthesia during magnetic resonance imaging (MRI).

METHODS AND MATERIALS

In children who undergo MRI studies in general anesthesia, we prospectively studied the incidence of atelectasis anesthesia-induced in mechanical ventilation in pressure support and spontaneous breath, with additional lung scans at the beginning and the end of anesthesia (axial-coronal T2 HASTE; 1.5T MRI Siemens Magnetom Avanto). Twenty children with American Society of Anesthesiology's physical status classification I and II, aged 1 to 10 yr old, mean weight 18.7 kg and mean height 105.3 cm were studied. Sevoflurane anesthesia (etSEV 1% to 6% in FiO_2 0.35), without premedication, was performed in spontaneous breathing and, after positioning of LMA mask, six patients were maintained in mechanical ventilation with pressure support (between 6 and 8 cmH_2O) and positive end-

expiratory pressure (PEEP) 4 cmH_2O while five patients were maintained in spontaneous breathing without PEEP.

RESULTS

The analysis of the chest's images was performed by two independent radiologists. The atelectasis was defined by a scale 1-5: no atelectasis, declivous, linear, segmental, lobar atelectasis. No atelectasis evidenced on first images in all patients. In the 50% of final MRI images in patients in spontaneous ventilation appeared pulmonary collapse, mostly in declivous pulmonary regions. In the 16.6% of children with mechanical pressure support and PEEP showed anesthesia-induced atelectasis. We also studied SpO_2 and $etCO_2$ trends.

CONCLUSION

Spontaneous ventilation in children undergoing general anesthesia causes pulmonary collapse and atelectasis regardless type of surgery and duration of anesthesia. Mechanical ventilation in pressure support with PEEP can otherwise prevent anesthesia-induced pulmonary collapse.

REFERENCES

• Acosta CM, Maidana GA, Jacovitti D, Belaunzarán A, Cereceda S, Rae E, Molina, A Gonorazky S, Bohm SH, Tusman G. Accuracy of transthoracic lung ultrasound for diagnosing anesthesia-induced atelectasis in children. Anesthesiology. 2014;120(6):1370-9.

• Biederer J, Mirsadraee S, Beer M, Molinari F, Hintze C, Bauman G, Both M, Van Beek EJ, Wild J, Puderbach M. MRI of the lung (3/3)-current applications and future perspectives. Insights Imaging. 2012;3(4):373-86.

• Cereda M, Xin Y, Emami K, Huang J, Rajaei J, Profka H, Han B, Mongkolwisetwara P, Kadlecek S, Kuzma NN, Pickup S, Kavanagh BP, Deutschman CS, Rizi RR. Positive end-expiratory pressure increments during anesthesia in normal lung result in hysteresis and higher numbers of smaller aerated airspaces. Anesthesiology. 2013;119(6):1402-9.

ABS 41

TISSUE OXYGENATION AND SPONTANEOUS CLOSURE OF PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECTS

P.P. Bassareo[1,2], R. Savage[1], E. Doran[1], C. O'Neill[1], K. Walsh[1,2]

[1]University College of Dublin, Mater Misericordiae University Teaching Hospital, Dublin, Republic of Ireland

[2]Our Lady's Children Hospital Crumlin, Dublin, Republic of Ireland

INTRODUCTION

From 10 to 30% of perimembranous VSD close itself, thus avoiding the need of surgery or transcatheter occluding devices [1]. Anemia is quite common in children suffering from CHD [2]. It often results from lack of enough iron for 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 for 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 on the basis of no residual shunts at colorDoppler across the previous perimembranous VSD.

RESULTS

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) (**Tab. 1**). At multivariable linear regression analysis, only Hb and albumin were associated with the 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.

Table 1 (ABS 41). Results (self-healing group [SHG] vs needing intervention group [NIG]).

	SHG	NIG	p
VSD dimensions (mm)	0.54 ± 0.2	0.5 6 ± 0.1	ns
Prevalence of anemia (%)	8.8	14.7	< 0.03
Hb (g/dL)	12.6 ± 0.2	11.6 ± 0.1	< 0.001
Ht (%)	43.3 ± 0.4	42.9 ± 0.3	ns
HbF (%)	0.9	0.8	ns
SaO_2 (%)	98%	97%	ns
Iron (μg/dL)	118.3 ± 7.5	115.1 ± 8.6	ns
Transferrin (md/dL)	260.5 ± 5.5	258.4 ± 6.7	ns
Ferritin (ng/mL)	158.0 ± 3.8	140.5 ± 4.1	< 0.02
Albumin (g/dL)	44.2 ± 4.4	41.3 ± 4.0	< 0.007

SHG: self-healing group; NIG: needing intervention group; VSD: ventricular septal defect.

CONCLUSIONS

Regarding the factors influencing VSD spontaneous healing, many anatomical parameters were proposed as potential independent predictors, but a 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.

REFERENCES

[1] Cresti A, Giordano R, Koestenberger M, Spadoni I, Scalese M, Limbruno U, Falorini S, Stefanelli S, Picchi A, De Sensi F, Malandrino A, Cantinotti M. Incidence and natural history of neonatal isolated ventricular septal defects: Do we know everything? A 6-year single-center Italian experience follow-up. Congenit Heart Dis 2018;13:105-12.

[2] Goldberg GF, Shah MD, Kantor PF, Rossano JW, Shaddy RE, Chiou K, Hanna J, Hagan JL, Cabrera AG, Jeewa A, Price JF. Prevalence and Severity of Anemia in Children Hospitalized with Acute Heart Failure. Congenit Heart Dis 2016:11:622-9.

[3] Xu Y, Liu J, Wang J, Liu M, Xu H, Yang S. Factors influencing the spontaneous closure of the ventricular septal defect in infants. Int J Clin Exp Pathol. 2015;8:5614-23.

ABS 42

WHAT CAN HIDE A PLEURAL EFFUSION IN A CHILD? THORACIC MASS IN A DRAVET SYNDROME

F. Mecarini[1], G. Colucci[1], G. Melis[1], V. Relli[1], S. Corda[1], M.S. Galassi[1], S. Marras[1], A. Canetto[1]

[1]*Department of Pediatric Emergency Medicine, Azienda Ospedaliera Brotzu, Cagliari, Italy*

INTRODUCTION

Primary thoracic masses may be detected incidentally on radiographs obtained in the evaluation of other complaints as respiratory symptoms. Although in most cases they can be initially asymptomatic, children with advanced disease can have systemic symptoms such as fever, cough or weight loss.

CASE REPORT

We describe a case of a 7-year-old girl, affected by Dravet syndrome, with three-day fever and a month's cough. The physical examination revealed no fever (temperature was 36.9°C), tachypnea, mild chest indrawing, hypoxemia (SPO_2 89% without O_2) and pulse rate (124 beats/min). Auscultation of her chest revealed decreased air entry in the left lung and bibasilar crackles. A chest radiograph was performed, showing homogeneous opacification of the entire left hemithorax with a contralateral shift of the mediastinum (**Fig. 1**). On investigation, hemoglobin was 13.6 mg/dl; white blood cell count was 15,120/mm^3 (neutrophils 63.2%, lymphocytes 26.5%, monocytes 8.6%, eosinophils 0.6%, and basophils 1.0%), CRP 4.8 mg/dl. Clinical-radiologic findings were compatible with a massive left pleural effusion. Thoracentesis was attempted, but pleural fluid could not be aspirated. Chest computed

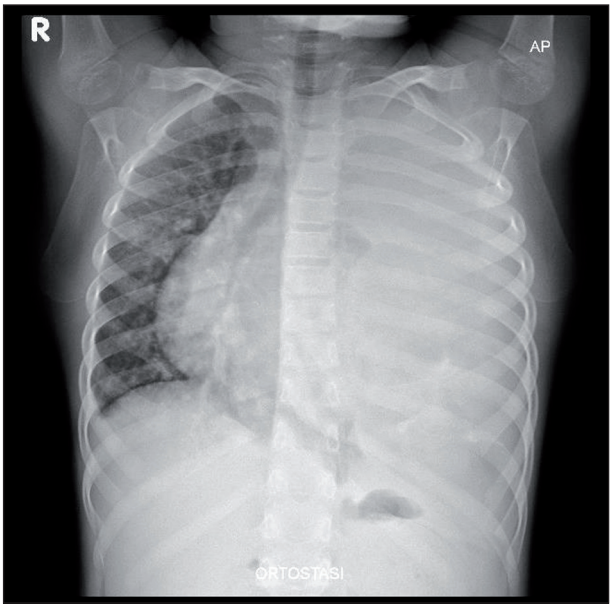

Figure 1 (ABS 42). Chest radiograph showing homogeneous opacification of the entire left hemithorax with contralateral shift of the mediastinum.

tomography (CT) revealed a huge mediastinal mass occupying the entire left thoracic cavity containing fat, calcification and soft tissue components (**Fig. 2**). The child was admitted into the Department of Oncohematology, where the nature of the mass is still under investigation.

CONCLUSION

We report a patient with large thoracic mass mimicking as a pleural effusion on routine chest radiography. Dravet syndrome is a rare pediatric genetic epilepsy syndrome with early-onset, that is largely refractory to current antiepileptic medication. To the best of our knowledge, no correlation between thoracic mass and Dravet syndrome or antiepileptic drugs has been reported in literature. In our case, an intercurrent respiratory illness allowed to unmask an otherwise poorly symptomatic pathology. In young patients presenting with massive pleural effusion, thoracic masses could be ever considered as a rare cause of it. The patient will be subjected to tissue biopsy and the histopathological examination will confirm the resected mass as a teratoma, sarcoma or other neoplasm. Paediatrics Emergency Department plays a prominent role in the treatment of acute disease, but is also essential to identify chronic illnesses and start a rapid diagnostic workup. Possibly emergency thoracic ultrasound could be routinely used to improving diagnostic yield for pleural fluids, helping clinicians detect insidious diseases.

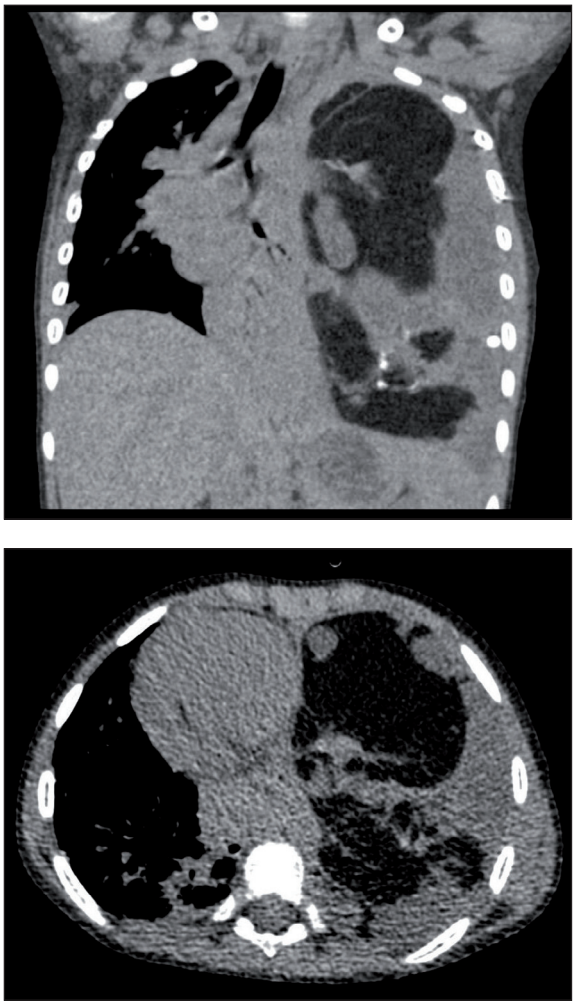

Figure 2 (ABS 42). Coronal (**A**) and axial (**B**) chest computed tomography on admission showing a large mediastinal mass occupying the left hemithorax.

REFERENCES

- Chow MB, Lim TC. Massive mediastinal teratoma mimicking a pleural effusion on computed tomography. Singapore Med J. 2014;55(5):e67-8.
- Vijayesh TK, Kumar A, Mohan N, Bansal P, Choudhary P. Rhabdomyosarcoma mimicking as pleural effusion. J Family Med Prim Care. 2017;6(3):683-5.
- Yokoyama Y, Chen F, Date H. Surgical resection of a giant mediastinal teratoma occupying the entire left hemithorax. Gen Thorac Cardiovasc Surg. 2014;62(4):255-7.

ABS 43

MATERNITY BLUES: A RISK FACTOR FOR ANHEDONIA, ANXIETY, AND DEPRESSION COMPONENTS OF EDINBURGH POSTNATAL DEPRESSION SCALE

V. Manghina, F. Volpe, L. Giliberti, R. Maione, G. Straface, V. Zanardo

Division of Perinatal Medicine, Policlinico Abano Terme, Abano Terme, Italy

INTRODUCTION

Women undergo adaptive physical and psychological changes during pregnancy, which make them vulnerable to psychological disorders.

METHODS

This study used a prospective observational design and included concurrent validation analysis of the 16-item Maternity Blues Scale (MBS) Dutch version to determine the direction and magnitude on the Edinburgh Postnatal Depression Scale (EPDS) symptoms, including three factors, anhedonia, anxiety, and depression in 320 puerperae early after childbirth.

RESULTS

We found a statistically significant correlation between MBS and EPDS global scores (0.22, $p < 0.001$). Moreover, Negative affect was significantly correlated with the EPDS global score (0.23, $p < 0.001$), anhedonia (0.12, $p < 0.05$), and anxiety (0.25, $p < 0.001$); positive affect with the EPDS global score (0.14, $p < 0.05$) and depression (0.13, p

< 0.05); and depression subscale with EPDS global score (0.15, p < 0.05), anhedonia (0.12, p < 0.05), and anxiety (0.12, p < 0.05), and depression (0.12, p < 0.05). In addition, the subgroup of women 33 (10.3%) with EPDS > 12 presented significantly higher gobal MBS score (2.51 ± 0.38 vs 2.26 ± 0.38, p = 0.01), and namely negative affect (2.88 ± 0.67 vs 2.62 ± 0.38 p = 0.04) and positive affect (2.52 ± 0.69 vs 2.32 ± 0.38, p = 0.04) and depression (2.09 ± 0.75 vs 1.82 ± 0.36, p = 0.02).

CONCLUSION

These findings together suggest that women with higher maternity blues scores may represent a distinct subgroup at increased risk of depression.

ABS 44

OXYGEN THERAPY IN INFANTS WITH EXTREME PERIODIC BREATHING

L. Nosetti[1], A.C. Niespolo[1], M. Vergani[1], A. Salvatoni[1], M. Agosti[2]

[1]Clinica Pediatrica, Università degli Studi dell'Insubria, Ospedale F. Del Ponte, Varese, Italy

[2]Neonatologia, Terapia Intensiva Neonatale, Università degli Studi dell'Insubria, Ospedale F. Del Ponte, Varese, Italy

INTRODUCTION

Periodic breathing (PB) is a common respiratory pattern in infants defined as three episodes of apneas lasting longer than 3 seconds, separeted by continued respiration of 20 seconds or less.

PB is generally thought to be benign, even if two aspects must be deeply considered. The first is that the respiratory pauses in PB sometimes lead to a decline in SaO_2. The clinical relevance of the decrease of SaO_2 during PB episodes is not well defined, even if there are suspects about the role it could play in neurodevelopment. Second, sometimes PB is extreme (PB > 6 SDs above the mean for corrective gestational age and > 10% time in PB); this condition can be associated with Apparent Life-Threatening Events (ALTE)/Brief Resolved Unexplained Events (BRUE) or others acute clinical events [1]. We hypothesized that low flow oxygen might reduce extreme PB in infants and improve the SaO_2 associated [2, 3].

MATERIALS AND METHODS

Subjects who completed an overnight cardio-respiratory monitoring (Getemed V3100) at the Center for Pediatric Sleep Disorders of the University of Insubria, Varese, Italy from October 2017 to July 2018 due to ALTE/BRUE or respiratory irregularity which had extreme PB associated with decreasing of SaO_2 were included in the study. The subjects had 2 additional overnight cardiorespiratory monitoring during the second-night subjects were given supplemental oxygen trial (0.5 L/min via nasal cannula), and during the third night, the study was repeated without supplemental oxygen. The following variables were collected: total sleep time, %PB, number of PB episodes/night, number of apneas with SaO_2 < 90%, % episodes of PB with SaO_2 < 90%, minimum SaO_2, number of apneas/episode, duration of PB episodes, apneas, normal respiration and PB cycle, ventilation/apnea (V/A) ratio. Variables were compared with a non-parametric statistics and p-value < 0.05 was considered significant.

RESULTS

We studied 15 infants (10 female); 5 were born 40-41^{+4} weeks gestational age, 5 between 37-39^{+6} w, 4 between 31-33 w and 1 of 27^{+3} w. The median corrected gestational age at the beginning of the study was 4^{+4} weeks (3^{+1}-6^{+5}); the weight of the subjects was 3.12 kg (2.81-3.295).

CONCLUSIONS

The addition of 0.5 L/min of supplemental oxygen to infants presenting with ALTE/BRUE or respiratory irregularity and extreme PB associated with decreasing of SaO_2 normalized the percentage of PB. This effect was not sustained when infants did not receive supplemental oxygen. However the improved in SaO_2 noticed during oxygen supplementation was maintained during the night following the trial. The others parameters evaluated didn't change significantly during the trial with oxygen. Further studies with a more prolonged period of oxygen administration and more extended follow-up period are needed to improve the understanding of this phenomenon.

REFERENCES

[1] Patel M, Mohr M, Lake D, Delos J, Moorman JR, Sinkin RA, Kattwinkel J, Fairchild K. Clinical Associations with Immature Breathing in Preterm Infants. Part 2: Periodic Breathing. Pediatr Res. 2016;80:28-34.

[2] Pal T, Dutta PK, Maka S. Oxygen therapy for management of periodic breathing: A theoretical approach. Math Biosci. 2017;283:106-17.

[3] Simakajornboon N, Beckerman RC, Mack C, Sharon D, Gozal D. Effect of supplemental Oxygen on sleep architecture and cardiorespiratory events in preterm infants. Pediatrics. 2002;110:884-8.

ABS 45

A NEWBORN WITH RDS AND CONGENITAL HYPOTHYROIDISM: A CASE REPORT

F. Marino, L. Bertasi, F. Rimondi, F. Rigon, G. Passarella, M. Berard, C. Lorenzetto, S. Rugolotto

Division of Pediatrics, Rovigo Hospital, Rovigo, Italy

INTRODUCTION

Congenital hypothyroidism is the most common endocrinological neonatal disorder. The thyroid gland is dysgenetic in 70% of the cases, in 30% of the cases, an autosomal recessive defect in hormonal biosynthesis is present. Early signs of hypothyroidism in the first week of life include prolonged gestation, LGA, large anterior fontanelle, and respiratory distress syndrome. After the first week of life hypotonia, lethargy, hypothermia, feeding difficulties, prolonged jaundice may be seen. Neonatal screening may help early diagnosis of the disease and therefore prevention of its subsequent complications (mainly mental retardation).

CASE REPORT

Male, born at 41 weeks gestation by spontaneous vaginal delivery. APGAR: 9-9. Birth weight 3,800 g. Soon after birth, tachypnea (and dyspnea) greater than 80/min with subcostal retraction requiring oxygen by nasal cannula (0.3 L/min) showed up. At chest X-ray, an I-II degree RDS was shown. Laboratory tests: WBC, Hct, Hb, RBC and PLT, PCR, and PCT were normal. During the following days, poor suction and difficult feeding were documented. On the 15th day of life, the birth weight started to grow again. The neurological physical examination was always normal. Neonatal screening test and regular laboratory tests (TSH > 100 mUI/L, FT4 0.41 ng/dL, FT3 1.44 pg/mL) confirmed congenital hypothyroidism. L-Thyroxin (initially at 6 ug/kg/die) was started at 10 days of life and later at 8 ug/kg/die. Thyroid gland ultrasound showed a normal gland in a regular position. Subsequent thyroid hormones control (FT3 3.45 pg/mL, FT4 1.36 ng/dL, TSH 110 mUI/l) showed a good response to therapy. Improvement in the clinical picture also confirmed the improved laboratory tests: RDS symptoms decreased until discontinuation of oxygen, and feeding difficulties stopped at 15 days of life. At discharge mild postprandial tachypnea was present.

CONCLUSIONS

Neonatal hypothyroidism has to be considered in the number of causes for neonatal RDS at term, even in the case of absence of evident congenital hypothyroidism and/or parental history of thyroid pathology.

REFERENCES

• Gomella TL. Neonatology: Management, Procedures, On-Call Problems, Diseases, and Drugs. 7th edition. New York: Mc Grow Hill Publisher, 2013.

• Cassio A, Cantasano A, Orquidea Bal M. Ipotiroidismo congenito. Prosp Pediatria. 2014;44(173):2-7.

ABS 46

THE HYPOTHERMIC TREATMENT: A GOOD CHOICE FOR THE BRAIN. WHAT ABOUT THE HEART?

C. Loddo, D. Manus, C. Fanni, G. Palmas, P. Neroni

Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

Perinatal asphyxia (PA) associated with hypoxic-ischemic encephalopathy (HIE) has an incidence of 1-2 cases in 1,000 live births, and it is associated with myocardial involvement in 30% of cases [1]. Hypothermic treatment (HT) is the therapy of choice in affected infants and may be associated with adverse effects, thus requiring inotropic support [2, 3].

OBJECTIVE OF THE STUDY

The present study was conducted to evaluate the hemodynamic impact of HT in a population of asphyxiated neonates, together with a possible correlation between myocardial involvement and severe clinical pictures.

MATERIALS AND METHODS

The study was conducted on 59 newborns with a gestational age ≥ 34 weeks with moderate-severe HIE, admitted to our Neonatal Intensive Care Unit between July 2010 and June 2018, treated with selective HT with a target rectal temperature of 34.5°C for 72 hours, followed by rewarming with increments of no more than 0.5°C/hour. All patients were monitored in mean arterial pressure (MAP), heart rate (HR) and urinary output (UO) during the various phases of HT. A blood gas analysis within the first 60 minutes of life with an echocardiographic investigation during cooling was performed. All patients underwent a magnetic resonance imaging (MRI) scan approximately one month after birth. Patients were further subdivided into subgroups based on a pathologic MRI or neonates' survival.

RESULTS AND DISCUSSION

Our population presented a limited variability of MAP values, presumably linked to the exclusive use of selective HT. Less than half of our patients presented an ejection fraction (EF) < 55% during cooling, suggesting a cardioprotective role of this HT. Furthermore, the percentage of subjects with persistent pulmonary hypertension (PPHN) was similar to previous studies

Table 1 (ABS 46). Comparison between live patients (group A) and deceased patients (group B).

	Group A (n = 55)	Group B (n = 4)	p-value
Caesarean section	20 (36.4%)	4 (100%)	**< 0.05**
CTG anomalies	9 (16%)	2 (50%)	0.09
Placental anomalies	6 (10%)	1 (25%)	0.40
Endotracheal intubation < 10 minutes	28 (51%)	4 (100%)	≥ 0.05
Apgar ≤ 5 at 10 minutes	25 (45%)	3 (75%)	0.896
pH at blood gas analysis	7.066 ± 0.202	7.065 ± 0.113	0.330
BE at blood gas analysis (mmol/L)	-13.95 ± 5.368	-17.8 ± 5.027	0.402
ECG anomalies during cooling	21 (38%)	1 (25%)	0.598
HR during cooling (bpm)	97.8 ± 16.259	116.25 ± 7.77	0.229
MAP during cooling (mmHg)	49.64 ± 2.00	40.75 ± 9.73	0.184
UO during cooling (ml/kg/h)	1.6 ± 0.439	0.7 ± 1.05	0.062
EF < 55% during cooling	18 (33%)	1 (25%)	0.749
PPHN	12 (22%)	3 (75%)	**0.018**
Inotropes	31 (56%)	4 (100%)	≥ 0.05
Troponine T ≥ 0.1 µg/L	10 (33%)	1 (25%)	0.735

CTG: cardiotocography; BE: base excess; HR: heart rate; MAP: mean arterial pressure; UO: urinary output; EF: ejection fraction; PPHN: persistent pulmonary hypertension of the newborn.

(19.5%) [3]. In the comparison between patients with pathological (n = 31) and normal MRI (= 23), we could not find any statistically significant difference. Regarding deceased patients (n = 4), they were all born by cesarean section, and in 3/4 of the cases, a PPHN was documented ($p < 0.05$), demonstrating how PPHN is an important cause of mortality in PA (**Tab. 1**). As regards inotropes, dopamine determined an increase in UO in 66% of cases within 48 hours from the start of treatment, while 23 patients required dobutamine therapy at an average dose of 5-10 mcg/kg/min, with an improvement in EF values already after 24 hours of therapy in 82% of cases and of PPHN within 24 hours in 66% of cases.

CONCLUSIONS

PA is still a significant problem at birth, with a worsened prognosis if associated with PPHN. Therefore, it could be useful to promote effective antenatal care and accurate evaluation of the modalities of birth, in order to reduce the extent of PA. In addition, preventive use of dopamine and dopamine at doses ≤ 10 mcg/kg/min could be effective in improving EF, PPHN, and UO, thus ameliorating the outcome of these patients.

REFERENCES

[1] Martín-Ancel A, García-Alix A, Gayá F, Cabañas F, Burgueros M, Quero J. Multiple organ involvement in perinatal asphyxia. J Pediatr. 1995;127(5): 786-93.

[2] Jacobs S, Hunt R, Tarnow-Mordi W, Inder T, Davis P. Cooling for newborns with hypoxic ischaemic encephalopathy. Cochrane Database Syst Rev. 2007;(4):CD003311.

[3] Tauqueer A, Shaad A, Tabassum S, Syed Manazir A, Uzma F, Iraj Alam K. Prevalence and outcome of pulmonary arterial hypertension in newborns with perinatal asphyxia. J Clin Neonat. 2018;7(2):63-6.

ABS 47

CAPICE – CHILDHOOD AND ADOLESCENCE PSYCHOPATHOLOGY: UNRAVELLING THE COMPLEX ETIOLOGY BY A LARGE INTER-DISCIPLINARY COLLABORATION IN EUROPE

H.S.R. Rajula (Cagliari, Italy), A.G. Allegrini (London, UK), E. Shahid (Amsterdam, the Netherlands), K. Agarwal (Twente, the Netherlands), V. Karhunen (London, UK), O. Akingbuwa (Amsterdam, the Netherlands), E. Haan (Bristol, UK), E. Diemer (Rotterdam, the Netherlands), L. Schellhas (Bristol, UK), A. Thompson (Stockholm, Sweden), S. Doering (Gothenburg, Sweden), M. Leone (Solna, Sweden), V. Fanos (Cagliari, Italy)

ESR 1: KRATIKA AGARWAL (THE UNIVERSITY OF TWENTE, THE NETHERLANDS)

Harmonised phenotypes for emotional problems and ADHD

This study aims to harmonize questionnaire item data with an objective of having one phenotype that is comparable across various cohorts. Our focus here is on internalizing problems and ADHD symptoms. In order to harmonize questionnaire item data, we used the Western Australian Pregnancy Cohort study (RAINE) dataset as it consists of both Child Behaviour Checklist (CBCL) and the Strength and Difficulties Questionnaire (SDQ) data on 10-year-old children.

We were able to identify common dimensions in SDQ and CBCL questionnaire data from Australian data on 10-year-olds. The psychometrics analysis showed

that particular subsets of CBCL and SDQ items can be used together but also separately to measure emotional problems and ADHD.

ESR 2: ANDREA GIUSEPPE ALLEGRINI (KING'S COLLEGE LONDON, UK)

Genomic prediction of cognitive traits in childhood and adolescence

Methodological advances in the flourishing field of polygenic epidemiology, coupled with constantly increasing sample sizes in genome-wide association studies (GWAS), call for a practical application of current state-of-the-art methodologies to complex trait prediction.

Here we set out to test the extent to which we can maximize prediction accuracy of cognitive and educationally relevant traits in a sample of 7,026 individuals representative of the UK population.

These results set the lower bound for the polygenic score prediction of cognitive-related traits and serve as a benchmark against which we compare different prediction models. We are building our models by leveraging several large publicly available GWAS summary statistics and testing different multivariate GWAS methods, and polygenic score approaches with the aim of maximizing variance predicted and educational achievement. We will report on the most predictive combination of modeling approaches to trait prediction.

ESR 3: ESHIM SHAHID (VU UNIVERSITY, THE NETHERLANDS)

Internalising problems are highly prevalent in childhood and correlate strongly with anxiety, depression and related disorders in adulthood (Hannigan et al., 2017). It is known that internalizing problems are heritable (Polderman et al., 2015) but research thus far has been unsuccessful in identifying common genetic variants that underlie these behaviors. In this large-scale genome-wide association meta-analysis (GWAMA), our primary aim is the identify common genetic variants that influence the development and course of internalizing symptoms across childhood and adolescence. Cohorts within and beyond the CAPICE consortium with genotypic data and phenotypic data on childhood internalizing problems are invited to participate in this study. The inclusion of a large number of cohorts with thousands of individuals will help to yield sufficient power in order to detect small genetic effects. With this study, we hope to improve our understanding of the development and progression of mood and related disorders in youth.

ESR 4: VILLE KARHUNEN (IMPERIAL COLLEGE LONDON, UK)

My project aims to improve understanding of the relationship between multi-omic variation and behavioral traits, especially those related to adolescent attention-deficit hyperactivity disorder (ADHD), and to apply advanced statistical methods in order to exploit multi-omics datasets as efficiently as possible. The first specific objective was to examine the association between exposure to maternal smoking (which is known to be associated with offspring ADHD) and offspring DNA methylation. Smoking during pregnancy is known to alter DNA methylation in newborns. We have been studying whether the changes in DNA methylation in the exposed offspring persist into adolescence and adulthood and whether these changes mediate the effect of intrauterine smoke exposure on later life health outcomes. Our findings indicate a long-lasting effect of exposure to maternal smoking on offspring DNA methylation and that some of these changes may act as a potential mechanism between maternal smoking and later-life diseases in the exposed offspring.

ESR 5: OMOWONUOLA AKINGBUWA (VU UNIVERSITY, THE NETHERLANDS)

Longitudinal cohort-based studies have shown that the onset of various psychiatric disorders in adulthood is often preceded by psychiatric symptoms and disorders in childhood and adolescence (Kessler et al., 2007, Rao and Chen, 2009). Similarly, childhood psychopathology has been found to be associated with physical traits including BMI, as well as adversely affecting cognitive traits like IQ and educational attainment (Pine et al., 2001, Singh et al., 2013, Costello and Maughan, 2015). These individuals typically continue to have less favorable outcomes in areas of adult functioning related to health, SES and social relationships/isolation (Copeland et al., 2015, Costello and Maughan, 2015). This project aims to perform large-scale analyses of the genetic overlap between adult psychiatric disorders and related traits, and childhood and adolescent psychiatric phenotypes. To achieve this, this study will use available GWAS summary statistics data on adult psychiatric disorders and related traits to construct polygenic risk scores (PRS), as well as phenotype data on childhood internalizing behavior, ADHD/Attention Problems and Social Problems from multiple suitable cohorts.

ESR 6: ELIS HAAN (UNIVERSITY OF BRISTOL, UK)

My Ph.D. is focusing on alcohol use, smoking and caffeine use in mothers during pregnancy and my main outcome of interest is ADHD in offspring. More specifically I am looking at associations between genetic variants of consumption behavior and mental health outcomes in children. I am currently working

with three projects: "Associations between alcohol, tobacco and caffeine consumption in pregnancy and externalizing disorders in offspring: a systematic review and meta-analysis". Negative control study for comparing maternal and paternal consumption behavior with offspring mental health outcomes. Phenome-Wide association study (PheWAS) for looking at if genetic variants associated with consumption behavior are associated with mental health phenotypes across the lifespan in different time points using ALSPAC data.

ESR 7: ELIZABETH DIEMER (ERASMUS UNIVERSITY MEDICAL CENTRE ROTTERDAM, THE NETHERLANDS)

Mendelian randomization (MR), a type of instrumental variable model in which single nucleotide polymorphisms are proposed as instruments, is increasingly popular. Like all instrumental variable models, MR relies upon a set of unverifiable assumptions, which researchers often support using subject matter knowledge alone. However, the instrumental variable model implies certain inequalities, offering an empirical method of falsifying (but not verifying) the underlying assumptions. While these instrumental inequalities are said to detect only extreme violations of instrumental variable assumptions in practice, they have not been used in settings with multiple proposed instruments. In our study, we plan to demonstrate the utility of the instrumental inequalities in identifying violations of the assumptions required for MR analyses of prenatal exposures and offspring outcomes in the Generation R cohort, a population-based cohort based in the Netherlands, across SNPs jointly proposed as instruments.

ESR 8: LAURA SCHELLHAS (UNIVERSITY OF BRISTOL, UK)

A phenome-wide association study to Investigate the association of polygenic risk scores for alcohol, tobacco and caffeine consumption and a range of mental health phenotypes in three generations in ALSPAC (adults, adolescents, and pregnant women). A meta-analysis of epigenome-wide association studies investigating the association of caffeine consumption during pregnancy and offspring DNA methylation. A systematic review is summarizing the association of maternal alcohol, tobacco and caffeine consumption during pregnancy and offspring methylation.

ESR 9: HEMA SEKHAR REDDY RAJULA (UNICA, ITALY)

We worked on CAPICE data catalog. There are 16 cohorts available for CAPICE data catalog. ALSPAC is one of the cohorts from the University of Bristol. The Avon Longitudinal Study of Parents and Children (ALSPAC) is a transgenerational prospective observational study investigating influences on health and development across the life course. We worked on ALSPAC data and trying to pull the list of variable names from the ALSPAC variable catalog. We added the description as well to the listing. It might be interesting from a metadata perspective as this might give a longitudinal perspective on certain variables. In the future to perform the multi-site analyses most efficiently, the aim is to build a facility that allows analyzing all data available over sites without necessarily having access to the raw data. The role of big data in neuropsychiatric disorders: a focus on metabolomics. Neuropsychiatric disorders are a heterogeneous group of conditions with multiple diatheses. Indeed, the trajectory leading to a diagnosis of a neuropsychiatric disorder is likely modulated by the interplay of genetic and environmental factors. Specific criteria guide the identification of a specific neuropsychiatric phenotype (diagnosis), the use of psychometric tools (scale and/or questionnaires), and, to a certain extent, by biomarkers, including those derived by "omics" approaches. The large datasets obtained by the integration of clinical and omics data need specific analytical pipelines. Indeed, the term big data refers to highly complex, heterogeneous and high-dimensional large-scale datasets. Big data approaches are hypothesis-generating and discovery-oriented, with the goal of revealing the hidden patterns or information behind complex data using computer science and, statistical approaches.

ESR 10: ASHLEY THOMPSON (KAROLINSKA INSTITUTET, SWEDEN)

Long-term negative outcomes in ADHD

ADHD has impairing consequences for the individual, the family, and the society. This mental illness has been associated with increased risk of premature mortality, and other negative outcomes such as criminality, suicide attempts, substance use problems, and transport accidents. While effective pharmacological treatments exist to mitigate these outcomes, there is a current treatment gap for this vulnerable group. This gap is exemplified by the current lack of knowledge of how to best identify the subset of individuals with ADHD with the highest risk for severe outcomes. Thus, the overarching goal of the Ph.D. project is to identify individuals with ADHD in need of special attention, as well as to understand the features that characterize this group. This aim will be realized with large, longitudinally collected data from two substantial cohorts to predict adverse outcomes in ADHD patients. Supervised machine learning techniques will be used

in order to create a prediction model that can hopefully be turned into a checklist for clinical use. Therefore, it is expected that this project will lead to improved prediction and identification of individuals at high risk for negative events. This innovation will help inform targeted prevention and treatment for those who would benefit the most, thus lowering costs for the individuals as well as for the society at large.

ESR 11: SABRINA DOERING (UNIVERSITY OF GOTHENBURG, SWEDEN)

Anxiety disorders are the most prevalent mental disorders in childhood and adolescence. When left untreated, they often lead to psychiatric outcomes in adulthood, such as anxiety disorders, depression, and substance abuse. The overarching goal of my Ph.D. project at the University of Gothenburg and within CAPICE is to create prediction models for both psychiatric and functional outcomes, e.g., unemployment, criminal convictions, sick leave, in young adulthood for adolescents who present with various degrees of anxiety.

ESR 12: MARICA LEONE (JANSSEN-CILAG AB, SWEDEN)

Aim

To investigate the relationship between early-onset depression and the subsequent development of any somatic medical outcomes. The purpose of this study is to provide valuable insights into the long and short-term effects of depression assessed at a young age.

Statistical analysis

This study will test all the individuals born in Sweden between 1982 and 1996 with a follow up until December 31st, 2013. For this cohort, exposure will be a diagnosis or a filled prescription of one or recurrent depressive episodes between age 3 and 19, and the data will be gathered from the National Patient Register (NPR), Prescribed Drug Register (PDR) and the Pastill register, a comprehensive clinical database for child and adolescent psychiatry in Stockholm established in 2001. Socioeconomic status and birth year will be considered as potential confounders.

FIGURES

In **Fig. 1** the website of CAPICE Project (https://www.capice-project.eu) is presented; **Fig. 2** is the picture of the group of the Early Stage Researchers (ESRs).

Figure 1 (ABS 47). The website of CAPICE Project (CAPICE: Childhood and Adolescence Psychopathology: unravelling the complex etiology by a large Interdisciplinary Collaboration in Europe).

Figure 2 (ABS 47). The group of the Early Stage Researchers (ESRs).

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ABS 48

NEONATAL PARECHOVIRUS SEPSIS: A CASE REPORT

F. Marino, L. Bertasi, F. Rimondi, F. Rigon, G. Passarella, M. Berardi, C. Lorenzetto, S. Rugolotto

Division of Pediatrics, Rovigo Hospital, Rovigo, Italy

INTRODUCTION

During the first month of life, more than 10% of the neonates is affected with an infectious episode, 2% of these infections start *in utero*. The most common infections are urinary tract infection, sepsis, septicemia, and meningoencephalitis. The most common infectious agents are *E. coli*, *Streptococcus agalactiae Group B*, *Listeria Monocytogenes*, *Enterococcus*, *Staphylococcus Aureus*, *Moraxella*, HSV, Enterovirus and Parechovirus. We describe a case report of Parechovirus neonatal sepsis.

CASE REPORT

Male of 24 days of life, born at 40 weeks gestation, spontaneous vaginal delivery, birth weight 3,180 g. Maternal vaginal swab negative. He comes to ER for fever (temp. max 38.8°C) which has been present for some hrs. Physical examination: discrete general status, pale/pink skin, CRT 2 sec, HR 190 bpm, SaO_2 98% in RA, RR 40/min, alert, good cry and suction, anterior fontanelle soft and flat. No meningeal signs. The rest of the physical examination is normal. In the beginning, parenteral hydration is started with NS. Laboratory tests: WBC 5,020/mL (N 70%), PCR 5.7 mg/dL; PCT 0.63 ng/mL, ABG wnl, LFT and KFT wnl, urine test normal. Blood, liquor and urine cultures are started, and antibiotics (ampicillin and gentamicin) are given. After 24 hours a worsening general appearance is observed with temp. max 40°C, irritability, moaning cry, marble skin, cold and pale extremities, CRT 3 sec, HR 190-220 bpm, SaO_2 98% in RA, RR 40/min, BP 94/48 mmHg. Laboratory tests: WBC 4,020/mmc (N 52.5%), PCR 8.3 mg/dL, PCT 1.04 ng/mL. Therefore he is transferred to the PICU for severe neonatal sepsis. Acyclovir is added to the antibiotic therapy, and viral PCR is performed on blood and nasopharyngeal secretions. On both samples, Parechovirus are confirmed. During the following days, a progressive improvement is shown: after 3 days fever stops, WBC increase to 7,430/mL, with a PCR of 0.6 mg/dL. Acyclovir has been stopped after 3 days due to negative PCR on the blood of HSV, and after 7 days of antibiotic therapy has been stopped too.

CONCLUSIONS

Parechovirus infections are common during neonatal age with a prevalence of 5%. They are a common cause of neonatal fever with sepsis-like illness and neurologic symptoms; these require hospitalization mainly during summer time. RT-qPCR is the gold standard for the diagnosis. Therapy comprehends mainly supportive treatments: the antiviral agent has been proved to be effective for parechovirus. In severe cases, Pleconaril has been considered for compassionate use. Acyclovir is not effective in this infection.

REFERENCES

• de Crom SCM, Rossen JWA, van Furth Am, Obihara CC. Enterovirus and parechovirus infection in children: a brief overview. Eur J Pediatr. 2016;175:1023-9.

• Piralla A, Mariani B, Stronati M, Marone P, Fausto Baldanti F. Human enterovirus and parechovirus infections in newborns with sepsis-like illness and neurological disorders. Early Hum Dev. 2014;90(1):S75-7.

ABS 49

JOURNEY OF FIRST YEAR OF MY PH.D. AT UNIVERSITY OF CAGLIARI

H.S.R. Rajula[1], M. Mauri[2]

[1]*Early Stage Researcher (ESRs) of CAPICE Project (CAPICE: Childhood and Adolescence Psychopathology: unravelling the complex etiology by a large Interdisciplinary Collaboration in Europe).*

[2]*University of Cagliari, Cagliari, Italy*

This is Hema Sekhar Reddy Rajula, Marie Curie Ph.D. student at the UNICA (University of Cagliari, Italy). There are 12 ESRs involved in the CAPICE project (**Fig. 1**) "CAPICE: Childhood and adolescence psychopathology: Unraveling the complex etiology by a large interdisciplinary collaboration in Europe". Within the CAPICE consortium, my specific goal is "Building a sustainable facility for multi-site analyses and translating the results to the clinic". Another aim is to summarize the results of (epi) genetic and transcriptomic analyses and explaining the relevance of these findings to the clinic. I am also involved in the dissemination activities of UNICA and the dissemination activities of this project.

I participated in the 13th International Workshop on Neonatology on October 25th to 28th, 2017 (Cagliari Italy). There were 150 speakers from 25 countries. During this event, I presented the poster *CAPICE: Childhood and adolescence psychopathology: Unraveling the complex etiology by a large interdisciplinary collaboration in Europe*. I also participated as one of the discussants within the ACTION (Aggression in Children: unraveling gene-environment interplay to inform Treatment and InterventiON strategies) session in this workshop.

There are several workshops/training sessions during the 3 years of CAPICE project. We participated in our first major CAPICE event which was a workshop on genetics hold in London on 22-24 January, 2018. It was organized by Prof. Robert Plomin, MRC Research Professor, and Deputy Director. It took place at the King's College London Institute of Psychiatry, Psychology, and Neuroscience at our Social, Genetic and Developmental Psychiatry (SGDP) Center. The goal of the workshop was to give an overview of behavioral genetics, both quantitative and molecular. The second workshop of CAPICE project on "Introduction to the statistical analysis of GWAS" at Imperial College London from 2 to 6 July 2018. I did not have much experience in GWAS studies before, by attending this course got an overall idea on GWAS studies. Professors covered the concepts during the course are the Quality control for GWAS, statistical models for genetic association analysis, population structure, genetic risk scores, Mendelian randomization and analysis of rare variants. The practical sessions are well organized and easy to follow. The invited lectures also give us knowledge on practical applications of GWAS studies.

For my secondment, we worked on CAPICE data catalog. There are 16 cohorts available for CAPICE data catalog. ALSPAC is one of the cohorts from the University of Bristol. The Avon Longitudinal Study of Parents and Children (ALSPAC) is a transgenerational prospective observational study investigating influences on health and development across the life course. We worked on ALSPAC data and trying to pull the list of variable names from the ALSPAC variable catalog. We added the description as well to the listing. It might be interesting from a metadata perspective as this might give a longitudinal perspective on certain variables. In the future to perform the multi-site analyses most efficiently, the aim is to build a facility that allows analyzing all data available over sites without necessarily having access to the raw data.

Figure 1 (ABS 49). The logo of CAPICE Project.

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ABS 50

NEONATAL TRANSPORT SERVICE IN SARDINIA: STATE OF THE ART

C. Loddo, M. Puddu, G. Ottonello, C. Fanni, A. Atzei

Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

The perinatal care network has as its main objective to be able to centralize high-risk pregnancies. Better care would be obtained by promoting *in-utero* transport, a procedure that is not always possible;

therefore it is necessary to activate a neonatal transport system (NTS), which requires a highly specialized transport team, together with dedicated tools [1]. In 2015 the Italian Society of Neonatology published a survey on the situation of NTS in Italy [2], detecting that 5 Italian regions were without the service. In recent years, these Regions have been working to fill this gap.

SARDINIAN SITUATION

Currently, Sardinia is the only region still without its NTS, but the Region is proceeding to overcome this delay. The first step has been the activation of the helicopter rescue on July 2018, consisting of 3 active airbases (Cagliari, Alghero, and Olbia). The helicopters supplied are provided to ensure neonatal emergencies in our local territory, from the 'Spoke' hospitals to the reference 'Hubs', represented by Neonatal Intensive Care Units (NICU) of Cagliari and Sassari. As regards the transports to the peninsula, the helicopters currently supplied would not allow arriving in time. Therefore, together with the military aircraft, already widely used, the possible use of private carriers has been evaluated. The 31st Wing "Special Transport" based in Ciampino (Rome) represents the Italian Air Force Unit in charge for the air transport of critical newborns from Sardinia to the hospitals of the Peninsula. It offers the best collaboration 24 hours a day, 7 days a week, even in adverse weather conditions [3].

OUR DATA

We evaluated, using part of our previous study data [3], the epidemiology of neonatal transport in Sardinia during a 3-year observational period (from the 1st January 2015 to the 1st September 2018). The data were extracted from the SISAR regional system and the paper records of the NICU and the Neonatal Pathology of Cagliari. During the period we evaluated, 69 transports were carried out, of which 33 (48%) of the NICU and 36 (52%) of the Neonatal Pathology. The diseases that required immediate transport were: 41 (59%) surgical pathologies, 17 (25%) cardiopathies, and 8 (12%) neurological or metabolic diseases and 2 (3%) ophthalmic diseases (**Fig. 1**). The main destinations were: 46 (67%) to the Bambin Gesù Paediatric Hospital in Rome, 4 (6%) to the Meyer Paediatric Hospital in Florence, 2 (3%) to the Pasquinucci Hospital in Massa Carrara, 12 (17%) to the IRCCS San Donato Milanese Polyclinic and 4 (6%) to the Gaslini Paediatric Hospital of Genoa.

CONCLUSIONS

In recent decades the Italian Military Air Force has guaranteed important support for the health of critical newborns, guaranteeing them the possibility of obtaining the best care. With the introduction of the NTS in Sardinia, we hope to continue the collaboration with the 31st Wing, in order to obtain the best guarantees for our critical newborns.

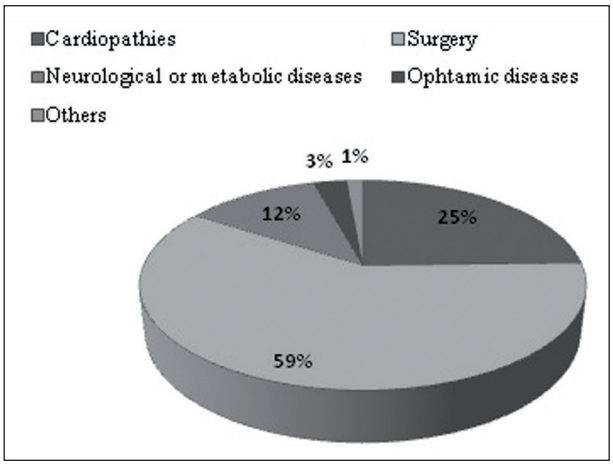

Figure 1 (ABS 50). Diseases or problems that required immediate air transport.

REFERENCES

[1] Chang ASM, Berry A, Sivasangari S. Specialty teams for neonatal transport to neonatal intensive care units for the prevention of morbidity and mortality. Cochrane Database Syst Rev. 2008(4):CD007485.

[2] SIN. Trasporto neonatale: manca in 5 regioni. Available at: https://www.neonatologia.it/down/x5e_oRe9xVoArxBzD2FfKWTG1d1mpOBE4fivsbHT3E//TRASPORTO%20NEONATALE:%20MANCA%20IN%205%20REGIONI, last access: 10 September 2018.

[3] Atzei A, Puddu M, Ottonello G, Fanos V. Air neonatal transports in Sardinia: from stork wings to airplane's. In: Selected Lectures of the 13th International Workshop on Neonatology; Cagliari (Italy); October 25-28, 2017. J Pediatr Neonat Individual Med. 2017;6(2):e060235.

ABS 51

AUTOSOMAL RECESSIVE WAARDENBURG SYNDROME TYPE IV B IN A NEWBORN WITH NEPHRO-UROLOGIC MALFORMATIONS AND INTESTINAL AGANGLIOSIS

D. Milani, C. Marchetti, A. Mussari, R. Mattei, C. Marcellino, C. Scalamogna, S. Rugolotto

Division of Pediatrics, Adria Hospital, Adria (RO), Italy

INTRODUCTION

Waardenburg syndrome is a rare autosomal dominant genetic disorder with deafness (various degrees) and pigmentation anomalies (e.g., a forelock of white hair). We describe a case report of type IV B Waardenburg syndrome, autosomal

recessive and with intestinal and neurological features.

CASE REPORT

His parents are consanguineous (I degree cousins), and his 3-year old sister is healthy. Fetal ultrasound was significant for large bladder, bilateral hydronephrosis with posterior urethral valves. Amniocentesis test was done: normal male karyotype and CGH-array. Pregnancy was uneventful. Born at 39 weeks gestation with spontaneous vaginal delivery; neonatal anthropometric parameters: weight 3,585 g, length 50 cm, HC 36 cm; APGAR score 8-9. Physical examination showed only a forelock white hair and white eyelashes. Admitted to NICU for diagnostic purposes, at 2 days of age there is no meconium passing through, with abdominal distension and first surgical intervention. A midgut volvulus was confirmed with gut malrotation and ischaemic intestinal loops; at 10 days of age, ileostomy was done. Ileus (partial) and colon agangliosis were confirmed. Due to difficult feeding tolerance, a PEG was performed. Renal scintigraphy showed: 72.5% left kidney function and 27.5% function due to a scar in the third middle part. Renal ultrasound: right caliectasis with a 2 cm diameter pelvis and thin renal parenchyma; bladder wall thickness. At 31 days of life: due to a DIC episode (with initial urethral bleeding) and multiple transfusions were given and antibiotic treatment started. At 50 days of life, an epileptic episode was confirmed with EEG and treated with phenobarbital and later levetiracetam. OAE and ABR were bilaterally pathologic. Fundus oculi slightly hypopigmented. A muscular VSD was shown at echocardiography. At 3 months of age right ureteral implantation was done with a new gastrostomy. Waardenburg syndrome was studied with molecular EDN3 gene analysis. It is located in 20q13.2-q13.3, it encodes endothelin 3 (ET3) protein; a C364>T (p.Glu122*) 3 mutations was confirmed, homozygous, and a type IV B Waardenburg-Shah syndrome was diagnosed. It is characterized by neurosensory deafness of variable degree, pigmentation anomalies, intestinal agangliosis. All these affected tissues come from the neural crest. Parenteral transmission is AR and, in our boy, both parents are healthy heterozygous. At 1 year of age, he was admitted to PICU due to fever, hypernatremic dehydration, renal failure and anemia (Hb 7.8 g/dL). At almost two years of age his weight is 7.5 kg, he has an ileostomy, a PEG and receives parenteral nutrition. Present physical examination with no bowel movements, profound neurosensorial deafness, blindness, a neurological examination with a WS4 level, hypertonus, mental retardation, drug dependent epilepsy. A thorough full surgical, lab and physiotherapist follow up is provided.

ABS 52

NEWBORNS IDENTIFICATION PROTOCOL IN NEONATAL INTENSIVE CARE UNITS

A. Casanova[1], S. Barra[1], L. Barberini[2], M. Puddu[3], V. Fanos[3]

[1]Department of Mathematics and Computer Science, University of Cagliari, Cagliari, Italy

[2]Department of Public Health Clinical and molecular medicine, University of Cagliari, Cagliari, Italy

[3]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

In this paper, we propose a protocol, ear-based, for assessing the hospitalized patients identity. If compared to other biometric traits, face, for example, the ear presents several advantages: first of all, the smaller surface and the quite simple structure allow faster processing as well less complex recognition strategies [1, 2]; ears are relatively static in size and structure in the very first years. Biometrics researches have confirmed the high uniqueness of the ear; this characteristic is mostly confined to the external ear "flap", technically defined as "pinna", with its morphological components. Anyway, the remaining structure significantly varies across different individuals, and this leads to the conclusion that ear can be considered suitable in solving identification problems, particularly in environments like neonatal wards, where the number of subjects to identify consists of few dozens. One of the most extensive and consistent research in this area came from the pioneering group of Iannarelli [3]. As in any biometric system, recognition is only the last step in a process starting from the acquisition, continuing with detection of the required trait, e.g., face or ear, and then taking to feature extraction and template matching. Each step presents different issues according to the acquisition modality especially in the comparison between 2D vs. 3D. The 3D imaging provides crucial enhancements when dealing with illumination and pose variations, but has as drawbacks to be much more expensive and computationally demanding. Since the application we propose is aimed to run on

mobile platforms, with limited hardware resources, we strongly preferred 2D images.

METHOD

The processing pipeline used in our work can be split up into four general steps, as shown in **Fig. 1** and explained in the following. Four images for each left ear must be acquired. The image is first resized so that height and width are no greater than 800 pixels. Then, Viola-Jones algorithm [4] is exploited to identify one or more candidate regions of interest (ROIs) possibly containing the ear. Starting from the original position and rotating the image of 10 and 20 degrees clockwise and counter-clockwise, we look for a positive response from the detector. For each image rotation, a growing threshold is then iteratively applied to finally possibly select a single region of sufficient size for each image. After the ear is detected, we used an approach based on the Active Shape Model, namely STASM [5], that, as results of a training phase, in which some landmarks are manually selected, automatically segments and crops the quasi-elliptical shape related to the ear. In the normalization phase, the image is carried to a normalized format to facilitate the recognition process. As regards, the orientation, the center of the found ellipse is used as a pivot for the rotation of the image, performed in such a way that the major axis of the ellipse is parallel to the y-axis. Size normalization is achieved choosing an image size of 90 x 144, with a height/width ratio of 1.6, which is a good approximation of the average size for the ears of newborns; for color normalization, we applied greyscale conversion, histogram equalization to improve contrast, and median filter for noise reduction. The feature vector is computed exploiting the multiscale linear binary pattern LBP [6] after dividing the image in 32 × 32 square regions. After this, in order to reduce the dimension of the feature vector, we applied four different techniques and compared the recognition performance obtained by Euclidean distance between probe and gallery vectors: Principal Component Analysis (PCA) [7], Linear Discriminant Analysis (LDA) [8], Neighbourhood Preserving Embedding (NPE) [9], and Orthogonal Locality Preserve Projections (OLPP) [10].

RESULTS AND DISCUSSION

We tested the recognition process using the before mentioned reduction techniques, and with a varying number of images in the gallery of each subject. This element should positively influence recognition, since having more images to compare can help catching some variations and improve both verification and identification. We used the Euclidean metric among

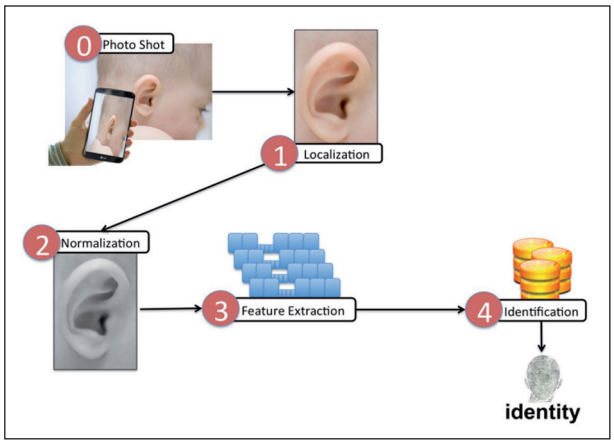

Figure 1 (ABS 52). Phases involved in the ear recognition.

templates for matching, measuring performance by setting a false acceptance rate threshold at 10-3, which is an acceptable value in this context; we calculated NPE, OLPP, PCA and LDA measuring their performances calculating Genuine Acceptance Rate (GAR) and False Rejection Rate (FRR), and finally, we further computed the Equal Error Rate (ERR). As expected, increasing the number of images for each subject positively affects performance of all four methods, in both verification and identification operations. The differences among dimensionality reduction techniques are often negligible, and this can be assumed to depend on the characteristics of multiscale LBP.

CONCLUSION

Images resolution obtained by modern mobile phones are suitable for a proper biometrics parameterization of the human ear, allowing for successful newborns identification in Neonatal Intensive Care Units. Results obtained in our work encourage the application of this protocol based on Biometrics in the Clinical environment. Our work is still running and testing on larger dataset to evaluate all the limits and potentiality of this biometrics-based protocol.

REFERENCES

[1] Azevedo N. Identificacão neonatal. XVIII Congresso Nacional de Criminalistica; Belem, PA; 2005. Oral presentation.

[2] Barra S, De Marsico M, Nappi M, Riccio D. Unconstrained Ear Processing: What is Possible and What Must Be Done. Signal and Image Processing for Biometrics. Lecture Notes Electrical Engineering. 2014;292:129-90.

[3] Iannarelli A. Ear Identification. In Forensic identification series. Fremont, CA: Paramount Publishing Company, 1989.

[4] Viola, P, Jones M. Rapid object detection using a boosted cascade of simple features. CVPR. 2001;1:1-51.

[5] Milborrow S, Nicolls F. Locating facial features with an extended active shape model. ECCV. 2008;504-13.

[6] Mäenpää T, Pietikäinen M. Multi-scale binary patterns for texture analysis. Image Analysis. 2003;2749:885-92.

[7] Daultrey S. Principal components analysis. Norwich: Geo Abstracts Limited, 1976.

[8] Etemad K, Chellappa R. Discriminant Analysis for Recognition of Human Face Images. JJOSA. 1997;14:1724-33.

[9] He X, Cai D, Yan S, Zhang HJ. Neighborhood preserving embedding. ICCV. 2005;2:1208-13.

[10] Cai D, He X, Han J, Zhang HJ. Orthogonal laplacian faces for face recognition. IEEE Trans Image Process. 2006;15:3608-14.

ABS 53

HE HAS PAIN, BUT IT IS A GREEN CODE, HE HAS TO WAIT!

Y. Khayamian, M. Manni, M. Mistretta, A. Canetto

Paediatric Emergency Department, A.O. "G. Brotzu", Cagliari, Italy

INTRODUCTION

Access to pediatric emergency department (PED) is frequently done without a paediatrician filter. It is often inappropriate and related to the fears and anxieties of the parents: in the last one year only 9% of the accesses of our reality was represented by red and yellow codes, the remaining 91% by green and white. Specifically, these must wait a lot of time. Earache, abdominal cramps, headache, fever, cough, are the most common causes to admission in a pediatric emergency department. These causes may seem trivial to health workers but not to the parents of children who have pain. More and more often, overburdened by the workload and the small number of staff, we lose sight of the fulcrum around which nursing care turns: the child.

AIMS

Estimate the percentage of nurses applying the See and Treat method: administration, according to pre-established and shared protocols, of pharmacological therapies to treat fever or pain, considering vital signs, Wong-Baker faces pain raiting scale and patient's general condition.

MATERIALS AND METHODS

An anonymous test was distributed to all nurses staff to evaluate the percentage of patients treated with drug therapy, already in the triage step.

RESULTS

Between August 2016 and August 2017, we have registered 18,203 children: 26 red colour codes, 1,480 yellow, 15,475 green and 1,222 white.

- 70 percent under 6 years old;
- Respiratoy distress is the leading causa of access to PED;
- The most highly non-urgent rated factors were fever, vomitig, diarrhea, headache, earache, urinay tract infection;
- The shared protocol was applied by two thirds, in triage step, administering paracetamol (15 mg/kg) or ibuprofen (10 mg/kg) for the treatment of temperature > 38.5°C, Wong Baker Face Pain Scale > 4 point.

CONCLUSIONS

See and Treat method allows to treat patients with fever, pain or other symptoms that could remain in the waiting room for long periods of time, according to established protocols. This little detail helps to reduce the costs of care thanks to a rapid diagnostic-therapeutic path, to improve the care quality based on codified criteria and guidelines, to grant continuity with the pediatrician, involved in the continuation of the home therapy and in the patient follow-up, and, first of all, to relieve the inconvenience of children and the family.

REFERENCES

• Radice C, Ghinaglia M, Doneda R, Bollini G. See and Treat' in the Emergency Department: legal aspects and professional nursing responsibility. Prof Inferm. 2013;66(3):175-81.

• Gausche-Hill M, Ely M, Schmuhl P, Telford R, Remick KE, Edgerton EA, Olson LM. A national assessment of pediatric readiness of emergency departments. JAMA Pediatr. 2015;169(6):527-34.

ABS 54

THE TRAP OF DIGITAL ERA FOR YOUNG MOTHERS

A. Ciubara[1], M. Burlea[2], M. Vendemmia[3], S. Vendemmia[4]

[1]Department of Psychiatry, University of Galati, Galati, Romania

[2]Pediatric Department, University of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania

[3]Neonatal Intensive Care Unit, University of Naples Federico II, Naples, Italy

[4]Head Emeritus of Pediatrics and Neonatology, Aversa, Italy

With the emergence and development of social networks and gadget development, a series of new events emerged in the sphere of mental health issues. These manifestations are not to be regarded as necessarily self-evident, being often a form of expression, expression (a symptom) of common mental disorders, classified by the psychiatric associations in the world. Professor Uri Nitzan of Tel Aviv University's Sackler Faculty of Medicine and Psychiatrist at Shalvata Mental Health Care Center published in 2011 in the *Israel Journal*

of Psychiatry and Related Sciences an article demonstrating the implication of using the Facebook Social Network to trigger psychotic episodes in people without history of psychotic manifestations or abuse of psychotropic substances. In each of the cases studied, a clear link was made between the use of the social network and the development and exacerbation of psychotic symptoms. Including psycho-productive phenomena, anxiety, confusion associated with increased use of social networking. From here to postpartum depression is only one step. Adolescence can be seen as a beautiful time in life, but it can also be interpreted as a difficult stage for both those who go through it and parents. The problem with adolescence is that young people feel obliged to "function" in three dimensions: past, present, and future. Consciously and unconsciously, adolescents are still caught up in childhood issues, especially those related to parenting and the environment. At the same time, they are trying to figure out what to expect from the future. We must not forget that the period of adolescence is a period that involves multiple changes, including changes to the psychological structure. Therefore, it is a period of major vulnerability. The transition from childhood to maturity implies a fragility of the personality, which evil intentional people can exploit. Practically, this group of "blue whale" games is a manipulation mode that exploits various dysfunctions that appear in the adolescent's personality. It is also the age at which the teenager brags, wants to do demonstrative things, draw attention to him.

REFERENCE

• Nitzan U, Shoshan E, Lev-Ran S, Fennig S. Internet-Related Psychosis-A Sign of the Times? Israel J Psych Rel Sci. 2011;48(3):207.

ABS 55

PLACENTAL AND FETAL MEMBRANES INFECTION IN PREGNANCY WITH RUPTURE OF MEMBRANES. A PILOT STUDY

S. Cireddu[1], C. Gerosa[2], M. Anardu[1], M. Russo[1], F. Coghe[3], V. Fanos[4], G. Faa[2], S. Angioni[1]

[1]Division of Gynecology and Obstetrics, Department of Surgical Sciences, AOU Cagliari, University of Cagliari, Cagliari, Italy

[2]Division of Pathology, Department of Surgical Sciences, University Hospital San Giovanni di Dio, University of Cagliari, Cagliari, Italy

[3]Laboratorio Analisi Chimico Cliniche e Microbiologia, Policlinico Duilio Casula, AOU Cagliari, Cagliari, Italy

[4]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

INTRODUCTION

The placenta and membranes may be infected by ascending bacteria from the maternal birth canal and the maternal and fetal inflammatory reactions, elicited by these microorganisms, can determine important clinical outcomes. Our study aimed to investigate placental histology and fetal membranes infections in pregnancies complicated by preterm rupture of membranes (pPROM) or rupture of membranes at term (PROM).

METHODS

This prospective study was conducted from February to September 2017 in the Division of Gynecology and Obstetrics of the University of Cagliari. 50 consecutive pregnancy with pPROM or PROM entered the study. A placental swab on amniotic membranes near the cord insertion was collected for microbiological evaluation. Placentas were sent to pathology investigation. Obstetrical and neonatal data were collected.

RESULTS

The sample included 23 patients with pPROM and 27 patients with PROM. The microbiological cultures of bacteria was obtained in 30% of pPROMs and 26% of PROMs. The microbiological sampling was positive in 76% of the cases. Chorioamnionitis was identified in 54% of cases (48% pPROMs and 59% PROMs). Chorioamnionitis was identified in 71% of patients with pPROM and positive culture. Histological signs of chorioamnionitis were also found in cases with negative microbiological cultures. Apgar scores ≤ 6 were detected in 35% of pPROMs. In 50% of these cases, chorioamnionitis was present and in 38% of cases was associated to the identification of bacteria in the membranes. In cases of neonatal infection, the bacteria evidenced in the fetal membranes often correlate with neonatal microbiological investigation. Moreover, a case of arteritis and a case of funisitis were found in association of microbiological positivity of membranes and histological chorioamnionitis.

CONCLUSIONS

This study provides important preliminary results: 1) it is possible to collect microbiological samples in the fetal membranes at delivery and this analysis could be important in particular in preterm births; 2) histological evaluation of the placentas correlates strongly with microbiological evaluation of membranes. These data are of great interest because they could open a new chapter of intrapartum diagnostics in the case of pPROM and PROM. If confirmed on larger series our results would provide microbiological and histopathological data

to the pediatricians that could allow a targeted and personalized treatment of the newborn.

ABS 56

A SYSTEMATIC REVIEW ON THE IMPACT OF THE CONCOMITANT USE OF CANNABINOIDS ON TREATMENT RESISTANCE TO ANTI-PSYCHOTICS: A PATHWAY TOWARD AGGRESSION?

M. Pinna[1], R. Agabio[2], B. Carpiniello[3], F. Pinna[3], V. Fanos[4], E. Denovan-Wright[5], M. Manchia[3,5]

[1]Psychiatry Unit, San Martino Hospital-Regional Health Agency, Oristano, Italy

[2]Department of Biomedical Sciences, University of Cagliari, Cagliari, Italy

[3]Section of Psychiatry, Department of Medical Sciences and Public Health, University of Cagliari, Cagliari, Italy

[4]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

[5]Department of Pharmacology, Dalhousie University, Halifax, Nova Scotia, Canada

BACKGROUND

Patients affected by severe psychiatric disorders, including schizophrenia, have higher rates of aggressive behavior/violence compared to the general population. The risk of aggression is not homogeneous over the lifespan, with peaks during childhood and adolescence, and during early adulthood. Further, in psychiatric disorders, the risk of aggressive behavior increases exponentially during acute illness episodes, particularly of psychotic mania. For instance, a recent study found that approximately 10% of bipolar disorder patients at their first episode of psychotic mania manifested severe hetero-aggressive behavior [1]. Several factors modulate the trajectory leading to the manifestation of aggression in the context of a severe mental disorder. One of the most important is the response to pharmacological treatment, particularly during acute phases. Typically, antipsychotics (typical and atypical) are first-line treatments for acute episodes of psychotic mania. Since these drugs are administered during hospital admissions, often via the parenteral route, treatment adherence is not a concern. However, there is a proportion of patients that do not respond adequately to antipsychotic treatment of psychopathological and behavioral symptoms. This lack of an adequate response could be partly explained by the concomitant use of recreational drugs, particularly cannabis. Indeed, psychotic patients with cannabis use receive prescription of several different antipsychotic drugs, indicating clinical judgment of treatment failure [2]. Here, we performed a systematic review of the literature to test the hypothesis that patients treated with antipsychotic for an acute psychotic episode could present a decreased rate of response when cannabis use was concomitant.

METHODS

We searched Medline using the following terms: ("cannabis"[All Fields] AND "psychosis"[All Fields] AND "treatment"[All Fields]), applying these filters: ("humans"[MeSH Terms] AND English[lang]). Data were then exported in .xml format and inputted in Rayyan [3]. Inclusion criteria were as follows: patients affected by major psychosis (schizophrenia, schizoaffective disorder, bipolar disorder, schizophreniform) or psychosis in the context of a major depressive disorder, presence of concomitant cannabis use, presence of antipsychotic treatment, patients of age > 16 years, samples size of at least 10 patients. We did not apply time limits to our search. Although aggression was not the main outcome of our analysis, we reported whenever non-response to treatment led to the manifestation of aggressive behavior.

RESULTS

Our systematic search identified 187 studies. The articles were refined by manual reading of title and abstract. This yielded 35 studies, of which, after screening, only 13 were included in the review. This is outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart (**Fig. 1**). The total sample size was of 4,172 patients. One study included also 10 controls. The studies are summarized in **Tab. 1**. The majority of the studies (9 out of 13) reported a decreased efficacy of antipsychotic treatment when cannabis use was concomitant. Of interest, 2 studies reported the manifestation of aggressive behaviour in antipsychotic-treated cannabis users.

CONCLUSION

Our systematic search identified 13 studies for a total sample size of 4,172 patients. Our qualitative synthesis showed that antipsychotics where less effective in treating psychotic symptoms when cannabis use was concomitant leading to a worse clinical outcome. This effect appeared to be partly mediated by the decline of medication adherence. Other studies should be conducted to confirm these results and investigate potential causes. As an aside, we observed that in two studies aggressive behavior was highly prevalent in antipsychotic-

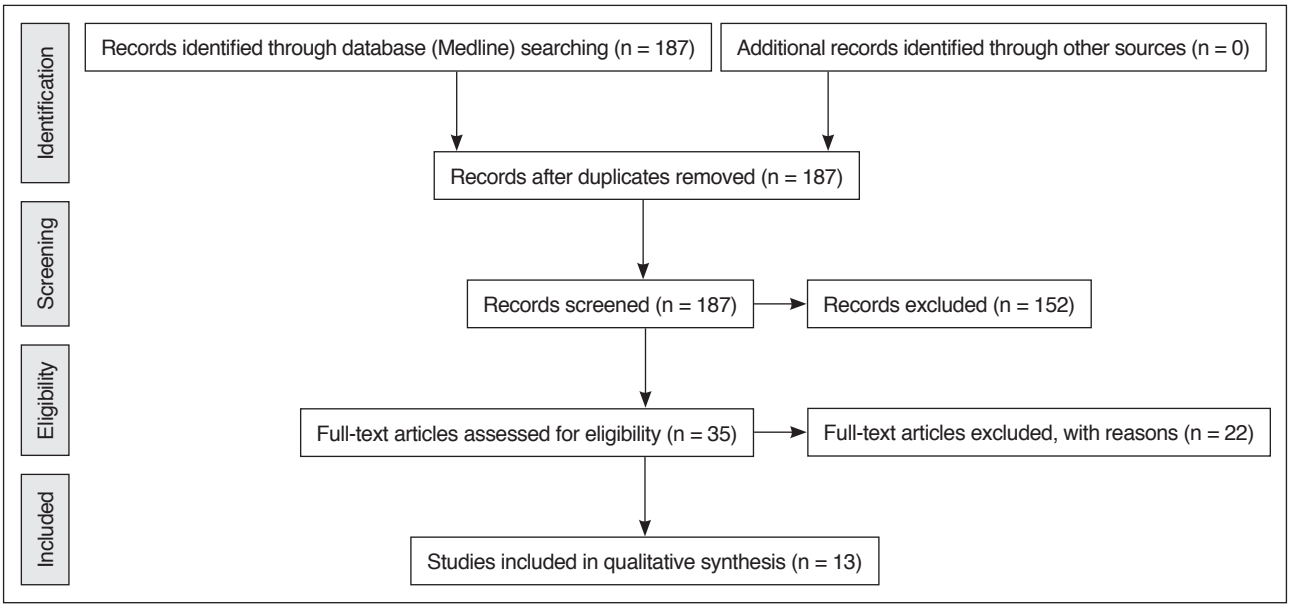

Figure 1 (ABS 56). Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.
Our systematic search identified 187 studies. The articles were refined by manual reading of title and abstract. This yielded 35 studies, of which, after screening, only 13 were included in the review.

Table 1 (ABS 56). Experimental and observational studies of antipsychotic treatment in patients with concomitant use of cannabis.

Year	Reference	Authors	Sample size	Outcome	Aggressive behaviour	Results
1991	**[4]**	**Chaudry et al.**	15 patients 10 controls	Development of psychotic symptoms with bhang	Yes	Good response to antipsychotic treatment after 5 days of treatment
1997	**[5]**	**Kovasznay et al.**	96 patients with schizophrenia and 106 with affective psychosis (64 with psychotic bipolar disorder and 42 psychotic major depression)	Antipsychotics treatment outcomes after a 6-month longitudinal observation	Not assessed	At 6 months psychotic symptoms were more severe in individuals with a personal history of substance abuse, including cannabis (N = 29); no effect on compliance
2004	**[6]**	**Green et al.**	262 patients with schizophrenia, schizoaffective disorders, or schizophreniform, of which 74 had cannabis use disorder	Antipsychotics (olanzapine and haloperidol) treatment outcome in an international multicentre RCT	Not assessed	No effect of cannabis on treatment response
2009	**[7]**	**Miller et al.**	112 first psychotic episode patients	Risk of treatment non adherence to antipsychotics due to cannabis concomitant use	Not assessed	Concomitant cannabis use increased of 6.4 the risk of drop-out and of 2.4 of loss of adherence
2011	**[8]**	**González-Pinto et al.**	92 first psychotic episode patients	To test the influence of cannabis use on the long-term outcome of psychotic patients	Not assessed	Patients with cannabis use had a worse clinical outcome with more severe negative symptoms
2012	**[9]**	**Faridi et al.**	192 first episode patients	Treatment adherence	Not assessed	No effect of cannabis use on the risk of relapse at 12 months
2012	**[10]**	**Schimmelmann et al.**	99 first psychotic episode patients	Clinical outcome at 18 months	Not assessed	Cannabis use was associated with a higher rate of treatment non-adherence and of hospital admissions

treated cannabis users. Clinicians should be aware of the possible manifestation of treatment resistance to antipsychotics when cannabis use is co-occurring and modulate pharmacotherapy accordingly. This would favor a preventive approach to the manifestation of externalizing behaviors, such as aggression, that might present in the acute phase of the illness.

REFERENCES

[1] Khalsa HK, Baldessarini RJ, Tohen M, Salvatore P. Aggression among 216 patients with a first-psychotic episode of bipolar I disorder. Int J Bipolar Disord. 2018;11(6):18.

[2] Patel R, Wilson R, Jackson R, Ball M, Shetty H, Broadbent M, Stewart R, McGuire P, Bhattacharyya S. Association of cannabis use with hospital admission and antipsychotic treatment failure in first episode psychosis: an observational study. BMJ Open. 2016;6:e009888.

[3] Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan – a web and mobile app for systematic reviews. Systematic Reviews. 2016;5:210.

[4] Chaudry HR, Moss HB, Bashir A, Suliman T. Cannabis psychosis following bhang ingestion. Br J Addict. 1991;86(9):1075-81.

[5] Kovasznay B, Fleischer J, Tanenberg-Karant M, Jandorf L, Miller AD, Bromet E. Substance Use Disorder and the Early Course of Illness in Schizophrenia and Affective Psychosis. Schizophr Bull. 1997;23(2):195-201.

[6] Green AI, Tohen MF, Hamer RM, Strakowski SM, Lieberman JA, Glick I, Clark WS; HGDH Research Group. First episode schizophrenia-related psychosis and substance use disorders: acute response to olanzapine and haloperidol. Schizophr Res. 2004;66(2-3):125-35.

[7] Miller R, Ream G, McCormack J, Gunduz-Bruce H, Sevy S, Robinson D. A prospective study of cannabis use as a risk factor for non-adherence and treatment dropout in first-episode schizophrenia. Schizophr Res. 2009;113(2-3):138-44.

[8] González-Pinto A, Alberich S, Barbeito S, Gutierrez M, Vega P, Ibáñez B, Haidar MK, Vieta E, Arango C. Cannabis and first-episode psychosis: different long-term outcomes depending on continued or discontinued use. Schizophr Bull. 2011;37(3):631-9.

[9] Faridi K, Joober R, Malla A. Medication adherence mediates the impact of sustained cannabis use on symptom levels in first-episode psychosis. Schizophr Res. 2012;141(1):78-82.

[10] Schimmelmann BG, Conus P, Cotton S, Kupferschmid S, McGorry PD, Lambert M. Prevalence and impact of cannabis use disorders in adolescents with early onset first episode psychosis. Eur Psychiatry. 2012;27(6):463-9.

ABS 57

EMOTIONAL AND PSYCHOLOGICAL ASPECTS IN LONG-TERM HOSPITALIZED PREGNANT WOMEN

M. Costa[1], I. Melis[1], E. Corvetto[1], C. Giuliani[1], M. Agus[2], S. Angioni[1]

[1]*Department of Surgical Sciences, Division of Gynecology and Obstetrics, University of Cagliari, Cagliari, Italy*

[2]*Department of Psychology, University of Cagliari, Cagliari, Italy*

INTRODUCTION

An increasing number of women develops psychological alterations and manifests feelings such as anxiety, irritability, unstable mood, and depression mainly in the first and third trimester of pregnancy. Most of the high-risk pregnant women are hospitalized for long periods that sometimes last until the time of delivery. Our study aimed to investigate the psychological impact of hospitalization in such cases because only 0.3% of hospitalized pregnant women receive an assessment of psychological well-being.

METHODS

We performed a pilot study at the Obstetric Clinic of the AOU of Cagliari, aimed at investigating the impact of hospitalization in pregnant women analyzing anxiety, mood, and stress levels. The sample involved a cohort of 53 hospitalized women, between 22nd and 37th week of gestation, suffering of pathological pregnancy that gave their informed consent. Cognitive Behavioral Assessment form Hospital (CBA-H) was used to perform a screening concerning the subjective, emotional and behavioral problems related to a specific clinical pathology.

RESULTS

Regarding the emotional aspects, the analyzed sample showed significant values of the state of anxiety, also called situational, higher than the reference values during hospitalization. Moreover, even depression values were found to be higher than the reference normative value. Finally, the length of hospital stay correlated with a decrease in psychophysical wellbeing.

CONCLUSION

Basing of our study, we suggest the CBA-H as a good and reliable method for the screening of emotional and psychological aspects in long-term hospitalized pregnant women. The emotional experience of high-risk pregnant women during hospital should always be considered. The midwife, employed in long-term care units, should establish a "helping relationship" towards the pregnant woman and become an important positive figure in the patient adaptation to the disease.

ABS 58

AN INCESSANT… HEARTTHROB

F. Bardanzellu[1], I. Bo[2], M. Puddu[1], D. Manus[1], F. Cioglia[1], A. Atzei[1], P. Neroni[1]

[1]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy
[2]Pediatric Cardiology, Great Ormond Street Hospital NHS trust, London, UK

INTRODUCTION

Permanent junctional reciprocating tachycardia (PJRT), or Coumel tachycardia, is a rare incessant supraventricular arrhythmia characterized by an anterograde conduction through the atrioventricular node and a slower retrograde conduction via an accessory way, usually occurring in neonates or infants. Antiarrhythmic therapy may control heart rate (HR), although drug failure is frequent. Rare self-limiting cases have been reported. Radiofrequency ablation of the accessory way results efficacious, definitive and safe. However, related outcome are not fully clarified yet [1, 2]. Electrocardiographic features are deep negative P waves in inferior leads (II, III, and aVF), narrow QRS complexes and a long RP interval [3, 4].

CASE REPORT

G., a male neonate, affected by trisomy 21, was born at 31 weeks of GA, weight 1.760 g (AGA), by urgent cesarean section due to a fetal tachycardia which determined ventricular dysfunction, fetal cardiac failure, and hydrops. At birth, due to a moderate respiratory distress, nasopharyngeal aspiration and non-invasive ventilation (NIV) (FiO_2 0.40%) were performed. G. was hospitalized in neonatal intensive unit care, requiring NIV (FiO_2 0.25). At 2 days, cardiac ultrasound detected a not hemodinamically rilevant PDA without other structural anomalies or pericardial effusion. At 3 days, a severe paroxysmal supraventricular tachycardia occurred (HR 190-200/min), and ecg allowed the diagnosis of PJRT (**Fig. 1**). A poorly contracting left ventricle (EF 63%) and a mild effusion were also evidenced. Thus, cordarone at the dose of 50 mg/kg in one hour was administered. Since the arrhythmia persisted, cordarone was continued through a second bolus in 30' and a maintenance dose of 0.5 mg/kg/h. After 24 hours, ecg showed a sinus rhythm (HR 155-160/min) with pattern of atrioventricular block 1:1. Moreover, propranolol at the dose of 1 mg/kg divided in 3 daily administrations was prescribed. This double drug administration allowed to slow the conduction through the accessory slower way, therefore reducing the HR. In the following days. G. was routinely evaluated and showed a HR of 110-140/min and EF 76-78%, without pericardial effusion or pulmonary hypertension and steady clinical conditions. At 11 days, cordarone was stopped, and the dose of propranolol progressively increased to 3 mg/kg. At 20 days, a positive T wave in V1 appeared, without clinical signs of right sections overload. G. was discharged at 39 weeks of corrected GA, in stable conditions, regular growth and continuing beta-blocking therapy. During hospitalization, he underwent 28 days of NIV and was nourished through gavage. G. will be evaluated with a well-defined clinical follow-up and results eligible to ablation.

CONCLUSIONS

PJRT is a potentially lethal condition. Radio-frequency ablation should be considered if HR cannot be controlled by drugs, especially in case of persistent left ventricular dysfunction [1, 3].

To the best of our knowledge, this is the first reported case in a patient with Down syndrome.

REFERENCES

[1] Vaksmann G, D'Hoinne C, Lucet V, Guillaumont S, Lupoglazoff JM, Chantepie A, Denjoy I, Villain E, Marçon F. Permanent junctional

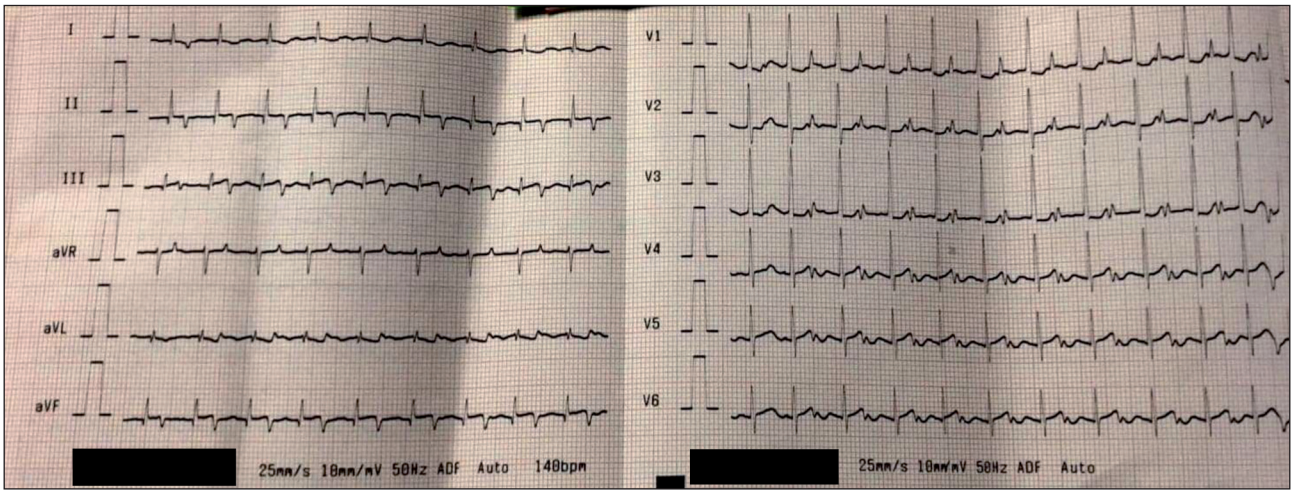

Figure 1 (ABS 58). Typical electrocardiographic features of permanent junctional reciprocating tachycardia (PJRT): deep negative P waves in inferior leads (II, III, and aVF) and narrow QRS complexes.

reciprocating tachycardia in children: a multicentre study on clinical profile and outcome. Heart. 2006;92:101-4.

[2] Kang KT, Potts JE, Radbill AE, La Page MJ, Papagiannis J, Garnreiter JM, Kubus P, Kantoch MJ, Von Bergen NH, Fournier A, Côté JM, Paul T, Anderson CC, Cannon BC, Miyake CY, Blaufox AD, Etheridge SP, Sanatani S. Permanent junctional reciprocating tachycardia in children: a multicenter experience. Heart Rhythm. 2014;11:1426-32.

[3] Shebani SO, Ng GA, Stafford P, Duke C. Radiofrequency ablation on veno-arterial extracorporeal life support in treatment of very sick infants with incessant tachymyopathy. Europace. 2015;17:622-7.

[4] Cornette J, ten Harkel AD, Steegers EA. Fetal dilated cardiomyopathy caused by persistent junctional reciprocating tachycardia. Ultrasound Obstet Gynecol. 2009;33:595-8.

ABS 59

PSYCHOLOGICAL IMPACT OF MISCARRIAGE

G. Impera[1], F. Dessolis[1], D. Deiana[1], M.G. Orlando[1], C. Giuliani[1], M. Agus[2], I. Melis[1], S. Angioni[1]

[1]Department of Surgical Sciences, Obstetric, and Gynecology, AOU Cagliari, University of Cagliari, Cagliari, Italy

[2]Department of Psychology, University of Cagliari, Cagliari, Italy

INTRODUCTION

Miscarriage is a frequent complication of early gestation. Emerging evidence has suggested that miscarriage could be associated with significant and possibly enduring psychological consequences. As many as 50% of miscarrying women suffer some form of psychological morbidity in the weeks and months after loss. Nevertheless, its impact on mother psychological wellbeing has not been thoroughly evaluated and studied. It is common clinical practice to pay no attention to the psychological aspects of spontaneous abortion, because it is commonly thought that women who live this experience do not suffer, unlike how is supposed for an endo-uterine death that occurs in the last stages of pregnancy. This study aimed to evaluate if miscarriage could have a psychological impact on women.

METHODS

We performed a prospective study collecting 70 consecutive cases of miscarriage that were hospitalized in the Division of Obstetrics and Gynecology of the University of Cagliari from February 2017 to October 2017. Patients gave their written consent to the study. Clinical characteristics were collected, and every patient fulfilled two questionnaires during hospital admission, investigating anxiety and depressive factors. Statistical analysis of the collected data was performed.

RESULTS

Our study showed that 34.3% of the patients had high levels of anxiety and 10% have high levels of depression. Using Pearson correlation (r), a direct relationship between the number of previous abortions and levels of depression has been demonstrated. ($r = 320$, $p < 0.5$). Also, more long was the time for pregnancy obtaining, greater were the depressive symptoms ($r = 322$, $p < 0.5$). The same correlations were observed for anxiety levels.

CONCLUSIONS

Our study showed that spontaneous miscarriage is associated to important psychological symptoms. We believe that medical professionals should be sensitive to these psychological consequences and the possible factors such as childlessness, history of psychiatric illness and poor marital adjustment that may increase the risk of these outcomes. Also, clinicians should be sensitive during explanation of the ultrasound findings in early pregnancy and delivery of surgical treatment.

ABS 60

HUMAN BREAST MILK-ACQUIRED CYTO-MEGALOVIRUS INFECTION

F. Bardanzellu, A. Reali

Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

The beneficial impact of Breast Milk (BM) on short- and long-term neonatal outcome has been deeply demonstrated in literature, representing the best source of nutrition especially in the vulnerable category of extremely low birth weight newborns. Unfortunately, BM could not be always safe, especially due to the possible presence of maternal viruses undergoing reactivation during lactation, which can be transferred to the breastfed neonate. In example, the majority of Cytomegalovirus (CMV) IgG positive mothers shed the virus in BM without any clinical sign of infection [1, 2]. Among these, CMV can potentially lead to a serious and acute illness, mostly in case of low gestational age (GA). Symptomatic infection can vary from a self-limiting disease to a serious and even mortal condition (sepsis-like symptoms),

especially in newborns showing less than 32 weeks of GA. Moreover, infected infants can show an increased risk of bronchodysplasia [1, 2]. In literature, BM acquired infection from CMV + mothers ranges from 5.7% to 60%, depending on the study and the technique used for CMV inactivation. Therefore, a strategy to remove CMV from BM with a minimal or absent impact on its beneficial components would be desirable [1, 3]. Up to now, pasteurization, freezing, ultraviolet-C or microwave irradiation are the available techniques, showing different levels of efficacy and variable effects on BM composition. Long-term pasteurization completely inactivates CMV but modifies several BM components reducing its properties. Short-term pasteurization seems very promising, inactivating CMV without modifying its components. Freezing and irradiation can reduce viral concentration and result very interesting, although their effects on BM properties and even on newborn's outcome should be fully understood [1, 3]. Many studies are still needed to clarify such strategies' influences on newborns and to investigate the new techniques which could show a relevant role in the next future, such as metabolomics [4].

REFERENCES

[1] Hamprecht K, Goelz R. Postnatal Cytomegalovirus Infection Through Human Milk in Preterm Infants Transmission, Clinical Presentation, and Prevention. Clin Perinatol. 2017;44:121-30.

[2] Yoo HS, Sung SI, Jung YJ, Lee MS, Han YM, Ahn SY, Chang YS, Park WS. Prevention of Cytomegalovirus Transmission via Breast Milk in Extremely Low Birth Weight Infants. Yonsei Med J. 2005;56:998-1006.

[3] Ben-Shoshan M, Mandel D, Lubetzky R, Dollberg S, Mimouni FB. Eradication of cytomegalovirus from human milk by microwave irradiation: a pilot study. Breastfeed Med. 2016;11:186-7.

[4] Fattuoni C, Palmas F, Noto A, Barberini L, Mussap M, Grapov D, Dessì A, Casu M, Casanova A, Furione M, Arossa A, Spinillo A, Baldanti F, Fanos V, Zavattoni M. Primary HCMV infection in pregnancy from classic data towards metabolomics: an exploratory analysis. Clin Chim Acta. 2016;460: 23-32.

ABS 61

ECTROMELIA APPEARANCES

C. Perna, C.D. Arru, C. Porcu, G. Ledda, L. Saba

Department of Radiology, AOU of Cagliari, Cagliari, Italy

INTRODUCTION

Ectromelia (ἔκτρωμα abortion, μέλος limb) is a congenital malformation of the limbs. Limbs may be missing or be underdeveloped. Limbs embryological development begins in the early stages of pregnancy (from the 4th week on) from the mesodermic lateral plates. Any obstacle in the differentiation process may lead to limb anomalies. Genetic disorder, vascular noxae, iatrogenic events may determine such conditions. Clinical examination and diagnostic imaging (X-ray, US and MRI) are the keys to evaluate these malformations.

CASES REPORT

We present two cases with clinical suspect of ectromelia. X-ray, US, and MRI were performed to confirm and categorize the diseases. The first one regards a newborn boy, born handless. This clinical evidence required an X-ray study, that confirmed complete absence of the distal segment of the right superior limb (true transversal hemimelia). In the second case, a newborn boy was born with a shorter lower limb. He was assessed with a total body X-ray exam, that showed the right femoral and tibial hypoplasia, an absence of the fibula and the 3rd and the 4th metatarsal and phalangeal bones. These features describe atypical phocomelia (partial absence of the proximal segment). Right hip US was not exhaustive; therefore, MRI was performed and proved a partial dislocation of the hip.

CONCLUSION

Ectromelia often involves multiple bone segments. Our two cases show the importance of going beyond clinical appearance by taking advantage of diagnostic imaging examination, that allows a thorough assessment.

ABS 62

ETIOPATHOGENIC, DIAGNOSTIC AND THERAPEUTIC PARTICULARITIES IN CORROSIVE ESOPHAGITIS IN CHILDREN IN ROMANIA

M. Burlea

Pediatric Department, University of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania

INTRODUCTION

Postcaustic esophagitis is a severe medical problem, being the most common form of severe esophagitis in children.

Caustic substances cause tissue damage through chemical reactions. These substances may be acidic or alkaline.

EPIDEMIOLOGY

In Romania, the incidence of this intoxication is 6-10% of all intoxications (especially with caustic soda used in the rural environment to produce soap). In rural areas, supervision of little children is deficient. Most common ingestions are accidental by children under the age of 5, and other ingestions that occur are the voluntary ingestion as suicide attempts in teenagers and inhalation due to exposure to corrosive vapors [1].

GENERAL DATA

Corrosive substances cause caustic esophageal stenosis by chemical reaction [2]. The lesions of corrosive substances in the digestive tract evolve in three stages: acute, latent and chronic stage, with the maximum risk of perforation of the esophagus in the first 3 days after ingestion and on days 6 to 10. The clinical manifestations of post-caustic esophageal stenosis include a combination of many symptoms, all depending on the nature of the agent and the specifics of the ingestion. The essential examination is the upper digestive endoscopy, which it is used for the exact mapping of lesions and predicts the prognosis. This must be effectuated as early as possible, within 24 hours, and by its use, the mortality was reduced by ~50% in the last 25 years.

TREATMENT

The treatment of post-caustic esophageal stenosis is very complex, and a modern method is the endoscopic dilatations with Savary devices, useful in mild stenosis, surgery is reserved for severe stenosis.

CONCLUSIONS

Upper digestive endoscopy should be performed to prevent unnecessary hospitalization, to establish treatment and follow-up strategies and to treat stenosis caused by caustic ingestion in children.

REFERENCES

[1] Baskin D, Urganci N, Abbasoğlu L, Alkim C, Yalçin M, Karadağ C, Sever N. A standardized protocol for the acute management of corrosive ingestion in children. Pediatr Surg Int. 2004;20:824-8.

[2] de Jong AL, Macdonald R, Ein S, Forte V, Turner A. Corrosive esophagitis in children: a 30-year review. Int J Pediatr Otorhinolaryngol. 2001;57: 203-11.

ABS 63

DOUBLE BLADDER IN AN INFANT?

C.D. Arru[1], C. Porcu[1], N. Pandolfo, M. Erta[1], F. Loi[1], G. Ledda[1], G. Ottonello[2], L. Saba[1]

[1]*Department of Radiology, AOU of Cagliari, Cagliari, Italy*

[2]*Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU of Cagliari, Cagliari, Italy*

INTRODUCTION

Congenital anomalies of the kidney and the urinary tract (CAKUT) have an incidence of 0.3-1.6 per 1,000 stillborn and live infants; they represent 20-30% of congenital anomalies in the prenatal period. Renal development is a very complicated process; it begins from the very first weeks of pregnancy. Knowing the way around it allows understanding the features of the malformations fully. Prenatal and postnatal Ultrasounds (US) are the gold standard to diagnose these anomalies, sometimes a second level imaging study, such as Magnetic Resonance Imaging (MRI), may be useful to define the condition.

CASE REPORT

We present the story of a newborn girl, who was diagnosed with right hydroureteronephrosis and absence of the left kidney through a prenatal ultrasound. We completed the diagnosis by US (high-frequency linear transducer) and MRI (sequence).

RESULTS AND DISCUSSION

We performed the US when the baby was just born and observed a grade 4 right hydroureteronephrosis, absence of the left kidney and a large anechoic mass, with hyperechoic walls, adjacent to the urinary bladder and uterus (**Fig. 1**).

The US has some intrinsic limitations that prevent us to distinguish the urinary bladder from the anechoic mass; we opted out for a US-guided catheterization followed by saline infusion to allow us to recognize the real bladder.

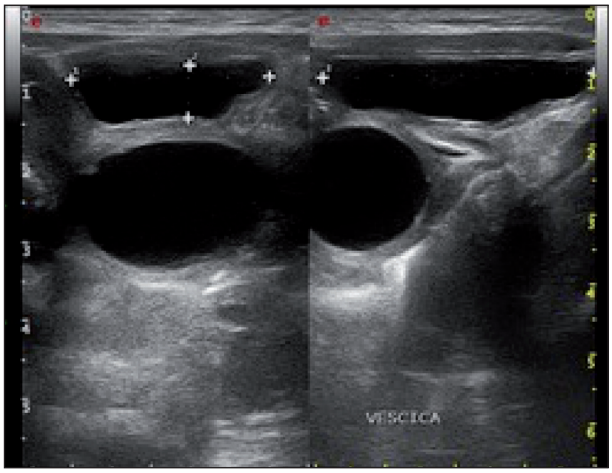

Figure 1 (ABS 63). US at birth: a grade 4 right hydrouretheronephrosis, absence of the left kidney and a large anechoic mass, with hyperechoic walls, adjacent to the urinary bladder. A normal utero was visualized.

MRI was then essential to delineate the nature and the connection to the other organs, it showed a large bilobate cystic mass (40 x 18 x 31 mm – 26 x 41 x 19 mm), with a T2 hyperintense content, regular and thin walls; the posterior end located in the Douglas pouch and the anterosuperior end layed on the urinary bladder.
The two lobules are connected through a small peduncle. Lateral to the urinary bladder there is a thin tubule (24 mm), slightly hyperintense in T2 sequences.
These MRI findings seem to represent the left kidney and left ureter.

CONCLUSIONS

An otherwise fatal condition may be diagnosed early thanks to the combination of two different Imaging studies.

ABS 64

NEONATAL TSH SCREENING VALUE FOR CONGENITAL HYPOTHYROIDISM RELATED TO PFASs AREAS OF VENETO REGION IN NORTH OF ITALY

S. Lauriola, M. Clemente, O. Pepaj, R. Gaudino, P. Cavarzere, F. Antoniazzi

Pediatric Department, University of Verona, Verona, Italy

INTRODUCTION

Prenatal exposure to some per- and polyfluoroalkyl substances (PFASs) may disrupt maternal and neonatal thyroid function, which is critical for healthy growth and neurodevelopment. In the last years, the environmental PFAS pollution focused on the Veneto region in the north of Italy, an area where these substances are widespread. Both toxicological and epidemiologic evidence suggests that PFAS exposure may alter thyroid function. Normal thyroid function is critical for proper fetal and neonatal growth and neurodevelopment. The fetus is entirely dependent on maternal thyroid hormones during early pregnancy until 18-20 week gestation, when fetal thyroid hormone production begins. Maternal thyroid dysfunction, especially during early pregnancy, has been associated with adverse pregnancy and developmental outcomes, such as impaired fetal growth, preterm delivery, and neurodevelopmental deficits, including lower IQ in children. Studies of the effects of PFAS exposure on thyroid function in newborns have not been as consistent. We examined 97,538 newborns, screened from 2014 to 2016.

AIM OF THE STUDY

To examine the trend of neonatal TSH values in babies born in Veneto region contaminated by pFAS.

MATERIALS AND METHODS

We examined associations of PFAS exposure during early pregnancy with neonatal thyroid hormone levels using neonatal screening. 75,066 newborns from mothers resident in Veneto region aged 22 to 42 gestation weeks. Neonatal weight from 500 to 5,999 grand TSH values > 0 U/L, last blood check among 0 and 3 days of life. Newborns of a critical red area near Treviso (where the levels of pFAS are higher) were divided in two groups according to the area of residence "red area A (Alonte, Asigliano, Brendola, Cologna Veneta, Lonigo, Montagnana, Noventa Vicentina, Pojana Maggiore, Pressana, Roveredo di Guà, Sarego, Zimella) and red area B" (Albaredo, Arcole, Bevilacqua, Bonavigo, Boschi Sant'Anna, Legnago, Minerbe, Terrazzo, Veronella) and then correlated with TSH values.

RESULTS

We found elevated TSH values (> 4 U/L) in 55% of patients born in the Treviso region related to the other Veneto cities. In 95% of newborns from red areas mothers, TSH value was < 2.5 U/L, 14.5% lower than the median TSH value of mothers in other Veneto cities.

ABS 65

THE AETIOLOGY OF MOLAR INCISOR HYPOMINERALIZATION IN PERINATAL AGE: FOCUS ON BREASTFEEDING

F. Cosimi, G. Rosati, F. Fabiano, M. Oricchio, C. Pala, M. Aprile

School in Pediatric Dentistry, University of Cagliari, Cagliari, Italy

INTRODUCTION

Molar incisor hypomineralization (MIH) is defined as a quality enamel defect, that affects one to four permanent first molars frequently associated with hypomineralizated incisors. Anomalies that occur during the enamel matrix secretion cause enamel hypoplasia, while enamel anomalies during the maturation stage can determinate the onset of hypomineralization. The MIH defect is characterized by asymmetric demarcated opacities, where the enamel looks soft and porous and has a typical color variation that goes from white to yellow/brown. The prevalence has been reported to

range from 2.4% to 40.2%. The etiology of MIH is complex and unknown, but in literature, some causes are environmental factors with systemic effects. These may include prenatal, perinatal and childhood medical conditions. In the literature between possible causes, we can found environmental changes, respiratory diseases and oxygen shortage of the ameloblasts. Similarly, an oxygen shortage combined with the low birth weight, disturbances in the calcium/phosphate metabolism and more frequent childhood disease with high fever could all be possible. Sometimes the use of antibiotics has been mentioned and also the exposure to dioxin by prolonged breastfeeding. On the other hand, some authors reported that children who had been breastfeeding for a less than six months period had three times the possibility of having MIH than those who were breastfed the first year of life.

MATERIALS AND METHOD

For the bibliographic review, a sample of 20 articles was chosen among the journals with the highest scientific impact, also using the PubMed portal. The research started in 2003 when the MIH was officially recognized as a real pathology by the European Academy of Pediatric Dentistry. For each article, the geographical area in which the study was carried out was analyzed, in particular, the environmental conditions and the socio-economic level. Attention was also paid to the age of the various samples of selected children. No article has been discarded since we do not yet have substantial literature on the subject.

RESULTS

All the causes of MIH mentioned and related to the perinatal period appear in the literature as valid. Regarding the theme of breastfeeding interrupted before the six months, there is only one article that combines this thesis; unlike prolonged breastfeeding beyond the year of life. We must not forget that the transmission of dioxin is strongly linked to the environmental situation, therefore to the degree of pollution of the geographical area taken into consideration and, to the possible presence of accidents with the release of dioxin.

CONCLUSIONS

Among the most important causes of MIH, surely we find those related to the perinatal period. However, it is essential to continue the epidemiological study of this pathology that is increasing exponentially. An early diagnosis, only possible thanks to the collaboration of the pediatrician, will always be helpful to the dentist for the protection of these teeth.

ABS 66

NASAL SEPTAL CHONDRITIS IN AN IMMUNOSUPPRESSED CHILD: RADIOLOGICAL IMAGING AND CLINICAL MANAGEMENT

G. Columbano[1], F. Carta[2], M. Porcu[1], R. Puxeddu[2], L. Saba[1]

[1]Department of Medical Sciences and Public Health, Unit of Radiology, AOU of Cagliari, University of Cagliari, Cagliari, Italy

[2]Department of Surgery, Unit of Otorhinolaryngology, AOU of Cagliari, University of Cagliari, Cagliari, Italy

INTRODUCTION

Nasal chondritis is a rare inflammation of the perichondrium layer and the cartilage of the nasal septum. This pathology can be observed alone or associated with nasal septal abscess [1]. The purpose of our work is to describe a case of unusual nasal chondritis to make aware physicians about its clinical and radiological presentation.

CASE REPORT

A 7-year-old boy with a clinical history of immunosuppressive drugs after heart transplantation was admitted in the Unit of Otorhinolaryngology for bilateral nasal obstruction, more intense on the left side, associated with mucus-purulent rhinorrhea, dysgeusia, frontal cephalea, facial pain, persisting for 20 days despite the antibiotic treatment. During the admission both clinical and radiological exams were suggestive for nasal septal abscess (**Fig. 1**); consequently, the patient underwent an immediate surgical incision of the septal swelling, in order to prevent any sequelae or complication. However, during the procedure, the surgeons did not find any collection, but they observed only a diffuse low-bleeding swelling of the nasal mucosa. Once the specimens were taken, the mucosa and the perichondrium were incised. The patient was discharged from the Department of Otorhinolaryngology 3 days after the surgical procedure under antibiotics therapy, in good condition. No sequelae or complications were observed at 30-day follow-up no complications and/or sequelae. Histology reported a non-specific inflammatory chronic process.

DISCUSSION

The incidence of this pathology is low, more frequently as a complication of post-traumatic hematoma [2]. Symptoms are generally nasal obstruction, facial pain, and rhinorrhea. Less frequently, the pathology occurs in immunosuppressed patients. A physical and neurological examination can be helpful to detect possible complications as cavernous

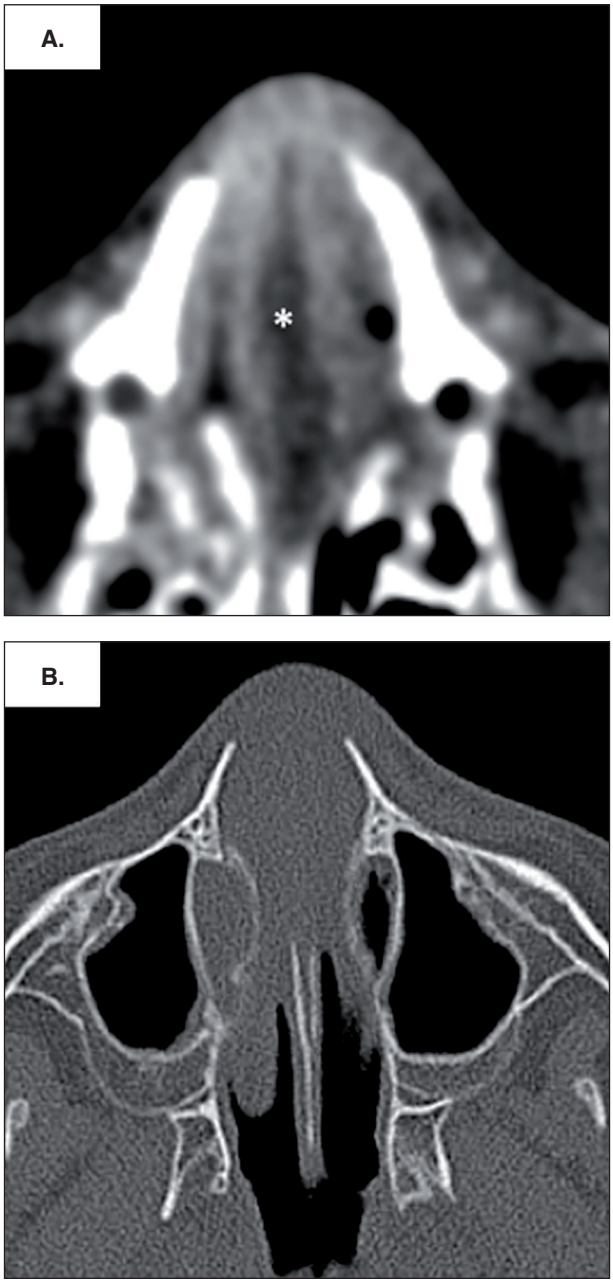

Figure 1 (ABS 66). A 7 y/o male child with suspected nasal septal abscess. **A.** CT axial after administration of medium contrast shows a midline low-attenuation lesion (asterisk) with thin peripheral contrast enhancement of the wall, in the anterior part of the nasal cavity. **B.** The bone window reconstruction reveals a decalcification of the nasal septum.

sinus thrombosis, septal perforation, deformity of deformation of the nasal saddle, sepsis and bacteremia, subarachnoid empyema, meningitis, brain abscess, cavernous sinus thrombosis, and maxillary hypoplasia.

CONCLUSIONS

The management of the nasal septal abscess requires an early diagnosis in order to establish an antibiotic therapy and the drainage of the pus collection, to prevent the necrosis of the nasal skeleton, esthetical deformations and/or neurological complications [3].

REFERENCES

- Ambrus PS, Eavey RD, Baker AS, Wilson WR, Kelly JH. Management of nasal septal abscess. Laryngoscope. 1981;91:575-82.
- Sayin I, Yazici ZM, Bozkurt E, Kayhan FT. Nasal septal hematoma and abscess in children. J Craniofac Surg. 2011;22:17-9.
- Dispenza C, Saraniti C, Dispenza F, Caramanna C, Salzano FA. Management of nasal septal abscess in childhood: our experience. Int J Pediatr Otorhinolaryngol. 2004;68:1417-21.

ABS 67

CEREBELLAR HYPOPLASIA IN A TERM BABY

C.D. Arru[1], C. Perna[1], C. Porcu[1], M. Puddu[2], L. Saba[1]

[1]Department of Radiology, AOU of Cagliari, Cagliari, Italy

[2]Neonatal Intensive Care Unit, AOU of Cagliari, Cagliari, Italy

INTRODUCTION

Cerebellar non-cystic malformations may be hypoplastic, dysplastic or aplastic involving the vermis and occasionally the cerebellar hemispheres. There may be an association between brainstem hypoplastic elements. Definite causes are unknown: they may be due to early noxae in the prenatal period (such as hemorrhages) or to genetic mutations. Cerebellar hypoplasia is a rare condition, usually unilateral. Severity does not always match the symptons, which are often clinically silent.

MATERIAL AND METHODS

We report of a term newborn boy who showed a mild neurological impairment (tremors and apnea crisis). A brain ultrasound was performed using a high-frequency linear transducer through an anterior transfontallar window. A week later an MRI was performed (1,5 T; T1, T2, tse, DWI, T1 3D).

RESULTS AND DISCUSSION

Ultrasound imaging of the posterior cranial fossa reveals the absence of the right cerebellar hemisphere and a large anechoic structure. These features are suspected for megacisterna magna. MRI (**Fig. 1**) demonstrated a residual portion of the right cerebellar hemisphere with the typical "a folia" architecture; left cerebellar hemisphere is normal. Cerebellar vermis appears small but morphologically normal. A small cleft between the fourth ventricle and the posterior subarachnoid space is observed. The absence of the inferior cerebellar peduncle

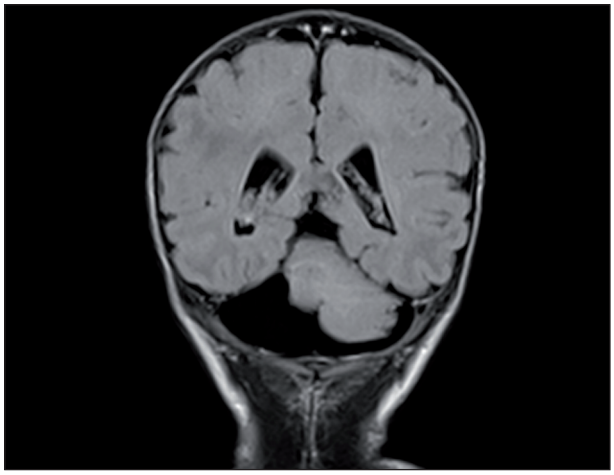

Figure 1 (ABS 67). MRI demonstrated a residual portion of the right cerebellar hemisphere with the typical “a folia” architecture; left cerebellar hemisphere is normal.

and hypoplasia of the left inferior olivar nucleus determine an anterior deviation of the ventral side of the pons and medulla oblongata, resulting in an asymmetrical brainstem.

CONCLUSION

Prenatal ultrasound usually allows an early diagnosis even though there is evidence of false negative cases. Brain ultrasound is the first step to diagnose the condition: it is cheap, repeatable, safe; though it shows a low sensitivity, therefore, it becomes mandatory to execute a second level exam such as the MRI. MRI is the gold standard in assessing cerebellar anomalies.

ABS 68

NEW DEVICES AND POSSIBLE REALITIES IN THE SHAPING OF THE PRESENT AND THE FUTURE

A. Cuttano[1], B. Gigantesco[1], M. Del Pistoia[1], F. Lorenzoni[1], P. Ghirri[1], E. Sigali[1], S. Bardelli[1], A. Mattiola[1], S. Tognarelli[1,2], M. Ciantelli[1], R. Scaramuzzo[1]

[1]Centro di Formazione e Simulazione Neonatale “NINA”, U.O. Neonatologia, Azienda Ospedaliera Universitaria Pisana, Pisa, Italy

[2]Scuola Superiore Sant’Anna, Pisa, Italy

It is said that every beginning of the century brings an exciting wave of innovation and represents a watershed between the old and the new.

The early twentieth century marked a considerable leap forward for mankind with electricity, photography, cinema and flight.

At the turn of the 2000s, we moved to a different dimension, with the ubiquitous expansion of the Internet, the development of microprocessors, lithium batteries, satellites, geolocation and miniaturization of the systems used in home automation and smartphones.

Space got warped and time expanded. We now speak of a global village and the temporal dimension becomes a "gate" to the next conquest.

Even training, at all levels has undergone a profound metamorphosis.

Today "students" have changed.

More years are spent in education (one life is not enough!), and information sources have multiplied. We remain "always connected" in a continuous and necessary updating. We do not talk about Courses anymore, but more appropriately of Routes (always in progress).

With the Internet, greater access to knowledge has become accessible to everyone. By quickly changing, ground rules have, however, exposed a gap between digital native millennials and digital migrants born around the middle of last century (current teaching), with their obsolete teaching/learning tools.

But we should not confuse this different digital approach with mere computerization and the subsequent simple ability to manage devices and software.

The way we read the world around us is changing, from a textual to a hypertextual mode. Access to medical library networks (Pubmed) and internet training courses (FAD) makes mobility redundant and reduces training time, making it increasingly ubiquitous. The possibility of videoconferences and remote training increases democratic availability of these tools.

We are beginning to come to terms with augmented reality, where we add something ephemeral and intangible to the truth, up to virtual reality where experience is the result of graphic elaboration and multi-sensory construction from refined informatic-engineering research. There is also a profound transformation in communication at the core of these processes, from the "profound synthesis" of social media (an alternative source of information if well used) to counselling language.

When speaking of technology, our mind goes to screws and bolts. They are still there, but joined by chips, controllers and mechatronic actuators. In our laboratory at the Nina Training and Simulation Center in Pisa we have started to build five-chamber pulmonary simulators (with the possibility of

varying VT, Compliance, Resistances ...) to train us to use pulmonary ventilators in all their different and possible uses. We have developed sensorized intubation heads models for training, in playful mode; approaches to spinal and epidural techniques with a high-fidelity model, after looking at human tissues and exploiting the availability of silicones of equal elasticity. We set out to review consolidated procedures… just by improving them a bit.

Beyond screws and bolts then. The creation and use of ever more sophisticated humanoid simulators make simulation sessions more and more realistic. This is true for both practical or technical skill acquisition and a more holistic approach to the study of non-technical skills.

Innovation means using devices such as hololenses (glasses that deceive our vision by putting forward/offering non-real or non-existing holographic details), or trying to analyse more carefully events and mental processes (extrapolated during post-simulation analysis/debriefing) through the subjective point of view obtained with google glasses.

Where now the search for "correct care" is not postponed, in complex health systems, we must improve numbers of protocols and "good" guidelines. Nothing can be left to chance and the "bug" (the possible error) must be analyzed and resolved immediately. Growing legal medical litigation (negative boost) and the need to follow a seemingly unstoppable progress (positive spring), made of research, safety and therapeutic assurance, push us in one direction.

In the face of incessant technological research, training must become more imaginative to better serve those who operate in complex work environments such as ours.

REFERENCES

• Panizza D, Scaramuzzo RT, Moscuzza F, Vannozzi I, Ciantelli M, Gentile M, Baldoli I, Tognarelli S, Boldrini A, Cuttano A. Technical realization of a sensorized neonatal intubation skill trainer for operators' retraining and a pilot study for its validation. Ital J Pediatr. 2018;44(1):4.

• Baldoli I, Tognarelli S, Vangi F, Panizza D, Scaramuzzo RT, Cuttano A, Laschi C, Menciassi A. An active simulator for neonatal intubation: Design, development and assessment. Med Eng Phys. 2017;39:57-65.

• Baldoli I, Cuttano A, Scaramuzzo RT, Tognarelli S, Ciantelli M, Cecchi F, Gentile M, Sigali E, Laschi C, Ghirri P, Menciassi A, Dario P, Boldrini A. A novel simulator for mechanical ventilation in newborns: MEchatronic REspiratory System SImulator for Neonatal Applications. Proc Inst Mech Eng H. 2015;229(8):581-91.

• Baldoli I, Tognarelli S, Cecchi F, Scaramuzzo RT, Ciantelli M, Gentile M, Cuttano A, Laschi C, Menciassi A, Boldrini A, Dario P. An active one-lobe pulmonary simulator with compliance control for medical training in neonatal mechanical ventilation. J Clin Monit Comput. 2014;28(3):251-60.

• Halamek LP. Simulation and debriefing in neonatology 2016: Mission incomplete. Semin Perinatol. 2016;40(7):489-93.

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OSTEOPENIA OF PREMATURITY: AN UNDER-ESTIMATED DIAGNOSIS

P. Abou Jaude, V. Modica, M. Samarani, G. Nicolas, M. Amm, M.C. Fadous Khalife

Holy Spirit University of Kaslik, Kaslik; UH-Notre Dame Des Secours, Jbeil, Lebanon

INTRODUCTION

Neonatal osteopenia, which is a well-described condition, is becoming more frequent nowadays due to the increase in the premature infants' survival. This condition is described as a reduction in bone mineral density that predisposes newborns to pathological fractures. Many risk factors are associated with this condition, with prematurity and very low birth weight being the most important ones because of insufficient intrauterine supply of calcium and phosphorus. However, few studies are available regarding the prevention and treatment of neonatal osteopenia. Being a silent condition, screening is mandatory for diagnosis. We report the detection of neonatal osteopenia in premature infants.

CASE REPORT

One patient was diagnosed having neonatal osteopenia with an alkaline phosphatase of 1,935 at the age of 5 months with a diffused bone demineralization and was ameliorated after treatment with vitamin D, calcium chloride, phosphoric acid, magnesium and alfa calcidiol. Another case was also detected at the age of 45 days with an alkaline phosphatase of 1,174. The same treatment was started with complete healing of the osteopenia. The two cases had a common risk factor of necrotizing enterocolitis which led to a long fasting duration. In this period adequate calcium and phosphorus supplementation, as well as vitamin D, was hardly achieved. Then both babies were fed by an extensively hydrolyzed formula. The literature review showed that phosphate in this formula has limited bioavailability. From those cases, we learn that early screening is essential for premature infants with high-risk factors such as VLBW, prolonged parental nutrition, corticosteroids, and diuretic treatment. Receiving amino acid formulas in premature infants should be considered as an important risk factor requiring screening. The

prolonged use of elementary formulas should probably be considered as an additional risk factor for osteopenia in this right risk population.

REFERENCES

- Chen HY, Chiu LC, Yek YL, Chen YL. Detecting rickets in premature infants and treating them with calcitriol: experience from two cases. Kaohsiung J Med Sci. 2012;28(8):452-6.
- Gonzalez Ballesteros LF, Ma NS, Gordon RJ, Ward L, Backeljauw P, Wasserman H, Weber DR, DiMeglio LA, Gagne J, Stein R, Cody D, Simmons K, Zimakas P, Topor LS, Agrawal S, Calabria A, Tebben P, Faircloth R, Imel E, Casey L, Carpenter TO. Unexpected widespread hypophosphatemia and bone disease associated with elemental formula use in infants and children. Bone. 2017;97:287-92.
- Rehman MU, Narchi H. Metabolic bone disease in the preterm infant: Current state and future directions. World J Methodol. 2015;5(3): 115-21.

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URINARY METABOLOMICS IN EXTREMELY LOW GESTATIONAL AGE NEWBORN INFANTS AND NEUROLOGICAL OUTCOME AT 2 YEARS: A PRELIMINARY STUDY

C. Fanni[1], H. Hagberg[2], M. Alkmark[2], F. Cesare Marincola[3], S. Corbu[3], M.A. Marcialis[1], M. Testa[1], M.C. Pintus[1], C. Loddo[1], V. Fanos[1], K. Sävman[4], V. Fellman[5]

[1]Neonatal Intensive Care Unit, Neonatal Pathology and Neonatal Section, AOU and University of Cagliari, Cagliari, Italy

[2]Centre of Perinatal Medicine & Health, Institute of Clinical Sciences, University of Gothenburg, Gothenburg, Sweden

[3]Department of Chemical and Geological Sciences, University of Cagliari, Cagliari, Italy

[4]Centre of Perinatal Medicine and Health, Institute of Neuroscience and Physiology and Clinical Sciences, University of Gothenburg, Gothenburg, Sweden

[5]Department of Clinical Sciences, Pediatrics, Lund University, Lund, Sweden and Children's Hospital, University of Helsinki, Helsinki, Finland

INTRODUCTION

Improvements of obstetric and neonatal care lead to increased survival of extremely low gestational age newborn (ELGAN) infants [1] and thus to an increase of the number of children with neurocognitive impairments as the rate of sequelae has remained largely unchanged [2]. We aimed to evaluate the value of urinary metabolic profile in predicting adverse neurocognitive outcome in a subpopulation of the EU-funded NEOBRAIN study on ELGAN infants. To investigate this, we correlated the urinary metabolic profile at 4 weeks of age with neurocognition at 2 years of age.

MATERIALS AND METHODS

We studied 18 subsequently enrolled surviving ELGAN infants with a mean gestational age 25.3 weeks (range 23.4-27.4) and birth weight 736 g (range 444-1,038) born in Skåne University Hospital, Lund, Sweden. They were assessed at 2 years of age by a neurologist and psychologist (Bailey-III) and the composite outcome categorized as normal or adverse development.

Sample collection

Urine samples were collected at 4 weeks of life with a cotton ball into the diaper, withdrawn in a sterile syringe, and frozen at -80°C. ^{1}H-NMR experiments: ^{1}H-NMR experiments were performed with a Varian UNITY 500 spectrometer at a frequency of 499.83 MHz.

Statistical analysis

Multivariate statistical analysis was performed through SIMCA program version 14.1 (MKS Umetrics, Sweden).

RESULTS AND DISCUSSION

Both Principal Component Analysis (PCA) and Orthogonal Projections to Latent Structures Discriminant Analysis (OPLS-DA; R^2Y = 0.865; Q^2Y = 0.297; p = 0.4) of ^{1}H-NMR spectra failed to evidence group separation according to neurodevelopment outcomes. Sample distribution in the PC1 vs. PC2 PCA scores plot (**Fig. 1**) was mainly driven by the levels of the following metabolites: glucose, N-acetyl derivates, myo-inositol, succinate, betaine, DMA, 1-methyl-nicotinamide and creatinine. The former was most abundant in the urine of two infants with abnormal development whose corresponding scores are located on the extreme right side of the

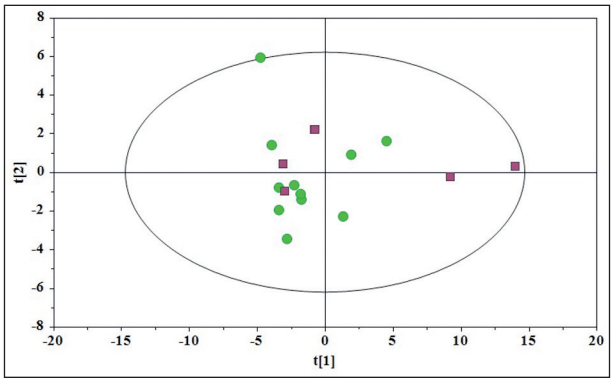

Figure 1 (ABS 70). PCA score plot of ^{1}H-NMR urine spectra collected at 4 weeks of life from 18 subsequently, surviving ELGAN infants. The scores are colored according to neurodevelopment: normal, green circles; abnormal, dark red boxes.

PCA score plot, while all the other metabolites were present at high levels in the urine of the other newborns. Some of the detected metabolites are related with energetic metabolic pathways: myo-inositol is located mainly in glial cells, and it is essential to maintain the osmotic balance of the cells [3]; succinate is an intermediate product of citric acid cycle, and its oxidation leads to the accelerated production of reactive oxygen species with the consequent mitochondria damage [4-6].

CONCLUSIONS

Further investigations on plasma metabolites at earlier time points are warranted to be compared with the urinary metabolomic profile and outcome measures.

REFERENCES

[1] EXPRESS Group; Fellman V, Hellström-Westas L, Norman M, Westgren M, Källén K, Lagercrantz H, Marsál K, Serenius F, Wennergren M. One-year survival of extremely preterm infants after active perinatal care in Sweden. JAMA. 2009;301:2225-33.

[2] Moore T1, Hennessy EM, Myles J, Johnson SJ, Draper ES, Costeloe KL, Marlow N. Neurological and developmental outcome in extremely preterm children born in England in 1995 and 2006: the EPICure studies. Br Med J. 2012;4;345:e7961.

[3] Haris M, Cai K, Singh A, Hariharan H, Reddy R. In vivo mapping of brain myo-inositol. NeuroImage. 2011;54:2079-85.

[4] Sahni PV, Zhang J, Sosunov S, Galkin A, Niatsetskaya Z, Starkov A, Brookes PS, Ten VS. Krebs cycle metabolites and preferential succinate oxidation following neonatal hypoxic-ischemic brain injury in mice. Ped Res. 2018;83:491-7.

[5] Koning G, Leverin AL, Nair S, Schwendimann L, Ek J, Carlsson Y, Gressens P, Thornton C, Wang X, Mallard C, Hagberg H. Magnesium induces preconditioning of the neonatal brain via profound mitochondrial protection. J Cereb Blood Flow Metab. 2017 Jan 1. [Epub ahead of print].

[6] Chouchani ET, Pell VR, Gaude E, Aksentijević D, Sundier SY, Robb EL, Logan A, Nadtochiy SM, Ord ENJ, Smith AC, Eyassu F, Shirley R, Hu CH, Dare AJ, James AM, Rogatti S, Hartley RC, Eaton S, Costa ASH, Brookes PS, Davidson SM, Duchen MR, Saeb-Parsy K, Shattock MJ, Robinson AJ, Work LM, Frezza C, Krieg T, Murphy MP. Ischaemic accumulation of succinate controls reperfusion injury through mitochondrial ROS. Nature. 2014;515:431-5.