ID: 145

**TITLE:** EARLY INTERVENTION PROGRAM FOR VERY PRETERM INFANTS THAT ALLOWS FAMILIES TO APPLY IT CONTINUOUSLY AT HOME IMPROVES NEURODEVELOPMENT OUTCOME IN THE FIRST YEAR OF LIFE

**AUTHORS:** Rita C Silveira 1; Nadia C Valentini 2; Lilian Refosco 3; Eliane Mendez 4; Lenir Cauduro 3; Renato S Procianoy 1

**AFFILIATIONS:** 1- Pediatric Department., Federal University of Rio Grande do Sul and Neonatal Section Hospital de Clinicas de Porto Alegre, RS, Brazil
2- Programa de Pos graduação em Ciencias do Movimento Federal University of Rio Grande do Sul. Porto Alegre, RS, Brazil
3- Neonatal Section, Hospital de Clinicas de Porto Alegre, RS, Brazil
4- Escola de Enfermagem, Federal University of Rio Grande do Sul. Porto Alegre, RS, Brazil

**CONTENT:**

Early intervention programs for preterm infants that focus on development while the babies are still in the hospital and post discharge, and into the community setting may have an important impact on long-term morbidity. Aim is to develop an early intervention program for very preterm infants that allows families to apply it continuously at home, as well as to quantify the results of early parental stimulation on improvement of cognition and motor skills.

Randomized Clinical Trial (NCT02835612) inborn preterm infants GA < 32 weeks or BW <1500 grams. Exclusion; death before 48 hours after birth, major congenital malformations. Intervention Group (IG): standard care plus tactile-kinesthetic stimulation during NICU stay. After discharge they receive systematics orientations for simulation at home and usual follow-up. Conventional Group (CG): standard care (kangaroo and breast-feeding policy) and they are referred to follow-up clinic which takes care of the demands according to their necessity. Home visits to to be sure that the intervention had been done by families (IG). Neurodevelopment outcome was measured by AIMS and Bayley III scales at 8 months CA.

A total of 66 preterm infants, birth weight and gestational age was 1083 ±313 grams and 29 ±2 wk IG; 1102 ±295 grams and 28.6 ± 1 wk CG. Late-onset sepsis and antibiotics use were more prevalent in CG (p=0.024). Pre-discharge PBI had similar means of maternal care and overprotection, means of paternal care and overprotection IG had Head Circumference smaller than CG at discharge (IG 33±1.9 cm and CG 34.1±1.9 cm, p=0.041). However, CG had poorer language compositum and motor function than IG at 8 months CA (MDI language 90±12 and 98± 14;p=0.038; PDI 84 ± 17 and 95± 15; p=0.025, respectively). In IG 24% and CG 54% of children had atypical development by AIMS (p= 0.041). After binomial regression stratified analyses including variables at p<0.10, the effect of intervention for obtain normal neurodevelopment was 1.62 (IC95% 1.10-2.61; p 0.04).

Parents can learn how to support their child’s development of motor and cognitive processes by receiving specialized and multidisciplinary skills training improving the neurodevelopment outcome of premiers at 8 months CA.

This study was supported by grants from CNPQ, Brazil Health Ministry and Bill and Melinda Gates Foundation.

**IMAGES:**
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=bc6f14a7630d6082d3a6e3d2220e74db-MjAxOS0wNSM1Y2UyNjY2YmRkOThh

**COI:** None declared
ID: 208

TITLE: EARLY MOTOR PROBLEMS AND THE EFFECTS OF PHYSIOTHERAPY ON LATER CHILD OUTCOMES

AUTHORS: Nicole Baumann 1; James Tresilian 1; Dieter Wolke 1,2

AFFILIATIONS: 1 Department of Psychology, University of Warwick, Coventry, United Kingdom
2 Warwick Medical School, University of Warwick, Coventry, United Kingdom

CONTENT:

Early motor coordination problems have previously been associated with detrimental outcomes across various developmental domains in childhood. Despite increasing evidence suggesting that physiotherapy may not be effective to improve motor performance, children with early motor deficits are often referred to physiotherapy. However, previous studies have not yet investigated whether and how treatment via physiotherapy may influence the association between early motor problems and later developmental outcomes.

A prospective whole-population longitudinal study in Southern Germany assessed 1374 children from birth to 8 years. Early motor functioning was assessed at birth and at 5 months through standardised neurological assessments. Information on referral to physiotherapy was taken from parent interviews at 5, 20 and 56 months. Developmental outcomes included motor skills, mental health, cognitive function, attention regulation, academic achievement, and peer and parent relationships, and were measured at age 6 and 8 years via various standardised assessments and observations. Structural Equation Modelling (SEM) was applied to test direct and indirect associations between early motor problems and physiotherapy to later child outcomes.

Both, infant motor problems and physiotherapy were negatively associated with motor skills ($\beta=-0.22$, $p<.001$ and $\beta=-0.14$, $p=.004$), cognitive function ($\beta=-0.10$, $p<.001$ and $\beta=-0.18$, $p<.001$), attention regulation ($\beta=-0.09$, $p<.001$ and $\beta=-0.16$, $p<.001$) and academic achievement ($\beta=-0.10$, $p<.001$ and $\beta=-0.13$, $p<.001$) at school age. Detrimental effects of early motor problems on developmental outcomes, such as motor skills ($\beta=-0.04$, $p=.006$), cognitive function ($\beta=-0.06$, $p<.001$), attention regulation ($\beta=-0.05$, $p<.001$), and academic achievement ($\beta=-0.04$, $p=.001$), were partly mediated by physiotherapy. Early motor problems and physiotherapy had no direct effect on mental health. Physiotherapy however, had a direct negative effect on peer relationships ($\beta=-0.11$, $p=.011$) and a positive direct effect on parent-child relationships ($\beta=0.09$, $p=.032$).

Findings show that infant motor problems are associated with later developmental problems across various psychological domains. Infant motor problems may represent a starting point of a trajectory of difficulties that may lead to problems in multiple developmental domains. No evidence for a beneficial effect of early physiotherapy on later developmental abilities was found in at-risk children.

COI: None declared
ID: 213

TITLE: A SYSTEMATIC REVIEW OF BIOMARKERS IN NEONATAL ENCEPHALOPATHY TO PREDICT LONG TERM OUTCOME

AUTHORS: Mary O’Dea 1-6, Tim Hurley 1-4, David Mocker 7, Kasper Kyng 8, Bob Phillips 9, Eleanor Molloy 1-6

AFFILIATIONS: 1. Department of Paediatrics and Child Health Trinity College Dublin, Ireland
2. Coombe Women and Infant's University Hospital, Dublin, Ireland
3. National Maternity Hospital, Holles Street, Ireland
4. Rotunda Hospital, Dublin, Ireland
5. National Children's Research Centre. Crumlin, Ireland
6. National Children's Hospital Foundation. Tallaght, Ireland
7. Subject Librarian, School of Medicine, Trinity College Dublin, Ireland
8. University of Aarhus, Denmark
9. University of York, UK

CONTENT:

Neonatal Encephalopathy (NE) describes central nervous system dysfunction from all causes and has a multifactorial aetiology. NE is difficult to diagnose, to treat and to predict outcome. In recent years there has been extensive research in diverse fields including blood, urine, CSF and neuroimaging to identify biomarkers in NE to predict outcome. Despite this there is no gold standard biomarker known at present and predicting outcomes in NE remains a significant challenge. Identifying prognostic biomarkers has implications for counselling parents on expected neurodevelopmental outcomes, future adjunctive therapies and guiding research.

The systematic review protocol was registered with Prospero. EmBase, PubMed, Cochrane and Web of Science were searched with relevant search terms. Biomarkers examined included serum, CSF and neuro-imaging to predict a composite outcome of death or abnormal neurodevelopmental assessment from six months of age to school age.

Two independent reviewers used Covidence software for study screening. A modified Cochrane data extraction form was used for data extraction and study quality was assessed using the QUIPS risk of bias (ROB) tool. Analysis of data and ROB was completed using Revman software (v5.3). When appropriate, studies were included in a meta-analysis (MA), using weighted mean difference and standard deviation for continuous data, and odds ratio for discrete data.

1613 papers were identified after duplicates were excluded. Following title and abstract screening there were 314 studies for full text screening, after which 71 papers were included to examine biomarkers to predict long term outcome. These 71 papers reported outcomes for over 20 different biomarkers. There was sufficient data to complete MA for 6 serum biomarkers and MRI as an individual biomarker.

MRI brain was the best biomarker to predict outcome. The meta-analysis included 938 patients from 23 studies. Abnormal MRI brain was predictive of adverse outcome with an odds ratio of 18.78 (95% CI 12.53 to 28.14). Raised serum Interleukin-6 (p value <0.01, effect estimate 141, 95% CI 32 to 252) and neuron specific enolase (p value <0.01, effect estimate 43.7, 95% CI 5 to 83) are associated with adverse long term outcome in NE, however there were small patient numbers in both studies.

MRI brain provides early prognostic information on long-term developmental outcome in NE. Early prognostic information is important to initiate early intervention of therapies, to counsel parents and for resource planning. Conclusive results could not be reached for many biomarkers due to reporting methods, small patient numbers and significant heterogeneity in reporting. Studies in future will benefit from establishment of core outcomes.
Figure 1: Meta-analysis of MRI brain to predict long term neurodevelopmental outcome and death

COI: nil
ID: 387

TITLE: HEAR ME! PERMANENT CHILDHOOD HEARING IMPAIRMENT (PCHI) IN HYPOXIC ISCHEMIC ENCEPHALOPATHY (HIE)- SINGLE CENTRE 9 YEAR COHORT STUDY

AUTHORS: Dr. Ebtehal Hamed, Paediatric Registrar ST4
Co authors:
Dr Nazakat Merchant- Consultant Neonatologist
Dr Alpana Kulkarni- Consultant In Audiovestibular Medicine

AFFILIATIONS: Department of Neonatology, Watford General Hospital, West Hertfordshire Hospitals NHS Trust, UK

CONTENT:

HIE and PCHI both present a significant clinical burden with high morbidity and mortality. PCHI in HIE increases the risk for further developmental delay. Evidence through metanalysis of moderate-severe HIE showed a 5.4% incidence of PCHI with no difference in the cooled and uncooled groups (Edwards 2010). There is currently no published data on mild HIE. Also the specificity and sensitivity of newborn hearing screen test is not known in infants with HIE. An unexpectedly high proportion of PCHI was noted in our HIE follow up.

Aim of our study was to establish the incidence of PCHI and to investigate the contributing risk factors that may increase risk of acquiring PCHI in infants with HIE.

Single centre retrospective cohort study of term & near term infants with HIE over 9 years (2010-18). Deaths & babies with temporary hearing impairment due to middle ear effusion were excluded. Detailed demographic & clinical data were collated. Babies who failed the Newborn Hearing Screening Programme (NHSP) had diagnostic ABR. Age appropriate behavioural audiological follow up testing was done as per British Society of Audiology. Aetiological investigations were offered for SNHL as per British Association of Audiovestibular Medicine guidelines. Results were analysed using STATA 12 and Microsoft excel.

Incidence of PCHI 8.8% (8/91) in our cohort of HIE infants was significantly higher than previously reported. Between groups of HIE with or without hearing loss, there was no significant difference in birthweight, gestation, gender, delivery, Apgars-10 minutes, ventilation days, severity of HIE or aminoglycoside treatment. Babies with PPHN, lower Apgars at 1 & 5 minutes or loop diuretics treatment were significantly more likely to have PCHI.

Amongst 8 PCHI babies, 6 had bilateral sensori-neural hearing loss (SNHL), 1 had unilateral SNHL and one had unilateral auditory neuropathy. Mean degree of hearing loss was 51.4 (±SD 14.4) dBHL. Aetiological investigations for SNHL were normal MRI IAMS, negative for CMV in all and negative genetics (Connexin 26 & A1555G mutation) in bilateral SNHL. NHSP detected all infants with hearing loss in HIE with 100% sensitivity and 97.59% specificity.

Our study reported detailed methodology for hearing loss in HIE. It raises the awareness that infants with PPHN & diuretic medication are vulnerable to PCHI. We hypothesise that acute perinatal hypoxia even with early recovery may be associated with hearing loss. NHSP has high sensitivity and specificity which is reassuring. Further research is needed with a larger cohort to look at these risk factors and long-term neurodevelopmental outcome.

IMAGES:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=6136728b0c40b6645dd3fb867c07529-MjAxNy0wNSM1Y2UyNjY2YzQ2OGFj

COI: None declared
ID: 416

TITLE: EDUCATIONAL ACHIEVEMENTS OF CHILDREN WHO UNDERWENT NEONATAL CARDIAC SURGERY FOR CYANOTIC CONGENITAL HEART DISEASE

AUTHORS: Constanze Pfitzer 1; Aleksandra Buchdunger 2; Hannah Ferentzi 3; Paul C. Helm 4; Maximilian J. Blickle 5; Felix Berger 6; Christoph Bührer 7; Katharina R.L. Schmitt 8

AFFILIATIONS: Constanze Pfitzer1,2,3,4, Aleksandra Buchdunger1, Hannah Ferentzi1, Paul C. Helm5, Maximilian J. Blickle1, Felix Berger1,4,6, Christoph Bührer2, Katharina R.L. Schmitt1,4
1 Department of Congenital Heart Disease, Paediatric Cardiology, Deutsches Herzzentrum Berlin, Berlin, Germany
2 Department of Neonatology, Charité – Universitätsmedizin Berlin, Berlin, Germany.
3 Berlin Institute of Health (BIH), Berlin, Germany
4 DZHK (German Centre for Cardiovascular Research), partner site Berlin, Germany
5 National Register for Congenital Heart Defects, DZHK (German Centre for Cardiovascular Research), Berlin, Germany
6 Department of Paediatric Cardiology, Charité – Universitätsmedizin Berlin, Berlin, Germany.

CONTENT:

Patients with congenital heart disease (CHD) are at increased risk for neurodevelopmental delays, such as deficits in motor function, cognition and language. These deficits may impair educational achievements. Especially children with complex CHDs were found to be at risk for possible neurodevelopmental deficits. Therefore, the educational achievement of children diagnosed with univentricular heart physiology (UVHP) or transposition of the great arteries (TGA) are of special interest. These primary cyanotic CHDs require cardiac surgery during the neonatal period. The aim of our present study was to evaluate the academic performance and graduation of this specific patient cohort.

Data of CHD patients registered with the National Register for Congenital Heart Defects (NRCHD) in Germany was analyzed for this exploratory study. Information pertaining to the educational achievements were ascertained with an online survey performed among the NRCHD patient cohort in 2017. For this study, a subgroup analysis among patients diagnosed with TGA (n=173; 36.3%) and UVHP (n=304; 63.7%) was conducted. Patients born between 1992 and 2011 were included. The primary focus of the survey was to assess data regarding their school careers and graduation.

Median age of the total sample was 13 years (range 5-25) and 1/3 of participants were female (same distribution in the subgroups). A noteworthy number of patients had been diagnosed with behavioral or learning disorders and received early supportive therapy or remedial teaching before and during their school careers. Median age of the whole patient cohort at school enrollment was 6 years (range 5-8). The large majority of study participants were enrolled at a normal elementary school (77.1%; German general population: 93,5%). Half of the study group (45.8%; German general population: 53%) graduated from an academically higher ranked secondary school form (≥ISCED level 3). We could not detect a significant difference between CHD subgroups regarding achievement of a high or low ISCED level. Only patients with UVHP (8.0%) reported not graduating school.

The majority of patients undergoing neonatal cardiac surgery had average school careers. These results are of great importance to CHD patients, affected families and treating physicians. However, study participants were still confronted with academic difficulties and frequently required additional support. This emphasizes the need for long-term follow-up examinations and regular developmental assessments to identify at risk patients.

IMAGES:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=afe939f6e148e766a8bc16c40aa7f7c8-MjAxsOS0wNSM1Y2UyNjY2YzU2YTMx
COI: Constanze Pfitzer will receive a travel grant for the 3rd Congress of joint European Neonatal Societies in Maastricht by the company Chiesi.
ID: 424

TITLE: CONGENITAL HEART DEFECTS AND NEURODEVELOPMENTAL FOLLOW-UP

AUTHORS: Mette Marie Baunsgaard 1, Mette Høj Lauridsen 1,2, Charlotte K Gilberg 3, Dorthe B Wibroe 3, Trine Haugsted 3, John R Østergaard 1,2, Vibeke E Hjortdal, 1,4

AFFILIATIONS: 1 Institute for Clinical Medicine, Aarhus University, Aarhus, Denmark, 2 Department of Pediatrics and Adolescent Medicine, Aarhus University Hospital, Aarhus, Denmark, 3 Department of Physio- and Occupational Therapy, Aarhus University Hospital, Aarhus, Denmark, 4 Cardiothoracic Research Department T, Aarhus University Hospital, Aarhus, Denmark.

CONTENT:

Children with congenital heart disease (CHD) have previously been shown to be at an increased risk of impaired cognitive development from as early as infancy. We have followed a group of children born with and without a CHD from early pregnancy. Our aim in the present study, was to assess their birth biometrics and their cognitive development at the age of 18 months. This was done using the The Bayley Scales of Infant and Toddler Development-Third Edition (Bayley-III) and the ages and stages questionnaires third edition (ASQ-3). We hypothesised that the children with a CHD would have significantly lower developmental scores than the children without a CHD.

Recruitment of women expecting fetuses with and without heart defects took place at Aarhus University Hospital between 2014 and 2016. We performed Magnetic resonance imaging of the fetuses twice during pregnancy. In the present study we present follow-up of 13 children with- and 27 children without a CHD. At the average age of 18 months a physiotherapist and an occupational therapist performed the blinded Bayley-III assessment. The Bayley scores were converted to percentiles. At the same age their parents completed the ASQ-3 according to age (ASQ-3, 18 months) as well as the questionnaires for a 6-month older child (ASQ-3, 24 months). We calculated the corresponding z-scores. We used the Pearson chi2-, z- and t-test to compare the results between those with and those without a CHD.

Children with CHDs were born with significantly smaller head circumferences (P = 0.025). Also, they achieved significantly lower scores in the ASQ-3, 24 months communication (P =0.0498) and gross motor (P = 0.046) categories. There were no significant performance differences between the two groups in the Bayley-III assessment.

Children with CHDs show significantly lower scores in ASQ-3, 24 months communication and gross motor categories compared with their age equivalent peers. This may be indicative of impaired cognitive development; next follow-up will be at 36 months of age.

COI: The authors have no conflicts of interest
ID: 564
TITLE: MATERNAL EDUCATION AND LANGUAGE SKILLS AT 2 YEARS CORRECTED AGE IN CHILDREN BORN VERY PRETERM
AUTHORS: Mariane Sentenac 1; Marie-Laure Charkaluk 2; Samantha Johnson 3; Jennifer Zeitlin 1
AFFILIATIONS: 1 Inserm UMR 1153, Obstetrical, Perinatal and Pediatric Epidemiology Research Team (Epopé), Center for Epidemiology and Statistics Sorbonne Paris Cité, Paris, France.  
2 Paris 2 Université Catholique de Lille, Lille, France 3 Service de néonatologie, Hôpital Saint Vincent de Paul, Groupement des Hôpitaux de l’Institut Catholique Lillois/Faculté de Médecine et Maïeutique, Lille, France  
3 Department of Health Sciences, George David Centre, University of Leicester, University Road, Leicester, LE1 7RH, UK.

CONTENT:

In the general population, children from socioeconomically disadvantaged families face higher risks of developmental language delay (DLD). Less research exists on very preterm (VPT) children and results have been contradictory, which may reflect a lesser impact of socioeconomic factors when perinatal risks for delayed development are high. Our objective was to investigate the association of maternal education, used as a proxy for the socioeconomic context, with DLD at 2 years of age by degree of perinatal risk, in children born VPT in six European countries.

Data come from the area-based Effective Perinatal Intensive Care in Europe (EPICE) cohort of children born <32 weeks’ gestational age (GA) in 2011/2012. Perinatal data were abstracted from medical records and follow-up was conducted using parental questionnaires at 2 years corrected age. Six countries (Belgium, Estonia, France, Italy, Netherlands, UK) used a validated short form MacArthur Developmental Communicative Inventories version; DLD was assessed using 3 outcomes: not yet combining words; and expressive vocabulary <10th percentile and <10 words. We estimated RRs for DLD for maternal education overall and by perinatal risk (low, moderate, high), classified using GA, small for gestational age and severe neonatal morbidities.

Among the 4666 eligible children, 2990 (64%) were followed up. After exclusion of families speaking only other languages at home and children with severe hearing impairment, 2643 VPT children (mean GA 28.8 weeks) assessed at a median 24 months corrected age were included in this study. 25.3% were not combining words; and expressive vocabulary <10th percentile and <10 words. Among children with low perinatal risk only, risks of DLD were higher when mothers had less than high school versus tertiary education (RR word combination: 2.2 (95% CI: 1.5; 3.3); RR <10th percentile: 1.6 (95% CI: 1.2; 2.1); RR <10 words: 2.6 (95% CI: 1.3; 5.3) – adjusted for country and age at assessment). Among children with higher perinatal risk (lower GA, SGA and severe morbidities), maternal education was not associated with DLD.

Maternal education was associated with developmental language delay at 2 years of corrected age only among VPT children with low perinatal risk. This finding suggest that social factors interact with perinatal risk; this interaction may explain contradictory findings in previous studies.

COI: None declared
ID: 590

**TITLE:** HEMOSTATIC AND FIBRINOLYTIC PARAMETERS IN PREBUBERTAL CHILDREN BORN PREMATURELY – ASSOCIATIONS WITH CARDIOVASCULAR RISK FACTORS

**AUTHORS:** Panagiota Markopoulou 1, Michail Mazarakis 2, Aimilia Mantzou 3, Ioannis Papassotiriou 4, Eleni Platokouki 2, Tania Siahanidou 1

**AFFILIATIONS:** 1 Neonatal Unit of the First Department of Pediatrics, National & Kapodistrian University of Athens, School of Medicine, Athens, Greece, 2 Hemophilia Center and Hemostasis Unit, "Aghia Sophia” Children’s Hospital, Athens, Greece, 3 Choremio Research Laboratory, “Aghia Sophia” Children’s Hospital, Athens, Greece, 4 Department of Clinical Biochemistry, “Aghia Sophia” Children’s Hospital, Athens, Greece

**CONTENT:**

It still remains a controversial issue whether prematurity consists an independent risk factor for the subsequent development of metabolic syndrome and cardiovascular disease. Components of the metabolic syndrome have been associated with hemostatic abnormalities and impaired fibrinolysis, which may lead to a hypercoagulable condition. It has not been studied, so far, if preterm birth is associated with hemostatic and/or fibrinolytic alterations in later life. The aim of this study was to determine hemostatic and fibrinolytic parameters in prepubertal children born prematurely and to assess possible correlations with cardiovascular risk factors.

The study population consisted of 91 children, 8-13 years old [52 preterm of gestational age 33 (30-34.2) weeks and 39 fullterm, as controls]. Anthropometric measurements (body mass index-BMI, waist/hip circumference-WHR) and arterial blood pressure were assessed. Hematological and biochemical parameters (full blood count, serum glucose, insulin, and lipid levels), as well as plasma concentrations of hemostatic and fibrinolytic parameters [fibrinogen, von Willebrand Factor antigen (vWFAg), factors VIII and IX, proteins C and S, plasminogen, plasminogen activator inhibitor-1 (PAI-1)] were also assessed. For statistical analysis, Student’s t-test and stepwise regression analysis were applied.

In comparison with controls, children born prematurely, of gestational age ≤32 weeks, presented with higher levels of vWFAg and PAI-1 (p=0.03 and p=0.04, respectively). No significant difference of other hemostatic and fibrinolytic parameters assessed was found between preterm and fullterm population. In the total preterm population, fibrinogen correlated significantly with BMI (β=4.01, p=0.02) and insulin levels (β=2.76, p=0.01); vWFAg correlated significantly with gestational age (β=-2.99, p=0.04) and diastolic blood pressure (β=-1.6, p=0.01); factor IX was positively correlated with insulin levels (β=0.96, p=0.03); protein S was positively correlated with WHR (β=95.05, p=0.02); plasminogen was correlated significantly with BMI (β=1.63, p<0.001); PAI-1 levels were correlated significantly with gestational age (β=0.09, p=0.05), BMI (β=0.11, p=0.03) and glucose levels (β=0.03, p=0.03).

Prepubertal children born prematurely of gestational age ≤32 weeks demonstrate higher vWFAg and PAI-1 levels in comparison with controls, reflecting hypercoagulability and hypofibrinolysis. In the total preterm population, hemostatic and fibrinolytic parameters are independently associated with metabolic syndrome components and cardiovascular risk factors, implicating their role in the progression of metabolic syndrome and cardiovascular disease.

**COI:** None declared
ID: 731

**TITLE:** LONG-TERM TRENDS IN SURVIVAL AND CEREBRAL PALSY AMONG EXTREMELY PRETERM INFANTS (≤28 WEEKS) IN NORTHWEST GREECE

**AUTHORS:** Aikaterini Drougia 1, Maria Baltogianni 1, Theodoros Gouvias 1, Dimitrios Rallis 1, Nikolaos Krallis 1, Iliada Nakou 2, Natasa Bega 3, Meropi Tzoufi 2, Vasileios Giapros 1.

**AFFILIATIONS:** 1 Neonatal Intensive Care Unit (NICU) University Hospital of Ioannina, 2 Paediatric Clinic-Department of Paediatric Neurology University Hospital of Ioannina, 3 Hellenic Society of Children with Special Problems - Ioannina Branch, Ioannina, Greece.

**CONTENT:**

Improved perinatal and neonatal care has significantly increased the survival of extremely preterm (EP) infants. However, surviving children born EP are at high risk of long-term neurodevelopmental problems, particularly cerebral palsy (CP). The aim of the study was to investigate the trends in survival and evaluate the prevalence of CP among EP neonates hospitalized in the Neonatal Intensive Care Unit (NICU) of Ioannina University Hospital – the referral tertiary perinatal centre for northwest Greece. Also the perinatal data of the study population were recorded.

The study population comprised all neonates with gestational age (GA) ≤28 weeks who were cared for in the NICU from January 1, 2000 to December 31, 2015. The survival rates and the perinatal characteristics were retrospectively analyzed from the electronic NICU database. Cerebral palsy cases were identified at the outpatient neonatal follow-up clinic and subsequently referred to the special CP team. Minimum age for the diagnosis of CP was the age of 2 years. Changes in these parameters were evaluated and compared in two periods: Period I (2000-2007) and period II (2008-2015).

193 EP neonates were cared for in the NICU: 74 in period I and 119 in II. The mean GA and BW were 26.3 weeks and 858g respectively. Outborns were 23% in period I vs 8% in II (p<0.01). 84 neonates (43.5%) were born to multiple pregnancies. A total of 121 (62.7%) survived to discharge: 43 (58.1%) in period I and 78 (65.5%) in II. Survival rate was 39.1% in neonates ≤26 weeks vs 75.8% at 26+1-28 weeks (p<0.01). Increased survival trend was observed at 26+1–28 weeks during period II (79.5% in period II vs 69.6% in I). Among 121 discharged infants, 93 (76.9%) attended the follow-up clinic: 36 in period I (83.7%) and 57 in II (73.1%). CP was diagnosed in 10 children (10.9%): 4 in period I and 6 in II. In period I 3 had severe tetraplegia and 1 diplegia. In period II 2 had tetraplegia and the remaining 4 had mild hemiplegia. All CP cases had severe cerebral lesions on neonatal ultrasound scan.

During the 16 years of the study, the total number of EP neonates and their survival at hospital discharge were increased at the second period. However CP prevalence remained stable in the study population and also during the second period CP cases were less severe. This demonstrates that increased number of survivors was not at the cost of later severe neurodevelopmental disability.

**COI:** None declared
ID: 940

TITLE: CLASSROOM-EVALUATED SCHOOL PERFORMANCE AT NINE YEARS OF AGE AFTER VERY PRETERM BIRTH

AUTHORS: Lisette Jansen 1; Cacha Peeters-Scholte 2; Sica Wiggers-de Bruine 3; Annette van den Berg-Huysmans 4; Jeanine van Klink 5; Andrea van Steenis 6; Monique Rijken 7; Robert Vermeiren 8; Sylke Steggerda 9.

AFFILIATIONS: 1/5. Department of Medical Psychology, Leiden University Medical Center, The Netherlands
2. Department of Neurology, Leiden University Medical Center, The Netherlands
3/4. Department of Radiology, Leiden University Medical Center, The Netherlands
6/7/9. Department of Neonatology, Leiden University Medical Center, The Netherlands
8. Department of Child and Adolescent Psychiatry, University Medical Center, Curium, Leiden, The Netherlands.

CONTENT:

Children born preterm are at risk for academic difficulties. They have a lower full-scale IQ compared to their peers and recent studies assessing school performance have found lower achievements for reading and spelling, but in particular for mathematics in extreme preterm (<28 weeks gestation). A major question for parents of a preterm born child is whether their child will be able to follow a regular educational trajectory. The aim of our study was to determine classroom-evaluated school performance nine years after preterm birth, in relation to perinatal risk factors, brain abnormalities on neonatal magnetic resonance imaging and maternal education.

Children were recruited from a cohort of 113 preterm infants (<32 weeks gestation), whom participated in a longitudinal prospective study, investigating brain injury and neurodevelopmental outcome. Data on perinatal risk factors, the presence of brain injury as seen on neonatal magnetic resonance imaging at term equivalent age and maternal education were collected. Information on school performance included enrollment in regular education or special (primary) education, grade repetition and classroom-evaluated school results from the Dutch Pupil Monitoring System regarding reading comprehension, spelling and mathematics.

Information on school enrollment was available in 87 children (77%), of whom 7 (8%) were in special primary education and 19 (22%) repeated a grade. These were higher percentages compared to their Dutch peers (p ≤ .05). Twenty percent received additional assistance in the classroom. Classroom-evaluated school results were obtained from 74 children (65%). A below average performance was often seen for reading comprehension, spelling and mathematics. Univariate analysis showed that a lower performance on reading comprehension was associated with male sex and maternal education, spelling with male sex and mathematics with BPD, white matter injury and maternal education. In a multivariate model, male sex and a lower level of maternal education were independently associated with a poorer performance on reading comprehension and moderate/severe white matter injury with mathematics.

More than half of preterm born children need extra assistance during their school age, either through support in the classroom, grade repetition or enrollment in special primary education. Preterm born children more often have difficulties with reading comprehension, spelling and mathematics. Regular follow-up therefore remains important for preterm born children during school age.

COI: None declared

Organising Institutions: Supported by: Powered by:
ID: LATE BREAKER

TITLE: RANDOMISED CONTROLLED TRIAL: VERY LOW MICRODROP DOSES OF PHENYLEPHRINE AND CYCLOPENTOLATE EYE DROPS FOR RETINOPATHY OF PREMATURITY EYE EXAMINATIONS

AUTHORS:

AFFILIATIONS:

CONTENT:

Background: Premature infants are being exposed to doses of mydriatic eye drops that are equivalent to, or more than, what an adult would be administered. These mydriatic eye drops are used to dilate the pupil to prepare the eye for a retinopathy of prematurity eye examination (ROPEE). Mydriatics have been associated with unwanted side effects, such as; bradycardia, apnoea, and necrotising enterocolitis. In some cases the use of these eye drops has been associated with fatalities.

To address these findings, this pilot study has evaluated the efficacy of low dose, microdrop administration of phenylephrine and cyclopentolate eye drops in premature infants.

Method: Sixteen premature infants were randomised to receive microdrop administration of treatment A; phenylephrine 1% and cyclopentolate 0.2%, or treatment B; phenylephrine 0.5% and cyclopentolate 0.1%.

Efficacy of the two regimens was ascertained from, 1) pupil measurements at baseline, time of ROPEE (approximately 45 min), 90 min and 120 min, 2) successful ROPEE performed by the Ophthalmologist. Additionally the Ophthalmologist gave a score on the ease of the ROPEE as being easy or difficult.

Results: All participants had sufficient pupil dilation for a successful ROPEE. Ophthalmologists rated the ROPEE as easy in 90% of the time. Pupil dilation measurements at the time of examination, mean ± SD, 4.8 mm ± 0.2 mm (95% CI 4.5-5.2) for treatment A, and 5 mm ± 0.2 mm (95%CI 4.6-5.4) for treatment B, with a non-statistically significant p-value of 0.61.

Conclusions: Very low microdrop doses of phenylephrine and cyclopentolate eye drops provide sufficient pupil dilation for the ophthalmologist to successfully screen for ROP. To date, this is the first randomised controlled trial evaluating the efficacy of very low microdrop doses of phenylephrine and cyclopentolate. This pilot study has provided valuable information to design a sufficiently powered non-inferiority randomised controlled trial.