



September 18th, 2021 08:30 - 10:30

## PARALLEL SESSION 34 - EFCNI 5

### ID 155. PARENTAL BONDING EFFECTS ON COGNITIVE OUTCOMES AFTER MODERATE AND LATE PRETERM BIRTH

**Lexuri Fernández De Gamarra-Oca<sup>1</sup>**, Leire Zubiaurre-Elorza<sup>1</sup>, Andrea Sierra-Ibarbia<sup>1</sup>, Ainara Gómez-Gastiasoro<sup>1</sup>, Begoña Loureiro<sup>2</sup>, Javier Peña<sup>1</sup>, M. Acebo García-Guerrero<sup>1</sup>, Naroa Ibarretxe-Bilbao<sup>1</sup>, Natalia Ojeda<sup>1</sup>  
<sup>1</sup>University Of Deusto, Bilbao, Spain, <sup>2</sup>Cruces University Hospital, Bilbao, Spain

Background: Moderate and late preterm (MLPT) neonates are born during a sensitive period for brain development, accounting for more than 80% of preterm deliveries. For this reason, the aim of this study was to assess the cognitive functioning after MLPT birth during childhood. Besides, it sought to evaluate the potential role that parental bonding may play in MLPT children's cognition. Methods: A total of 97 participants partook in this study: 40 moderate preterm-born children (Mage=11.63 years; SDage=1.61), 32 late preterm-born children (Mage=12.22 years; SDage=0.79), and 25 full-term peers (Mage=11.08 years; SDage=1.75). All participants underwent a cognitive assessment and parental bonding measures of care and overprotection were registered through The Parental Bonding Instrument. Cognitive functioning was assessed using a composite score (Cronbach's alpha=0.88) obtained from the following psychometric tests: Peabody Picture Vocabulary Test-III, Modified Wisconsin Card Sorting Test, Wechsler Intelligence Scale for Children-V, Verbal Fluency Test, Stroop Test, Color Trail Making Test, and Rey Auditory Verbal Learning Test. Results: Significant differences were found in cognitive functioning among groups with a large effect size ( $F=8.65$ ,  $p<0.001$ ,  $\eta_p^2=0.22$ ). Despite parental bonding's care and overprotection measures did not significantly differ between groups, care measure moderated the relation between the degree of maturity/immaturity at birth and cognitive functioning ( $F(4,92)=6.64$ ,  $p<0.001$ ,  $R^2=0.22$ ). In terms of different degrees of care (i.e. low=24.00; medium=29.50; high=33.00), for only lower care measure there was a significant relation between the degree of maturity/immaturity at birth and cognitive functioning; that is, having a high-up care (i.e. higher than 29.08) did not further moderate this relation across childhood. Conclusions: Findings showed different cognitive functioning during childhood, with MLPT children reporting lower values. Additionally, higher parental care in this study seems to have a protective effect on cognition only in those with the lowest gestational age. In fact, while those born at term would perform worse cognitively in the face of higher degrees of care, those late preterm-born children will obtain similar outcomes regardless of the degree of care received. Nevertheless, cognitive functioning of those who are moderately preterm-born children is negatively affected by an unfavorable care level at this stage.

None declared



## ID 278. MOVEMENT DIFFICULTIES AT THE AGE OF 5 YEARS IN CHILDREN BORN EXTREMELY PRETERM: PREVALENCE AND RISK FACTORS IN THE EUROPEAN EPICE-SHIPS COHORT

**Mr Adrien M. Aubert<sup>1</sup>**, Professor Raquel Costa<sup>2</sup>, Professor Ulrika Ådén<sup>3</sup>, Professor Marina Cuttini<sup>4</sup>, Professor Mairi Männamaa<sup>5</sup>, Professor Véronique Pierrat<sup>1</sup>, Professor Iemke Sarrechia<sup>6</sup>, Professor Arno F. van Heijst<sup>7</sup>, Professor Michael Zemlin<sup>8</sup>, Professor Samantha Johnson<sup>9</sup>, Professor Jennifer Zeitlin<sup>1</sup>

<sup>1</sup>Université de Paris, CRESS, Obstetrical Perinatal and Pediatric Epidemiology Research Team, EPOPé, Inserm, Inrae, Paris F-75004, France, <sup>2</sup>EPIUnit, Instituto de Saúde Pública, Universidade do Porto, Porto 4050-600, Portugal, <sup>3</sup>Department of Women's and Children's Health, Karolinska Institutet, Stockholm, Sweden, <sup>4</sup>Clinical Care and Management Innovation Research Area, Bambino Gesù Pediatric Hospital, Roma, Lazio, Italy, <sup>5</sup>Department of Pediatrics, University of Tartu, Children's Clinic of Tartu University Hospital, Tartu, Estonia, <sup>6</sup>Centre for Developmental Disabilities, Antwerp University Hospital, Belgium; Department of Primary & Interdisciplinary Care, Disability Studies, Faculty of Medicine, University of Antwerp, Antwerp, Belgium, <sup>7</sup>Department of Neonatology, Radboud University Medical Center-Amalia Children's Hospital, Nijmegen, The Netherlands, <sup>8</sup>Department of Neonatology, University of Heidelberg, Heidelberg, Germany, <sup>9</sup>Department of Health Sciences, University of Leicester, Leicester, The United Kingdom

### Background:

Children born extremely preterm (EPT <28 weeks of gestational age (GA)) have a higher risk for movement difficulties (MD) compared to their term-born peers. However, estimates of the prevalence of MD vary greatly between studies. In addition, while male sex has been consistently associated with increased risk for MD in the literature, knowledge about other perinatal, neonatal and sociodemographic risk factors is needed to identify the children who could benefit from early intervention.

### Methods:

We used data from a European population-based cohort of children born EPT in 2011-2012 in 19 regions in 11 European countries. 772 children, without cerebral palsy (CP) or severe neurosensory impairment (NSI), were assessed with the Movement Assessment Battery for Children – 2nd edition (MABC-2) at 5 years of age and then classified as having no MD, at risk of MD (6th to 15th percentile) or significant MD (SMD) ( $\leq$ 5th percentile). We assessed associations of MD with perinatal, neonatal and sociodemographic factors using multinomial logistic regression models. Inverse probability weighting (IPW) was used to account for loss to follow-up.

### Results:

47.4% of the children had no MD, 23.7% were at risk of MD, and 28.9% had SMD. Wide variations existed between countries (range of SMD: 11.6% to 74.2%). Children born with a lower GA, severe brain lesions, and who received postnatal steroids were more likely to have SMD, while small for GA (<3rd percentile), male sex and BPD were associated with being at risk of MD and SMD. Children with younger and less educated mothers were more likely to have SMD, whereas children with at least one parent unemployed were more likely to be at risk of MD.

### - Conclusion:

This study confirms a very high prevalence of MD among EPT children. In addition to perinatal and neonatal risk factors, we show that social factors affect the risk for MD. Persistent differences between countries after case-mix adjustment suggest that contextual factors play a role which may explain widely varying prevalence estimates from study to study.

None declared



## ID 408. Creative music therapy and neurodevelopmental outcomes in pre-term infants at age two years: Results of a randomized controlled pilot trial

**Doctor Friederike Haslbeck<sup>1</sup>**, Prof. emer. Dr. Hans-Ulrich Bucher<sup>1</sup>, Prof. Dr. Dirk Bassler<sup>1</sup>, Dr. Cornelia Haggmann<sup>2</sup>, Prof. Dr. Giancarlo Natalucci<sup>1</sup>

<sup>1</sup>Newborn Research Zurich, University Hospital Zurich, Department of Neonatology and University Zurich, Zurich, Switzerland, <sup>2</sup>University Children's Hospital, Neonatology, Zurich, Switzerland

**Background:** Creative music therapy (CMT) aims to prevent and reduce neurobehavioral deficits in high-risk neonates using musical stimulation and socio-emotional co-regulation, integrating both the infant and parent(s) in meaningful infant-directed singing. The present trial's primary outcome analysis provide evidence that CMT beneficially affects brain connectivity as assessed by cranial magnetic resonance assessment in very preterm born infants (VPT) at term equivalent age.

**Methods:** This randomized, clinical pilot trial was conducted to test the feasibility and the effect of CMT on structural brain development in VPT, i.e., born < 32 weeks' gestation. Here, we present the prespecified secondary outcomes at two years of corrected age. Eighty-two infants were randomized to either CMT or standard care. A specially trained music therapist provided CMT 2-3 times a week during hospitalization. The secondary outcomes were: the cognitive, language, and motor scores of the Bayley Scales of Infant and Toddler Development, 3rd edition; cerebral palsy; hearing and vision problems; and somatic growth parameters. Outcomes were compared between groups according to the treatment assigned to randomization using the independent t- and the Fisher's Exact test for continuous and nominal variables.

**Results:** Fifty-six (68%) randomized infants underwent follow-up examination. Baseline characteristics of participants and non-participants in the two-year follow-up were similar except for of a lower gestational age ( $p < .001$ ), longer supplemental oxygen therapy ( $p = .001$ ), and longer hospital stay ( $p < .001$ ) in infants assessed at age two years than in dropouts. No evidence for a difference in the secondary outcomes was observed between groups.

**Discussion:** While in this randomized pilot trial, a positive effect of CMT on brain connectivity was demonstrated in VPT infants at term equivalent age, no evidence of a treatment effect on cognitive, language, motor, and neurosensory outcomes was reported at two years of corrected age.

**Conclusion:** Long-term neurodevelopmental follow-up of larger cohorts of VPT exposed to CMT are recommended to elucidate possible effects of music on more sensitive outcomes such as executive function, detailed language processing, and social-emotional development since the small size of the collective and the short-term neurodevelopmental measurements limit these findings' generalisability.

None declared



## ID 416. NEWBORN NEUROBEHAVIOR IS RELATED TO LATER NEURODEVELOPMENT AND SOCIAL COGNITION SKILLS IN EXTREMELY PRETERM BORN CHILDREN, A PROSPECTIVE LONGITUDINAL COHORT STUDY

**Mrs Leena Aho<sup>1</sup>**

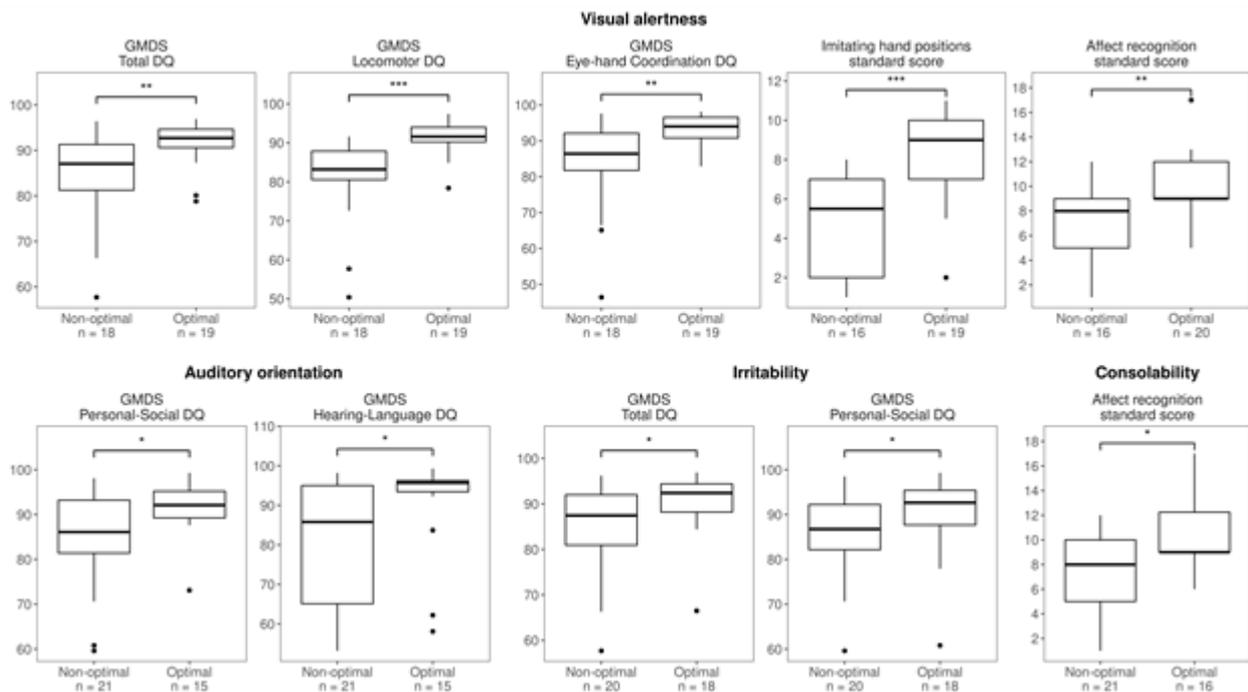
<sup>1</sup>Helsinki University Hospital, Helsinki, Finland

**Background** Extremely preterm born children are at high risk for sensorimotor, language, visuocognitive and social impairments. Understanding of neonatal predictors of childhood outcomes is important for early detection of neurodevelopmental impairments and for allocating timely interventions at an early age of the potential brain plasticity. Our aim was to evaluate the ability of the neonatal neurobehavioral characteristics to act as an indicator of later neurodevelopment and neurocognitive performance.

**Methods** Sixty-six infants born extremely preterm (< 28 gestational weeks) were followed until 6.5 years. Neurobehavior at term age was assessed by the behavior subscale of Hammersmith Neonatal Neurological Examination (HNNE) using dichotomic rating, optimal and non-optimal. The Griffiths Scales (GMDS) at two years, and Wechsler Intelligence Scales and a Neuropsychological Assessment at 6.5 years were used to assess neurodevelopment and neurocognitive performance including social cognition skills.

**Results** An optimal auditory orientation at term age was associated with better developmental quotients (DQ) in Personal-Social and Hearing-Language GMDS subscale at 2 years ( $p < 0.05$ ). An optimal visual alertness was associated with better Total ( $p < 0.01$ ), Locomotor ( $p < 0.001$ ), and Eye-Hand Coordination DQs ( $p < 0.01$ ) at 2 years, and with sensorimotor function ( $p < 0.001$ ), and social perception ( $p < 0.01$ ) tests at 6.5 years of age. Figure.

**Conclusion** Newborn neurobehavior might serve as a precursor of social cognition skills and the HNNE behavior subscale offer a tool to identify infants at risk for later deficits in neurodevelopment and social cognition.





The relationships between the Hammersmith Neonatal Neurological Examination items and the Griffiths Mental Developmental Scales (GMDS) and a Developmental Neuropsychological Assessment. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

The relationships between the Hammersmith Neonatal Neurological Examination items and the Griffiths Mental Developmental Scales (GMDS) and a Developmental Neuropsychological Assessment. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.